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Lexical Inferencing Strategies and Topic Familiarity: A Multiple Case Study of Arabic EFL University Students Reading English Texts

by

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ABSTRACT

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Inferencing the meanings of unfamiliar words from context is a vital coping strategy that allows learners to compensate for a lack of specific language knowledge to meet the language demands when reading and listening. This study offers insights into the lexical inferencing behaviour displayed by L1 Arabic (a Semitic language) EFL learners as they inferenced the meanings of unfamiliar words while reading culturally familiar (Eid Al-Fiter) and unfamiliar (Bonfire Nights) topics. The current study aimed at exploring and describing how learners representing 3 different English proficiency levels (C1-B2-B1) approached the TWs and the text itself. In addition, the range of knowledge source clues and lexical inferencing strategies these three groups displayed as they inferenced the unfamiliar words while reading these two texts are examined.

An interpretive embedded mixed method multiple case study approach was adopted in the current study. The study employed a number of research instruments; Oxford's online proficiency test, a Vocabulary Levels Test, questionnaires (online and paper-based), semi-structured classroom observations, think-alouds, immediate stimulated recalls, semi-structured interviews and field notes. In addition, the reading materials and the choice of target words were developed by the researcher. Participants for the study were selected through stratified random sampling while data triangulation, thematic analysis and comparative methods have been applied to analyze the data.

The findings of the study stress the importance of readers' topic familiarity of the text; learners activated more clues and strategies in the familiar topic compared to the unfamiliar one. In terms of proficiency levels, the three groups either displayed the same or different combinations of knowledge source clues and lexical inferencing strategies due to their proficiency levels across the texts. Furthermore, it was found that metacognitive awareness plays a vital role in learners' approaches to the reading texts, the target words, their strategic behaviour and incidental vocabulary learning. The results of the study have led to theoretical contributions to the field of applied linguistics and the proposal of a lexical inferencing model for the L1 Arabic EFL reader. In addition, a number of pedagogical implications have been suggested to guide and improve L1 Arabic EFL readers in their lexical inferencing processes while reading, such as, teaching inferencing strategies, enhancing metacognitive reading strategies, increasing L1 Arabic EFL readers' vocabulary size.

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Declaration of Authorship

I, Nesreen Masoud Eid Al-Ahmadi declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

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I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission.

Signed: .....

Date: .....

Acknowledgements

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List of Abbreviations

Terms	Abbreviations
Bonfire Night	Text-2, unfamiliar text
Eid Al-Fiter	Text-1, familiar text
English as a Foreign Language	EFL
English as a Second Language	ESL
Evaluating Strategy	ES
First Language	L1
Foreign Language	FL
Form-Focused Strategy	FFS
Immediate Stimulated Recall	ISR
Knowledge Sources	KS
Lexical Inferencing Strategy	LIFS
Meaning-Focused Strategy	MFS
Mixed Methods Research	MMR
Monitoring Strategy	MS
Proficiency Level	PL
Second Language	L2
Target Language	TL
Target Word	TW
Think-Aloud	TA
Unknown Word	UNW
Verbal Report	VR

Chapter 1 Introduction

> Research is formalized curiosity. It is poking and prying with purpose. It is seeking that he who wishes may know the secrets of the world and they that dwell therein.
>
> Hurston (1997) cited in Silverman (2013:81)

This chapter presents an overview of the research study, background and context. It begins by discussing the importance of reading comprehension in academic settings and sets the background of the study through which the phenomenon of lexical inferencing strategies (LIFSs) during reading is introduced and defined. This is followed by the research study's rationale, significance and objectives. Next, the study's research questions are listed before a summary of its methodology and methods are presented to the reader. A brief overview of the status of English in Saudi Arabia is presented focusing more on learning English in the Saudi higher educational context. Finally, a summary of the structure of this thesis is outlined to the reader.

1.1 Background of the study

The importance of reading in a foreign (FL) or a second language (SL) has always been an area of interest especially in academic settings. For example, Cziko (1980:473) states that "throughout the world the primary, secondary and university education of most students is conducted in whole or in part in a language other than the one spoken at home and the academic success of these students is intimately related to their ability to read a second language". Interest in second language reading research and practice has increased dramatically in the past 15 years (Carrell and Grabe, 2013), particularly in students' progress and success in academic university settings (Anderson, 1991; Grabe, 1991; Huckin and Hayes, 1993; Bengeleil, 2001; Grabe, 2009). For in today's world, reading knowledge of a foreign/second language is essential in academic studies, professional success and personal development (Alderson, 1984). Learners' ability to read in English, whether English is regarded as a foreign language (EFL) or a second language (ESL), plays a substantial role in second language (L2) literacy. L2 reading ability is regarded as the most needed skill for EFL learners in academic settings and its inability may hinder academic development (Alderson, 1984; Mebarki, 2011). Since L2 reading presents the primary method that L2 learners can learn on their own beyond the borders of the classroom (Carrell and Grabe, 2013). Furthermore, due to the increasing growing international status of English today, the ability to read in English is of primary importance because it allows access to academic and professional materials, for example, journals and books relevant to specializations or professions which are

written through the medium of English. Furthermore, the ability to read in English allows individuals to keep updated with current issues in today's world.

Research supports the view that reading in a language that is not the learner's first is a source of considerable difficulty (Alderson, 1984; Grabe, 1991; Block, 1992; Abu-Rabia and Bluestein-Danon, 2012; Verhoeven *et al.*, 2019). L2 readers are expected to encounter more unknown words, including conceptually unfamiliar ones, language and cultural references while reading authentic or adapted reading material than L1 readers. Thus, they need to repair more gaps in their comprehension than L1 readers (Shefelbine, 1990; Block, 1992). Nation (2001:223) puts forward the idea that, regardless of how much a learner knows, "there will always be words that are unknown and strategy use provides a way of coping with these unknown words" Thus, learners of English, especially FL learners, are requested to read authentic academic texts which were not written for people with a limited stock of vocabulary that contain many unfamiliar words (Laufer and Yano, 2001). During reading comprehension, EFL/ESL learners have identified lexical problems as the most severe source of difficulty while encountering a large number of unknown words (UNWs) due to their limited vocabulary knowledge size (Walker, 1983; Laufer and Sim, 1985b; Grabe, 1991; Huckin and Bloch, 1993; Gu and Johnson, 1996; Nagy, 1997; Nation and Waring, 1997). Such a limitation has highlighted vocabulary acquisition as "the largest and most important task facing the language learner" (Swan and Walter, 1984:vii). Encountering UNWs while reading is not only a momentary obstacle for learners but can become severe enough to lead to miscomprehending the whole text (Haynes and Baker, 1993; Wittrock, 1975 cited in Al-Fuhaid, 2004:98; Qian, 2004). This scenario is even more difficult for EFL learners who are at a disadvantage regarding the amount of language exposure compared to learners in ESL settings. Therefore, learners need to come up with ways to compensate for their limited vocabulary knowledge.

Early reading research tended to focus on the product of reading, such as the scores on a reading comprehension text and the problems that were associated with it. One early explanation to understanding the nature of reading comprehension problems was by Alderson (1984:4), who put forth the question; "Is second language reading a language problem or a reading problem?" and proposed two primary hypotheses:

1. "Poor reading in a foreign language is due to poor reading ability in the first language. Poor first-language readers will read poorly in the foreign language and good first-language readers will read well in the foreign language.
2. Poor reading in a foreign language is due to inadequate knowledge of the target language".

However, the imperial evidence is by no means conclusive. Different studies provide support for these different views, in terms of whether reading comprehension problems are due to reading problems in readers L1 or limitations in language proficiency in the TL (for an overview see Coady, 1979; Cummins, 1979; Clarke, 1980; Cummins, 1981; Alderson, 1984; Koda, 2005).

Since then, there has been a shift from a focus on the product of reading to an emphasis on its process. Through identifying how language learners use tactics or strategies while reading to overcome language reading comprehension problems helps "reveal a reader's resources for understanding" (Block, 1986:465). Oxford (1990) labels these tactics as compensational strategies used to overcome breakdowns in language communications. In her taxonomy of language learning strategies, Oxford (1990) lists 'guessing intelligently' as a sub-strategy under her overarching direct 'compensation strategies' where guessing involves using both available linguistic and non-linguistic clues. Guessing meanings of UNWs, also known as inferencing[1], is part of vocabulary learning strategies which alternatively composes part of the language learning strategies (Oxford, 1990; Schmitt, 1997; Nation, 2001). However, guessing/inferencing strategies differ from vocabulary learning strategies in that they only involve the initial step of deriving the initial meanings of unknown words while the latter set of strategies involve intentionally (deliberately) learning the meanings of these derived words. Thus, vocabulary learning strategies are the second step after initially extracting the meanings of the unknown words through guessing/inferencing.

Therefore, lexical inferencing is viewed as a vital technique for EFL learners by acting as a compensatory strategy when encountering difficulty in reading comprehension due to low/limited proficiency level (PL) (Tavakoli and Hayati, 2011; Rahbarian and Oroji, 2014) or vocabulary knowledge or both (Nassaji, 2006; Jelić, 2007). Success of lexical inferencing, as studies have reported, is motivated by factors depending on the reader's PL, vocabulary size and background knowledge. In addition to the text and the internal structure of the unknown/unfamiliar words themselves (Haastrup, 1991; Brown, 1993; Chern, 1993; Nassaji, 2006; Wesche and Paribakht, 2010; Tavakoli and Hayati, 2011). In language classrooms, learners are taught to judge the saliency or importance of the UNWs to understanding the message. If the UNW is important, then looking that word up or using the available surrounding content to guess begins, otherwise it can

[1] For the purpose of this introductory chapter, the term guessing and inferencing is used interchangeably. However, a distinction is made between the two terms in Chapter 2.

be ignored (Laufer and Yano, 2001). However, a critical question arises, how and on what basis can learners evaluate the importance of UNWs in contexts?

Guessing from context is a complex process, in which many factors can contribute to the success/failure of uncovering meanings of UNWs as Bensoussan and Laufer (1984:27) describe:

> Lexical guessing is a very difficult task either because of the complexity of the text, or because of the limitations of the reader, or both. Some words do not have clues in the text in which they appear; when there are clues for such words foreign language learners will not necessary look for them; and when readers do look for these clues very often they cannot locate or understand them.

Readers use a variety of strategies when encountering UNWs in a text to compensate for their limited lexical knowledge. Some tend to ignore these words, consult a dictionary, ask the teacher/peer for help or attempt to guess the meanings through the context using either contextual clues or resorting to their background knowledge about the topic (Haastrup, 1991; Chern, 1993; Haynes, 1993; De Bot *et al.*, 1997; Schmitt, 1997; Paribakht and Wesche, 1999; Nation, 2001; Yin, 2011; Alhaysony, 2012). Due to its critical importance for language learners, especially EFL, Liu and Nation (1985:40) stress that "Guessing from context is a very powerful strategy for dealing with low frequency vocabulary. It deserves a considerable amount of attention in English classes".

Vocabulary size is a good indicator of a range of language abilities; grammatical knowledge, reading and writing (Milton and Meara, 1998). Due to their limited vocabulary, Saudi students face difficulties in reading English materials due to their insufficient vocabulary learnt at schools, the lack of vocabulary learning strategy training and instruction. A number of studies have highlighted Saudi university students' limited level of vocabulary (size) (Al-Bogami, 1995; Al-Akloby, 2001; Aldukhayel, 2016). For example, Al-Nujaidi (2003) found that 226 first year students representing both genders from 7 different institutions in Saudi Arabia had average scores of 10/30 at the 2000 word frequency band on the Vocabulary Levels Test (Schmitt, 2010). More specifically, the average vocabulary size at the 2000 band was around 680 words while for the 3000 band, between 445 and 680 words. This was further supported by Masrai and Milton (2012), who found that the vocabulary size of 92 Saudi male university students majoring in English was between 1650-3000 words upon entering university and around 3000-5000 words near graduation.

There are various reasons why Saudi learners display a low vocabulary level, one of which is the teaching methods used. English classrooms are teacher-centered, where Arabic (L1) is also used

alongside English, old teaching methods like the Grammar Translation and Audio-Lingual methods are still used, in addition to recent ones like the Communicative Language Teaching approach (Al-Seghayer, 2014; Alqahtani, 2018; Alrabai, 2018). New words are taught either through looking them up in a dictionary or providing their meanings in Arabic by the teacher and memorising them later (Baniabdelrahman and Al-shumaimeri, 2014; Alrashidi and Phan, 2015).

The second might be related to EFL learners' uptake of words which Laufer (2010) attributes low vocabulary levels to the limited exposure to English beyond the classroom. Compared to FL learners in Europe and the Far East, who acquire 3-4 words per hour (Milton and Meara, 1998), Laufer's (2010) Middle East FL learners provided a slightly lower estimate of 2-3 words per contact hour. Saudi EFL learners also suffer from limited exposure to English which also explains why Masrai and Milton's (2012) findings are in line with Laufer's (2010), where Saudi university male students acquired vocabulary at a slightly lower rate between 2-2:1/2 words per contact hour. Further supporting this limited exposure, several studies in the Saudi context reported that learners do not read English material outside the classroom either for pleasure (Alrabai, 2015) or to improve their reading ability (Al-Nujaidi, 2003; Alsamadani, 2011). Because English is not immediately relevant to their needs, Saudi students do not pay attention to the language and devote minimal effort just to pass to the next grade/level (Al-Seghayer, 2014). Teachers in the Saudi EFL context, including myself, already know that learners only memorize grammatical rules, passages of written texts and vocabulary to pass exams and achieve high grades without actually mastering the language (Zaid, 1993; Alrabai, 2018).

Within the classroom, learners might resort to looking up unfamiliar words in a dictionary or asking their peers/teacher but on their own and during reading tests, the situation is more challenging, let alone reading a text which they lack the relevant background knowledge to comprehend the text. L1 conceptual knowledge is a major source of individual differences in L2 text comprehension (Carrell and Eisterhold, 1983; Koda, 2005). However, in the Saudi context, the scenario is even more severe/difficult since FL published textbooks, which are only used in higher education at university levels, are modified by their original publishers in order to filter out language phrases, pictures and topics that violate the religious and social aspects of the Saudi culture. The results are several international textbooks with labels 'Middle East', 'Middle East and North Africa' and 'Special Edition'. Therefore, how will L1 Arabic EFL learners react to a reading topic for which they lack relevant background knowledge embedded with unknown words? What lexical inferencing (guessing) strategies (LIFSs) will EFL Saudi learners resort to in order to guess their meanings? Furthermore, what clues and knowledge sources (KS) (i.e. knowledge of phonology/orthography, morphology, etc.) of the target language (TL) will they use? Similarly,

would they do better on texts resembling a topic from their own Saudi culture compared to one culturally distant (unfamiliar/novel) from theirs in the TL?

1.2 Rationale of the study

A number of rationales for this current study have emerged from both the lexical inferencing literature and my own personal motivation which stemmed from my experiences as a university language instructor in the Saudi higher education context. The following sections present the current study's rationale.

The first and the most important rationale of this study lies in the fact that very little has been done with first language speakers of Semitic languages, more specifically Arabic compared to other languages. Semitic languages have the longest recorded history of any language family and belong to the Afro-Asiatic language phylum (Huehnergard and Pat-El, 2019). Arabic, Hebrew, Aramaic and Ethiopian are just a few examples of Semitic languages. The vast majority of lexical inferencing studies have been either conducted on English as a FL by different learners representing different linguistic background; Chinese (Li, 1988; Chern, 1993; Haynes, 1993; Huckin and Bloch, 1993; Yin, 2011; Hu and Nassaji, 2012; Hu and Nassaji, 2014), Iranian (Paribakht, 2005; Paribakht and Wesche, 2006; Riazi and Babaei, 2008; Tavakoli and Hayati, 2011; Atef-Vahid *et al.*, 2013; Rahbarian and Oroji, 2014), Spanish (Walker, 1983), Japanese (Matsumura, 2010), Philippines (Soria, 2001) Russian (Comer, 2012), Mandarin (Hostetler, 2013) and Ethiopian (Ibrahim, 2015). Some also investigated Chinese and Korean second language learners of English (Qian, 2004) while others researched ESL learners or advanced EFL studying abroad (mainly enrolled on MA programmes) or residing there (Haynes, 1993; Huckin and Bloch, 1993; Hu and Nassaji, 2012; Hostetler, 2013; Hu and Nassaji, 2014). However, exposure to an all English environment might affect their lexical inferencing strategy behaviours leading those studies to "not be reflective of subjects learning English in their native country" (Huckin and Bloch, 1993:174). Thus, supporting the argument of inapplicability of comparing between findings to other EFL learners living in their homeland. This is the case with my participants in this present study which emphasises a need for research on learners of different language backgrounds in order to further understand the process inferencing UNWs while reading.

Furthermore, learners not only differed in the amount of exposure to the TL (English) but can also be affected by cross-language factors like L1 influences on L2 performance, known as "transfer effects" in the linguistics sub-systems (phonology, morphology, etc.) (Wesche and Paribakht, 2010). Researchers found that the closer the target language is to the native language, the easier it is for learners to benefit from some of these similarities. In the lexical inferencing literature, the

use of cognates has been reported in a number of studies (De Bot *et al.*, 1997; Paribakht and Wesche, 1999; Bengeleil, 2001; Tavakoli and Hayati, 2011). Cognates are "words between two languages which come from the same parent word. Speakers of Romance languages have a distinct advantage in this regard, for many English words can be guessed according to their similarity to Romance words" (Schmitt *et al.*, 2001:77). However, even equipped with knowledge of cognates does not essentially entail this knowledge will be used by learners. Paribakht and Wesche (1999) reported that although their 38 intermediate-level university ESL participants were fluent in French, only two learners used cognates (French to English) to derive meanings of unfamiliar words. Furthermore, it has also been reported that knowledge of cognates is more misleading than helpful in deriving word meaning (Haastrup, 1991; Laufer, 1997a; Paribakht and Wesche, 1999). However, since Saudi Arabic does not share cognates with English, cognates are not a part of this current study. Research findings obtained from learners whose native language is an Indo-European one (e.g., French. Spanish) cannot be generalized without causation to learners whose native language is an Afro-Asiatic language (as Arabic a Semitic language) (Al-Shumaimeri, 2006).

On the other hand, studies conducted on L1 Arabic learners are rare, with Libyan participants (Bengeleil, 2001; Bengeleil and Paribakht, 2004) or without any given information about their Arabic nationality (Hostetler, 2013). However, a few studies have reported investigating learners from mixed L1 backgrounds which included L1 speakers of Arabic (Haynes, 1993; De Bot *et al.*, 1997; Paribakht and Wesche, 1999; Nassaji, 2003a; Nassaji, 2006). English and Arabic belong to two different language families, English belongs to the Indo-European group of languages while Arabic, as mentioned earlier, belongs to the Afro-Asiatic group of languages (Benrabah, 2014). However, it of crucial importance to highlight to the reader that Arabic participants in these mixed L1 backgrounds were Moroccan and/or Algerian, who also have some linguistic knowledge of French or Spanish due to the historical colonial era which has shaped the sociocultural history of Algeria and Morocco as well as their social linguistic profile (for an overview see Benrabah, 2014). This is also true for Libyan participants, who have some linguistic knowledge of Italian (D'Anna, 2018). Thus, these participants could benefit by tapping into their knowledge of French, Spanish or Italian and their similarities to English when inferencing.

Cross-linguistic reading research comparing L2 readers with different L1 backgrounds has consistently demonstrated superior word recognition performance for those with L1 orthographic backgrounds more similar to the L2 (Carrell and Grabe, 2013). In Indo-European languages, words tend to be composed of a relatively stable root (stem) and a system of affixes added to these stems. On the other hand, Arabic words are constructed differently from European languages, where every base or root word in Arabic includes three or sometimes four consonants. When

reading in Arabic, the consonantal root is of great importance since it contains the majority of the semantic information (Alhazmi et al., 2019). These consonants can be combined with different vowel patterns to produce a family of words that share a common meaning (Ryan and Meara, 1991). For example, the root /k-t-b/ combines with vowel patterns to produce: '***maktaba'*** (library), '***Ketaab'*** (book), '***Kataba'*** (he wrote), '***Katabat'*** (she wrote) and so on. In each case, the root/k-t-b/is retained in root order. Reading comprehension in Arabic thus depends mainly on the ability to recognize the construal roots in words then employ contextual and linguistic knowledge (Bu Rabia and Siegel, 1995; Abu-Rabia, 1998).

Therefore, the literature suggests that that native Arabic speakers exhibit unique difficulty when reading in English due to the characteristics of the Arabic alphabetic system, how words are constructed and the reading strategies used by L1 Arabic speakers when reading English as a FL (Ryan and Meara, 1991; Masrai and Milton, 2018; Alhazmi *et al.*, 2019). In order to explain the difficulty in reading English by Arabic speakers, the notion of 'vowel blindness' has been addressed in the literature. The underlying hypothesis of this concept is the idea that Arabic speakers tackle the complexity of English vowels in written English words by ignoring them and transfer the skills of accessing meaning via the consonants only, as they do in Arabic (Ryan and Meara, 1991; Khan, 2013). Vowel blindness has been viewed as the process of inappropriate word-decoding strategy transferred from L1 Arabic reading that gives more attention to consonant letters than vowels and has been used to explain reading difficulty among native Arabic learners of English (Alhazmi *et al.*, 2019).

Alsulaimani (1990) displayed English words on a computer screen and participants were ask to read them aloud. Errors were then analysed and it was found that they almost preserved the consonant structure of the target word. The vowels were often omitted, incorrect or occur in the wrong place relative to the surrounding consonant. For example, '***pulls***' for '***plus***', where the underlying constants **PLS** patterns are preserved but the vowel position varies. Ryan and Meara (1991) report that because of the emphasis on consonants in the lexical structure and orthography of their L1, Arabic speakers tended to do the same when attempting to recognize L2 words. Participants in this study were 3 groups of 10 Arabic male speakers from the Middle East (experimental group) and two control groups; English teachers while the second were non-Arabic speakers (7 males, 3 females) with no further information regarding their L1 backgrounds. In Ryan and Meara's (1991) study, participants were shown ten-letter words on a computer screen for approximately 1 second, then the word disappeared for another 2 seconds. The word then reappeared either spelled correctly or in an altered form where a vowel is removed either in the second, fourth, sixth or eighth position. The participants were then asked to decide whether the two presentations are

identical by clicking either YES or NO on the keyboard. Decision time for each participant to each stimulus was calculated, too. Findings report that L1 speakers of Arabic scored the highest number of incorrect responses and the slowest reaction time for correct responses for each stimulus (position) type. Thus supporting the impact L1 orthography has on L2 processing as reported by others (Khan, 2013; Alhazmi *et al.*, 2019).

Thus, there is a need for research involving Semitic languages which in the present study are Saudi L1 Arabic speakers learning English as a FL. Studies of this type compared to other nationalities and language groups still remain in their early stages compared to Indo-European languages. Clackson (2007:1) stresses this point for:

> Indo-European (IE) is the best-studied language family in the world. For much of the past 200 years more scholars have worked on the comparative philology of IE than on all the other areas of linguistics put together. We know more about the history and relationships of the IE languages than about any other group of languages.

The only study conducted in the Gulf Cooperation Council area that investigated topic familiarity and UNWs was by Klykova (2008) who addressed Emirati ESL learners. English in the United Arab Emirates is an official language that is now used alongside Arabic (L1) in most businesses and government sectors in the country (Troudi, 2007; Al-Issa and Dahan, 2011; Dorsey, 2018). Through using multiple choice reading comprehension questions and a questionnaire, Klykova's study found that topic familiarity had a positive impact on lexical inferencing. Learners displayed more correct inferences while reading the familiar topic compared to the less familiar one. Furthermore, being equipped with appropriate background knowledge may have helped learners to direct their attention more efficiently to input while reading the more familiar story. However, a limitation of this study was using multiple choice reading comprehension questions which are prone to random guessing. On the other hand, resorting to questionnaires requesting participants to report on their inferencing strategies have found a difference between participants' observed behaviours while inferencing compared to their self-perception stagey use reported on questionnaires (Qian, 2004; Jelić, 2007).

Only two studies investigated word guessing/inferencing in general within a Saudi university setting (Alhaysony, 2012; Baniabdelrahman and Al-shumaimeri, 2014). The limitations of both these two studies were in terms of their methodology. A closed questionnaire where the LIFSs were listed through a 5-point Likert scale in the first study. While the second study listed 9 closed multiple choice statements with the last choice as an open-ended item. Solely using survey data in strategy research is precarious, for "perceived learning strategies do not always reliably reflect what strategies learners actually adopt" (Qian, 2004:167). Thus, a mismatch between participants'

perceptions of LIFSs and their actual adapted behaviour occurs. This effect was present in Qian's (2004:166) lexical inferencing study where he advocates that:

> It now becomes a question whether or not learners' judgements should be deemed reliable based on their reports on their own reading behaviours when encountering unknown lexical items in texts. In other words, we should be concerned about to what extent we can rely on research results purely generated from survey data

This is further supported by Jelić (2007:253), who also employed questionnaires to investigate LIFSs and reports a "difference between lexical inferencing strategies actually used by the learners and their perception of their strategy use". Furthermore, learners might use more than one LIFS to approach UNWs (Harmon, 1999; Hu and Nassaji, 2014) which questionnaires fail to capture or report their order of occurrence that would add further insights to this phenomenon. Thus, there is a need for a different self-report method to capture what learners are actually doing while they are carrying out the lexical inferencing task.

A second important rationale for conducting the current study is that research on learner's background knowledge, also known as topic familiarity, and lexical inferencing strategies is still in its early stages. From the perspective of reading, a lot of research has been done on the role of EFL/ESL learners' topic familiarity and reading comprehension (Carrell, 1983b, 1983a; Al-Shumaimeri, 2006; Pulido, 2007a, 2009; Biria and Baghbaderani, 2015) including the role of cultural background knowledge and reading comprehension (Floyd and Carrell, 1987; Dehghan and Sadighi, 2011; Yousef *et al.*, 2014). However, the opposite is true for LIFSs research, where the role of learners' background knowledge/topic familiarity of the text and inferencing UNWs has only been highlighted by a handful of studies (Haastrup, 1991; Bengeleil and Paribakht, 2004; Wesche and Paribakht, 2010; Alhinty, 2011; Atef-Vahid *et al.*, 2013; Hu and Nassaji, 2014; Ibrahim, 2015). However, to the best of the researcher's knowledge, there has not been a study that has investigated the role of the reader's cultural background knowledge/topic familiarity of a text and LIFSs to uncover the meanings of UNWs from the perspective of lexical inferencing as opposed to reading comprehension.

The third motivation for this present study builds up from the previous rationale. In terms of reading comprehension, except for Haastrup (1991) most lexical inferencing studies have failed to consider linking LIFSs with proposed reading models, like the Schema Theory or Coady's (1979) Psychological Model of L2 reading. For in order to understand how learners inference the meanings of unfamiliar words, a crucial understanding of how learners first build their comprehension of the text and through which begin to inferencing the UNWs is needed.

The present study also builds on methodological rationales which emerged from the fact that diverse methods have been used in investigating LIFSs during reading. These varied from the nature and number of TWs used, the choice of texts (authentic, adapted or constructed for the purpose of the study) and the data collection instruments used. Studies were mostly quantitative, thus mirroring the researcher's positivist approach to the topic and their deductive approach to the phenomenon. These studies used statistical analysis to look for significance in order to generalize their findings. Arguably, there remains a need to incorporate a deeper qualitative approach allowing richer detail regarding the topic (Dörnyei, 2007; Cohen *et al.*, 2018).

Although the majority of studies used audiotaped think-alouds, a form of verbal report, it was mainly the only method used (Haynes, 1993; Huckin and Bloch, 1993; Paribakht and Wesche, 1999; Fukkink, 2005; Nassaji, 2006; Paribakht and Wesche, 2006; Wesche and Paribakht, 2010; Hu and Nassaji, 2012; Hu and Nassaji, 2014). A handful of studies followed think-alouds with other instruments through retrospective questioning; either immediate in the form of questions in segments during the think-alouds to probe into some of the statements mentioned during the think-alouds (De Bot *et al.*, 1997) or a delayed retrospective questioning after finishing the task (Haastrup, 1991; Bengeleil and Paribakht, 2004; Yin, 2011; Alhaysony, 2012). Using a monomethod in research leads to incomplete and inconclusive findings, thus stressing the need for triangulation, both methodological (using more than one method to investigate the research topic) and data (generating data from different methods) triangulation (Clark and Ivankova, 2016; Cohen *et al.*, 2018; Creswell and Creswell, 2018). Studies also varied in including training/warm-ups before think-alouds (De Bot *et al.*, 1997; Paribakht and Wesche, 1999; Nassaji, 2003a; Bengeleil and Paribakht, 2004; Fukkink, 2005; Nassaji, 2006; Paribakht and Wesche, 2006; Wesche and Paribakht, 2010; Yin, 2011; Comer, 2012; Hu and Nassaji, 2012; Hu and Nassaji, 2014; Ibrahim, 2015). Warm-ups are a compulsory critical element in ensuring validity in verbal reports (Ericsson and Simon, 1984). On the other hand, others did not provide any warm-ups (Haastrup, 1991; Huckin and Bloch, 1993). In terms of research instruments, researchers have used cloze texts (Dubin and Olshtain, 1993; Fukkink, 2005; Biria and Baghbaderani, 2015) or questionnaires (Qian, 2004; Jelić, 2007), all of which have their limitations.

Therefore, the present study is different from these previous studies in the fact that not only were there think-aloud warm-ups before the main think-alouds were conducted but these think-alouds were followed by immediate stimulated recalls. The presence of a stimulus in these recalls has the advantage of adding validity to the reports obtained through minimizing the decay of information as time passes (Pressley and Afflerbach, 1995) after a guess has been reached. Thus, adding to the accuracy of the recalls from the Working Memory. Furthermore, immediate stimulated recalls have the advantage over post hoc or retrospective interviews which depend heavily on memory

without specific prompts (Gass and Mackey, 2017). In addition, in this present study audio semi-structured interviews were used to further investigate and explore what learners reported doing while carrying out the task in their think-aloud and immediate stimulated recall sessions. These interviews also uncovered what participants' normal reading habits were through elaborating on their own experiences and what they do when encountering an UNW.

Furthermore, diversity is also present as to the procedures undertaken for the selection of TWs, reading texts and how learners provide their meanings. In my experience, the choice of TWs and reading texts have been mostly arbitrary or ignored and both lacked a systematic approach to their criteria. In terms of TWs, some researchers have either asked participants to underline/circle the words that were unknown to them (Haynes and Baker, 1993; De Bot *et al.*, 1997; Harmon, 1999; Tavakoli and Hayati, 2011), replaced words with low frequency synonyms (Hu and Nassaji, 2014), or used nonsense words (Walker, 1983; Liu and Nation, 1985; Chern, 1993; Haynes, 1993; Pulido, 2007a; Atef-Vahid *et al.*, 2013; Hostetler, 2013; Ibrahim, 2015). As for texts used, studies varied in the sources of their reading material ranging from adapted texts (Haastrup, 1991; Haynes, 1993), composing their own texts (Wesche and Paribakht, 2010), from academic textbooks (Huckin and Bloch, 1993; Hu and Nassaji, 2012; Baniabdelrahman and Al-shumaimeri, 2014; Hu and Nassaji, 2014; Ibrahim, 2015), general interest magazines (Bengeleil and Paribakht, 2004; Yin, 2011) or randomly selected in the hope it will yield a more complete picture of the how unfamiliar words are dealt with while reading (Ames, 1966).

Assessing L2 proficiency for learners accurately and reliably is important for teachers and researchers (Leclercq and Edmonds, 2014). Valid proficiency measurements are crucial since without them accurate meaningful interpretation of research results remain elusive (Norris and Ortega, 2003; Pallotti, 2009; Leclercq and Edmonds, 2014). However, there is a clear lack of uniformity in how L2 proficiency was measured in previous LIFS research that has looked at proficiency. Different measures were used; standard entrance exams (university or school) or standardized tests (e.g. TOEFL) (Etaywe, 2013; Rahbarian and Oroji, 2014) scores from reading comprehension tests (Bengeleil and Paribakht, 2004; Riazi and Babaei, 2008; Tavakoli and Hayati, 2011) or were not explicitly mentioned (Liu and Nation, 1985; Alhaysony, 2012). The diversity and inaccuracy of some of the previous measures make it challenging to compare participants between studies, for different test results have different criteria. Thus results should be interpreted with caution since different measures of what constitutes a certain level of proficiency for a learner were used. Since proficiency directly influences the performance of L2 learners on given tasks, is it critical that proficiency should be precisely and accurately measured in experimental research (Tremblay, 2011). Therefore, the international widespread usage of standardized proficiency tests (e.g. TOEFL, IELTS, Oxford placement tests) when measuring

learners proficiency offers estimated calculations to convert results between these standardized proficiency tests. Thus, in this study the Oxford placement test was used to further increase the reliability and robustness of results and compare the study's findings on lexical inferencing behaviours to UNWs between studies in which proficiency is a variable. The rationale for using this test was because this placement test is commonly used to determine students' initial level and is used by King Abdul Aziz University (the research site) to assign first year students into their appropriate English level courses in the foundation year programme. Furthermore, it was due to practical reasons; the research sample's familiarity with the test, time and financial restrictions.

Finally, my personal motivation, teaching experience and curiosity to what my Saudi EFL university students did to uncover meanings of UNWs was also a driving motivation for this study on lexical inferencing. Ever since I started as a lecturer and began teaching English as a FL at a Saudi university and for nearly 12 years, I have witnessed how my EFL university learners have struggled in reading exams, in which they are provided with two reading comprehension texts. The first text is precisely taken from their language textbook but accompanied by different comprehension and vocabulary questions than those originally found in their textbooks. While the second is an unseen text (students have not seen or read this text in class before since it is not part of their textbooks) related to one of the themes covered by a unit in their current textbooks. This unseen text is taken from another source (a different language textbook) and follows the same type of questions as the seen text. Learners do better on the first text since they are already familiar with it while for the second, they would complain about how some words were new, unfamiliar or even never seen. Thus, preventing their understanding of the text, its vocabulary and thus hindering them from correctly answering the comprehension questions.

In this study, I decided to focus on university students majoring in English for a number of reasons, the first was being part of this academic context and thus ease of access to the research participants in this context. Second, is the fact that Saudi learners majoring in English depend more on LIFSs, whether listening or reading, more than school pupils. For university students majoring in English at Saudi universities, compared to other majors and schools, English is the only medium of instruction. Therefore students rely on inferencing strategies when listening to their academic lectures, reading course materials and submitting module assignments. At King Abdul Aziz University, the study's research site, after students have passed their compulsive preparatory foundation year, they enroll at the department of English and European languages to major in English. Upon graduating, students become teachers of English, translators or work in sectors that require using English like newspapers, banks, hospitals, etc. Therefore, course modules focus on the subject knowledge and academic content than teaching students language and strategies whether language learning or LIFSs.

Since reading ability is regarded as the most needed skill for EFL learners in academic settings, its inability may hinder academic development (Alderson, 1984) and the important role lexical inferencing plays on reading comprehension and vocabulary size. A large body of research has found evidence that through reading, vocabulary growth (i.e. incidental learning) occurs (Hulstijn, 1992; Paribakht and Wesche, 1993b; Fraser, 1997; Fraser, 1999). The underlying assumption is that incidental vocabulary learning initially begins through the process of inferencing word meanings of UNWs encountered as we read. However, attention to these UNWs is a prerequisite for any learning to occur (Ellis, 1994a; Schmidt, 1994) and high rates of ignoring would limit the chances of word learning opportunities (Fraser, 1999). Furthermore, learners' vocabulary size (breadth and depth) contributes to reading proficiency and comprehension (Qian, 1999; Nation, 2001). Paribakht and Wesche (2006:118) point out the role of lexical inferencing and reading comprehension, where "Lexical inferencing is an active, creative process of hypothesis making and texting that-if it produces an appropriate word meaning-enhances accuracy of text comprehension and interpretation". With reading being the most important skill for all university learners, especially those majoring in English, when searching for resources that are mostly written in English. This becomes more crucial for learners majoring in English in my context. Thus, the present study on lexical inferencing could aid L1 Arabic EFL students, especially those majoring in English to improve their vocabulary size and reading comprehension. Thus, there is need to investigate and understand how L1 Arabic EFL students, majoring in English infer the meanings of UNWs especially since they encounter more unfamiliar words in their discipline compared to other disciplines and school pupils.

1.3 Significance and aims of the study

This present study is a significant step towards providing research that focuses on investigating and understanding how Saudi L1 Arabic speakers' inference meanings of UNWs while reading English texts within the Saudi higher education since there is a definite lack of research in this field. Another significance of the study lies in the fact, as previously mentioned, that only a handful of lexical inferencing studies have investigated the role of readers' cultural background knowledge and its role in inferencing UNWs while reading culturally familiar and unfamiliar texts. Thus, this study also has the potential to contribute to the existing body of EFL reading literature. More specifically, it will bring new insights into reading comprehension challenges in EFL contexts, particularly those related to native L1 Arabic speakers in the Arab world in general and specifically Saud Arabia. This study is also important for the methodology used, as this study is the first to use a number of qualitative methods; open-ended questionnaires, semi-structured classroom observations, think-alouds followed by immediate stimulated recalls, field notes and finally,

semi-structured interviews. For this study implements an embedded mixed methods multiple case study design with an Interpretivist stance to the inquiry which adds both depth and richness to the findings.

The main aim of the study is to contribute and further add to the existing findings reported in the lexical inferencing literature through investigating how first language speakers of a Semitic language, Arabic, inference unfamiliar words while reading English texts. More specifically, this present study aims to describe and explain how L1 Arabic EFL students representing 3 groups of different English proficiency levels (C1-B2-B1) approach and inference meanings of unknown words while reading in English. In addition to the research gaps mentioned in (1.3), the study also aims to look at how native L1 Arabic students use different clues and strategies to deduce the meanings of unknown words in terms of their familiarity or novelty with the reading topics and their proficiency levels. Therefore, this study has the following specific aims:

First, regarding the existing lexical inferencing knowledge, it will contribute to understanding what L1 speakers of a Semitic language, who in this study are L1 Arabic speakers, do when encountering unknown words while reading. More specifically, the type of clues and LIFSs reported by L1 Arabic EFL learners as they inference meanings of unknown words. In Saudi university settings, no study has so far attempted to report L1 Arabic learners inferencing strategies through using verbal reports (think-alouds followed by immediate stimulate recalls) and semi-structured interviews. Although there have been some attempts to look at guessing strategies through using only questionnaires or asking participants to write down the strategies they used (Alhaysony, 2012; Baniabdelrahman and Al-shumaimeri, 2014).

Second, the present study also aims to explore the role of cultural topic familiarity and unfamiliarity on the lexical inferencing process in terms of clues and LIFSs used by three different proficiency (advanced-intermediate-low) groups of L1 Arabic EFL learners. Furthermore, the present study differs from previous studies on lexical inferencing in that it investigates both the knowledge source clues and LIFSs in one study while previous studies have looked at either one of these in their research.

Third, the study aims at proposing a taxonomy of lexical inferencing behaviours by Saudi L1 Arabic EFL university students when deducing meanings of UNWs. This LIFS behavioural taxonomy composes the types of lexical strategies and knowledge source clues used. Arabic is typologically distant from English as opposed to the majority of lexical inferencing studies where participants' first languages were close to English, thus exploring and investigating Saudi EFL learners' lexical inferencing strategies will shed some new light on what Arabic learners do to infer the meanings of UNWs while reading. Therefore, this current study and future studies on L1 Arabic EFL learners

will make it possible to compare, identify and detect universal LIFS behaviours between EFL learners or specific ones related only to Saudi L1 Arabic learners where the former would be a fertile ground for further studies.

Fourth, a further aim of the study is to explore the importance of background knowledge/topic familiarity and learners' language proficiency on the LIFSs and knowledge source clues used while inferencing meanings of UNWs while reading. This is fulfilled through bridging the gap between lexical inferencing and reading theories, more specifically the Schema Theory and Coady's (1979) Psychological Model of the ESL reader which both integrate and stress the interactive role that readers' background knowledge plays during reading comprehension. From a theoretical reading perspective, these theories informed the present study to understand what learners do when encountering UNWs while inferencing as they build their comprehension of the text. Except for Haastrup's (1991) study, the majority of lexical inferencing literature has failed to establish this link when researching LIFSs during reading. Furthermore, through following a systematic approach to the TW through real words based on the criteria of a word's frequency instead of using nonsense words or randomly selected words will enable the comparison of findings based on word frequency and thus enhance further replication studies. In the current study, the target words were selected based on word frequency through using Coxhead's (2000a) Academic Word List. In terms of text selection, two cultural reading texts were constructed to fit the needs of the study's research questions and aims rather than using authentic or adapted ones from magazines or students' textbooks (see 3.7.4.2).

Through fulfilling these aims, it is hoped that this study will shed insight on how native L1 Saudi Arabic learners compensate for their limited vocabulary size, proficiency level and background knowledge of the reading topic. More specifically, how they approach the unknown words, the range of knowledge source clues and lexical inferencing strategies that they resort to in terms of text and their proficiency level. Based on the study's aims, theoretical and pedagogical implications are proposed through raising teachers' awareness as to how L1 Arabic EFL learners behave towards UNWs while reading in English. This is fulfilled through the two proposed taxonomies of the current study, which can be used as a platform for strategy training, instruction and providing guidance for EFL teachers and learners. Finally, based on the findings of this current study, a lexical inferencing model of the Arabic EFL reader will be proposed which takes into account components from both the reading and lexical inferencing literature.

1.4 Research questions

In order to fulfill these research objectives, the current study's design is an embedded mixed methods multiple case study framed by an interpretivist philosophical orientation to answer the following 3 main research questions and their sub-questions:

1. How do Saudi Arabic L1 speakers majoring in English infer meanings of unknown words while reading?
    - 1.a. How do they approach the unknown words?
    - 1.b. What are the range of knowledge sources clues do they tap into to uncover the meanings of the unknown words?
    - 1.c. What are the range of lexical inferencing strategies do they resort to uncover the meanings of the unknown words?
2. How does topic familiarity of the text affect, if any, learners' lexical inferencing of unfamiliar words with respect to their proficiency levels?
    - 2.a. What are the numbers of lexical attempts and responses made between the groups in the two texts?
    - 2.b. What are the similarities/differences between the groups in terms of knowledge source clues used when reading culturally familiar and unfamiliar topics and with what frequency?
    - 2.c. What are the similarities/differences between the groups in terms of lexical inferencing strategies employed when reading culturally familiar and unfamiliar topics and with what frequency?
3. In terms of successful inferencing, what is the role of learners' topic familiarity, if any, on their lexical inferencing?
    - 3.a. How successful are the groups in their lexical inferencing attempts?
    - 3.b. What are the knowledge source clues activated by the groups in both texts and with what frequency?
    - 3.c. What are the lexical inferencing strategies used by the groups in both texts and with what frequency?

The three different proficiency groups represent the three cases that are investigated in this multiple case study. In order to explore and understand how L1 Arabic EFL learners inference meanings of unfamiliar English words while reading, a number of methods were employed in this study categorised into preliminary and primary (main) methods. Preliminary methods included online questionnaires, semi-structured classroom observation and paper-based questionnaires. These instruments were used to explore and understand the context of my participants. On the other hand, the primary instruments were audiotaped think-alouds, including their warm-ups,

immediate stimulated recalls and semi-structured interviews. In addition to the two reading texts, the Vocabulary Level Test (Schmitt, 2010) and Oxford's Online Placement Test.

1.5 Contextual background: The status of English in Saudi Arabia

In Kachru's (1992) Three Circles Model of World Englishes, an attempt was made to explain the use of English in three concentric circles that represent the changing distributions and functions of the English language, Saudi Arabia falls in the third category; the expanding circle. Here, English carries a FL status and is the primary method for communication only with those who do not speak Arabic. This scenario exists in other parts of the world where "English is the primary vehicle of international communication even among non-native speakers, it is a passport to international, cultural and metropolitan citizenship" (Haque, 2000:15). With the exception of the U.A.E, English in Saudi Arabia is a FL like many Gulf Cooperation Council countries (Troudi, 2007; Al-Issa and Dahan, 2011; Dorsey, 2018).

English was introduced in Saudi Arabia with the discovery of oil in the 1970s, where most of the oil production was run by foreign companies (Al-Johani, 2009). Foreign labour began with workers arriving from different parts of the world where the vast majority of these workers were from non-English speaking countries but communicated through it. This stressed the importance of developing a FL programme that could train Saudi citizens to successfully communicate in English with their co-workers (Al-Seghayer, 2014). As Mahboob (2013:17) explains:

> With the discovery of oil and the ensuing American interest in the region, English gained prominence and became the dominant language of business and trade in Saudi Arabia and the region. The growing acceptance of English as the language of international business was reflected in the education sector reforms to introduce English as a core subject.

Furthermore, nearly 2 million Muslims from around the world visit Saudi Arabia to perform Umra (a religious ritual), making it essential for Saudis to learn English to interact with the large numbers of English-speaking visitors to their country (Al-Seghayer, 2014). The status of learning English also extends to aspects of employment. Job openings in both public and private sectors such as national TV stations, companies, hotels, hospitals stress preference for potential employees who can speak English (Al-Seghayer, 2014).

1.5.1 English in the Saudi education system

English and French were initially introduced in the Saudi educational system in the 1930s at the intermediate (grades 7-9) and secondary (grades 10-12) levels (Al-Seghayer, 2014). However, due to the increasing importance of English, French was removed from the intermediate level and remained an elective subject at the secondary level before being removed from the educational system (Elyas and Picard, 2018). Since 1958, English was the only compulsory FL taught as part of the Saudi curriculum for intermediate and secondary school levels (Alqahtani, 2018; Elyas and Picard, 2018). In 2003, the Saudi government decided to introduce English at the elementary level rationalizing this due to Saudi students' low English proficiency levels since English instruction begins at the intermediate level (Al-Seghayer, 2014). This was opposed by critics' misconceptions that teaching English at a young age will affect young Saudi learners' religious and cultural identity, including their language development of their mother tongue, Arabic (Elyas, 2008). Culture is one of the main factors that affects EFL learning in Saudi Arabia, Nouraldeen and Elyas (2014) argue that because Saudi Arabia has never been under colonial rule and thus has not been affected by European cultures This resulted in a refusal by Saudi society to accept learning/teaching English when it was first introduced to the public.

In 2013, English became part of elementary education from grade 4 with two classes a week. This change was a response to students' low level of English proficiency due to limiting English instruction to intermediate and secondary levels (Al-Seghayer, 2014). On the other hand, in private schools English is taught as early as kindergarten through a foreign curriculum. However, by the official grade, these schools are obliged to teach the official curricula as well which is designed and directed by the Ministry of Education (MOE). In public schools, both genders study the same textbooks and have four English classes running 45 minutes each week.

1.5.2 English in the higher education system

All Saudi universities teach English as either an elective subject or a major field of study, even non-English majors take a compulsory introductory English course. Some departments like science, medicine and engineering only use English as a medium of instruction (Al-Seghayer, 2014). Since 2008, some Saudi universities have started implementing a preparatory foundation year programme where general compulsory subjects are given to first year students regardless of whether students want to pursue a scientific or literary discipline for their bachelor degrees. In this programme, intensive English is one of the core courses which aim to improve students' linguistic and learning skills. At our research site, King Abdulaziz University, foundation year students are given 18 hours per week of intensive English, in which four English levels are

completed within the academic year. Learners are allocated to their initial level depending on the results of a proficiency test, Oxford's Online Placement Test. Upon finishing this foundation year, students can then major in their specialized disciplines and begin their undergraduate degrees.

The present study was carried out at King Abdulaziz University, one of the public universities in Saudi Arabia located in Jeddah, a coastal city in the western region of the country. The research sample were 15 Saudi first year female students majoring in English at the Department of European Languages and Literature who have successfully passed their preceding foundation year programme at the university. A single gender sample was used since gender segregation in educational and governmental workplace is an aspect of Saudi society. Even arranging to meet with male participants in a mixed gender workplace (medical hospital, research centre) and myself, the researcher, on campus was rejected by the administration.

1.6 Structure of the thesis

This thesis is organized into 6 chapters. Chapter one has presented an overview of the research study and has detailed the background of the study and context. It has identified several gaps in the current lexical inferencing literature before highlighting the rationale of the current study. This paved the way for the current study's significance and aims before outlining the research questions. It also provided a brief account of the methods used before concluding with a summary of the structure of the thesis.

Chapter two provides an overview of both the reading and lexical inferencing literature. The first part of the chapter begins by discussing the reading process, its components and the theoretical models of reading that have influenced our understanding of reading in other languages (EFL/ESL). It then outlines and describes two reading theories, Coady's (1979) Psychological model of second language reading and the Schema Theory which shape part of the present study's theoretical (conceptual) framework. The second part of Chapter two is devoted to reviewing the lexical inferencing literature. It begins by highlighting the place of LIFSs in terms of learning and language learning strategies. Next, the importance of lexical inferencing for both reading comprehension and incidental vocabulary learning through reading is discussed. Two proposed models of lexical inferencing are presented; the Hypothesis-Generation/Testing Model (Huckin and Bloch, 1993) and the L2 Lexical processing Model (De Bot *et al.*, 1997) which are part of the theoretical framework. The chapter also discusses the type of clues and strategies used in lexical inferencing before listing the factors that affect the inferencing outcomes in terms of both the learner and the reading texts. Finally, an overview of the current study's conceptual framework is presented and discussed.

Chapter three outlines the study's design, it begins by reviewing the research questions and objectives of the study. This is followed by the researcher's philosophical stance, interpretivism and the underpinning rationale to investigate and explore the LIFSs used by L1 Arabic participants. A discussion about the chosen design: a mixed methods embedded multiple case study, the reasons for adopting this approach and its challenges in addition to defining these cases. Next, the research context, participants and sampling procedures are presented to the reader, followed by the data collection methods. Furthermore, the research setting and sampling procedures are discussed. This is then followed by the data collection methods used in this study and why a mixed methods approach was chosen for this study. The chapter also discusses a number of relevant issues, such as the two pilot studies that have been conducted, how the data collection methods were implemented in the main study, triangulation, ethical issues and developing relationships with the participants. Finally, the details of the data collection and analysis phase are discussed in detail before discussing the concept of trustworthiness and how it was maintained in this study.

The findings of the current study are discussed in chapters four and five. Chapter four will present the qualitative key findings of the **RQ1** which were obtained through triangulating the data from think-alouds, immediate stimulated recalls, semi-structured interviews and my field notes. It will present the various knowledge source clues and LIFSs used by L1 Arabic EFL learners as they were engaged with the inferencing task. Furthermore, key results from the semi-structured interviews will be discussed which displayed learners' approaches to the UNWs, the texts during the inferencing task and their motives behind this. Furthermore, how learners approached UNWs on their reading exams.

Chapter 5 presents the findings of the quantitative research questions, **RQ2** and **RQ3**. The first section of the chapter addresses the **RQ2** and displays the findings of participants' lexical inferencing attempts and their responses in both texts. Next, the type of knowledge source clues and LIFSs used by the three groups and their frequency of usage are presented to the reader. This view integrates all the inferencing responses (correct-partially correct-incorrect) in order to display the range of clues and LIFS used by L1 Arabic EFL learners. The second part of the chapter focuses on the clues and LIFSs used with **'successful inferencing'** responses (**RQ3**) for the three groups in each text. It also presents the combinations of clues and strategies used by each group regarding the number and type of clues and strategies used.

Next, a discussion of the key findings of the study is presented to the reader in Chapter 6. The findings are discussed in terms of each research question and linked to the literature. The first part of the chapter discusses the qualitative findings (**RQ1**) of the study and the role that learner's

metacognitive awareness plays in the lexical inferencing process. The second part of the chapter discusses the quantitative findings of the **RQ2** in terms of participants' lexical inferencing attempts, responses, knowledge source clues and lexical inferencing strategies used in both texts. More specifically, the similarities/differences between the three proficiency groups in terms of their inferencing attempts, responses, knowledge source clues and lexical inferencing strategies, including their frequency. Finally, the remaining part of the chapter is devoted to discussing the **RQ3** (quantitative) regarding ***successful*** inferencing in terms of; inferencing responses, knowledge source clues and lexical inferencing strategies used between groups and their frequency. Furthermore, the various combination patterns in terms of knowledge source clues and lexical inferencing strategies groups displayed with their successful responses. The chapter also highlights the role of the learner's proficiency level and background knowledge in successful inferencing.

Chapter 7 brings together key issues that are of interest to the study in the previous chapter. It begins by presenting a summary of the main findings and their significance in terms of each research question. It then identifies theoretical contributions to the field of applied linguistics followed by a proposed theoretical lexical inferencing model of the L1 Arabic EFL reader. This is followed by a number of pedagogical implications; teaching LIFSs, enhancing learners' metacognitive strategic reading awareness and increasing EFL learners' vocabulary through reading. Next, the present study's challenges and limitations are presented to the reader. Finally, research recommendations highlighting the potential issues and ideas to further deepen our understanding of the lexical inferencing process are discussed.

Chapter 2 Literature Review

"Reading may well be a psycholinguistic game. But words are the toys you need to play it right" (Laufer, 1997a:32)

2.1 Introduction

In this present study, the process of lexical inferencing is investigated through reading. Therefore, this chapter aims to provide an overview of both the processes of reading and lexical inferencing strategies. In order to understand how learners inference unknown words (UNWs) during reading, it is crucial first to have a general understanding about the reading process followed by the lexical inferencing process during reading. As the ultimate objective of both reading comprehension and lexical inferencing is to understand the text through the events and information presented while deriving meanings of its UNWs. Thus, the process of lexical inferencing during reading is a link between not only reading comprehension (2.8.1) but also incidental vocabulary learning (2.8.2).

This chapter is divided into three main sections, it begins by addressing and discussing an overview of the reading process; its definition, lower-level and higher-level processing and metaphorical reading models. Next, an interactive approach to reading which the present study adopts is discussed. This is followed by presenting Coady's (1979) Psychological Model of the ESL Reader and the Schema Theory, both interactive models of reading which are part of the present study's conceptual framework.

The second section of this chapter focuses on the process of lexical inferencing strategies (LIFSs) which sheds light on some issues that have been associated with inferencing meanings of unknown words while reading, that lie within the boundaries of the study. It begins with a brief overview of the term 'strategies' and the place of LIFSs which are a subset of vocabulary learning strategies, which in return constitute as part of language learning strategies. Next, some definitions of the process of LIFSs are presented before discussing how LIFSs are linked to vocabulary development and reading comprehension. This is followed by theories/models that have been associated with the LIFS literature. The chapter then moves on to define what is meant by clues and knowledge sources (KS) before listing some taxonomies of clues and KSs that have been associated with the LIFSs literature. Next, the factors that have been reported to affect the outcomes (success/failure) of inferencing which are of importance to the present study are outlined to the reader. These factors are discussed in terms of the UNWs, reading texts and readers. The scope of this study is on how L1 Arabic Saudi EFL learners uncover meanings of

UNWs from context rather than indirect learning or retention of meanings which is another approach to researching LIF from context (Bengeleil, 2001).

The third and final section of this chapter presents the currents study's theoretical framework (2.12) that underpins this research. Due to the interdisciplinary nature of the current study, which lies within the boundaries of reading and semantics, this framework incorporates both reading and inferencing theories/models discussed earlier in two previous sections. It will also discuss how this theoretical framework will guide the researcher into collecting, analysing and interpreting the data.

2.2 The reading process

Second language researchers consider reading as a primary skill in a second/foreign language to ensure success in learning, more specifically in academic settings (Huckin and Bloch, 1993; Alderson, 2005; Gilakjani and Ahmadi, 2011; Grabe and Stoller, 2013). According to Carrell (1992b:1), "Reading is by far the most important of the four skills in second language, particularly in English as a second or foreign language". The term 'reading' is frequently used in the literature but to date there is no consensus regarding its definition. The existence of various definitions of reading is a result of the broad span of its functions which shape its definitions (Grabe, 2009; Grabe and Stoller, 2013). This span covers different purposes of reading, reading to search for information (scanning), for quick understanding (skimming), to learn, to integrate information, to evaluate/critique, use information and finally general comprehension. Early definitions of reading have viewed reading as simply a decoding process of extracting meaning from print. For example, one definition describes reading as "an act of communication in which information is transferred from a transmitter to a receiver" (Smith, 1973:2). This view is also shared by Urquhart and Weir (1988:22), who define reading as "the process of receiving and interpreting information encoded in language form via the medium of print". However, others argue that reading comprehension is not a passive act of simply decoding meaning from a text but an interaction between the text (vocabulary, syntax, etc.) and the activation of appropriate background knowledge by readers (Carrell, 1984, 1992a; Alderson, 2005; Koda, 2005; Gilakjani and Ahmadi, 2011). Koda (2005:4) views reading as an interactive process between text and reader, furthermore that "successful comprehension emerges from the integrative interaction of derived text information and preexisting reader knowledge". Another definition which highlights some of the process involved in reading is by Hudson (2007:10-11) where:

> Reading involves the interaction of an array of processes and knowledge. It involves basic DECODING SKILLS such as letter recognition, higher level cognitive skills, such as

inferencing, and interactional skills, such as aligning (or not aligning) oneself with an author's point of view.

Put simply, comprehension occurs when readers extract and integrate various information from the text with what they already know. Defining reading is more complex for second language (L2) reading due to the existence of several distinct L2 reader populations (preschool, school-aged children, adults), all with disparate L1 literacy experience (Koda, 2005). From the previous section, it is apparent that defining reading as a complex process or building meaning from a text is not very informative for several reasons. According to Grabe and Stoller (2013), such a definition does not convey the idea that various ways of reading exist, which differ depending on the reader's purpose for reading. Each purpose also has different combinations of skills and strategies, too. In order to capture the essence of reading, Grabe (2014:8) explains that "The most commonly accepted way for researchers to explain the above definition [of reading] is to identify the key component abilities and skills that allow reading comprehension to emerge".

Two common terms used to describe the reading process are skills and strategies. Skills represent the linguistic processing abilities that are relatively automatic in their use and combinations (e.g. word recognition, syntactic processing, etc.) while strategies are often defined as a set of abilities under the conscious control of the reader (Grabe and Stoller, 2013; Oxford, 2017). However, this distinction between skills and strategies is not always clear, for it depends on the individual's awareness, control, intention and specific reading situation (Afflerbach *et al.*, 2008). Therefore, strategies are often confused with skills. According to Oxford (2017:12), it is "impossible to tell whether an action is a strategy or a skill without finding out whether it is under the learner's automatic or deliberate control". A skill may have been initially learnt as a strategy. According to Grabe (2009:221) "Strategies are cognitive processes that are open to conscious reflection but that may be on their way to becoming skills" through becoming thoroughly automatized. Throughout this study, Grabe and Stollers' (2013:9-10) definitions have been used; the term 'reading process' is used to refer to the "cognitive activity involving skills, strategies, attentional resources, knowledge sources and their integration" to construct meaning. Furthermore, 'reading strategies' will be defined as "abilities that are potentially open to conscious reflection, and reflect a reader's intention to address a problem of a specific goal while reading". Grabe and Stoller (2013) distinguish between two approaches to reading, process and models. Reading processes are divided into lower-level and higher-level processes according to their function in Working Memory (2.3.1). While reading models are divided into metaphorical models (2.3.2) and specific models (2.4).

2.3 Approaches to reading

In order to address how EFL learners infer the meaning of UNWs while reading in a second language (L2), reading processes and theories first need to be highlighted to the reader. Historically, first language (L1) models have provided frameworks to help explain L2 reading processes and the variables that may be involved (Hudson, 2007; Stevenson, 2015). Most of what is known today about reading in L2 was derived from initial research on L1 reading for a number of reasons, some of which can be summarized in the following points (Koda, 2005; Grabe and Stoller, 2013). First, far more research has been carried out in the L1 context (mostly in English as an L1) compared to L2 research. Second, by the time they read, L1 readers have already established a basic linguistic foundation and usually achieve a reasonable level of fluency in reading comprehension abilities comapred to reading in the L2. Finally, reading implications and practices for teaching reading from research are more developed in L1 reading contexts than L2.

2.3.1 Lower-level and higher-level processes

Although differences do exist between readers when reading, some of these depend on readers' motivation, the purpose of reading and language abilities (Grabe and Stoller, 2013). There are however a set of common underlying processes that are activated as we read. To better understand the reading process and comprehension, reading researchers broadly classify the reading processes involved in reading into two main categories; lower-level and higher-level processes (Koda, 2005; Gilakjani and Ahmadi, 2011; Grabe and Stoller, 2013; Birch, 2014). All processes occur in Working Memory which can be perceived "as the pattern of cognitive neural network activations at any given moment" (Grabe, 2014:9). Working memory refers to the temporary storage of information while processing incoming data and receiving information from long-term memory (for an overview of the Working Memory see Baddeley, 2000; 2003b; 2006, 2015; Wen, 2016). Information is held actively briefly in the Working Memory and its contents decay gradually if not rehearsed promptly (Henry, 2012; Wen, 2016). The term, lower-level processes, does not imply that they are easier but rather they form the group of linguistic processes/skills that have the potential to become strongly automatized (Koda, 1994; Grabe, 2009). The automaticity of these lower-level reading processes is seen as a requirement for fluent reading and efficient word-decoding processes (Anderson, 2000; Koda, 2005; Grabe and Stoller, 2013). Lower-level reading processes include several processes; word recognition, syntactic parsing and semantic proposition (Koda, 2005; Grabe, 2009; Grabe and Stoller, 2013).

Word recognition has been identified and accepted as one of the most important processes that contribute to reading comprehension and predicting latter reading abilities (Perfetti and Hart,

2002; Perfetti, 2007). Perfetti (2007:357) argues that successful comprehension depends on successful word reading and that "skill differences in comprehension can arise from skill differences in word reading". Furthermore, in terms of fluent reading comprehension, rapid word recognition has been found to contribute to rapid automatic lexical access, "the activation of the information associated with the words autographic representation, including the word's meanings and its phonological representation" (Stanovich, 1991:4; Grabe and Stoller, 2013). In other words, fluent reading comprehension is not possible without automatic rapid word recognition and meaning retrieval of a large stock of vocabulary. A number of studies have reported that inefficient word-recognition processes are a major obstacle for learners (Nation, 1990, 2001; Grabe, 2009; Rousoulioti and Mouti, 2016). In such cases of word recognition difficulties or/and encounters of UNWs, the impact of contextual information contributes to word recognition and guessing meanings of unknown words (Haastrup, 1991; Schmitt, 2010; Nation and Webb, 2011).

One word recognition strategy for young children and beginning readers is sight reading (Grabe, 2009; Pressley and Allington, 2014). Sight reading is also a characteristic of fluent readers in cases of highly redundant words that are accessed over the course of extended reading (Grabe, 2009). During sight reading, the sight of the word allows the activation of its pronunciation and meaning immediately in the reader's memory and thus allows readers to focus their attention on comprehension rather than word recognition (Ehri, 2014). As the word is met and understood in different contexts, "all the sources of information about a word are consolidated into a single, highly cohesive representation… Thus a printed word becomes a symbol for its phonological, semantic, syntactic and orthographic information" (Harrison and Sipay, 1990:435-436). As a result of multiple encounters, words enter the reader's sight vocabulary and thus automatic word recognition is developed and activated (Day and Bamford, 1998; Nation, 2001).

Word recognition involves a subset of processes, Perfetti and Hart (2002:191) describe these processes as "constitutes" of word recognition, where "the identification of the word is the retrieval of these constituents". These researchers view word recognition as an interaction of activated orthographic, phonological, syntactic and semantic processing. Fast and automatic word recognition occurs when a word's visual input activates the lexical entries in the reader's lexicon that have well-represented information of these constituents (Grabe, 2009). Most models of skilled word identification and reading development hold that word identification involves at least two vital processes; orthographic and phonological (Hagiliassis *et al.*, 2006).

Reading is a language process that begins with the visual (orthographic) representations of words. Orthographic processing, one of the key subskill processes in reading, refers to the visual recognition of word forms from printed materials which includes knowledge about permissible

letter patterns, the ability to form, store and access orthographic representations (Cunningham *et al.*, 2001; Grabe, 2009). Word identification begins by identifying the string of letters (graphemes) and the relationships between the letters that constitute words. Successful word recognition occurs when visual input from a string of letters activates one or more word forms in the lexicon (Perfetti, 1999). Orthographic processing is also crucial for the recognition of complex words with one or more morphological affixes (e.g. prefixes and suffixes) (Cunningham *et al.*, 2001; Pressley and Allington, 2014). The second component of word recognition is phonological processing, which refers to the ability to perceive, store and manipulate speech sounds which also includes phonological awareness (Moll *et al.*, 2014). Phonological awareness plays an important role during early literacy, it enables children to understand and systematically exploit the mappings between graphic symbols and the sound structure of spoken language.

Syntactic parsing refers to the process of integrating and accessing meaning information from words and sentence structures (Grabe, 2009). During reading, syntactic parsing contributes to word recognition and reading comprehension in a number of ways (Perfetti, 1999; Grabe, 2009). For example, it helps to disambiguate words that have multiple meanings out of context (e.g. '*book'* as a noun and verb, '*bank'* as in a commercial financial establishment compared to the side of the river). Furthermore, syntactic information, for example, pronouns references, word order, determiners, subordinate clauses, tense and modality provide some information to constructing text meaning during reading (Grabe, 2009). For example, the sentence 'The dog chased the cat' would have a different interpretation compared to a different word order in 'The cat chased the dog'. However, sometimes syntactic parsing could also misleading. When readers come across syntactically ambiguous sentences, known as 'garden-path sentences', this metaphor comes from the fact that the individual (reader/listener) is lead down to an attractive but incorrect syntactic analysis of the sentence and thus an incorrect interpretation (Slattery *et al.*, 2013; Staub, 2015).

Finally, semantic proposition, also known as meaning proposition (Grabe, 2009) is the "process of combining word meanings and structural information into basic clause level units" (Grabe and Stoller, 2013:18). In this process, the meanings of individual words and phrases are integrated to construct a representation of the overall meaning of the sentence. Semantic propositions are formed simultaneously with both word recognition and syntactic parsing, which are essential processes in recognising words and accessing meanings during reading (Perfetti and Britt, 1995; Staub, 2015). During reading, once meaning has been activated from the individual words along with their grammatical information, readers integrate this information to relate it to what they have previously read. As new information is presented and connected by the reader, it becomes active in the Working Memory, for example central ideas are activated as long as they are

repeated or recalled in the text if not, they are decayed and lost (Henry, 2012; Grabe and Stoller, 2013).

For the fluent reader, lower-level processes occur automatically when they are functioning well, thus working together effortlessly in the Working Memory. However, in instances when they are not, the comprehension process slows down and alternatively comprehension is difficult to maintain (Grabe and Stoller, 2013). While lower-level processes are vital for reading comprehension, reading also requires attention to a range of higher-level processes. These higher-level comprehension processes "more closely represent what we typically think of reading comprehension" (Grabe and Stoller, 2013:19). These higher-level comprehension processes are text model of reading comprehension, situation model of reader interpretation, background knowledge and executive control processes (Grabe, 2009; Grabe and Stoller, 2013).

A text model of reading comprehension is built around the coordination of ideas from a text that represent the main points and supporting ideas to form a meaning representation of the text, i.e. what the writer is conveying. On the other hand, a situation model of reader interpretation (also known as a reader's situation model) which is built around the emerging text model of reading comprehension, depends more on the reader by displaying how the reader interprets the text in terms of his/her own reading goals, objectives, background knowledge, experiences and expectations. The situation model of reader interpretation accounts for how a reader can understand what the author is conveying (text model) and how this reader can also interpret the information for his/her own purpose (the situation model) (Grabe and Stoller, 2013).

Reader's background knowledge plays a vital role in reading comprehension since usually texts are incomplete and rely on the readers to fill in gaps and make links to their prior knowledge (Goodman, 1967; Carrell, 1987; Kintsch and Walter Kintsch, 1998). The reader's network of ideas from their background knowledge are integrated with the situation model, thus the new information is interpreted in light of the reader's background knowledge, attitudes, goals and task purposes (Kintsch and Walter Kintsch, 1998). The ability to integrate text and background information appropriately and efficiently is a trait of expert reading in a specific topic (Grabe and Stoller, 2013). Finally, executive control processes, a major component of working memory that selects and operates strategies and therefore commonly identified as a central element in the comprehension processes (Baddeley, 2006; Grabe, 2009), deals with how individuals plan, select, direct and orchestrate the various cognitive process available to them to fulfill a specific goal (Britton and Glynn, 1987; Grabe and Stoller, 2013). In other words, it represents how readers focus selective attention while reading, assessing their understanding, sensing breakdowns in comprehension, aiming at repairing them and evaluating their success.

To summarize, lower-level processes represent the more automatic linguistic processes that are viewed as more skills-oriented while the higher-level processes generally represent comprehension processes that make use of readers' background knowledge and inferencing abilities (Grabe and Stoller, 2013). These processes are simultaneously interacting with each other, this interaction between these skills leads to fluent reading comprehension (Bernhardt, 2005).

2.3.2 **Metaphorical models of reading**

Metaphorical classifications of reading models/theories were used as an attempt to represent the overall frameworks and capture the various mechanisms underlying different reading models/theories in the literature (Hudson, 2007; Grabe, 2009). These classifications are categorised into; bottom-up, top-down and interactive models.

2.3.2.1 **Bottom-Up Model**

Bottom-up models, also called 'data-driven' (Rumelhart, 1980) or 'information processing-model' (Tracey and Morrow, 2012), are the oldest of all metaphorical models. In this model, the reader constructs meaning which begins through letters, words, phrases, clauses to construct meaningful sentences (Carrell, 1992b, 1992a; Hudson, 2007). This hierarchical approach emphasises text-based variables such as orthographic recognition, vocabulary, syntax and grammatical structure (Alsamadani, 2009; Gilakjani and Ahmadi, 2011). Proponents of this model stress the importance of the role of text in reading comprehension, thus reading here is 'data-driven' or 'stimulus-driven' according to these models (Gough, 1972; LaBerge and Samuels, 1974) In such models, the emphasises is placed on the reader's ability to recognize words in isolation through mapping the input onto a form in the mental lexicon (Hudson, 2007). In bottom-up models, readers are perceived as passive decoders of visual stimuli (Ibrahim, 2015).

Thus, in light of this bottom-up reading model, foreign/second language problems of reading comprehension were basically viewed as decoding problems of deriving meanings from print. For in this approach, readers need to access the meanings of all the words and thus "put more emphasis on knowledge of vocabulary than other models" (Alsamadani, 2009:30). It has been suggested that ESL readers fall into this approach since they are linguistically bound to the text due to their limited language knowledge and background information of the topic (Carrell, 1983b; Al-Shumaimeri, 2006). Stanovich (1980) explains that due to poor word recognition skills by poor readers, these readers thus place greater reliance on the context since it provides additional information sources. Furthermore, due to the importance of orthographic recognition in this model, EFL/ESL learners whose first languages have a different orthographic system from the TL,

may have some difficulty in word identification and recognition. For example, word-shape recognition can sometimes affect comprehension more than contextual information (Haynes, 1993). Huckin and Bloch (1993) reported that their participants mistook the UNW '*optimal*' for a known word like '*optional*' although the text did not support such meaning. Another limitation of this language-based model is neglecting the role of the reader as an active element in the reading process and that problems of L2 readers at the early stages of language can be caused by the differences in orthographic systems between the L 1 and L2 (e.g. Arabic and English) (Eskey, 1992; Mushait, 2003). Furthermore, this one-way liner model does not allow interaction between lower-level and higher-level processes since the role of the reader is passive and is only seen as a decoding process (Rumelhart, 1977a).

2.3.2.2 **Top-Down Models**

In this view, reading is a linear process driven not by the visual stimuli (words) but by the reader's mind and expectations of the text. They are also known as 'inference-driven' or 'knowledge-based processing/models' (Sternberg and Powell, 1983). This concept-driven model was introduced by Goodman (1967:2) in his Psycholinguistic Theory of Reading, who views reading in L1 as a '*psycholinguistic guessing game*', where readers' background knowledge combined with their expectations of the text are what guides readers in their quest of meaning reconstruction of the text. The most cited cues (clues) that readers used with this model are graphophonic, syntactic and semantic (Goodman, 1969; Goodman, 1970). Readers merely use these cues only to sample the text to confirm/reject their predictions by relating them to their past experiences, background knowledge or knowledge of the language (Carrell, 1992b, 1992a; Grabe and Stoller, 2013). While sampling, the reader chooses certain words and phrases to comprehend the meaning of the text rather than reading it all. The essential underlying element of this model is that readers are selective, tentative and anticipatory while they hypothesize what is yet to come in the text. The theory suggests that if the text is consistent with readers' predictions and expectations, reading continues fluently and easily, if not, reading becomes slower as readers resort to a text-driven or "bottom-up" reading word-by-word appaoch and sometimes letter-by-letter.

Goodman (1967) coined the term 'miscues' when a reader's response to a text is different from what the text actually means. He differentiates miscues from what is traditionally knowns as "reading errors", since in his view miscues shed positive light on the deviations that readers make from the actual text while reading. Thus miscues are "windows on the reading process" (Goodman, 1973:3) since they also show how readers correct miscues when they disrupt the meaning of what has been read which indicates the degree that readers are monitoring their reading (Christie, 1981). Furthermore, comparing the ways miscues differ from the correct

expected reading response provides direct insights into how the reading processes at a specific time are revelled (Goodman, 1969).

From this perspective, texts have no meaning on their own since this responsibility falls on the readers who reconstruct the meaning through resorting to their background knowledge (Alsamadani, 2009). Thus, inferencing is a prominent feature of top-down models, as is the importance of content guessing and the reader's background knowledge. Furthermore, language proficiency is also crucial for readers to decode and understand the syntactic structures as they sample the texts to confirm/reject their predictions (Grabe and Stoller, 2013). Therefore, not only do proficient readers generally make successful predictions but can also recover quickly when they produce miscues which distort the meaning (Goodman, 1970). The top-down model assumes that readers would have no decoding problems to use the text to activate top-down (higher) process and strategies. Thus, a drawback of this model is that it focuses on the reader's conceptual background knowledge rather than bottom-up processes like orthographic information, so it does not emphasize the decoding problems of L2 learners. Therefore, it becomes more applicable to fluent and proficient readers but not for weak language beginners since it also requires vocabulary knowledge to decode the text accurately (Coady, 1979; Stanovich, 1980; Eskey, 1992; Mushait, 2003). Furthermore, it does not address how a reader's lack of information about the text or its background knowledge can affect the process of comprehension (Eskey, 1992). This is stressed even more in terms of texts that assume a level of cultural background knowledge about the TL (English) by ESL/EFL readers, for without this knowledge, readers' predications cannot be generated.

2.3.2.3 **Interactive Models**

Rumelhart (1977b) proposed his Interactive Model rationalizing that the previous approaches do not account for what occurs during reading. The name mirrors the underlying process of reading where both bottom-up and top-down processes are bidirectional in nature, involving higher order mental processes and background knowledge as well as features of the text itself as opposed to unidirectional manner as with the previous models (Hudson, 2007). Each type of processing is seen to contribute to the reconstruction of the meaning encoded in the text (Eskey, 1992). Shifting between these processes is a trait of skilled readers as they accommodate to the changes and demands of the text and the reading situation while less skilled readers rely on one process resulting in deleterious effects on comprehension (Carrell, 1992a). According to Davies (1995:64), Rumelhart's interactive model has a number of strengths; first, the 'selective nature' of the information where the reader is able "to draw simultaneously, but selectively, upon a range of sources of information: visual, orthographic, lexical, semantic, syntactic and schematic". Second,

it takes into account the readers' varied reading behaviours and provides the different ways of processing. This includes both the decoding difficulties encountered by readers at beginning levels of reading (L1/L2) and lack of prior content or cultural knowledge.

Stanovich (1980) extended Rumelhart's Interactive Model to include not only text processors as interactive and nonlinear but also as compensatory, in the sense that if a deficiency occurs in one type of processing (lower/higher), it is compensated for by the other type of processing, known as the Interactive-Compensatory Model. This model assumes that poor readers compensate for their deficiencies/limitations in bottom-up processes (e.g. word recognition) by resorting to top-down processes more often than good readers do. The opposite is true in terms of readers who do lack the necessary background knowledge (top-down processes) and thus rely on bottom-up processes to compensate for this lack in prior knowledge (Eskey, 1992). Both Coady's (1979) Psycholinguistic Model of the ESL reader and the Schema Theory, which constitute part of the present study's theoretical framework, are interactive reading models since they integrate both bottom-up and top-down processes (Rumelhart, 1980; Carrell, 1983a). In such interactive models, processing occurs at different levels, in which the output of each level acts as a bases for all levels of comprehension. In this way, the best guess is based on information from multiple sources (Levy, 1981).

To summarise the above, bottom-up processing ensures that readers/listeners are sensitive to the incoming information that tends to be novel or violates their ongoing hypotheses about the context through depending on lower-level reading processes. While top-down processes guide readers/listeners to overcome ambiguities by selecting alternative interpretations of the incoming data by activating their background knowledge and sampling the text (Carrell and Eisterhold, 1983). Finally, interactive processing where both bottom-up and top-down processing interact through compensating one another when a deficiency occurs in one.

2.4 Reading models and theories: An interactive approach to reading

Hosenfeld (1977:111) views reading as comprised of two sets of operations, one accounts for the readers' operations as they ascribe meaning to sentences "in a relatively uninterrupted manner", which she labels as "main meaning line". While the second set, "word-solving strategies," includes the operations when readers encounter UNWs and actions when their 'main meaning line' is interrupted. Reading has been viewed as an active process at two levels since it involves many processes that are carried out simultaneously (Anderson, 2004; Grabe and Stoller, 2013). At one level, readers are constantly identifying, recognizing words, analysing, assembling the sentence structure, constructing the main ideas of the text and monitoring their comprehension. This

information is kept active/held in the Working Memory. As mentioned in (2.3.1), Working Memory is the temporary storage and processing of information and it interacts with long-term memory, where we store background knowledge. Working memory is required for temporarily processing or storage purposes during thinking and reasoning tasks (Henry, 2012). During reading, working memory involves activating cognitive processes like recognizing letters, word information, using syntactic information, connecting pronoun references, building an overall text structure, integrating and restructuring information, establishing main ideas assessing inferences and adapting readers goals (Baddeley, 2003a; Alderson, 2005; Grabe and Stoller, 2013). The second level of interaction is between the text's information with the reader's activated information recalled through long-term memory, known as background knowledge. Thus, reading is the interplay between lower-level analytical process that focus on word recognition and higher-level conceptual processes (Carrell and Eisterhold, 1992; Grabe and Stoller, 2013). These two processes act together in a serial manner as opposed to a bidirectional manner as displayed by bottom-up and top-down models (2.3.2.1, 2.3.2.2).

In the current study, reading is viewed as both an interactive mechanism between lower-level and higher-level processing and also compensatory. Two reading theories constitute part of my conceptual framework (see 2.12); Coady's (1979) Psycholinguistic Model of the ESL reader and the Schema Theory. Both these reading theories highlight the interaction between readers' linguistic and background knowledge as central components to fulfill reading comprehension. EFL learners' background knowledge plays a critical role in this study, which aims at investigating how EFL university learners, who are L1 speakers of Arabic, use their background knowledge in terms of knowledge of the TL and topic familiarity of the texts to infer the meanings of UNW encountered while reading.

2.4.1 Coady's Psychological Model of second language reading

Coady (1979) extended Goodman's (1967) psycholinguistic model to include second language (L2) learners' reading processes. In this interactive model, as opposed to Goodman's top-down approach, ESL readers' background knowledge interacts with their conceptual abilities and processing strategies to produce comprehension (Figure 2-1).

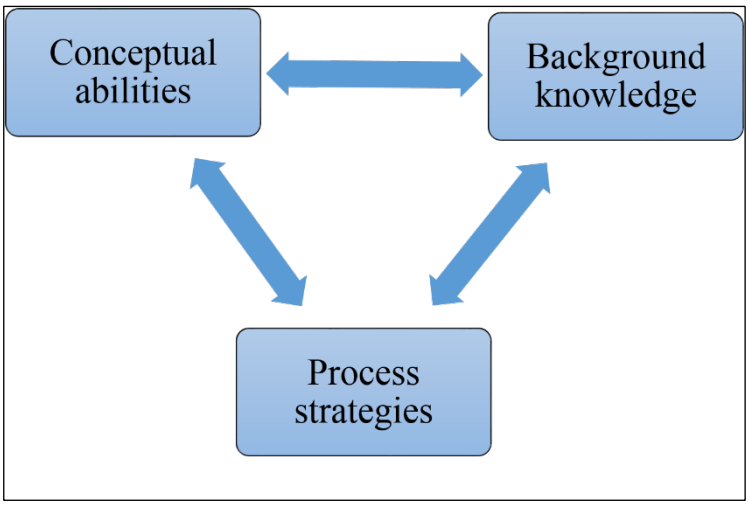


Figure 2-1 Coady's Psychological Model of the ESL Reader(1979:7)

The importance of Coady's model is that it has been specifically tailored to fulfill the needs of understanding L2 reading (Lally, 1998). Furthermore, Coady's model included the component of the reader's background knowledge which Goodman's model failed to highlight (Al-Hassan, 1992). One explanation for this failure lies in that Goodman's model focused on L1 readers of English who will tend to share the same background knowledge related to reading topics in their native language. Background knowledge is an essential component in Coady's model for "Given the additional linguistic barriers of a second language, the role of interest and background knowledge becomes increasing important" (Lally, 1998:269).

Although Coady does not go into much detail for the first two components, conceptual abilities refer to intellectual capacity or abilities (Carrell and Eisterhold, 1983; Urquhart and Weir, 2014). While for background knowledge, Coady explains that it is a vital component and that students with some Western background knowledge learn English faster on average than those without this background. By process strategies, Coady means both knowledge of the system and the ability to use the knowledge (Urquhart and Weir, 2014). Coady refers to process strategies (Figure 2-2) as subcomponents of reading ability with the concrete (i.e., basic or lower level) strategies positioned at the top, gradually descending to abstract (high) ones at the bottom. He explains that beginning ESL readers typically begin with concrete strategies (e.g. grapheme-morphophoneme recognition) but gradually learn to take advantage of abstract processing strategies like context and syntax. Such changes take place due to readers' awareness that certain strategies are not working well for them as other strategies or combinations might. On the other hand, proficient readers shift their attention to more abstract conceptual abilities and make more use of background knowledge (Grabe, 1991). In other words, skilled readers rely more on abstract strategies and less upon concrete ones except when difficulties occur.

Grapheme-morphophoneme correspondence
Syllable-morpheme information
Syntactic information (deep and surface)
Lexical meaning and contextual meaning
Cognitive strategies
Affective mobilizers

Figure 2-2 Coady's process strategies (Coady, 1979:7)

Coady supports this claim through Shuy's (1975 cited in Coady, 1979:9) maturation in process strategies (Figure 2-3) which display, from left to right, the use of process strategies initiating from a beginning reader to advanced. Baniabdelrahman and Al-shumaimeri's (2014) study on how Saudi L1 Arabic first year university EFL learners (males and females) guessed the meanings of UNWs supports Coady processing strategies. It was found that these Saudi Arabic EFL learners tended mostly to rely on the familiarity of sound/spelling of the UNW to a familiar word they know, followed by using local clues within the same or nearby sentence of the UNW.

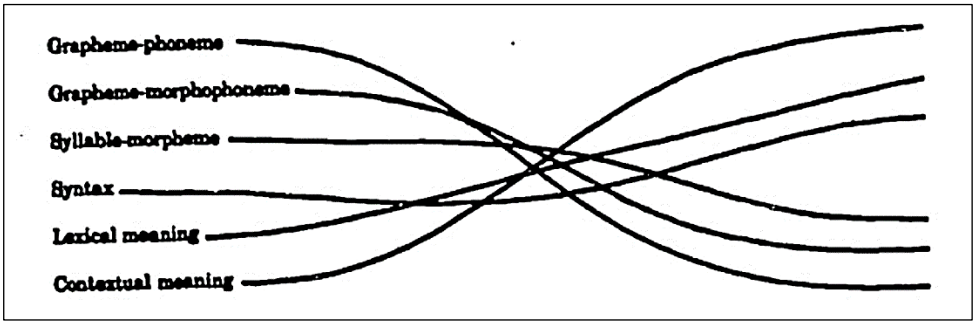


Figure 2-3 Shuy's (1975) maturation processing strategies (Coady, 1979:8)

In contrast, Field (1984) clarifies that proficient readers might resort to concreate strategies in difficult texts but according to her Psychological Model of the Chinese ESL Reader, culture and teaching methods also affect this progression from concrete to abstract strategies. In her model, Field opposes Shuy's developmental processing stages, advocating that although syntax and contextual meaning are used in reading Chinese, yet Chinese ESL learners are discouraged to transfer these strategies when reading English. For in China, students translate English into Chinese in order to comprehend, therefore stressing word accuracy rather than general understanding. Furthermore, some strategies are not prone to transfer due to their inexistence in an L1, like the grapheme-phoneme strategy since the Chinese writing system is logographic where each Chinese character represents a morpheme as well as a syllable which is different to English (Ho and Bryant, 1997).

Although Coady (1979:9) views that "success in reading a second language is directly related to the degree of proficiency in that language", some proficient ESL learners still read slowly and display poor combinations of processing strategies. Coady's model predicts that these students are using poor processing strategies, thus a reading-related problem not a language one. Furthermore, due to the interaction of these components, compensation for a weakness in one component can be fulfilled with another. For example, a learner's background knowledge of the topic can compensate for syntactic deficiencies (process strategy) from which Coady (1979:12) proposes to teachers that:

> The subject of reading material should be of high interest and relate well to the background of the reader, since strong semantic input can help compensate when syntactic control is weak. The interest and background knowledge will enable the students to comprehend at a reasonable rate and keep him involved in the material in spite of its syntactic difficulty.

For this reason, I tend to regard this model as an interactive one. While this reading model was devoted to learners reading in a second language, it does have limitations. First, the concept of conceptual abilities is vague. Second, this model was adapted from Goodman's (1967) L1 reader model rather than derived from L2 data research. Third, the concept of background knowledge is ambiguous, for it is not clear if it refers to general knowledge of the world, the reading topic itself, cultural knowledge or the difference between the learners' culture and the authors'. Furthermore, Coady (1979) fails to include the role/effect of the text's organization and/or genre in comprehension which studies have reported to affect comprehension outcomes (Alkhaleefah, 2010, 2017).

2.4.2 The Schema Theory

Cognitive psychology research has contributed to our understanding of the importance of prior knowledge in understanding and learning new information. Furthermore, how people interpret new situations and meanings based on their pre-existing knowledge structures (Nagy and Scott, 1990). The term 'Schema' is attributed to the work of Bartlett (1932:201) who defines it as "an active organization of past reactions or of past experiences, which must always be supposed to be operating in any well adapted organic response". In learning, the Schema Theory has extensively marked the importance of learner's prior knowledge as an essential element to facilitate not only learning of information but also its recall (Kintsch and Greene, 1978; Carrell, 1983b; Anderson, 2004; Hudson, 2007; Ibrahim, 2015; Schwanenflugel and Knapp, 2016). Regarded as a theory about knowledge, it represents how individuals use their existing previous knowledge to interpret

new information or situations they encounter. According to this theory, "all knowledge is packaged into units. These units are the schemata. Embedded in these packets of knowledge is, in addition to the knowledge itself, information about how this knowledge is to be used" (Rumelhart, 1980:34). In other words, it is a theory about what and how our knowledge is used to understand situations, sequences of events/actions and underlying objects. According to this theory, language (spoken/written) only provides directions for the listeners/readers as to how they should construct or retrieve meaning from their own, previously acquired knowledge. This illustrates that schemata are not rigidly applied in the sense that no variation is allowed but they only provide "the skeleton around which the situation is interpreted" (Rumelhart, 1980:37).

Each separate individual schema is a device for representing knowledge of a concept along with its related associated specifications mapped onto an appropriate network of connections that seem to hold all components of that particular concept (Ibrahim, 2015). For example, in the schema for the concept of ***buy***, from our knowledge, we understand the situation involves the purchaser, the seller, money and merchandise. These previous elements and their interrelationships are called 'variable constraints', which help in the identification of various aspects of the situation with the variables of the schema and serve as initial guesses for variables whose values have not been observed (Rumelhart, 1980). Schemata (plural) are viewed as interlocking mental structures representing a reader's knowledge of ordinary events (Anderson and Pearson, 1984; Alderson, 2005; Nassaji, 2007). A reader comprehends a message when he/she is able to evoke or bring forward a schema that accounts for the information, objects, and events described in the text. Carrell and Eisterhold (1983:556) formalize the role of background knowledge in reading comprehension, advocating that any text, spoken or written does not carry meaning but "a text only provides directions for readers as to how they should retrieve or construct meaning from their own, previous acquired knowledge".

2.5 Schema Theory and reading comprehension

The Schema Theory "has clearly provided a powerful incentive to research into the products of understanding for first-as well as second-language readers" (Alderson, 2005:18). For it was a significant element in the development of reading models and had an important influence on research, particularly in relation to reading comprehension and learning (McVee *et al.*, 2005). Schema Theory has mostly influenced reading instruction through highlighting the vital role of reader's previous existing knowledge or schemata as a prerequisite for comprehending new knowledge and reading comprehension (Bransford and Johnson, 1972; Carrell and Eisterhold, 1983; Tracey and Morrow, 2012). According to Smith (2015:22), this "Knowledge of relevant schemes is obviously essential if we were to read any kind of text with comprehension. A child

who doesn't have a scenario about farming is unlikely to understand a story about farming or references to farming in a textbook".

While reading, readers process the text by integrating the information from the text into their pre-existing schemata. Thus, text comprehension is seen as an interactive process between the readers' background knowledge and the text (Carrell and Eisterhold, 1983). According to this, as we read, meaning construction of the text begins by mapping this input against some existing schema, in order to fulfill comprehension, that schema must be compatible with the incoming information (Carrell and Eisterhold, 1983). This process results in basic information-processing models, both bottom-up and top-down processing (Rumelhart, 1980; Carrell and Eisterhold, 1983). Schemata are hierarchically organized with the most general at the top and becoming more specified towards the bottom, both these processes occur simultaneously, thus making it an interactive model (Rumelhart, 1980). Furthermore, readers' schemata influence how they recognize information (linguistically and non-linguistically) in addition to how well they store this information (Read, 2000). Sometimes, in the light of new information, readers may misunderstand reading materials, choose to ignore them or revise their schemata to validate such information when it does not fit into their schemata (Rumelhart, 1980). Readers successfully comprehend a text if they are able to activate an appropriate schema that offers a coherent account for the text, if not comprehension is distorted (Rumelhart, 1980; Carrell and Eisterhold, 1983).

Failure to activate a schema and accordingly, comprehension has been acknowledged in a number of situations (Rumelhart, 1980; Carrell, 1984; Carrell and Eisterhold, 1992). First, the absence of an appropriate schema for a reader, especially culturally specific ones. Another scenario for this absence is that a schema might exist but it is not activated due to the text's 'opaqueness' in terms of insufficient clues provided by the writer in the text to evoke a schema. Similarly, if words used in the text are obscure or abstract, readers will find difficulty relating the text to a schema they have (Al-Shumaimeri, 2006). A famous example from Branford and Johnson's (1972), where participants were given a text about washing clothes (Appendix A) which they all possessed the relevant schemata for, but due to the opaqueness' and insufficient clues in the text, participants failed to evoke the washing clothes schema. Second, failure to evoke a schema has also been related to L2 readers' lack of control over vocabulary difficultly. Such readers are not able to use their background knowledge because they have not reached a "threshold level" necessary for its usage (Ridgway, 1997; Koda, 2005). This threshold hypothesis states that L2 readers need to know/reach a certain level of L2 knowledge (vocabulary, structures, etc.) so their background knowledge, L1 reading strategies and skills can be used efficiently to comprehend the text.

Finally, the third reason for text miscomprehension is that the reader might activate schemata for the text and not the one intended by the author. Thus, the reader will understand the text but misunderstand the author. A reader's background knowledge is a dominant factor in comprehension to the extent that when information contradicts reader's knowledge, they may let prior knowledge override the text and make elaborations based on it (Johnson, 1981; Carrell and Eisterhold, 1983; Alvermann *et al.*, 1985; Yousef *et al.*, 2014). Bensoussan (1998) found that 23% of incorrect comprehension questions for her 125 EFL learners occurred due to being driven by activating schemata that differed from the actual content of the text. This suggests that when readers' background knowledge of a topic contradicts the information in the text, readers may allow their prior knowledge to override the text's (Steffensen *et al.*, 1978; Alderson and Urquhart, 1985; Lahuerta Martínez, 2009). According to Carrell (1992a) overreliance on a top/down process occurs in two ways; the absence or suppression of a relevant schema to utilize top-down processing leads to overreliance on the text for comprehension, labelling it "*text-biased processing*" or "*text-boundless*". On the other hand, "*knowledge-biased processing*" or "*schema interference*" occurs when overreliance is stressed on top-down processing. Simply put, if ESL/EFL readers are not able to successfully engage with the text because they lack the appropriate content and/or formal schemata, they will compensate for this absence in two ways. Either by overly relying on text-based processes and thus constructing meaning totally from the textual input (which is impossible since no text contains all the information necessary for comprehension) or substituting the closest schema to the text they process, then trying to relate the incoming textual information to that schema, resulting in schema interference.

2.5.1 Types of schemata

Carrell (1983a, 1983b; 1983; 1987, 1992a) and Carrell and Eisterhold (1983) distinguished two types of knowledge (schemata) that readers possess which are critical for reading comprehension, formal and content schemata. The former refers to knowledge of the language and linguistic conventions, including how texts are organized and their different genres (i.e. text genre and rhetorical organization) while the latter represents a reader's knowledge of the world, (i.e. background knowledge). Today, in addition to content schemata, some have regarded linguistic knowledge as separate schemata from formal schemata, known as linguistic schemata (Figure 2-4) (Cohen, 1990; Carrell, 1992b; Singhal, 1998; LI *et al.*, 2007).

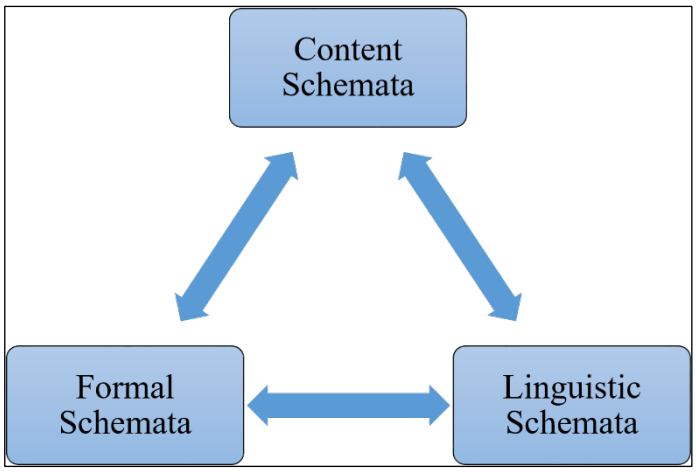


Figure 2-4 The components of background knowledge

This latter view will serve as the basis of the Schema Theory used in this present study since it stresses two reading components, critical for reading comprehension not found in Coady's Model, linguistic and formal schemata. Furthermore, as opposed to the previous model, it specifies three types of background knowledge; subject matter, world knowledge and cultural knowledge (see 2.5.1.3). This study aims at investigating the effects of L1 Arabic EFL learners' topic familiarity of cultural topics (content cultural schemata) and their level of English proficiency (linguistic schemata) on inferencing UNWs. Furthermore, how these two components affect learners' lexical inferencing outcomes, knowledge source (KS) clues and lexical inferencing strategies (LIFSs) used. Below is a brief overview of these types of schemata.

2.5.1.1 **Linguistic schemata**

In terms of foreign/second language, linguistic schemata refer to a reader's prior linguistic knowledge of the level of language proficiency, knowledge of vocabulary, grammar and idioms (Alderson, 2005; LI *et al.*, 2007). Linguistic knowledge plays an essential part in text comprehension without which the texts would be incomprehensible, the more the reader has, the faster and better comprehension will be (LI *et al.*, 2007; Ibrahim, 2015). Since some proficiency is required to activate a schema, it is not surprising that for second/foreign language learners, failure to activate one is often due to deficiencies in language processing (Carrell and Eisterhold, 1983).

2.5.1.2 **Formal schemata**

Carrell (1983a:83) defines formal schemata as "background knowledge of the rhetorical structures of different types", formal schemata are also known as textual schemata (Singhal, 1998) Formal schemata are higher order structures containing knowledge about the rhetorical structure of texts; in other words, the underlying structure of how texts are organized, what type of

information to expect and where to find it as well as how information is signalled (Carrell, 1983b; Alderson, 2005). In short, the linguistic conventions of the text that are expressed through the main features of a particular genre of writing. It represents the encoded internalized coherent patterns of the metalinguistic discourse and textual organization that guide readers as they attempt to understand the texts (LI *et al.*, 2007; Ibrahim, 2015). Readers will use their background knowledge of the rhetorical structures for different types of texts (genres), reading a story, poem, speech, academic papers, etc. to help them comprehend the organizational structure of the text. Formal schemata not only facilitates reading comprehension but also affects the quality and amount or recall of the text. Through using 3 story structured texts and their interleaved (mixed temporal events) versions, Carrell's (1984) study on 40 ESL learners from mixed L1 backgrounds found that quantity of recall was enhanced when the story's rhetorical organization mapped the reader's formal schemata as opposed to those that distorted it. Furthermore, a 24 hour delayed recall found that participants recalled the violated stories in the correct manner to the actual story' genre (formal schemata). This also stresses that compared to linguistic and content schemata, formal schemata offers less power in the reading process. Knowledge of text rhetorical organizations and genre facilitate reading comprehension through having "an extra link of relationship" between their parts, like problem-solving texts. Thus tightly controlled texts are better recalled, in quantity and quality, than loosely organized ones like descriptive texts (Zhang, 2008:199).

2.5.1.3 **Content schemata**

This refers to the knowledge that readers require regarding the content (topic) of the passage that needs to be activated by the reader to comprehend (Alderson, 2005). Evidence reports that the effect of content schemata is very strong even across passages with the same general theme, identical structure, syntax and very similar vocabulary, the more familiar version was better recalled (Alderson, 2005). Furthermore, familiarity with the topic affects reading comprehension and recall more than formal schemata, text organization, syntactic and semantic difficulty (Johnson, 1981, 1982; Floyd and Carrell, 1987). For EFL learners, content schemata is a critical component of reading comprehension that can make up for the degree or lack of readers' language and formal schemata (Carrell, 1981; Johnson, 1981; Yousef *et al.*, 2014; Al-Qahtani, 2016). Content schemata have further been divided into three different knowledge types: subject matter (topic), world knowledge and cultural knowledge (Alderson, 2005; Alptekin, 2006).

2.5.1.3.1 Subject matter

Regarded as one of the critical elements of knowledge that impose immediate threats to reading comprehension, if the subject matter (topic) of the text is beyond the borders of a reader's

experiences/knowledge, the reader drifts from accurate comprehension (Aebersold and Field, 1997). This type of schemata can compensate for learners' limitations in linguistic and formal schemata and thus make up for this lack by helping learners fall back on their content background knowledge if the text is within the boundaries of the latter (Carrell, 1984, 1987; Ibrahim, 2015). Studies have shown that readers' content schema influences their reading comprehension more than their formal schema (LI *et al.*, 2007) and linguistic schema (Al-Shumaimeri, 2006). Interestingly, Al-Shumaimeri (2006) reported that lack of prior topic knowledge affected only the performance of low proficient but not advanced Saudi learners. He explains that topic knowledge is helpful at lower levels of proficiency but not higher ones (Carrell, 1983b). Another reason, which supports the interactive model of reading, is that advanced learners' comprehension performance was not hindered with the unfamiliar topic, since their linguistic knowledge (language schemata) compensated for this lack. However, caution is required in generalizing such findings since multiple-choice questions, which are prone to guessing, were used to measure reading comprehension. Due to its importance, teachers need to build background knowledge through pre-reading activities to improve learners' reading comprehension, for "Having appropriate background knowledge of the content domain of a text is as important for an ESL reader encountering scientific texts, new stories and other texts as it is for culture-specific texts" (Floyd and Carrell, 1987:105).

2.5.1.3.2 Knowledge of the world

Anderson (1977) (cited in Carrell and Eisterhold, 1992:73) highlights the role of world knowledge in comprehension in that "Every act of comprehension involves one's knowledge of the world as well". It is through this background knowledge, which is not explicit, we comprehend our surroundings. A commonly cited example in the literature which illustrates this type of knowledge is the following (Rumelhart, 1977b:267)

The policeman held up his hand and the car stopped

Although not implicitly stated in the sentence, readers have no difficulties in comprehension as they imagine the driver pulling on the brakes as soon as the sight of the policeman's hand signalling to stop. This interpretation is based on our background knowledge schemata about how traffic police are known to communicate with drivers. The same sentence would have another interpretation if 'Superman' replaced the policeman. Readers would comprehend that direct physical contact was used to stop the car.

2.5.1.3.3 Cultural schemata

Cultural schemata or abstract schemata (Oller, 1995) refers and involves cultural membership and familiarity which helps readers to reconstruct the text by referring to more culturally relevant scripts to fully understand the meaning intended by the writer (Oller, 1995). Many studies have confirmed that cultural familiarity of a text had positive effects on readers' comprehension which was measured either by recall tasks (Malik, 1990) or objective questions (Johnson, 1981; Droop and Verhoeven, 1998) or both (Steffensen *et al.*, 1978). Furthermore, that exposure to the TL helped readers in free recall and recognition tasks (Johnson, 1982) while pre-reading activities helped learners to build on their background knowledge and improved their reading scores which were measured by objective questions (Floyd and Carrell, 1987). Our cultural orientations seem to be a dominant force in shaping our reading habits (Gilakjani and Ahmadi, 2011). Therefore, in some situations, a content schemata might not exist for a reader, one reason for this is that "the schema is culturally specific and is not part of a particular reader's cultural background" (Carrell and Eisterhold, 1983:560). Alderson (2005:45) labels this as cultural knowledge, explaining that peoples' world knowledge may work differently for:

> Such worlds may be idiosyncratic - because of personal history, experiences unique to the person- and thus difficult to predict or control, but they may also held in common with other people. To the extent that those other people are conventionally said to share a culture, then cultural knowledge is also crucial to text understanding.

Research has shown that the implicit cultural content knowledge presupposed by a text interacts with the reader's own cultural background knowledge (Steffensen *et al.*, 1978). Bartlett's (1932) classical study showed how British informants reading a North American Indian folktale, when asked to reproduce the story, altered both the story and even some of the lexical words used aligning it more to their cultural assumptions about the world. Texts whose content is based on one's own culture are easier to read and understand than syntactically and rhetorically equivalent texts based on a less familiar/unknown culture. In a cross-cultural study, Steffensen *et al.* (1978) reported that texts are easier in comprehension and recall if they shared the reader's cultural background knowledge than less familiar ones which are syntactically and rhetorically equivalent text. In this study, American and Indian participants were asked to read letters about weddings from their countries. Both groups read more rapidly, recalled larger amounts of information and produced more culturally appropriate elaborations on their native passages. On the other hand, more cultural distortions surfaced when the second text was read. A similar study on recalling folktales and their difficulty by advanced ESL Japanese and Chinese participants was conducted by Carrell (1981). These folktales represented three cultures; a native culture (Japanese or Chinese,

respectively), a Western European (English) culture and an unfamiliar one (American Apache Indians). It was reported that the origins of the text and the reader's familiarity/unfamiliarity of the topic affected the recall of information and increased the level of difficultly as reported by the participants. Similar findings on the role and effect of cultural familiarity and unfamiliarity on reading comprehension and recall have been reported by several studies (Kintsch and Greene, 1978; Reynolds *et al.*, 1982; Pritchard, 1990; Droop and Verhoeven, 1998; Lin, 2004; Liu, 2015; Shirzad, 2015).

Culture is even diverse within the same country for ethnicities do exist. Minority children may sometimes fail to comprehend school reading material because their schemata do not match the majority culture they are embedded in (Anderson, 2004). Reynolds *et al.* (1982) reported that despite the large amount of overlap, differences among groups in the United States influenced text interpretation. The researchers report that their 105 eighth grade students (boys & girls) representing both Afro-American and white ethnic backgrounds influenced how the same reading text was interpreted differently by both groups. Thus, supporting the idea that cultural group differences increase with age and that cultural knowledge develops as children turn into adulthood (Alderson, 2005). Cultural familiarity also plays a role in successful reading comprehension. Yousef, Karimi and Janfeshan's (2014) conducted a study on Iranian learners majoring in English Translation and representing 3 different ethnicities Arabs, Turks and Kurds. The study reported higher scores on the texts representing learners' own familiar ethnicity than the unfamiliar texts.

Lack of background knowledge plays a critical role as one of the main sources of comprehension problems in EFL reading. According to Rivers (1968 cited in Carrell and Eisterhold, 1992:83), this stems from the differences in values and attitudes since culture-specific values can be a significant factor in comprehension if the values expressed in the text differ from the values held by the reader. Thus, it has been proposed before presenting a text with covert cultural information to learners, teachers should provide the specific background information to evoke learners' knowledge to facilitate comprehension (Floyd and Carrell, 1987; Anderson, 2004; Tracey and Morrow, 2012).

Deficiency in any of the above schemata will result in a reading comprehension deficit. Students' apparent reading problems may be attributed to insufficient background knowledge in content, formal, and linguistic information since all of them contribute and facilitate reading comprehension (Carrell, 1992b). According to the Schema Theory, word inferences can be seen as a process where the reader searches for and evokes a relevant schema while reading to identify an unfamiliar verbal stimulus (Ibrahim, 2015). As opposed to reading comprehension, little has

been done on the role or effect of reader's content knowledge (topic and the world) (Pulido, 2007a; Atef-Vahid *et al.*, 2013; Biria and Baghbaderani, 2015), especially culturally specific ones. The lack of activating an appropriate schema and the lack of specific cultural background knowledge needed for comprehension are two major causes of low L2 reading motivation and difficulty in assessing the correct schema (Gasigitamrong, 2003). Casanave (1988) views that in order for successful reading comprehension to take place, not only does it depend on readers' ability to access and activate relevant content, formal and linguistic schemata but more crucially their ability to monitor and repair their understanding and take appropriate strategic action. She labels this strategic action as "strategy schemata", knowledge about monitoring behaviours. Nagy (1997:1) supports this, for both "world knowledge and strategic knowledge can help compensate for the limitations in second language learners' linguistic knowledge".

Although the Schema Theory plays a vital role in the field of learning and reading comprehension, yet it has also has been criticized for a number of reasons. First, although it appears to explain the knowledge we store and recall from long-term memory but not how the new information is called up and integrated with the old one, how we store, handle and recall it from long-term memory (Alderson, 2005). Second, how readers notice the similarities in the first place, how the information is misunderstood based on false similarities and comparisons is also not discussed. Furthermore, vagueness is associated with the term Schema Theory; it has been commonly used as a synonym for background knowledge, multiple definitions and interpretations have been given to the term. Some view and discuss the Schema Theory more as a metaphor of knowledge representation and memory retrieval than a fully developed model (Alderson, 2005; Nassaji, 2007; Grabe, 2009; Urquhart and Weir, 2014).

2.6 Overview of strategies: Language learning, vocabulary learning and lexical inferencing strategies

Before defining the term lexical inferencing strategies (LIFSs), it is crucial to present what is first meant by "strategy" since various definitions exist. Second, how these LIFSs have developed and differ from both language learning strategies and vocabulary learning strategies.

2.6.1 Language learning strategies

From the mid-1970s, the emphasis and the concerns with methods and products of language teaching moved to a focus on the learner, especially how language learners process, store, retrieve and use target language material. One major research area involved attempts to investigate and understand how language learners manage their learning and the strategies they

use to improve their target language (TL) competence (Schmitt, 1997; Oxford, 2017). However, little consensus exists in the literature concerning the definitions of learning strategies. One of the earliest definitions of learning strategies were "behaviors and thoughts in which a learner engages in during learning and that are intended to influence the learner's encoding process" (Weinstein and Mayer, 1986:3). The element of deliberate action was incorporated into learning strategy definitions, for they are "techniques, approaches or deliberate actions that students take in order to facilitate the learning, recall of both linguistic and content area information" (Chamot, 1987:71).

Research on language learning strategies began with Rubin's (1975) questions of the strategies employed by successful language learners which once identified could be taught to less successful learners. Studies conducted at that time reported that learners who use effective strategies will most likely continue to do so outside the classroom (Rubin, 1987). Furthermore, these strategies have the potential to enhance the development of oral skills in English as a SL (O'Malley *et al.*, 1985) and are used by good learners to assist them in gaining command of the language (Naiman *et al.*, 1978). These strategies are not only applicable to a variety of language tasks (Bialystok, 1983a; O'Malley *et al.*, 1983) but can be adapted to suit the proficiency level (PL) of individual learners (Cohen and Aphek, 1980; 1981). Since then, researchers and education practitioners have been aiming at identifying, describing and categorizing these strategies and integrating strategy training in language classrooms. However, due to the complex nature of language learning strategies, numerous controversial definitions began to emerge in the literature (Oxford, 1990; Ellis, 1994b; Cohen, 2014; Grenfell and Harris, 2017).

One of the earliest studies in language learning strategy to use the term "***strategy***, as Griffiths (2018) reports, was used by Rubin (1975:43) who defines them as "the techniques or devices which a learner may use to acquire language". Twelve years later, Rubin (1987:23) redefined language learning strategies as "strategies which contribute to the development of the language system which the learner constructs and affect learning directly". Another influential work was by O'Malley and Chamot (1990:1) who set language learning strategies within a cognitive framework defined them as "the special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information". This cognitive framework was derived from cognitive psychology by Anderson (1983, 1985) which provided a theoretical background to much language learning strategy research in the 1980s (Cohen and Macaro, 2007). Oxford (1990:1), known for her Strategy Inventory for Language Learning (SILL), which has been used worldwide by both teachers and researchers, defines strategies as "steps taken by students to enhance their own learning". This was a very broad and vague definition, one that does not take into account the nature or the type of steps and how they facilitate learning. However, she later redefines

them by specifying them as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (Oxford, 1990:8).

In the present study, my views of strategies are in line with Cohen's (2014:7), as "thoughts and actions, consciously chosen and operated by language learners. To assist them in carrying out a multiplicity of tasks from the very onset of learning to the most advanced levels of target-language performance". This definition stresses the element of choice which gives a strategy its special character. Furthermore, the notion of consciousness, although still a controversial issue, but according to Cohen (2014) is what distinguishes strategies from those processes that are not strategic. It is this ***deliberate*** conscious action that also defines learning strategies from *skills*, where the former are intentional and deliberate and the latter are automatic and out of awareness (Oxford, 2011).

To this day, the concept of strategy is described as "fuzzy" (Ellis, 1994b:529) with blurry borders surrounding it. Therefore, strategies have been classified in numerous ways, making it difficult in some cases to compare across/between studies (Chamot, 1987). This alternatively led to numerous classifications of various strategy labels; language learning, language use, production and communication (see Ellis, 1994b; Cohen, 2014), strategies used by language skills (Cohen and Weaver, 2006), strategies according to their function (cognitive, metacognitive, affective, social, compensational) (Chamot, 1987; Rubin, 1987; Oxford, 1990; 2011). In this study, the classification system I found most appropriate to define and classify the broad overarching classifications of the lexical inferencing strategies (LIFSs) was according to their function. First, it fits in with the study's research questions and aims; to identify and categorize the type of strategies learners used in terms of their level and role (function) during inferencing in the two texts. Second, it helps to capture the nature of LIFSs in their degree of simplicity (concreteness) of lower-level cognitive strategies and complexness (abstractness) of higher metacognitive ones. Finally, it allows us to see how these different combinations of strategies can be used in isolation or integrated (clustered) with different strategies. Only Cognitive and Metacognitive Strategies are used since affective and social strategies are beyond the scope of this study.

Cognitive strategies deal with the nuts and bolts of the language (Cohen, 2014). They include strategies as guessing, memorizing, repetition analysing, categorizing and practicing which allow manipulation or transforming information (Rubin, 1975, 1981). While metacognitive "*thinking about cognition*" strategies deal with higher-level cognitive processes, like coordinating, planning, monitoring, evaluating and organizing stagey usage (Oxford, 1990). These metacognitive strategies allow students to control their learning and "Students without metacognitive

approaches are essentially learners without direction or opportunity to review their progress, accomplishments, and future learning directions" (O'Malley and Chamot, 1990:8). The strategy literature reports that not only do higher proficiency learners use more metacognitive strategies but also successful learners use them more than their less successful counterparts (Chamot, 2005; Anderson, 2008). In this study, cognitive strategies are direct strategies which require direct linguistic analysis (meaning and form) or manipulation of information while problem-solving. On the other hand, metacognitive strategies are indirect strategies for planning, monitoring, evaluating and overviewing steps to regulate the cognitive strategies (O'Malley *et al.*, 1985; Rubin, 1987; Oxford, 1990; Schmitt, 1997; Cohen, 2014).

2.6.2 Guessing in language learning strategies

The learner's lexicon is now attributed as a core element in language acquisition and language learning (Laufer, 1997a; Schmitt, 1997). Lexical competence is an essential element for building linguistic capacity and communicative competence. Vocabulary's vital role in language over grammar is stressed by a famous quote by Wilkins (1972:110-111);

> There is not much value in being able to produce grammatical sentences if one has not got the vocabulary that is needed to convey what one wishes to say… While without grammar very little can be conveyed, without vocabulary nothing can be conveyed.

McCarthy (1990:viii) extents this importance further beyond grammar to communication, for "No matter how well the student learns grammar, no matter how successfully the sounds of L2 are mastered, without words to express a wide range of meanings, communication in an L2 just cannot happen in any meaningful way".

This is in line with Schmitt's (1997:201) view of English in foreign language contexts where "the most important part of learning a foreign language is learning vocabulary". This highlights vocabulary as a crucial element for language learning since vocabulary knowledge, the stock of words a person knows, is a prime predictor of a learner's L2 proficiency (Milton, 2010). Vocabulary research still shows that vocabulary learning is a never-ending incremental process, for the majority of our lexicon is learnt incidentally (indirectly) as opposed to intentionally (directly) as in classrooms (Nation, 1990; Schmitt, 2010). Learning or acquiring a second language (L2), henceforth learning, is a complex process since it is influenced by many factors, some social, psychological, cognitive, etc. (Lightbown and Spada, 2013; Dörnyei, 2014). Research has shown that L2 learners rely heavily on their vocabulary knowledge and its absence is the largest obstacle for them to overcome (Alderson, 1984). Therefore, learners encounter reading comprehension difficulties in the input due to their insufficient vocabulary knowledge and low proficiency level

(PL) (Bengeleil and Paribakht, 2004; Nassaji, 2006; Atef-Vahid *et al.*, 2013; Hu and Nassaji, 2014; Rahbarian and Oroji, 2014). Thus, they resort to inferencing (guessing) strategies to compensate for their reading comprehension difficulties

In the language strategy literature, guessing meaning has been a part of some classifications of language learning strategies. The earliest mention of guessing as a strategy was by Rubin (1981:119), who views it as a cognitive strategy that takes two forms "*inductive*" and "*deductive*". She labels the first as "***inductive inferencing***", where "hunches" from a wide range of sources for a particular situation, for example, keywords in the sentence, syntactic structure, pictures, context and topic of discourse and gestures, ignoring difficult words and trying to get an overall picture (inductive reasoning). While in the second, "***deductive inferencing***", a learner looks for and uses general rules based on knowledge of the L1 or other languages known, for example, comparing languages for similarities and differences, grouping words according to the similarity of endings, noting exceptions to rules (deductive reasoning) (Rubin, 1981; Rubin, 1987). The difference here is that in inductive inferencing, learners look for specific meanings or rules while during deductive inferencing they look for more general rules. She adds that good learners "must modify their rules for inductive and deductive reasoning on a continuous basis if they are to approach communicative competence" (1981:19).

Although the previous literature on strategies proposed classifications and generated taxonomies on language learning strategies in general, there was still a lack of research regarding strategies specifically targeting vocabulary learning strategies (Schmitt, 1997). Oxford (1990) includes 'guessing intelligently' as part of her direct Compensation Strategies, where she subdivides them into; 'using linguistic clues' and 'using other clues'. The first refers to seeking language-based clues like knowledge of grammar and vocabulary in the target language or their L1 in order to comprehend what is uttered/read. While the second refers to clues that are not language-based, like knowledge of the context, situation, text structure, personal relationships or general world knowledge.

A more detailed classification for vocabulary learning strategies was proposed by Schmitt (1997) who argued that Oxford's (1990) classification lacked strategies that described what learners do when initially encountering UNWs and thus discovering their meanings without resorting to the help of others. In addition to Oxford's classification (1990), Schmitt classifies his taxonomy of 58 vocabulary learning strategies into two overarching categories, ***discovery strategies*** for newly encountered words and ***consolidation strategies*** once these words have been encountered. Although Schmitt's discovery strategies take into account strategies for guessing unfamiliar words for the first time through using the 'textual context', it does not include the use of learners'

background knowledge to infer meanings of unknown words. This is not only limited to discovery strategies but also consolidation strategies. Although in his consolidation strategies, Schmitt lists learning a word through connecting it to a personal experience as a memory strategy where learners resort to their previous experiences, it is not clear if this experience also includes their background knowledge of the topic. Furthermore, there are more consolidation strategies (44) than discovery ones (14). Although Schmitt's taxonomy provides a list of vocabulary learning strategies, there was still a need to investigate what strategies learners resorted to when uncovering meanings of UNWs as they read as opposed to learning their meanings. Therefore, a need for the latter set of strategies was necessary, which is the focus of the next section

2.7 Lexical inferencing strategies

Inferencing unfamiliar or unknown words is a sub-type of the more general inferencing processes that operate at all levels of text comprehension (Wesche and Paribakht, 2010). Inferencing in the latter context refers to "connections people make when attempting to reach an interpretation of what they read or hear" (Brown and Yule, 1983:265). Inferencing is a central part of the reading process which occurs at all levels of reading comprehension; integrating the text with background knowledge, connecting different parts of the text together, linking UNWs elements in the text to construct coherent meaningful structures (Clarke and Nation, 1980; Kintsch, 1988). Furthermore, it is a central cognitive process in both L1 and L2 comprehension, where informed guesses about the contextual meaning of an unfamiliar word are hypothesised (Paribakht and Wesche, 2006). In this process, readers go through a number of cycles, accepting, modifying or rejecting formulated hypotheses to arrive at appropriate meanings of UNWs (Haynes, 1993).

The term "inferencing" was first coined by Carton (1971:45) for the process in which "attributes and contexts that are familiar are utilized recognizing what is *not* familiar". However, in the L2 literature, the term lexical inferencing became prominent due to the work of Haastrup (1991). Various definitions have been proposed with the aim of capturing the processes activated during lexical inferencing while reading. Nassaji (2006:392) defines lexical inferencing as "any cognitive or metacognitive activity that the learner turned to for help while trying to derive the meaning of the unknown word from context". Both these definitions are characterized as broad due to the absence of specific details on the inferencing process, as to what readers do to guide them in uncovering the meaings of UNWs. A more detailed definition of lexical inferencing is proposed by Bialystok (1983b:105) as

> the use of available information to derive explicit linguistics hypotheses. The information used for this purpose may be linguistic or non-linguistic, it may be taken from the

> speaker or from the environment, and it may relate to the structure or the meaning of the language.

In addition to mentioning the sources of clues (cues), linguistics and non-linguistic, Haastrup (1991:13) includes knowledge about the context (topic) of the text and the world and states:

> The procedures of lexical inferencing involve making informed guesses as to the meaning of a word in light of all the available linguistic cues in combination with learner's general knowledge of the world, her awareness of the context and relevant linguistic knowledge.

Thus, an interactive definition of inferencing that takes into account both bottom-up (linguistics knowledge) and top-down (knowledge of the world) processes. Furthermore, Haastrup (1991) considers lexical inferencing a central process in language use and language learning. For these reasons, I have adopted Haastrup's (1991) definition towards what is meant by lexical inferencing in this study. To summarize, the last two definitions stress the unfamiliarity of the word, hypothesis generation about the UNW's meanings through linguistic and non-linguistic clues with the addition of contextual information in the last definition. Both definitions can be applicable to inferencing UNWs through reading or listening. Based on Haastrup's definition, I define learner's lexical inferencing behaviour in this study as "a compensational technique or approach by the EFL learner when encountering an UNW while reading. Through using a combination of lexical inferencing strategies and knowledge source clues (linguistic & non-linguistic), that can successfully contribute to deducing the unfamiliar word's meaning".

One reason for the lack of various definitions on LIFSs might be explained in terms of the numerous idiosyncratic 'labels' made by researchers to refer to this process. Throughout the literature, the process of deducing meanings of UNWs from context has been mostly referred to as '*guessing from context*' (Clarke and Nation, 1980; Liu and Nation, 1985; Oxford, 1990). However, in my opinion, such a label would implicitly entail a greater degree of unguided randomness and ambiguity than the term '*inferencing'*. In order to overcome this sense of ambiguity, terms which reflect the nature of the process began to surface in the literature, like "*inferring from context*", "*deriving from context"* or even "*informed guessing from context*" (Bialystok, 1983b; Nation and Webb, 2011:77). While others have referred to guessing/inferencing strategies as "*word identification strategies*" (Walker, 1983), "*hypotheses testing*" (Bialystok, 1983b), "*word-solving strategies in reading*" (Chern, 1993), "*contextual guesswork*" (Dubin and Olshtain, 1993) and "*problem-solving*" (Huckin and Bloch, 1993). Although guessing and lexical inferencing have tended to be used interchangeably, I tend to view lexical

inferencing as a deeper cognitive process than mere guessing. Paribakht (2015, personal communication, May 6th) explains that;

> These are often used interchangeably. Guessing meaning of unknown words in context would simply imply using available clues in the text. Lexical inferencing may be more inclusive and also include, e.g., word analysis (stems & affixes) to guess the meaning. Of course, inferencing is one strategy used to solve gaps in lexical knowledge.

With such differences established, from this point onwards in this study, the terms lexical inferencing and guessing would be used interchangeably, yet still remaining within the overarching lexical inferencing view of Paribakht's (2015) classification.

Studies that have focused on guessing/inferencing UNWs from context have either provided a strategy to correctly infer the meanings of unfamiliar words or classifications/taxonomies for the observed strategies. Clarke and Nation (1980) describe a 4 step approach to guess the meaning from context; first, to look at the word itself and its surroundings to decide on its part of speech. Second, to look at the UNW's immediate grammar and context of the word. Third, to extend beyond the sentence of the word and look at the surrounding context (sentences). Finally, to guess the word and check the hypothesized meaning is appropriate/correct in the context.

A large body of research on LIFS classifications can be contributed to Nassaji (2003a; Nassaji, 2006) and Hu and Nassaji (2012; 2014). Through using think-alouds and stimulated recalls on 21 ESL university students representing various L1 backgrounds, Nassaji (2003a) identified 6 LIFs; repeating, verifying, self-inquiry, analysing, monitoring and analogy (word/form similarity). It was also reported that section repeating, verifying and self-inquiry lead to more successful inferencing, with the last two strategies contributing more. The relationship between the ease of inferencing and the retention of the inferred word meanings was also investigated by Hu and Nassaji (2012). The results found that the easier a word was inferenced, the more difficult it was to retain its meaning by the learners. Furthermore, inferenced words through Meaning-Focused Strategies were inferenced correctly but not retained while those retained were inferenced through Form-Focused Strategies. A similar finding was found by Haastrup (1991) were Form-Focused inferenced words had a higher degree of saliency in the memory than words inferenced through contextual clues alone. She explains that the harder the inferred difficultly of the word, the better this word is retained in the learner's memory. This further supports Laufer and Hulstijn's Involvement Load Hypotheses (2001) (see 2.8.2).

This LIFS classification was further developed by Hu and Nassaji (2014) in which the sub-LIFSs were classified into 4 categories; Meaning-Focused, Form-Focused, Evaluating and Monitoring

Strategies which all included sub-strategies. Their study aimed at investigating what distinguishes successful inferencers from unsuccessful ones through think-aloud data and statistical tests collected from 11 university ESL learners from various L1 backgrounds. It was found that successful inferencers activated both contextual and background knowledge, displayed a higher depth of analysis, displayed active involvement through using multiple clues and strategies and used more metacognitive (Monitoring and Evaluating) strategies. The researchers labelled these characteristics as 'strategic deployment of inferential strategies'. While unsuccessful inferencers were more word-bonded to the TW, associated the TW to the local context immediately, rarely used the wider context of the TW, used clues and strategies in a random and unrelated manner and often did not use metacognitive strategies to check their answers.

Continuing the same abductive approach to coding as with Knowledge Source (KS) clues (2.10), I have therefore adapted Hu and Nassaji's (2012; 2014) classifications of LIFSs at the same time being open to other strategies that my data generated not found in their taxonomy. The rationale behind this lies in the fact that this classification takes into account both cognitive (Meaning-Focused, Form-Focused Strategies) and metacognitive (Evaluating, Monitoring strategies) strategies. In other words, a functional approach to these strategies which is one of the objectives of the present study. In the following section, an overview of some of the most frequently reported LIFSs in lexical inferencing literature towards UNWs is presented.

During inferencing, it has been reported that learners sometimes tend to skip or ignore the UNWs (De Bot *et al.*, 1997; Schmitt, 1997; Al-Fuhaid, 2004; Alyami, 2011; Alhaysony, 2012). These two terms have been used interchangeably in both the vocabulary learning and lexical inferencing literature. Skipping is also viewed as a trait of successful confident readers since it is not necessary to know the meaning of each word to comprehend the passage, where a reader "skips words that he views as unimportant to total phrase meaning (Hosenfeld, 1977:120; Smith, 2015). Through a closed questionnaire, Alhaysony's study (2012) on 746 Saudi university learners representing both genders reported skipping was the second largest discovery strategy after social strategies while guessing and dictionary use were the least frequently reported by Saudi EFL learners. This contradicts Schmitt's (1997) findings on Japanese participants, where skipping was the least reported strategy on the 600 open questionnaires by 3 different age groups. Differences in research findings can be attributed to variations in participants' demographic, linguistic and educational backgrounds (Atef-Vahid *et al.*, 2013), cultural differences (Laufer and Yano, 2001) and methodological procedures (Cohen *et al.*, 2018).

However, from this point onwards in this present study a distinction is made between '*skipping'* and '*ignoring'* strategies. My underlying rationale lies in the underpinning motivational

differences that constitute both these strategies. 'Skipping' differs from ignoring in the sense that in skipping, learners "***temporarily decide to ignore***" the UNW to search for more appropriate clues and alternatively continue reading and will return back to the UNW upon finding these clues. While 'ignoring' an UNW means that learners decide to overlook this word and move on without any attempts to inference its meaning. Learners might decide to ignore an UNW if they judge its unimportance, that is, if learners are able to understand the general meaning of the sentence without providing the UNW's meaning (Paribakht and Wesche, 1999; Laufer and Yano, 2001; Nassaji, 2003a). Furthermore, participants might view the UNW as irrelevant or unimportant to carry out a given reading task, i.e. answering comprehension questions, summarizing and therefore decide to ignore it (De Bot *et al.*, 1997; Fraser, 1999). Hulstijn *et al.* (1996) mention two more reasons for ignoring a word; first, learners fail to notice the presence of the unknown word or they believe that they already know this word, when in reality they do not. Second, even if learners noticed an unfamiliar word, they would still decide to ignore it. Ignoring is the most repeated used strategy when encountering UNWs (Bensoussan and Laufer, 1984). Laufer and Sim (1981) reported that learners failed to provide meanings of words they had tended to ignore, even when they were asked to guess their meanings during oral interviews. In some cases, a participant might ignore the TW and upon further reading and picking up more clues, would eventually infer its meaning. The previous case was reported in Huckin and Bloch's study (1993), who label it as "***late bloomer***" when participants ignored a word and suddenly came up with an appropriate meaning. One explanation is that through using global clues and reading beyond the sentence, the participants gained more contextual clues and were able to infer its meaning. Sometimes a case of skipping an UNW might develop to ignoring. In their study, Huckin and Bloch (1993:160) reported what they label as a "***pothole case***" when "subjects detoured around the word without making a guess" when a second and third encounter of the UNW occurred. Motivation also plays a role, for learners might ignore deriving an UNW if they made multiple failed attempts and thus decide to give up (Huckin and Bloch, 1993).

Another lexical inferencing strategy is analysing an UNW, which is useful only if a root can be correctly isolated by the readers and if they already know a relevant meaning for its root (Haynes, 1993). Haynes (1993) reports that the TW "*campfire*" was successfully guessed by some ESL participants, who represented various L1 backgrounds, by analysing it into "*fire*" and "an *outdoors place*". At the same time, Spanish and Tunisians (Arabic L1) speakers analysed "*campfire*" by resorting to cognates in their native or schooled language. The morpheme "camp" was interpreted to mean 'a place with many people' by these participants who defined the word as a 'military camp' which was further enhanced by the presence of the word 'gun' in the same context. This did not only lead to an incorrect guess but more seriously how they misinterpreted

the whole text in light of that one word. One reason might be that using prefixes too early blinds readers from looking at the immediate text (usually within a clause or sentence), the grammatical structure surrounding the TW and later on the wider context (beyond the level of the clause and usually over several sentences) (Clarke and Nation, 1980). As a result, this guess "determines the interpretation of the immediate and wider context instead of the context influencing the guess"(Clarke and Nation, 1980:215). Another explanation, from my perspective, which has been neglected in guessing/inferencing research, might be due to the influence of Spanish and Tunisian readers activating their content military schemata when encountering "campfire" supported by the word 'guns' in the same sentence. Haynes (1993) reported that not only word analysis results in unsuccessful inferencing but it was frequently conflicted with the syntactic context. The saliency of word shape familiarity of the UNW overrode ESL readers' ability to attend to the syntactic relations of the UNW in context. In short, the more the UNW looked familiar in terms of its graphophonemic form, the more difficult it became for readers to shift their attention from the form to test the guessed meaning onto the syntactic context. In addition, syntactic clues are exploited the least or even ignored if they do not fit a reader's views in terms of background knowledge of the topic or the world (Laufer and Sim, 1985a). Furthermore, word analysis of the UNW through morphological analysis or its resemblance to words in other languages is used more than searching for contextual clues (local-global) in a text (Laufer and Sim, 1985a).

Repeating only the unfamiliar word or including the word before/after it or with part of the phrase during lexical inferencing while reading has been reported in the majority of LIFS literature (Walker, 1983; Pressley and Afflerbach, 1995; De Bot *et al.*, 1997; Paribakht and Wesche, 1999; Hu and Nassaji, 2014; Rahbarian and Oroji, 2014). Some researchers view this as more of a retrieval strategy than an inferencing one, perhaps to buy time, in an attempt to receive meaning from phonetic or graphic clues (Paribakht and Wesche, 1999; Rahbarian and Oroji, 2014). Through pronunciation, L2 learners use homonyms where the similarity of unfamiliar word sounds or looks like a word they know (Paribakht and Wesche, 2006). From which, learners can then identify if the UNW exists as part of their receptive (passive) lexicon or not (Walker, 1983).

2.8 Lexical inferencing and reading

Evidence from studies on L2 reading comprehension suggests that encountering many UNWs in a text may significantly influence L2 readers' reading comprehension (Nassaji, 2003b). Unknown words are problematic, whether in L1 or L2, for according to Laufer (1997a:20), "no text comprehension is possible, either in one's native language or in a foreign language, without understanding the text's vocabulary". Thus to inference the meanings of UNWs, readers must first understand the text. Reading is not simply a process of assessing readers' overall comprehension

but also exploring their 'process of reading' which involves those cognitive and metacognitive processes as readers try to make sense of what they read in texts (Alkhaleefah, 2017). Therefore, current research is more interested in examining readers' online processes than the product (output) of their reading comprehension (Alderson, 2005; Deschambault, 2012; Lin and Yu, 2015; Zarrabi, 2015). The findings of a number of lexical inferencing studies have concluded that lexical inferencing plays a vital role in reading comprehension and vocabulary development as discussed in the following sections.

2.8.1 Lexical inferencing and reading comprehension

Research has provided ample evidence that vocabulary knowledge contributes significantly to reading comprehension (Nation, 1990; Grabe, 2009; Hu and Nassaji, 2014). Previously mentioned in 1.1, that in addition to learners' lexical problems, which have been associated with their limited vocabulary knowledge, they also lack appropriate reading strategies (Haynes and Baker, 1993). Thus, to compensate for these elements, learners resort to compensational strategies "to make up for the limited knowledge, such as guessing meanings from the context and using synonyms and gestures to convey meaning" (Oxford, 2002:128) to overcome breakdowns in language communication. One of these strategies is guessing or lexical inferencing from context, "a subskill of reading and listening and depends on learners' ability to read and listen with a good level of proficiency" (Nation, 2001:261). During reading, learners will encounter difficulties in comprehending language input due to their low proficiency level (PL) and insufficient L2 lexical vocabulary knowledge (Rahbarian and Oroji, 2014). Furthermore, not only do we encounter new UNWs but even familiar words that are used in new or uncommon ways (Bensoussan and Laufer, 1984). Although encountering some UNWs does not impede reading comprehension, "but if too many words, or the most essential ones, are unknown, then comprehension will suffer" (Bensoussan and Laufer, 1984:17). Therefore, inferring word meanings from context is a metacognitive learning strategy used by successful learners to overcome their limitations in vocabulary knowledge and/or language in general (Laufer and Hulstijn, 2001).

In terms of reading, to fulfill successful reading comprehension it is essential that a reader has a high level of vocabulary knowledge (lexical coverage), for it is crucial that a large percentage of the words in the text are known to the readers (Nation, 1990; Laufer, 1997a). LIFSs can compensate for learners' weak reading strategy and limited vocabulary knowledge by guiding them to formulate hypotheses about the meanings of the UNWs and testing them using available sources of information within the reading context itself through searching for contextual clues (Nation and Coady, 1988) or resorting to their experience and background knowledge of the world (Haynes and Baker, 1993; Paribakht and Wesche, 1999; Atef-Vahid *et al.*, 2013).

2.8.2 Lexical inferencing and vocabulary development

Lexical inferencing during reading is seen as the core relationship between reading comprehension and vocabulary development (Wesche and Paribakht, 2010). In terms of reading comprehension, several advantages of lexical inferencing have been reported. First, it saves time through not looking-up words in dictionaries. Second, inferencing is seen as a way of maintaining reading fluency and strengthening text comprehension by allowing readers to continue engaging with the text without interruption whenever an UNW appears (Clarke and Nation, 1980; Schatz and Baldwin, 1986; Davies, 1991; Haastrup, 1991; Brown, 1993). Furthermore, in terms of vocabulary development, lexical inferencing is one of the key cognitive processes during foreign language reading comprehension which has been found to be closely associated with incidental vocabulary learning through reading (Nassaji, 2003a; Jelić, 2007). Incidental or indirect vocabulary learning through reading is regarded as a major source of increasing learners' vocabulary knowledge beyond the classroom (Nation, 1990; Haastrup, 1991; Fraser, 1999; Paribakht and Wesche, 1999; Nation, 2001; Paribakht and Wesche, 2006; Grabe, 2009; Nation and Webb, 2011). Reading research has shown strong correlations between reading and incidental vocabulary learning through exposures to new unknown words (Laufer, 1997b; Grabe, 2009). Further studies have shown that learning from context typically involves learning 5-15 % of new words upon a first encounter (Nation, 2001) in which lexical inferencing serves as an initial step in incidental vocabulary learning through reading (Fraser, 1999; Paribakht and Wesche, 2006).

However, according to Haastrup (1991:23), lexical inferencing is a "comprehension procedure that does not automatically lead to learning, although it has the potential for doing so". Since a prerequisite for word learning from context is multiple encounters of the words through a variety of contexts to make them more salient for the readers (Nagy and Scott, 1990; Paribakht and Wesche, 1999). Regardless of the number of studies that support incidental vocabulary learning through reading, debates still exist regarding this claim. In order for incidental vocabulary learning to take place, readers' consciousness needs to be activated to establish connections between the UNW's lexical form and its inferenced meaning before integrating this new information into their linguistic system (Pulido, 2007a). According to Laufer and Yano (2001), learners need to meet two conditions, to first notice and acknowledge the unfamiliarity of the word when encountering it during reading. Second, to accurately assess their ability to guess the word correctly or check/verify its meaning through a dictionary.

In some situations, learners are prone to incorrect guessing when they confuse the UNW for a familiar one, like '*adapt'* for '*adopt'* due to deceptive transparency (Laufer, 1989a, 1997b). Furthermore, even if they successfully notice the unfamiliarity of the word, they might incorrectly

guess it without verifying the meaning through a dictionary and hence may learn words incorrectly (Bensoussan and Laufer, 1984; Laufer and Sim, 1985a; Dubin and Olshtain, 1993). This emphasises that guessing and verification go hand in hand and are of utmost importance (Clarke and Nation, 1980). Furthermore, they are useful sub-reading strategies with their efficiency depending on the previous conditions.

Based on an analysis of tasks and conclusions drawn from the literature, Laufer and Hulstijn (2001) put forth the Involvement Load Hypothesis, which predicts that higher involvement in a word induced task will result in better retention regardless of whether it is an input or output task. Involvement is composed of three dimensions; Need, Search and Evaluation. Need is the motivational, non-cognitive aspect of the involvement and is concerned with the need to achieve. The authors illustrate this in the form of a learner who comes across an UNW which is critical for comprehension, that learner will experience the need to understand its meaning. Search and Evaluation are the two cognitive information processing dimensions of the theory, in which Search is the attempt to find the meaning of an L2 UNW by resorting to a dictionary or another authority (e.g. a teacher). Finally, Evaluation where the learner makes comparisons between the range of meanings a word has and assesses which meanings do or do not fit the given context (e.g. the word is a homonym). As a form of simplification, teachers might provide glosses for the UNWs in the text margins for their learners, making Search and Evaluation no longer necessary. According to the Involvement Load Hypothesis, this induces a weaker involvement since only Need is activated, as opposed to a stronger involvement in the presence of all three dimensions (Laufer and Hulstijn, 2001). Several studies have supported that inferenced meanings (stronger involvement) were better retained as opposed to those with meanings provided (Hulstijn, 1992; Paribakht and Wesche, 1993a). However, in reality, this does not always happen to all encountered UNWs, since not all these words are categorized as important by a reader to allow deeper processing but only surface processing that is less likely to be revived from memory (learner's overall vocabulary knowledge) (Hulstijn, 2001; Laufer and Hulstijn, 2001). Thus, most lexical development in L1 and L2 "occurs naturally when learners attempt to understand new words they hear or read in context" (Paribakht and Wesche, 1999:196).

2.9 Lexical inferencing processing models

Compared to theories/models of reading, little has been done regarding the process of lexical inferencing. Only two models, Hypothesis-Generation/Testing Model by Huckin and Bloch (1993) and the L2 Lexical processing or Lexeme/Lemma Model by De Bot *et al.* (1997) have been mostly referred to in the lexical inferencing literature. This lack of lexical inferencing models, from my point of view, is due to the dominance of a positivist quantitative preference to investigating the

lexical inferencing phenomena as opposed to an interpretivist qualitative one. Although this is not directly stated by the lexical inferencing researchers, it is clearly evident through their choice of large samples, confining methods to only think-alouds (sometimes without training or followed by stimulated recalls) due to the large sample followed by running statistical tests. Through a quantitative approach, the issue of generalizability to other contexts is emphasized rather than understanding the phenomena itself in-depth.

The following section presents an overview regarding the previously mentioned lexical inferencing models to the reader which constitute part of the current study's theoretical framework. These models represent individual attempts by previous researchers to represent the processes and mechanisms of lexical inferencing. Second, it supports the need for further research to present a detailed understanding of the lexical inferencing process which is one of the current study's objectives. Third, the aim of resorting to these models in this study is not to test them but rather to provide some insights during data analysis to interpret the LIFSs mentioned by participants (see 2.12).

2.9.1 Hypothesis-Generation/Testing Model

Huckin and Bloch (1993) proposed a lexical inferencing processing mechanism model that takes into account both lower and higher-level processing strategies in both a serial and parallel way. This cognitive model constitutes two main components, 'cognitive processing' and 'metalinguistic control steps' (Figure 2-5). The cognitive processing is carried out in the Generator/Evaluator, which is composed of a cluster of components; 'Vocabulary Knowledge', 'Syntax and Morphology', 'Text Schemata' (formal schemata), 'World Knowledge', 'Text Representation' and 'Permanent Memory'.

The first five components are straightforward and have been discussed previously (see lower-level processes 2.3.1 for Vocabulary Knowledge', 'Syntax and Morphology', 2.5.1.2 'Text Schemata' (formal schemata) and World knowledge 2.5.1.3). 'Text Representation' represents the learners' generated concept of the text, i.e. readers' text model of reading comprehension and situation model of reader interpretation (see higher-level processes 2.3.1). While for 'Permanent Memory', the authors do not fully explain what they mean by this but refer to it as participants' "written translations of the text up to that point" (1993:171). Thus, due to their interconnections, these cognitive processes in the Generator/Evaluator are carried out in a parallel "much more rapid and complex, and less readily analyzabel" direction than the metalinguistic control steps (1993:171).

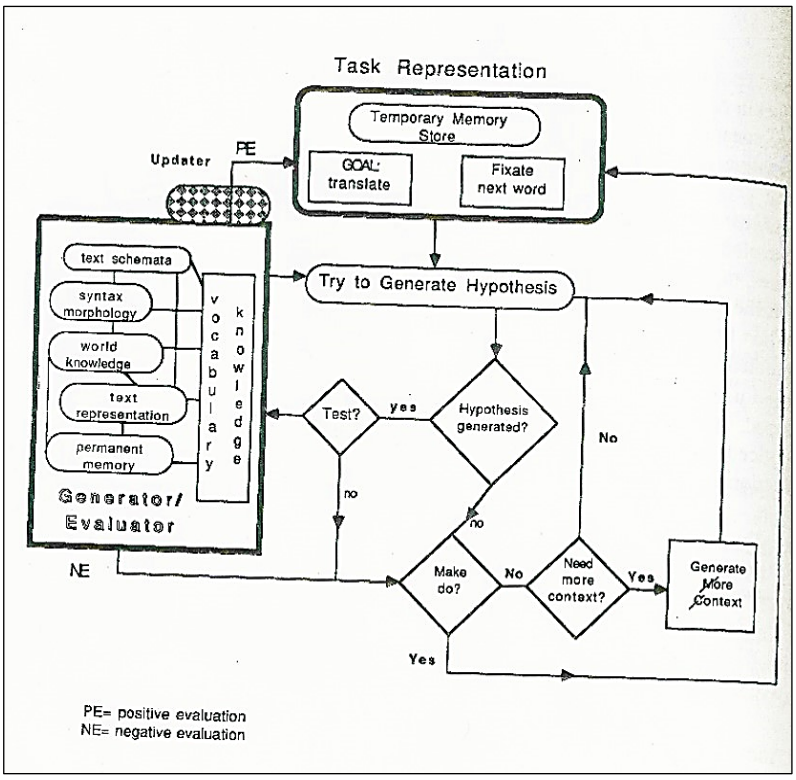


Figure 2-5 Hypothesis-Generation/Testing Model (Huckin and Bloch, 1993:170)

The metalinguistic control steps represent the serial processes governed by conscious decision-making actions like generating hypotheses or testing them if more context is needed, thus reading further past the UNWs. The sequences of such steps, as Huckin and Bloch report are not straightforward since participants displayed false starts, tried multiple hypotheses, some were not tested and ran into dead ends. When a hypothesis receives a positive evaluation this information is used to update the components in the Generator/Evaluator. On the other hand, when an unsuccessful hypothesis results in a negative evaluation, then a new hypothesis is generated by the readers or they would still tend to use the unsuccessful hypothesis anyway.

This cognitive processing model does not only highlight elements of the learner's linguistic schemata but also formal and context schemata. Thus, I regard it as an interactive model that uses both lower and higher-level processing. Furthermore, it displays the cluster of steps that learners engage in from generating their initial hypotheses and testing them through using a number of sources in the Generator/Evaluator to confirm/reject their hypotheses. Huckin and Bloch (1993:172) acknowledge that this model is "merely a tentative one. It is based on the cognitive processing behaviours of only three students doing translation tasks on only two texts". To this I add, that these 3 EFL learners were enrolled in an MA programme in the USA and had been living there for three years, thus there is an advantage of the effect of an all-English environment. Furthermore, the cognitive load of inferencing and translating the texts into L1

during a think-aloud task might place a heavier cognitive burden on the participants and affected their inferencing strategies compared to verbalizing and providing meanings only.

2.9.2 L2 Lexical Processing Model

According to Levelt's L1 speech processing model (for a detailed overview see Levelt 1989; 1993), lexical knowledge of a word (e.g. orthographic, phonological, semantic and syntactic features) is stored in the native speaker's mental lexicon at two distinct levels; lemma and lexeme (Figure 2-6). In the lexical entry, the lemma refers to the semantic and syntactic information about the lexical item (word) while the morphological and phonological information is carried in the lexeme. Depending on the level of proficiency of the language user, various types of information can be used to connect the word form with its meaning.

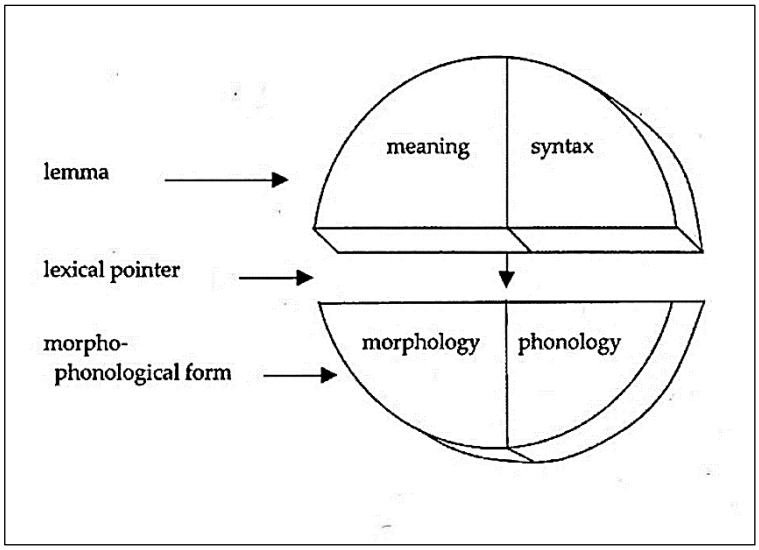


Figure 2-6 Levelt's representation of a lexical entry (Levelt, 1989:188)

Through adapting Levelt's model, De Bot, Paribakht and Wesche (1997) proposed their model of L2 language processing in written and oral language modes at one level and how the types of lexical knowledge are accessed by L2 speakers as they infer meanings of UNWs in written/aural contexts at a second level (Figure 2-7). The researchers also differentiated between production and comprehension, where all information in the former is top-down while in the latter it is interactive, where both bottom-up (letters, sounds, morphemes, etc.) and top-down (knowledge of the world, settings, etc.) are combined. In interpreting texts, both types of information, top-down and bottom-up (interactive) are used by the learner who "has the possibility of internalizing at least some features of the new lexeme" (De Bot *et al.*, 1997:316).

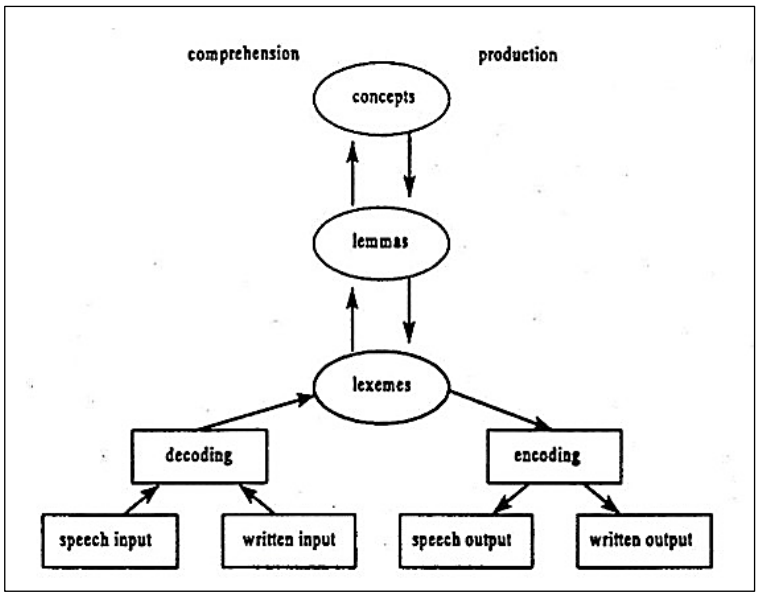


Figure 2-7 The Lexical Processing Model (De Bot *et al.*, 1997:315)

In terms of reading, which is the scope of this study, the first situation refers to encountering a known word in which the string of its letters (orthographic information) is matched against a lexeme. This alternatively activates a lemma which is later matched with a concept resulting in successful comprehension (at word level). The second situation involves encountering an UNW, in which the UNW's written form and its internal representation (lexeme) cannot be matched to a lemma. For example, a written word that is only partially known in its spoken form or its written form is familiar but not its meaning or it is not known at all. In such a situation, where the semantic information (lemma) is unknown, learners "attempt to fill in an empty lemma structure" (De Bot *et al.*, 1997:317). In other words, an UNW's form (lexeme) is given in the text and the conceptual frame but not the specific context needed to go from a lexeme to a lemma to a concept. The researchers stress that there is no simple one-to-one relationship between lexeme and lemma, nor is it clear how connections are made between them. However, depending on learners' PLs various types of sources can be used to connect a word form with its meaning.

2.10 Knowledge sources and lexical inferencing

Another line of research investigating the process of lexical inferencing is by looking at the type of clues and their knowledge sources (KS) as opposed to strategies used by readers to help them uncover the meanings of UNWs during reading (Haastrup, 1991; De Bot *et al.*, 1997; Paribakht and Wesche, 1999; Bengeleil, 2001; Nassaji, 2003a; Bengeleil and Paribakht, 2004; Paribakht and Wesche, 2006; Wesche and Paribakht, 2010). An early view of the importance of contextual clues was proposed by Sternberg and Powell (1983:882), who define them as "hints contained in the passage that can facilitate, in theory, and sometimes in practice impede, deciphering the meaning

of unknown words". Research has shown that L1 (Ames, 1966; Sternberg and Powell, 1983) and L2 (Haastrup, 1991; Morrison, 1996; Fraser, 1997; Paribakht and Wesche, 1999; Bengeleil, 2001; Nassaji, 2003a; Wesche and Paribakht, 2010) learners draw on a variety of clues when attempting to uncover the meanings of UNWs in written contexts. These clues cover the information in the written content or the reader's previous knowledge that guide or facilitate word-meaning retrieval. The significance of these contextual clues is not limited only to reading and EFL learners, but Haastrup (1991:46) views them as "extremely powerful devices for adult native speakers, for children acquiring their mother tongue language, and for L2 learners". Contextual clues not only facilitate the ease of inferencing but also lead to better retention (Li, 1988). Various labels have been used by scholars to refer to these guessing/inferencing clues: 'cues' (Carton, 1971), 'contextual aids' (Ames, 1966), 'contextual support' (Dubin and Olshtain, 1993) 'contextual clues/cues' (Sternberg and Powell, 1983; Haastrup, 1991; Paribakht and Wesche, 1999), 'linguistic clues' (Oxford, 1990), or 'knowledge sources' (Paribakht and Wesche, 1999). In this study for the aim of consistency, the term 'clues' and 'cues' will be used interchangeably to refer to the hints of information participants report using while attempting to inference the meanings of the TWs. Knowledge sources refer to the higher categories that represent a particular source of information that a learner made use of during lexical inferencing, for example, semantic, morphological, discourse, world or L1 knowledge sources (Nassaji, 2003a).

Although some might list the availability of clues as properties of the text which might affect inferencing, I have deliberately placed them under learner factors since the burden lies on the EFL learner not only to activate them but use them effectively. Since their presence does not impel learners to use them, some learners simply might overlook them or even acknowledge their presence but rather prefer to only look at the UNW, its morphology or resemblance to other languages they know (Laufer and Sim, 1985a). Sternberg (1987:93) stresses that the presence of any kind of clue, does not necessarily entail that clue to be helpful to deduce the meaning of an UNW, he explains that:

> If a given cue occurs in close proximity to the unknown word, then it is likely that the cue will be recognized as relevant to inferring the unknown word's meaning. If the cue is separated from the unknown word by a substantial portion of the text, the relevance of the cue may never be recognized; indeed, the cue may be misinterpreted as relevant to an unknown word to which it is more proximal. The helpfulness of a context cue may also be mediated by whether the cue comes before or after the unknown word.

For clues to be useful to uncover the meanings of unfamiliar words, they must be perceptually and conceptually familiar to the reader and provide information available to the

reader to find the relevant schema to account for the incoming input to identify the unfamiliar stimulus (word) in the context Li (1988).

2.10.1 Classifications of knowledge sources while inferencing unknown words

In the lexical inferencing literature, a number of taxonomies have classified the types of clues and their knowledge sources (KS) that learners make use of during inferencing meanings of UNWs (Sternberg and Powell, 1983; Haastrup, 1987; Haastrup, 1991; Morrison, 1996; De Bot *et al.*, 1997; Fraser, 1997; Paribakht and Wesche, 1999; Bengeleil and Paribakht, 2004; Paribakht and Wesche, 2006). Such classifications vary in terms of how they classify their clues, KSs and the degree of detail they provide. The earliest classification was proposed by Ames (1966), who pointed out that earlier studies had attempted to classify contextual clues through filling in the blanks with the appropriate words or analysing texts for contextual clues, thus lacking participants' elaborations on what served as clues to them in the text. Ames (1966) used think-alouds to investigate the contextual clues used by 12 advanced current PhD students while reading a number of authentic texts. Every 50th word was replaced with a nonsense word while preserving the rules of English morphology and phonology. The words were nouns, verbs, adjectives and adverbs. The researcher reported a classification of 14 main categories without further sub-classification. The 14 contextual categories can be summarized into three main categories; clues at word, syntactic and discourse level. A limitation of this classification was not taking into account the role of world knowledge, for there was no assessment of previous knowledge about the topics of the texts. The nearest clues to this were clues derived from language experiences/familiar expressions that participants have heard and are familiar with.

Through exploring the function of clues on inferencing in foreign language learning, Carton (1971) proposed three main clue types; intra-lingual, inter-lingual and contextual. Intra-lingual clues are supplied by the target language and occur in its morphological and syntactic forms while inter-lingual clues are the derivations made between loan languages, cognates and phonological transformation between these languages. Contextual or extra-lingual cues derive their usefulness from the learner's knowledge of the world since "an important function of language is represent objects and events in the real world" (Carton, 1971:55). A serious limitation of this classification was the absence of participant data since it was based on the researcher's views. Through data collected from reading passages for 123 English (L1) high school students, Sternberg and Powell's (1983) classification distinguishes between the internal and external context of the UNW. The internal context represents the morphological structure of the word, its prefix, suffix and stem while the external one is categorised according to the semantic information in the text surrounding the TW. There were eight clue types for the external context while three for the

internal one (for more see Sternberg and Powell (1983)). It was through the work of Haastrup (1991) that a taxonomy for second language learning was established. The study reported the clues that Danish's secondary school students learning English activated while inferencing through 31 paired think-alouds, with participants of the same gender and closely similar proficiencies. Based on Carton's (1971) three main categories of clues, Haastrup (1991) further developed her taxonomy to include more details of the types of sub-clues under each category. Paribakht and Wesche (1999) also developed a taxonomy of KS clues used by 10 ESL university students from various L1 backgrounds. Through using both think-alouds and stimulated recalls, the study investigated what clues and KSs learners used when encountering UNWs. Since then, this taxonomy has been developed a number of times (Paribakht and Wesche, 2006; 2010).

In the current study, even if a single participant used a particular type of clue/strategy which was not used by others, it would still be included in this current study's taxonomies of KS clues and lexical inferencing strategies of L1 Arabic students. This rationale was supported by Ames (1966:60), who explains that such an idiosyncratic clue "would be considered sufficient evidence that such an aid existed, had the possible utility, and should be taken into account in any attempted classification schema of contextual aids". Furthermore, in this study, as part of my abductive data coding and analysis, I initially adapted Haastrup's (1991) and Paribakht and Wesche's (2010) taxonomies and at the same time kept an open mind to other types of clues that my data generated. This was the result of two underpinning rationales; the first is that both taxonomies take into account learners' background knowledge, in which cultural knowledge is embedded as opposed to others which did not (Ames, 1966; Sternberg and Powell, 1983). The second, is to establish a close detailed classification to fulfill the purpose of the current study; to understand why and how L1 Arabic Saudi EFL learners use clues and LIFSs when encountering UNWs while reading. By comparing the two taxonomies in question, it was found that when a broad category was listed in one, specific sub-categories were present in the other. Furthermore, the absence of one category was supplemented in the second, thus ensuring a sense of compatibility among them. This compatibility was essential in coding, classifying and labelling the types of clues and their knowledge sources during data analysis. Furthermore, in this present study, the taxonomies will be further modified and developed throughout the data analysis stages to account for all the clues and strategies generated by participants' verbal reports. The outcome of which are proposed taxonomies of knowledge source clues and lexical inferencing strategies by the Saudi L1 Arabic EFL learner which is one objective of the present study.

2.10.1.1 **Contextual and non-contextual clues**

There is a consensus regarding the sources readers resort to help/guide them to infer the meaning of unfamiliar words. Several studies set out to identify and classify the clues used by FL/SL learners of English while processing unfamiliar words during reading (Sternberg and Powell, 1983; Haastrup, 1991; Fraser, 1997; Paribakht and Wesche, 1999; Bengeleil, 2001; Wesche and Paribakht, 2010). Research findings on LIFSs classify two major sources of clues that learners resort to as they inference the meanings of UNWs during reading; contextual (linguistic) and non-contextual (non-linguistic clues) (Haastrup, 1991; Dubin and Olshtain, 1993; Huckin and Bloch, 1993; Wesche and Paribakht, 2010):

1. Contextual clues are linguistic clues that describe the nature of the information used to infer a word's meaning within the written text. They are categorised as local and global clues (Haynes, 1993). Local clues are found in the immediate context surrounding the UNW, either before or after the UNW in the same sentence/phrase. On the contrary, global clues are located beyond the UNW's sentence or to its whole paragraph.
2. Non-textual (non-linguistic) clues integrate a range of clues, for example; reader's previous knowledge in terms of the reader's topic familiarity of text or their world knowledge, using titles, graphs, tables figures and drawings in the text (Al-Homoud, 2014).

2.10.1.1.1 Contextual Clues: Local and global clues

Local clues are also known as the 'immediate context', 'sentence-bound cues' (Chern, 1993) which refer to clues used by readers within the context of the UNW and its sentence. Sternberg (1987) clarifies that some clues might facilitate inferencing meanings of some words while others might not and that the helpfulness of clues depends on whether these clues precede or follow the TW and the distance between them. This distance is in line with what Nation and Webb (2011) refer to as the "proximity of relevant clues' which puts forward the idea that the nearer the clues are to the UNW, the more inferencing would be applicable.

Regarding global-clues, Chern (1993) further divides them into '***forward'*** and '***backward'*** clues. Forward clues require reading beyond the sentence containing the UNW to get more information to infer its meaning, while backward clues require the opposite, reading before the UNW's sentence. His findings report that advanced learners, who were also better at understanding the main idea of the text, preferred global clues-more specifically forward ones while low proficient learners used local clues. Studies not only report a preference for local clues due to being easier to resort to and used more successfully in inferencing unfamiliar words than global ones but also combinations of both types of clues were used (Chern, 1993; Haynes, 1993; Huckin and Bloch,

1993). However, the success in using global clues depends on the reader's accuracy of text comprehension and its interpretation, thus requiring a learner to "recognize the information structure in the text, and is sensitive to features of cohesion and coherence" (Haastrup, 1991:47). If students ignored some words or misunderstood others, or over-depended on their top-down processing, this might lead to incorrect inferencing (Ibrahim, 2015).

Through retrospective interviews, Bengeleil and Paribakht (2004) found that intermediate English proficiency learners reported that a significant source of difficulty for inferencing the TW was when it was surrounded by other unknown words. This can be explained in terms of learners' vocabulary knowledge size since the effective use of local clues entails that the surrounding words must be familiar. That is, learners need to know most of the words in the text by having an adequate or a high-level stock of vocabulary. In terms of clues and reading topic familiarity, Dehghan and Sadighi (2011:102-103) report that Iranian EFL learners did better on local clues in both culturally familiar and unfamiliar reading topics than global ones, as local (clues) "bottom-up items are totally easier than top-down items *(i.e. global clues)* for processing as they are related to the present text and not to extra linguistic types of knowledge" (italicization is my own). In other words, local clues are easier to process due to the linguistic context available as opposed to the difficulty of global clues since EFL learners need additional linguistic knowledge to process these clues.

2.10.1.1.2 Non-contextual clues

A reader might also provide his own clues that are not directly available in the text like contextual clues. During reading, "The language user brings with her to the inferencing task past experiences as well as knowledge" (Haastrup, 1991:47-48). These might be more difficult or confusing than global clues since they require advanced PLs and vocabulary knowledge (Bensoussan and Laufer, 1984). Regarding non-textual clues, Laufer (1997a:30) explains that sometimes clues are suppressed, for "So strong is the effect of background knowledge that it overrides lexical and syntactic clues", thus suppressing them. In their study, Laufer and Sim (1985a:9) provided their male and female participants a text which discussed the biological difference between genders and clearly implied that due to these differences, each should get a different education. During interviews, participants were asked about their incorrect answers and how they arrived at the meanings of the TWs in terms of textual clues and extra-linguistic knowledge. Learners insisted that the author was stressing the same education for both genders. Learners were using their world knowledge, in terms of equality between genders, as one student reported, "nobody today would dare suggested a different education for men and women, certainly not a women writer". Thus, compatibility between a reader's schemata and the reading context is critical for using clues

effectively. If texts violate a schema, the readers may impose their own background knowledge to falsely construct an interpretation to fit their convictions, even if it distorts the original meaning intended by the author. This also suggests that readers bring their own knowledge to the text which could facilitate comprehension. However, bringing reader's background knowledge to the text when there is insufficient linguistic knowledge to support it can "be dangerous, as biased opinions may be introduced into the subjects' interpretation of the passage, regardless of the linguistic facts" (Laufer and Sim, 1985a:9). However, even if clues are present, a single context most often is not sufficient enough for a reader to guess the full meaning of a word (Schmitt, 2000). Although clues might aid the inferencing process, they can also hinder or mislead (Huckin and Bloch, 1993; Laufer, 1997a) for there are also other variables/factors that affect either positively or/and negatively the application of the clues and inferencing strategies to deducing meanings of UNWs while reading as discussed in the next section.-

2.11 Factors that affect lexical inferencing

There are a number of factors that are of importance to this present study that come into play during inferencing UNWs which affect the outcome of the inferencing process. These factors have been classified below into text and the learner factors.

2.11.1 Text factors

These factors include both the nature of the unfamiliar word and the reading text itself. For example, in terms of the UNW its "intralexical factors", a term originally used by Laufer (1997b) to refer to the intrinsic properties of the word, its form and meaning that may affect its inferencing and learnability. For example, the UNW's part of speech influences inferencing, with verbs being the easiest to guess followed by nouns, adverbs and adjectives (Liu and Nation, 1985; Laufer, 1997b). Knowing the UNW's parts of speech has also been reported as an inferencing strategy (Clarke and Nation, 1980). However, knowing the part of speech does not necessarily provide any guidance to successfully inferencing the meaning of the unfamiliar word (Baniabdelrahman and Al-shumaimeri, 2014).

In terms of reading text, factors like the ratio of UNWs compared to known words, their importance to comprehend the text, their frequency in the tex and the number of known words surrounding the UNWs (for an overview see; Sternberg *et al.*, 1982; Sternberg and Powell, 1983; Bensoussan and Laufer, 1984; Liu and Nation, 1985; Nation and Hsueh-Chao, 2000; Nation, 2001; Schmitt *et al.*, 2011). According to, Paribakht and Wesche (1999:210), if the text is too easy with few UNWs, comprehension is possible without the reader stopping at every UNW. On the other

hand, if the text is difficult it will "cause frustration and readers may give up entirely". Furthermore, if the language of the text is too difficult for learners and is beyond their language capacity level, the available contextual clues cannot be used and become unavailable for learners (Kaivanpanah and Alavi, 2008).

The type and nature of clues available in the surrounding text of the UNW and degree of textual support also affect learners' inferencing processes and inferencing outcomes (responses) (Haastrup, 1991; Dubin and Olshtain, 1993; Haynes, 1993). However, not all contexts are equally informative in providing clues to inference the meanings of unfamiliar words, what Nation (2001) labels 'misdirective context'. Sometimes, contextual information in the text is not sufficient enough to assist learners in making use of it for correct guesses (Huckin and Bloch, 1993). Thus, Mondria and Boer (1991). make a distinction between what they label as a 'pregnant context' and 'non-pregnant context', where a pregnant context offers ample/significant clues to deduce the meaning of a new or unknown word while a non-pregnant context fails to provide such support. Studies have found that pregnant contexts facilitate and improved guessing (Al-Homoud, 2008) but did not improve retention (Mondria and Boer, 1991). In terms of clues, Carrell (1983b) classifies texts in terms of their textual support into transparent and opaque. Transparent texts provide concrete lexical items within the text which function as textual support to the topic of the text while opaque texts fail to do so. The importance of transparent clues in the text is that they help readers to enhance the meaning construction of the text, in other words, these clues should activate the appropriate schemata during reading (Carrell, 1983b) (see 2.5). Even if provided with a supporting context and clues, learners sometimes fail to make use of contextual clues through checking their guesses against the context. Haynes (1993) found that learners are blinded by the word-shape familiarity which sometimes overrides contextual clues during inferencing and as a result, learners do not attend to syntactic relations. Sometimes, "the contextual information may be so redundant that readers fail to connect the form of the unknown word to the meaning contained in the context" (Hulstijn *et al.*, 1996:328).

2.11.2 **Learner factors**

Since this study investigates the lexical inferencing behaviour of L1 Arabic EFL learners while reading, the following section is devoted to the main learner factors that affect lexical inferencing that are within the scope of the current study.

2.11.2.1 **Background knowledge**

As discussed in section (2.5.1.3), background knowledge is a factor that can either facilitate or hinder reading comprehension, and thus inferencing the UNWs. One factor that contributes to

successful lexical inferencing is the reader's background knowledge of the subject matter of the text, topic familiarity. While reading, inferences are drawn from the text based on the reader's expectations of a certain context. This strategy works smoothly when the reader's expectations of a text are mapped with the author's ideas, when it does not, distortion and miscomprehension arise. Unsuccessful inferencing has also been linked/connected to the lack of significant background knowledge about the reading topic (Konopak, 1988). Readers might misinterpret a meaning of a word in a text as a result of activating a content schema that is different from the text's (author's) context, which might lead to misinterpreting the text and thus the meaning of the UNWs (Laufer, 1997a). L2 readers, as opposed to L1, might lack relevant cultural and topical knowledge, which is regarded as essential information for successful inferencing (Paribakht and Wesche, 2006). Paribakht and Wesche (2006:127-128) highlight background knowledge proficiency in the TL by explaining that:

> Native proficiency not only means that readers have a high level of linguistic knowledge but also they tend to have a deeper understanding of cultural and social issues and probably greater familiarity with topics of the text originating in that language. This knowledge will allow them to more easily comprehend content relationships

In other words, working with a familiar content will allow successful inferencing of UNWs that are linguistically challenging while familiar language will allow inferencing and comprehension of occasional words in texts that deal with somewhat less familiar content. Since it is harder to learn/comprehend a new word for a new concept than learn/comprehend a new label for a familiar concept (Nagy, 1997). In other words, the overarching concept that word belongs to, due to the difference between cultures does not exist as part of a learner's background knowledge. For example, Arabic speakers are confused between the English words 'aunt' and 'uncle', although these concepts are found in Arabic. The source of confusion for Arabic learners is that in Arabic, these concepts have different labels depending on whether they are from the father's or mother's side of the family as opposed to English (Balhouq, 1976 cited in Laufer, 1997b:150). Paribakht and Wesche (1999) reported that unmotivated learners in their study either lacked or had little background knowledge in natural science, which was one of the reading topics in the study.

2.11.2.2 **Vocabulary knowledge**

Lexical inferencing has also be associated with a learner's vocabulary knowledge of the language, which refers to the slightest or basic knowledge of a word meaning, referred to as 'threshold knowledge' (Schmitt, 2000) or 'partial knowledge of words' (Nation, 2001). In vocabulary research, a distinction is made between two dimensions of vocabulary knowledge; depth and

breadth (Meara, 1996; Wesche and Paribakht, 1996; Read, 2000). Breadth of vocabulary knowledge is defined as the vocabulary size or the number of words (quantity) a learner knows at least with minimum knowledge of meaning (Qian, 1999; Nation, 2001). On the other hand, depth of vocabulary knowledge refers to the quality of learners' lexical knowledge of various aspects/properties of a given word (morphological, syntactic, register, etc.) (Nation, 1990; Meara, 1996). Thus both breadth and depth of vocabulary knowledge are essential to understand the relationship between vocabulary knowledge and reading comprehension (Qian, 1999). Studies have shown that measures of readers' vocabulary size positively correlate with measures of reading comprehension (Laufer, 1989b; Qian, 2002; Nation, 2006; Stæhr, 2008; Schmitt *et al.*, 2011; Grabe and Stoller, 2013; Masrai, 2019) which according to Alderson (2005:35) "are often, indeed, the single best predictor of text comprehension". In order to meet the demands of the L2 reading tasks, L2 learners need to be equipped with adequate vocabulary knowledge which allows them to cope with the linguistic demands of L2 reading tasks (Nation, 2001; Stæhr, 2008, 2009).

Through using Paribakht and Wesche's (1993b) Vocabulary Knowledge Scale, Nassaji (2006) examined how vocabulary knowledge related to the amount and type of LIFSs used. Twenty-one adult intermediate ESL learners from different L1 backgrounds were grouped into lexically skilled and unskilled learners. Think-aloud data and statistical analysis results indicated a significant link between depth of vocabulary knowledge and the types and degrees of LIFSs used. Learners with a stronger depth of vocabulary knowledge used evaluating and context-based strategies more effectively than those who had a weaker depth. Finally, depth of vocabulary knowledge made significant contributions to inferential success over the contribution made by learners' degree of the strategy used. Similar findings were reported by Qian (2005), where learners with a larger depth of vocabulary knowledge displayed higher rates of successful inferencing. A critical factor in successful inferencing is learners' vocabulary breadth (size) since this will affect the density of UNWs in the text (Nation, 2001). A reader's vocabulary size plays a vital role in facilitating reading since "vocabulary growth leads to improved reading comprehension, and amount of reading leads to vocabulary growth" (Grabe, 2009:226). In order to guess the UNWs, learners must already know a large portion of the words in the text to make use of the available clues for inferencing. The higher coverage of known words, the more chances of locating clues (local & global) to inference the UNWs successfully. This results in less cognitive capacity devoted to lower-level processing which is then freed for higher-level processing.

Researchers have proposed a threshold vocabulary for reading comprehension in ESL, where favourable conditions for guessing can be promoted, some through the word density of the text while others have looked at the learners' vocabulary size. In terms of text density, Liu and Nation (1985) and Laufer (1989b) agree that at least 95% of the running words need to be familiar to

learners to guess correctly. In the literature, other different densities have been suggested (for an overview see Bensoussan and Laufer, 1984; Laufer and Sim, 1985a; Laufer, 1992b; Nation and Hsueh-Chao, 2000) while others further take into account the text type and authenticity or adaptation (Nation, 2001; Schmitt, 2010). On the other hand, in terms of vocabulary size, a large 'sight vocabulary' (see 2.3.1) can solve problems of deceptive vocabulary and guessing ability resulting in fewer errors (Laufer, 1997a). Sight vocabulary refers to words whose meanings are so familiar to a person that they can be understood out of context (Pulido, 2007a; Laufer and Ravenhorst-Kalovski, 2010). It is suggested a vocabulary of 3,000 words allows readers to guess on average, 60%-70% of the unknown words in the text, with some learners around 80% (Clarke and Nation, 1980). The larger the vocabulary size learners have, the more chances that they employ proper inferencing processes (Bengeleil and Paribakht, 2004).

2.11.2.3 **Proficiency level**

Successful lexical inferencing has also been associated with learners' L2 proficiency level (PL) (Haastrup, 1991; Bengeleil and Paribakht, 2004; Tavakoli and Hayati, 2011). It was reported that although clues were available in the text, only higher PL participants used them correctly to infer the unfamiliar words. Studies have supported that PL not only plays a role in the success of inferencing but also in terms of strategy choice. The higher the PL, the more effective the choice, usage and combinations of inferencing strategies are (Haastrup, 1991; Baniabdelrahman and Al-shumaimeri, 2014). On the other hand, less proficient learners either tended to use the one LIFS they are most familiar/comfortable with (Huckin and Bloch, 1993; Morrison, 1996) or use strategies haphazardly/subconsciously (Baniabdelrahman and Al-shumaimeri, 2014). Bialystok (1983a) reported that the more advanced learners were, the more sensitive to constraints in the selection of specific strategies. Furthermore, these advanced learners made modifications when needed with great flexibility. The best strategy users "are those who have adequate formal proficiency in the target language and are able to modify their selection to account for the nature of the specific concept to be conveyed" (Bialystok, 1983a:16). However a study by Bensoussan and Laufer (1984) presented opposing results, they found no differences between the PLs (weak, good, and advanced) of EFL participants inferencing from context. They explain that good students do not guess differently than their weak counterparts but they simply know more words and that the language level did not have a significant effect on word inferencing from context since all the levels used the same strategies. However, one criticism regarding the previous study lies in terms of the transparency of the proficiency measurements used. The researchers used participants' raw scores on the inferencing experiment and confirmed this with participants' grades on their EFL university course at the end of the semester, without mentioning the nature

of the latter and the language skills measured. Furthermore, the nature of the text and its characteristics were not mentioned.

2.11.2.4 **Strategic awareness**

During reading, L2 readers are prone to encounter more unfamiliar language and cultural references while reading authentic or unadapted texts than L1 readers would. Therefore, learners need to be strategic in their approach to cope with this and may tend to "***repair***" more gaps in their comprehension than L1 readers (Shefelbine, 1990; Block, 1992). A number of studies on LIFSs have observed what distinguishes successful inferencers from less successful ones is being strategic to both approaches to the process of lexical inferencing and reading (Haastrup, 1991; Block, 1992; Hu and Nassaji, 2014). "Strategic" describes the ways learners approach either learning or challenging tasks and problems "by choosing from a repertoire of tactics those they believe best suited to the situations, and applying those tactics appropriately" (Winne and Perry, 2005:533-534). Successful strategy users also need a strategy for controlling their strategy use, this involves choosing the most appropriate strategy for the current situation from a range of options, upon which they then decide on how to pursue the strategy; whether to continue with the same strategy or abort it and switch to another (Gu and Johnson, 1996). Oxford (2011:7) pointed out that good language learners are those who make great use of both cognitive and metacognitive strategies "actively and constructively use strategies to manage their own learning". During lexical inferencing, strategic learners used multiple sources of KS clues and strategies, made more use of the wider context (global clues and world knowledge) and applied more evaluating and monitoring strategies when checking their answers against the text (Haastrup, 1991; Hu and Nassaji, 2014).

Strategic awareness and monitoring the comprehension process are critically important aspects of skilled reading (Pressley and Afflerbach, 1995; Sheorey and Mokhtari, 2001). These two aspects have often been reported in the literature as part of learners' metacognition (Martínez, 2008), where metacognition "entails knowledge of strategies for processing texts, the ability to monitor comprehension, and the ability to adjust strategies as needed" (Auerbach and Paxton, 1997:240-241). Block (1992) reported that the monitoring process constitutes 3 phases; an evaluation (identification of the source of the problem), action (strategic planning to find a solution) and checking phase (checking and evaluating their responses). It was found that proficient readers displayed more abilities in identifying their difficulties and strategies towards the UNW and referent problems than less proficient readers while reading expository text. The 25 participants were a mixture of native English speakers and ESL learners, grouped into proficient and non-proficient readers based on a standard reading test, The Descriptive Test of Linguistics Skills.

Think-aloud data revealed that less proficient readers (especially the native speakers) favoured a local, word-based possessing strategy while more proficient readers tended to prefer a more global meaning-based one. This supports other studies that have reported that global process are more favoured with L2 proficient readers while less proficient readers use a more localized processes (Carrell, 1989).

According to Sheorey and Mokhtari (2001), the combination of conscious strategic reading awareness and the actual application of strategies is what distinguishes skilled readers from unskilled ones. Furthermore, effective readers are able to monitor and adjust strategies according to their purposes for reading and to the type of text they are reading (Block, 1986). For a trait of good readers is monitoring their comprehension and knowing when and how to take strategic action when comprehension falters (Casanave, 1988). One line of research in L2 reading strategies has also demonstrated how differences in L2 reading proficiency are related to differences in strategically identifying and monitoring reading comprehension problems/difficulties and how learners strategically react to repair such problems. Research in the Saudi context has shown that factors like activating prior knowledge (content schemata), vocabulary size, time on task, purpose and enthusiasm for reading (or engagement) affect Saudi students' strategic reading and how students deal with challenges while reading and thus comprehension (Alsamadani, 2011; Al-Qahtani, 2016)

2.12 Theoretical framework

The overarching purpose of this present study is to investigate and understand the role of the presence and absence of background knowledge while reading on the lexical inferencing strategies (LIFSs) and knowledge source (KS) clues used to uncover the meanings of unknown words. More specifically, what are the KS clues and LIFSs used by 15 L1 Arabic Saudi EFL learners, who represent 3 different proficiency levels while reading a culturally familiar topic (Eid Al-Fiter) as opposed to a culturally unfamiliar one (Bonfire Night). Since the boundaries of the current study are interdisciplinary between reading and lexical inferencing, the theoretical framework for this study integrates both reading models/theories with lexical inferencing processing models. For in order to understand how learners inference the meanings of unfamiliar words, a crucial understanding of how learners first build their comprehension of the text and then begin to inference the UNWs is needed. Thus, there are two levels in the lexical inferencing process; the first is the reading process itself in which the second level, the process of inferencing unknown words takes place.

The models/theories used in the theoretical framework in the present study revolve around Constructivism. Constructivism is a theory of learning that views knowledge as a subjective process that is constructed and shaped by one's experiences. Elliott *et al.* (2000:256) view Constructivism as "an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner". As learners encounter new experiences and situations, they connect them to previous knowledge bases and understanding. These connections not only add to learners' original knowledge bases but also restructure the pre-existing knowledge (Pelech and Pieper, 2010). Thus, Constructivism prioritizes the active construction of knowledge by individuals, where learning occurs when individuals integrate new knowledge with existing knowledge (Stanovich, 1994; Gunderson *et al.*, 2019). Thus, "integration of new knowledge can only occur when the learner is actively engaged in the learning process" (Tracey and Morrow, 2012:58).

According to Tracey and Morrow (2012), Constructivism has three main components; first, it views learning through internal unobservable mechanisms in contrast to observable ones as viewed by Behaviourists. Second, learning results from a hypothesis-testing experience by the learner which is a central component of the Constructivist Theory. Finally, according to Constructivism, it is through the process of inferencing that learning is established. Inferencing in learning is broadly viewed as the process of filling in gaps by the learners to comprehend written and/or oral language, i.e. reading between the lines (Tracey and Morrow, 2012). When these components are mapped onto the reading process, in order to comprehend the text, readers need to associate their previous knowledge with new information from the text. In addition, learners need to inference the meanings of unknown words through generating hypotheses of their meanings and testing them against the text to fill gaps in comprehension to construct meaning while reading. Below is an overview of the present study's theoretical framework that will guide my understanding of the phenomenon of LIFSs by providing guidance throughout the stages of the study; the data collection, analysis, interpretation and discussion.

At the first level, the reading process itself is viewed as both an interactive mechanism between lower-level and higher-level processing and also a compensatory one. At the level of reading comprehension, in terms of understanding the role of background knowledge in reading, both Coady's (1979) Psycholinguistic Model of the ESL reader (2.4.1) and the Schema theory (2.5) highlight the interaction between readers' linguistic knowledge and their world (topic) background knowledge as central components to fulfill reading comprehension. EFL learners' background knowledge plays a critical role in this study, which aims at investigating how EFL university learners, who are L1 speakers of Arabic, use their background knowledge in terms of

knowledge of the TL and topic familiarity of the texts to infer the meanings of UNW encountered while reading.

Pearson (1994) argues for several lenses through which we can examine the complexities of literacy learning. Harmon (1999) also advocates and further extends this view to vocabulary studies in order to consider the multiple ways of viewing word meaning construction. A number of rationales informed my approach to adapting a multiple lens approach regarding the reading models/theories used in this study. First, in addition to sharing the elements of readers' background knowledge in both Coady's model and the Schema Theory, the limitations of one model/theory one can be complemented and strengthened by the other, for a few theories can explain/predict what is happening "Because no one theory offers all the answers, it makes sense to consider what each has to offer" (Woolfolk *et al.*, 2008:20). One component of Coady's model is learner's background knowledge, however, this model does not include knowledge about the rhetorical structure of texts or learner's linguistic knowledge which are components of the Schema Theory (Figure 2-4), linguistics schemata (2.5.1.1) and formal schemata (2.5.1.2), both of which contribute to reading comprehension. On the other hand, although one component of the Schema Theory is linguistic knowledge, it does not provide the linguistic processing or strategies that learners use while reading which are incorporated in Coady's Model (Figure 2-1&Figure 2-2). Understanding the role of background knowledge in the reading process provides insights into why students may succeed/fail in reading comprehension tasks. Failure of text engagement in terms of the Schema Theory can be explained due to the lack of background information regarding content, formal and linguistics schemata. This background knowledge overlaps with Coady's Model, which further adds that success/failure to comprehend a text can also be seen in terms of the process strategies used by learners, which the Schema Theory lacks. In situations where readers lack the background knowledge of the reading topic, readers will rely on text-based processes, constructing the meaning only from textual input, or activating the nearest schemata and interpreting the information through it, resulting in schema interference (Carrell, 1992a). Thus, leading to incorrect lexical inferencing of UNWs in the text. When students are familiar with the reading topic of the text, they are aware of the discourse level, organization structure of the text and are skillful in the decoding features needed to recognize words including how they fit together in a sentence (linguistic schemata) (Gilakjani and Ahmadi, 2011). In short, the more readers know about the topic of the text, the faster the schemata of that topic is activated and the easier the process of extracting information and comprehension becomes.

Second, according to Tierney (1994) the paradigm shifts in the research fields that have occurred with the study of reading, writing and the development of models have allowed researchers to move away from searching for a single model/theory of reading and recognizing the importance

of multiple models that could comprehensively explain all reading-related issues (e.g. reading process, development, etc.). Furthermore, this view is in line with my interpretivist approach(3.3) to investigate the phenomenon of LIFSs where there are many realities, interpretations and explanations to meanings participants give to phenomena and not a single unified standard one. Finally, both Coady's Model and the Schema Theory are built on the learning theory of Constructivism, which has been directly applied to reading to explain how readers construct and comprehend messages while reading (Temple *et al.*, 2013).

Regarding the second level, the process of lexical inferencing, in order to understand and explain how lexical inferencing takes place, both the Hypothesis-Generation/Testing Model (Huckin and Bloch, 1993) and the Lexical Processing Model (De Bot *et al.*, 1997) are used to analyse and interpret the verbal report data. The Hypothesis-Generation/Testing Model provides a cognitive approach to the process of inferencing meanings of UNWs while reading (Figure 2-5). It presents the metalinguistic steps which represent the serial process of learners' conscious decision-making actions as they aim at uncovering the UNW's meaning. It helps to visualize some decisions like why a learner might read more of the text in order to search for more clues or confirm their guess of a word and thus update their parallel cognitive processing components or might decide not to read beyond the TW sentence. It also displays why one learner might provide several attempts or hypotheses for an UNW while another learner (from the same or different proficiency level in the present current study) might not. On the other hand, the Interactive Lexical Processing Model provides insight into the interactive process of how a learner maps meanings (lemmas) on the given orthographic forms of the UNWs (lexemes) and how a reader's background knowledge and text effect this mapping (Figure 2-7). As previously discussed in 2.9.1.2, this model sheds light on the mapping between a lemma and a lexeme, which if successful, leads to correct inferencing and if not successful, explains why this mapping either in the lemma or lexeme, was incorrect.

2.13 Summary

In order to understand the underlying processes of reading, this chapter presented a definition of what is meant by reading and the approaches to reading. Next, the discussion moved to the reading process and the common approaches to understanding reading through its processes (lower-level and higher levels process) or metaphorical models (top-down, bottom-up and interactive). Since the present study adopts an interactive process to reading, Coady's Psychological Model of the Second Language Reader and Schema Theory were presented to the reader. The following section discussed and reviewed the lexical inferencing literature relevant to the current study in order to provide the reader with a background on lexical inferencing. It began by providing a general overview of learning strategies and moved on to language learning

strategies followed by vocabulary learning strategies. The discussion then moved to display how specific taxonomies for vocabulary learning strategies were needed separating them from the general language learning strategy taxonomies. From this point, a need to establish a separate classification for LIFSs emerged.

Next, definitions of LIFSs were presented before highlighting the importance of lexical inferencing in reading comprehension and incidental vocabulary learning. The discussion then moved to present the two models, Hypothesis-Generation/Testing Model and the Lexical Processing Model which have been associated with LIFSs. This was followed by an overview of knowledge source clues used while inferencing meanings of unfamiliar words during reading. Finally, factors that have been reported in the literature to affect lexical inferencing, which are within the scope of this study, have been presented before concluding with the present study's theoretical framework. The next chapter will present the philosophical framework, methodology and methods used for the research under study.

Chapter 3 Methodology: Design and Methods

3.1 Introduction

The aim of this chapter is to give a detailed account of the underpinning rationales of the present study in terms of the researcher's philosophical stance, methodology, methods, data collection and analysis procedures. The first part of this chapter focuses on the research design itself, it begins with reviewing the aim of the study and its research questions. This is followed by outlining the researcher's philosophical stance that informs this inquiry. Next, the discussion moves towards the methodological framework, an embedded multiple case study and the rationale for adopting this research approach. Finally, the research site, participants and their sampling techniques are discussed. The second part of this chapter describes and justifies the data collection methods, preliminary and main used in this study. This is followed by a discussion on the research instruments used by the researcher, why and how they were implemented. A summary of two pilot studies including their rationale, results and importance in reshaping the data collection methods in the main study are reviewed. The final and last section of this chapter is devoted to the procedures of data analysis which include coding and analysis, data representation, issues of interrater-reliability, trustworthiness and ethical considerations.

3.2 Research questions

The aim of this research is to describe and explore how 15 L1 Arabic Saudi EFL students representing 3 different proficiency levels infer meanings of unfamiliar words while they read culturally familiar and unfamiliar topics. More specifically, it aims at describing and reporting the overall types of knowledge sources (KS) clues (2.10) and the lexical inferencing strategies (LIFSs) (2.7) used by these learners in terms of their language proficiency levels. In addition, what clues and strategies, including their combination patterns, were associated with successful inferencing in the two texts by the 3 groups. The present study aims to address the following three main research questions:

1. How do Saudi Arabic L1 speakers majoring in English infer meanings of unknown words while reading?
    - 1.a. How do they approach the unknown words?
    - 1.b. What are the range of knowledge source clues do they tap into to uncover the meanings of the unknown words?

1.c. What are the range of lexical inferencing strategies do they resort to uncover the meanings of the unknown words?

2. How does topic familiarity of the text affect, if any, learners' lexical inferencing of unfamiliar words with respect to their proficiency levels?

2.a. What are the numbers of lexical attempts and responses made between the groups in the two texts?

2.b. What are the similarities/differences between groups in terms of knowledge source clues used when reading culturally familiar and unfamiliar topics and with what frequency?

2.c. What are the similarities/differences between groups in terms of lexical inferencing strategies employed when reading culturally familiar and unfamiliar topics and with what frequency?

3. In terms of successful inferencing, what is the role of learners' topic familiarity, if any, on their lexical inferencing?

3.a. How successful are the groups in their lexical inferencing attempts?

3.b. What are the knowledge source clues activated by the groups in both texts and with what frequency?

3.c. What are the lexical inferencing strategies used by the groups in both texts and with what frequency?

3.3 Research paradigm

The theoretical/philosophical framework is sometimes referred to as a "paradigm", which influences the way knowledge is collected and interpreted by different researchers (Mackenzie and Knipe, 2006). Guba and Lincoln (1994:105) view a paradigm as "the basic system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways". These paradigms have a powerful effect since they construct and sharpen the lenses through which we see the world (Covey, 1989 cited in Hussain et al., 2013). The three main most-commonly used paradigms that inform educational research are positivism, post-positivism, interpretivism (Willis *et al.*, 2007; Cohen *et al.*, 2018). While other researchers tend to classify the nature of research along a continuum; quantitative, mixed methods and qualitative (Dörnyei, 2007; Johnson *et al.*, 2007). In which quantitative research adopts positivism as an approach to study the phenomena while interpretivism to understand qualitative research. Since the overall framework of this study is a qualitative one, the following sections define qualitative research and the interpretivist paradigm which reflects my philosophical approach to the inquiry.

There is no consensus between researchers on a single definition of qualitative research in the literature. Gabrielian (1999) (cited in Savin-Baden and Major, 2013:11) defines it as "an umbrella cross-and interdisciplinary term, unifying very diverse methods with often contracting assumptions, which defies simple definitions". A more detailed account of the nature of qualitative research is given by Holloway (1997:2) where:

> Qualitative research is a form of inquiry that focuses on the way people interpret and make sense of their experiences and the world in which they live in. A number of different approaches exist within the wider framework of this type of research, but most of these have the same aim: to understand the social reality of individuals, groups and cultures. Researchers use qualitative approaches to explore the behaviours, perspectives and experiences of the people they study. The basis of qualitative research lies in the interpretive approach to social reality.

From these definitions, it is evident that the main objective of qualitative research is an understanding of what people do in their real world. One common approach to fulfill the previous objective of qualitative research lies in the Interpretivist paradigm which is adopted in the present study.

Interpretivism is also called the qualitative (Merriam and Tisdell, 2015), constructivist, naturalistic (Guba and Lincoln, 1994; Thomas, 2013), humanistic and anti-positivist (Neuman, 2014; Cohen *et al.*, 2018). Interpretivism is commonly used interchangeably with constructivism for many researchers like Lincoln *et al.* (2011), while others like Creswell (2014) and Savin-Baden and Major (2013:29) find differences between these labels, where the latter see constructivism as "a further move along the along the continuum of subjectivity". However, in this study, the term interpretivism and constructivism will be used interchangeably. The underpinning concept of interpretivism is to seek an in-depth understanding of the beliefs, values, experiences and meanings of the social phenomena in question. Interpretivism is defined as the study of individuals, social actors observed in their natural settings which aims at gaining insights to understanding how these social actors construct and create knowledge in their daily lives (Grix, 2010; Creswell and Clark, 2011; Cohen *et al.*, 2018). Research paradigms are based on the elements of ontology, epistemology, methodology and methods (Guba and Lincoln, 1994). Ontology and epistemology or '*knowledge claims'* (Creswell and Creswell, 2018) are the starting points of all research, initially beginning with ontology after which the epistemological, methodological and collection methods logically follow (Grix, 2010). Ontology and epistemology are at the heart of the researcher's philosophical stance and "are to research what footings are to a house; they form the foundations of the whole edifice" (Grix, 2010:57).

Ontological assumptions concern "the very nature or essence of the social phenomena being investigated" (Cohen *et al.*, 2018:5) and refers to the assumptions made about the nature of reality of the case under investigation. In other words, ontology is a belief about how to understand the social reality and human behaviour surrounding us. Interpretivists adopt a 'relativist' ontology (Guba and Lincoln, 1994), they believe there is no single form of reality but reality is constructed and interpreted differently by various individuals according to their life experiences, cultures and ideological positions (Cohen *et al.*, 2018). In other words, "the social phenomena and their meanings are continually being accomplished by social actors" (Grix, 2010:61). Interpretive researchers' also believe that since reality is fluid and fragile, is intangible, intertwined, complex, multi-layered, local and specific in nature (Guba and Lincoln, 1994). A single phenomenon can have multiple meanings, explanations and interpretations depending on the individual meanings constructed and attached by people. That is why researchers integrate themselves as part of their research instruments and immerse themselves in their participants' research context for the ultimate goal of understanding when conducting the research and interpreting the data (Guba and Lincoln, 1994; Grix, 2010; Thomas, 2013; Cohen *et al.*, 2018). In other words, interpretivists take on the role of an 'insider' to the situation being observed (Gasson, 2002) and tend to place a huge weight on their "participants' views of the situation being studied" (Creswell and Creswell, 2018:46). Bryman (2012:33) also uses the term 'constructivism' as an alternative ontological position that "asserts that the social phenomena and their meanings are continually being accomplished by social actors. It implies that the social phenomena and categories are not only produced through social interactions but they are in a constant state of revision". Acknowledging that there are a range of ontological positions can lead to different research results, in which one can begin to engage with the work of others (Grix, 2010) since reality is multi-layered, constructed and interpreted individually.

On the other hand, epistemology is concerned with the theory of knowledge and "the possible ways of gaining knowledge of social reality, whatever it is understood to be. In short, claims about how what is assumed to exist can be known" (Blaikie, 2009:9). Interpretivists adhere to a transactional and subjectivist epistemological approach to how knowledge is collected, where the researcher and the object of investigation are "assumed to be interactively linked so that the "findings" are literally created as the investigation processes" (Guba and Lincoln, 1994:111) In this way, the interpretive researcher imposes an influence on the observed phenomena and can make a difference (Hussain et al., 2013). In this scenario, the researcher's role is not only reporting how the participants interpret the world around them but also how researchers themselves interpret the world in terms of the concepts, theories and literature guidelines (Bryman, 2012; Cohen *et al.*, 2018). Furthermore, evidence about the social action cannot be isolated from the context in

which actions are assigned by the social actors involved (Neuman, 2014). Furthermore, interpretivists believe in the inseparability of their understanding from their interpretation, since inimitable understanding and interpreting that social reality is driven by researchers' desires and interests (Guba and Lincoln, 1994; Grix, 2010; Thomas, 2013; Cohen *et al.*, 2018). The insider issue is crucial for interpretivists, that Thomas (2013:109) advises that you "should be a participant in your own research situation and understand as an insider", which he explains can be done through recognizing your position (positionality) as a researcher in the inquiry process.

Finally, research methodology is the philosophy that underlines the procedures and principles in a particular field of inquiry, Crotty (1988:3) defines it as "the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes". Interpretivist researchers can choose between a number of qualitative approaches ethnography, grounded theory, narrative research, phenomenology and case study (Merriam and Tisdell, 2015; Marshall and Rossman, 2016; Creswell and Poth, 2018). Within their methodology, interpretivists use a range of data collection methods that are inextricably linked and guided by the proposed research questions or hypotheses (Crotty, 1988; Grix, 2010). In the current study, open-ended questionnaires, semi-structured classroom observations, think-alouds, immediate stimulated recalls and semi-structured interviewer were used.

In the present study, a number of factors have influenced my decision to adopt a qualitative interpretative approach to the inquiry as the theoretical framework that underpins my decisions in choosing the methodological framework, data collection methods and data analysis. More critically, how my beliefs about what constitutes reality and ways of gathering knowledge regarding the topic of lexical inferencing strategies (LIFSs) during reading. My first rationale lies in that the interpretative paradigm, when applied to educational research enables researchers to "build rich local understandings of the life-world experiences of teachers and students and of cultures of classrooms, schools and the communities they serve" (Taylor and Medina, 2013:4). This is attributed to both the degree of flexibility and the vast scope this paradigm offers allowing depth and interpretive adequacy regarding the social or educational phenomena under the investigation (Shank and Villella, 2004).

Second, this paradigm strives to explore the individuals' perception of a specific phenomenon, share their meanings and develop insights about the phenomenon in question (Grix, 2010; Bryman, 2012). The aim of my inquiry is to understand and investigate how LIFSs are applied by the different proficiency levels (PLs) of L1 Arabic participants, how these EFL learners use LIFSs in reality, what knowledge source (KS) clues they resort to during inferencing. Furthermore, how

does background knowledge about the reading topic affect, if any, the clues and strategies they use. By constructing and compiling these multi-layered realities on the phenomenon of LIFSs by different learners, the researcher can reach a more in-depth understanding of this phenomenon than using, for example, a positivist approach to the inquiry.

Third, interpretive researchers, as opposed to positivists, do not generally begin with a theory but throughout the research cycle they "generate or inductively develop a theory or pattern of meaning" (Creswell and Creswell, 2018:46). From my perspective, the vast majority of studies on LIFSs indirectly display a positivist approach to the phenomenon since researchers aimed more on associating statistical significance between LIFS variables more than understanding the process of lexical inferencing itself. This was followed by little qualitative data (verbal reports or individual interviews) used to compare and explain the quantitative results (inferencing scores). Although it is not essential for qualitative researchers to start with a theory in mind, yet this position carries some positive and negative aspects for researchers. Using a theory guides the researcher during the inquiry process to identify the boundaries of the study and data needed to answer the research questions. At the same time, this will also blind the researcher from uncovering other aspects by narrowing down the focus to only some aspects related to the theory. On the other hand, the absence of a theory will tend to make the research process complex and messy since the researcher takes all the data related to the phenomenon where the boundaries of which are blurry. To overcome these disadvantages, I intended to begin with a theory regarding the reading texts, Coady's Psychological Model of second language reading and the Schema Theory (2.4.1 & 2.4.2) while I observed what participants did through the verbal report data, my field notes and reflective journal. This data was consulted once again with the lexical inferencing literature to further understand the phenomenon to formulate both a taxonomy of LIFSs and KS clues used by L1 Arabic EFL readers when encountering unknown/ unfamiliar words.

Fourth, another characteristic of the constructivist paradigm is that simple interpretations cannot convey the event but 'thick descriptions' are needed (Savin-Baden and Major, 2013; Cohen *et al.*, 2018). Thick descriptions refer to "understanding a piece of behaviour - a nod, a word, a pause, etc.- in context, and using one's 'human knowledge' to interpret it when one describes it" (Thomas, 2013:109) which represents the complexity of the situation observed (Cohen *et al.*, 2018). By allowing the reader to gain an in-depth understanding of the phenomenon conveyed through the researcher's deeply reflective nature through identification and empathy since "facts have no meaning whatsoever apart from the interpretation" (Covey,1989 cited in Hussain et al., 2013:2375). Such thick descriptions do not only refer to reporting in detail but demand interaction that goes beyond the boundaries of meaning and motivations (Savin-Baden and Major, 2013). Denzin (2001:83) describes thick description in qualitative research as:

> A thick description…does more than record what a person is doing. It goes beyond mere fact and surface appearances. It presents detail, context, emotion and the webs of social relationships that join persons to one another. Thick description evokes emotionality and self-feelings. It inserts history into experience. It establishes the significance of an experience, or the voice sequences of events, for the person or persons in questions. In thick descriptions, the voices, feelings, actions and meanings of interacting individuals are heard.

Therefore in order to provide the reader with a rich thick description, one of the aims of the interpretive inquiry, is by carefully looking into details, complexity and situated meaning of the everyday life of individuals or social phenomena (Schwandt, 1994). Such descriptions allow a reader to decide whether the findings are applicable to his/her particular situations, for "it is the reader, not the researcher, who determines what can apply to his or her context" (Merriam, 2009:51).

3.4 A multiple case study approach

In qualitative research, there are various frameworks/approaches to the phenomenon under investigation depending on the research objectives, questions proposed and practical issues. In social sciences and education, for example, qualitative researchers have used action research, grounded theory, phenomenology, narratives, ethnography, life history and case study (Merriam, 1998; Marshall and Rossman, 2016; Cohen *et al.*, 2018; Creswell and Poth, 2018). Case study research is a common primary form of inquiry for qualitative and interpretive research (Stake, 2005; van Lier, 2005; Willis *et al.*, 2007) that has become a key method for researching changes and understanding a person, group or an institute (i.e. the case) in complex phenomena over time (Johnson, 1991; van Lier, 2005; Creswell and Poth, 2018; Yin, 2018). Case study research allows the exploration and understanding of complex issues and thus is considered as a robust research method "particularly when a holistic in-depth investigation is required" (Zainal, 2007:1). Thus, case study is a type of research design and analyse which has become the "most widely used approach to qualitative research in education" (Gall *et al.*, 2003:433). Therefore, case studies have played an important role in applied linguistics, particularly in language teaching, learning and use, for they have enhanced "our understanding of contexts, communities and individuals" (Duff, 2008; Hamilton and Corbett-Whittier, 2013:3; Duff, 2014). Johnson (1991:76) captures the significance of case studies in the field of language learning by highlighting that:

> Case studies can provide rich information about an individual learner. They can inform us about the processes and strategies that individual L2 [second language] learners use to communicate and learn, how their personalities, attitudes, and goals interact with the learning environment, and about the precise nature of their linguistic growth.

Many definitions of case studies have been proposed (for an overview see Stake, 1995; Stake, 2005; Duff, 2008; Yin, 2014, 2018). Gall *et al.* (2003:436) view case studies as "the in-depth study of instances of a phenomenon in its natural context and from the perspective of the participants involved in the phenomenon". Johnson and Christensen (2016:136) provide a simple definition of case studies as "research that provides a detailed account and analysis of one or more cases". On the other hand, Yin (2014; 2015:16; 2018) defines a case study as "an empirical method that investigates a contemporary phenomenon (the "case") in depth and within its real-life context, especially when the boundaries between the phenomenon and the context may be not clearly evident". Creswell and Poth (2018:153) define case study research as:

> A qualitative approach in which the investigator explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents and reports).

These definitions share the same essential key principles of case studies; boundedness or singularity, in-depth study, multiple perspectives, triangulation, particularity, contextualization, and interpretation (Duff, 2008). According to Yin (2012), a case study approach should be considered when (a) the focus of the study in answering how and why questions, (b) manipulating the behaviour of participants is not a part of the research, (c) aiming at discovering contextual conditions since they are believed to be relevant to the phenomena or (d) the boundaries are not clear between the phenomena and context. One crucial characteristic of case study research and one of its challenges is "the need for defining the unit of analysis—an individual, a small group, an intervention—and setting the boundaries around the case" (Miles and Huberman, 1994; Marshall and Rossman, 2016:19; Creswell and Poth, 2018; Yin, 2018).

In this present study, I have selected a case study approach to investigate the phenomenon under inquiry due to its characteristics. First, case studies are used to enable the researcher to seek the answers to the "how" and "why" questions while taking into consideration how a phenomenon is influenced by the context within which it is situated (Baxter and Jack, 2008; Yin, 2014). One aim of the current study is to understand how first language speakers of Arabic inference meanings of UNWs while reading, more specifically, what clues and strategies they use (see 1.3). Furthermore, why different proficiency groups used more/less of these clues, strategies and the effect, if any,

on the degree of topic familiarity. Second, case studies are used when there is no form of intervention (Yin, 2018). This was applicable to the present study since there was no form of intervention of strategy training through which participants could alter/manipulate their inferencing ability compared to what they normally do in such settings. Third, in terms of my interpretivist philosophical stance, case studies allow collaborations between participants and the researcher as they narrate their stories through which views of reality are described which enables the researcher a better understanding of participants' actions/behaviours (Baxter and Jack, 2008).

Fourth, qualitative case study approaches involve participants and sites that are described in rich detail through providing a detailed account and analysis of one case or more (Duff, 2008; Yin, 2012; Duff, 2014; Johnson and Christensen, 2016; Yin, 2018). This allows researchers the advantage to penetrate and uncover situations in ways that are not always susceptible to numerical analysis (Cohen et al., 2018). Case studies are generally studied in depth in order to provide an understating of the individual's views, issues, and insights within a particular linguistic, social or educational context (Duff, 2014). Thus, case study research accepts the view that many elements/variables operate in a single case and to accurately capture these elements/variables requires the use of more than one data collection instrument and many sources of evidence (Cohen et al., 2018). In order to capture these elements and present an in-depth understating of the case, case study researchers collect and integrate many forms of data collection methods to examine and interpret a complex phenomenon within their contexts using a variety of data sources through direct/participant observation, interviews, archival records, documentation and physical artifact (Baxter and Jack, 2008; Duff, 2008; Yin, 2014; Cohen *et al.*, 2018; Creswell and Poth, 2018). Through which the study "gains credibility by thoroughly triangulating the descriptions and interpretations, not in a single step but continuously throughout the period of the study" (Stake, 2005:443-444). In other words, a mixed methods approach is commonly used in case studies, which is used in the present study (3.5).

Finally, Dörnyei (2007:155) states that "The case study is an excellent method for obtaining a thick description of a complex social issue embedded with in a cultural context". This view is also supported by Cohen *et al.* (2018:337), where case studies strive to portray "what it is like to be in a particular situation, to catch the close-up reality and 'thick descriptions' of participants' lived experiences of, thoughts about and feelings for, a situation". Furthermore, a hallmark of a good case study is presenting an in-depth understanding of the case through thick descriptions, which is accomplished by collecting many forms of qualitative data (Creswell and Poth, 2018). This coincides with the present study's research questions and objectives which aim at a deeper detailed understanding of how L1 Arabic Saudi university learners inference UNWs and their

lexical inferencing behaviour by focusing on three different proficiency groups. Thus, in order to understand how Arabic Saudi EFL learners, representing different proficiency levels, uncover the meanings of UNW while reading and the role of cultural topic familiarity of the text, detailed thick descriptions are needed for the reader. This description captures the lexical inferencing strategies and knowledge source clues learners used while reading culturally familiar and unfamiliar texts collected through multiple sources of data collection methods in this present study.

3.4.1 Types of case studies

There are different classifications of case studies influenced by the purpose of the study and the type of reached questions (Merriam, 1998; Stake, 2005; Baxter and Jack, 2008; Duff, 2008; Yin, 2014). One classification is related to the researchers' s orientation, Stake (2005) categories case studies into two main types; intrinsic and instrumental. Intrinsic case studies are undertaken when a case has an unusual interest to the researcher. In other words, the researcher is seeking a better understanding of the case which is "not undertaken primarily because the case represents other cases or because it illustrates a particular trait or problem, but instead because, in all its particularity *and* ordinariness, this case itself is of interest" (Stake, 2005:445). On the other hand, in instrumental case studies, the case is not the focus (i.e. of secondary interest) but investigating this particular case facilities our understanding of a broader issue or phenomenon.

Case studies have also been classified in their different purposes or outcomes (descriptive, exploratory, and explanatory) or combinations which overlap and interact with each other (Merriam, 1998; Yin, 2012). Yin (2009) classifies case studies into exploratory, descriptive and explanatory. An exploratory case study aims to investigate a "distinct phenomena characterized by a lack of detailed preliminary research, especially formulated hypotheses that can be tested, and/or by a specific research environment that limits the choice of methodology" (Mills *et al.*, 2010:372). Exploratory case studies are used to "define parameters, refine research questions, test procedures, etc. prior to the main study" (Richards, 2011:111). In other words, an exploratory case study aims at defining the research questions, generating hypotheses of the study or determining the feasibility of the chosen research procedures (Duff, 2008; Cohen *et al.*, 2018).

According to Duff (2008:44), most case study research "aims to be more descriptive and explanatory than simply explanatory". The descriptive case study is characterized by Mills *et al.* (2010:288) as "one that is focused and detailed, in which propositions and questions about a phenomenon are carefully scrutinized and articulated at the outset". The main aim of this current study is to provide in detail the LIFSs and their KS clues that L1 Arabic participants used to infer meanings of unknown words as they read in terms of their degree of cultural topic familiarity,

proficiency levels and inferencing outcomes. Furthermore, to establish a detailed descriptive taxonomy of LIFS and KS clues used in inferencing the UNWs by L1 Arabic Saudi EFL learners. Thus, the main goal of this present descriptive case study is to describe in-depth and detail the natural phenomenon which occurs within the data in which the researcher describes and illustrates the events as they occur (Zainal, 2007).

Finally, explanatory case studies that use both qualitative and quantitative research methods strive not only to explore and describe a phenomenon but also explain casual relationships to develop or test a theory (Baxter and Jack, 2008; Mills *et al.*, 2010; Cohen *et al.*, 2018). Explanatory case studies examine the data closely both at the surface and deep levels to understand the underlying aspects to explain the phenomenon in the data (Zainal, 2007). The current study is also characterized by explanatory elements, for it aims to explain why some groups use certain LIFS and KS clues more than others. Furthermore, what were the specific LIFSs and KS clues that resulted in successful inferencing while others did not for the three groups. It also seeks to explain the role of cultural topic familiarity/unfamiliarity on their choice of LIFSs, KS clues and inferencing results among the different groups.

The focus in this present study is on the lexical inferencing behaviour of 3 groups of L1 Arabic Saudi EFL university students (see 3.6.3), who at the time of data collection were enrolled in a reading class, as they inferenced meanings of UNW while reading. Thus, it is a multiple case study that includes 3 cases. I have selected a multiple case studies approach (Yin, 2014), also known as collective case studies (Stake, 2005), to seek insights to answer my research questions. In order to understand, describe, compare and explain how the 3 different proficiency level groups inferenced the UNWs and the role of topic familiarity. According to (Stake, 2005:446), these multiple cases are “chosen because it is believed that understanding them will lead to better understanding, and perhaps better theorizing, about a still larger collection of cases”. Thus, multiple case studies are used for comparative and replication studies (Cohen *et al.*, 2018). The more cases included in a study, the greater the variation across cases/groups, thus a deeper understanding of the phenomenon which can strengthen the precision, the validity and stability of findings and increase the sense of representativeness or variation among the cases (Duff, 2008; Miles *et al.*, 2014; Merriam and Tisdell, 2015). Furthermore multiple case studies add confidence to findings “by looking at a range of similar and contrasting cases, we can understand a single case finding, as to how and where, and if possible, why it carries on as it does” (Miles and Huberman, 1994:29). Thus according to the classifications above, the present study is an instrumental, explanatory and descriptive multiple case study where each case represents one group of PL.

3.5 Research design

As mentioned in the introduction, this present study adopts an embedded mixed methods case study. Mixed methods research (MMR) focuses on collecting, analyzing and mixing both quantitative and qualitative data in a single or series of studies. Its central idea is that the use and combination of both the previous approaches provide a better understanding of the research problem and questions than using a single approach (Cohen *et al.*, 2018). Various definitions of MMR have been proposed in the literature in terms of philosophical orientations, research design, methods, data collection procedures, types of data, analysis and interpretation (Creswell *et al.*, 2003; Mills *et al.*, 2010; Tashakkori and Teddlie, 2010; Creswell and Clark, 2011; Clark and Ivankova, 2016; Cohen *et al.*, 2018). In this current study, MMR is viewed according to Johnson et al. (2007:123) definition where:

> Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration.

In other words, in MMR the investigator "collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a programme of inquiry. A key concept in this definition is integration" (Tashakkori and Creswell, 2007:4). This definition adds to the first, that not only is mixing carried out in the same study but more importantly how the integration takes place is also a critical issue in MMR (Dörnyei, 2007). A MMR design contains two strands, quantitative (QUAN-S) and qualitative (QUAL-S). A strand is a component of a study that encompasses the basic process of conducting quantitative or qualitative research: posing a question, collecting data, analysing data and interpreting the results based on that data (Teddlie and Tashakkori, 2009). In designing a MMR study, essential decisions that need addressing are related to the integration between the QUAN/QUAL-S: level of interaction, priority, timing and when and how to mix. Such factors lead to different types of mixed methods designs in terms of their purposes, philosophical assumptions, strengths, weaknesses and challenges (Leech and Onwuegbuzie, 2009; Teddlie and Tashakkori, 2009; 2010; Creswell and Clark, 2011; Creswell and Creswell, 2018).

This study adopts a mixed methods design, not only in terms of the QUAN/QUAL instruments used but also at the level of its methodology. That is, in addition to mixing instruments, mixing also expands to the research questions, data collection, analysis and interpretation stages (Clark

and Ivankova, 2016). MMR falls in a continuum (for an overview see Johnson and Onwuegbuzie, 2004) and according to Leech and Onwuegbuzie (2009), the present study is a fully MMR study which represents the highest degree of mixing in MMR. It involves using both QUAN and QUAL research elements within one or more of the following stages in a single study; the research objectives, type of data, analysis and inferences.

A number of rationales justify why I adopted a MMR approach in this study. First, through using different research methods individual weaknesses and strengths between methods can be balanced (Cohen *et al.*, 2018; Creswell and Creswell, 2018). Thus, maximizing internal and external validity (Dörnyei, 2007). This is often referred to as 'offsetting strength and weaknesses' to obtain "a more rigorous conclusion by using the two methods such that the strengths of the quantitative methods offset the weakness of the qualitative methods and vice versa" (Clark and Ivankova, 2016:84). Second, one source of gathered data may be insufficient to provide us with a detailed understanding of the problem, thus a need exists for another source to further explain initial results, generalize exploratory findings and understand the research objectives through the multiple research phases (Creswell and Clark, 2011; Clark and Ivankova, 2016). For example, one method might not provide us with a complete understanding of the topic or the results between QUAN and QUAL data are contradictory which would have been unnoticed if one method was used (Creswell and Clark, 2011).

Therefore, the third rationale for using MMR is for complementarity purposes, to obtain a more comprehensive and complete understanding about the phenomenon "to be obtained than single methods approaches and answers complex research questions more meaningfully" (Bryman, 2006; Clark and Ivankova, 2016; Cohen *et al.*, 2018:33). Complementarity occurs through integrating methods which lead to a more complete picture that is developed by addressing different research questions or goals (Teddlie and Tashakkori, 2009). Through such a combination, one inquiry can inform and support the other. According to Miles *et al.* (2014:343), "narratives and variable-driven analysis need to interpenetrate and inform each other. Realists, idealists and critical theorists can do better by incorporating other ideas than by remaining pure". Thus, researchers can provide a multi-level analysis of complex issues, resulting in a better understanding by converging numeric trends with specific QUAL data. In this current study, qualitative methods (verbal reports and semi-structured interviews) are integrated to explain initial quantitative data (lexical inferencing scores) in addition to quantifying the qualitative data. Furthermore, semi-structured interviews were implemented to further investigate more of the issues raised by learners in their verbal reports. Dörnyei (2007:45) advocates the use of mixed methods in appropriate multi-level analysis "because it allows investigators to obtain data about both the individual and the broader social context".

This leads o to the fourth reason for using MMR design, triangulation, which is generally defined as the use of two or more methods of data collection in the study of some aspect of human behaviour (Cohen *et al.*, 2018). Through triangulation, researchers are confident to make valid conclusions about a phenomenon by directly comparing results obtained from quantitative methods to those from their qualitative counterparts for convergence and divergence (Clark and Ivankova, 2016). Denzin (1978 cited in Merriam and Tisdell, 2015:215) proposes four types of triangulation by using multiple methods (instruments), sources of data, investigators and theories to confirm emerging findings. In this study triangulation, is carried out through using multiple sources of data, collection methods and theories/models. The first refers to the process of comparing or cross-checking data gathered through various methods. In this present study, initial results from participants' inferencing scores and think-alouds are further supported and examined with immediate stimulated recalls and interview data. The objective is to confirm, further penetrate and explain the first set of data, thus providing a better understanding in terms of breadth and depth to the phenomenon of lexical inferencing (Johnson *et al.*, 2007; Bryman, 2012; Cohen *et al.*, 2018). The second, methodological triangulation refers to using different methods to investigate the phenomenon which further supports the first rationale and that more valid conclusions are obtained by comparing and contrasting the results from both methods (QUAN/QUAL) (Clark and Ivankova, 2016). Finally, triangulation through using multiple theories to interpret the data which is less common than the previous forms (Merriam, 2009). Triangulation can ensure the validity and reliability of results in quantitative studies (Dörnyei, 2007; Cohen et al., 2018) and for qualitative studies the issue of trustworthiness is ensured (Lincoln and Guba, 1985) (see 3.12).

3.5.1 An embedded mixed methods case study design

Researchers commonly agree that various MMR designs exist in literature and thus key decisions need to be addressed on serval issues. Decisions include representing different disciplines and stressing critical issues involved in their classifications: sampling and size, level of interaction, priority of the QUAN/QUAL-S, their timing, methods used, their sequences, when and how to mixing takes place and ethical issues (Sandelowski, 2000; Onwuegbuzie and Collins, 2007; Leech and Onwuegbuzie, 2009; Teddlie and Tashakkori, 2009; 2010; Creswell and Clark, 2011; Morgan, 2014; Cohen *et al.*, 2018; Creswell and Creswell, 2018). According to Creswell and Clark's (2011) classification, this present study's design is an embedded (nested) one. Several rationales informed my decision to adopt this design. First, this design is appropriate when the researcher has different research questions that require different types of data to be collected in order to enhance the application of a quantitative/qualitative design to address the primary purpose of

the study (Creswell and Clark, 2011; Clark and Ivankova, 2016). The research design implemented in this study was an embedded mixed methods multiple case study, in which quantitative methods are embedded into a larger overarching qualitative design, a multiple case study (Figure 3-1). In other words, the overarching methodology was a qualitative (QUAL[2]) case study with an interpretivist philosophical orientation while the second method (quan) is incorporated within the previous larger research design. The embedded design provides unequal priority between the two sets of data (quan/QUAL) with the larger associated with the primary design, which in the present study is qualitative. While the second data set,which is quantitative in this study, maybe collected before, during and/or after implementing the data collection and the analysis procedures associated with the larger design (template).

The secondary embedded method is designed to fit the methodological requirements of the primary research design (Clark and Ivankova, 2016). This allows researchers "an enriched, elaborated understanding of the phenomenon" under investigation (Greene *et al.*, 1989:258). In addition, embedding quantitative methods within a case study design enhances the application of the case study for examining the complexities of the case(s) (Creswell and Clark, 2011; Clark and Ivankova, 2016).

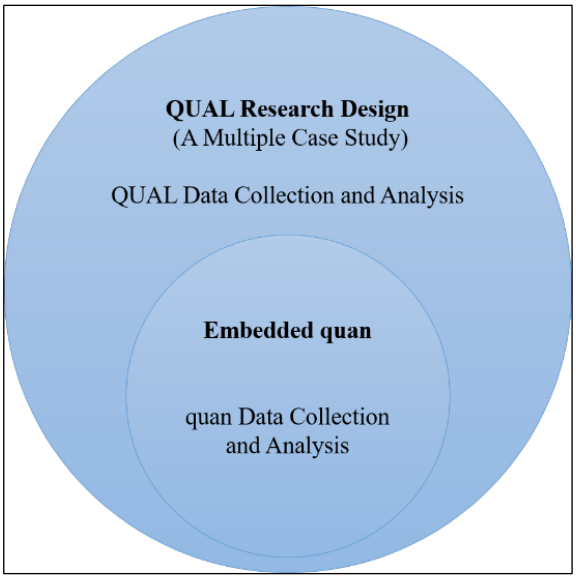


Figure 3-1 An embedded QUAL (quan) research design

As mentioned in 3.4, a common characteristic of case study research is using multiple methods for data collection and analysis. This makes mixed methods case studies useful frameworks for

[2] Uppercase letters represent the prioritized stand in the design while lowercase letters represent the less prioritized (Morse, 1991; Morse and Niehaus, 2016).

approaches to understand and engage with the complexities of case(s) through enriching qualitative case descriptions with quantitative information (Luck *et al.*, 2006; Bush *et al.*, 2011). Second, using a mixed methods case study adds consistency, strength and enhancement to adhering to my philosophical stance, thus ensuring understanding of the topic through an Interpretivist's lens. This philosophical worldview is maintained not only through the overall primary design a qualitative case study approach but also through the majority of primary qualitative data collection methods (think-alouds, immediate stimulated recalls, semi-structured interviews, field notes and researcher's reflective journal) and analysis. While the secondary data set (quan) provides additional support to the primary qualitative data. Furthermore, this design can be used when the investigator does not have sufficient time or resources to commit to an equal balance between the two types of data since one is given the main priority over the other (Creswell and Clark, 2011). The challenges of this design are designing the QUAN methods to provide useful information even for small sample sizes and incorporating the QUAN results in a meaningful way with enrich case study descriptions (Clark and Ivankova, 2016).

As mentioned in 3.5 and the beginning of this section, decisions like the level of interaction, priority, timing, when and how the mixing will take place between the QUAN/QUAL-S in the study's design are essential. In this study, the level of interaction between the QUAL-S and quan-S data sets is interactive in all stages of the research process and the data sets are mixed before the final interpretation, i.e. fully mixing (Creswell and Clark, 2011; Creswell and Creswell, 2018). In terms of priority in the current study, qualitative priority was stressed over secondary quantitative ones for a number of reasons, in addition to the points mentioned in the previous section above. First, the power of qualitative research data is advocated by many scholars as the best strategy for discovering or exploring a new area and for developing a hypothesis (Dörnyei, 2007; Miles *et al.*, 2014; Creswell and Poth, 2018). Qualitative methods can be used to explore substantive areas that little is known about, gaining access into intricate details through investigating issues like feelings, thought processes and emotions that are difficult to research using convention research methods (Corbin and Strauss, 2015). Under thought processes resides the phenomenon of LIFSs and thus better studied in ways that "generate qualitative data that are mainly descriptive and interpretative" (Imenda, 2014:190). One objective of this current study is to understand the effect that topic familiarity (content and culture schemata) plays on the type of LIFSs, KS clues used by the different proficiency groups and their success/failure of inferencing UNWs during reading. This is carried out through collecting mostly qualitative data over a sustained period of time (nearly three months) which makes them powerful for studying such processes since they go beyond snapshots of 'what' and 'how many' to explain how and why things happen as they do (Miles et al., 2014).

Second, in placing greater weight on a qualitative approach to the research methods, I was greatly influenced by the inherent flexibility and 'emergent design' of qualitative studies in terms of research questions, data collection and methods (Dörnyei, 2007; Miles *et al.*, 2014; Creswell and Creswell, 2018). This allowed me to make critical adjustments to my research instruments while present in the study's research site during the main stage of data collection. For I was only faced with the reality in terms of participants' time availability for the verbal report sessions in the main study's data collection stage which were not present in the first pilot stage. This flexibility gives qualitative researchers further confidence that they understand what is going on during the research process (Miles et al., 2014). The stage of the research where a researcher mixes the QUAN/QUAL strands is known as the 'point of inference' (Morse and Niehaus, 2016) or stage of integration (Creswell and Clark, 2011). In this present study, this point of inference was in the research design stages, data collection, analysis and interpretation.

In terms of timing between the QUAN/QUAL-S, concurrent timing occurred during the first phase, where both QUAL and quan strands are implemented during a single phase of the study (Figure 3-2). This was followed by sequential timing for the second and third phases of the study.

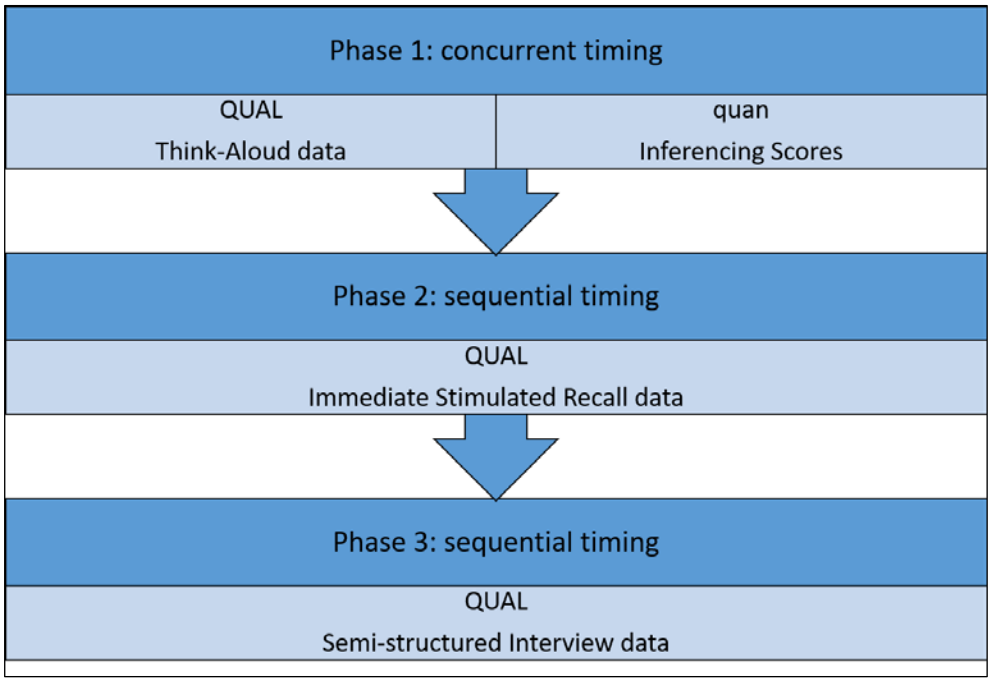


Figure 3-2 The sequential stages of the main phase of the study

Concurrent timing can produce valid and sustained findings since it allows researchers to obtain "different but complementary data on the same topic" (Morse, 1991:122). Furthermore, both types of data allow comparison, collaboration and identification of data disparities (Bush et al., 2011), their collection and analysis in a short period of time, saving both time and cost issues (Clark and Ivankova, 2016). Since one objective of using a MMR was triangulation, then a

concurrent design is appropriate so that both data sets can be triangulated. Creswell et al. (2003:217-218) support this claim explaining that by:

> concurrently gathering both forms of data at the same time, the researcher seeks to compare both forms of data to search for congruent findings (e.g., how themes identified in the qualitative data collection compare with the statistical results in the quantitative analysis).

3.6 Research site and participants

3.6.1 The research site

The present study's research site was at the Department of European Languages and Literature at King Abdulaziz University, a Saudi public university in Jeddah. As mentioned in Chapter 1 (see, 1.5.2), some Saudi universities implement a compulsory preparatory foundation year programme where general compulsory subjects are given to first year students, this is also applied at King Abdulaziz University. In this preparatory foundation year, in addition to Arabic, Islamic studies, mathematics, students are taught intensive English courses covering 18 hours per week, in which four English levels are completed within one academic year. Before enrolling on their English courses, students' language proficiency level is measured through Oxford's Online Placement Test. Depending on their results, students are initially allocated to one of the four language levels (101, 102, 103, 104) and need to go through them until the last language level (104). Upon finishing this year, they can then major in their specialized disciplines and begin their undergraduate degree.

After completing the preparatory foundation year programme, students who want to enroll at the Department of European Languages and Literature are given a department entrance exam. Upon succeeding, students who enroll at this department can choose to major either in English or French. In their first year at the department, they take several general compulsory courses; Arabic, Islamic studies, mathematics, computer and IT literacy, in addition to a general language course in the language they chose to major in. In the second year, students begin to take two levels of introductory courses related to their language major during the two academic semesters, reading, writing, listening and speaking, in addition to general compulsory courses (Islamic culture, Arabic). In their third and fourth years, students begin to undertake specific language courses like introduction to linguistics and literature, poetry, translation, photonics, phonology, morphology, research methods. Graduates of the Department of European Languages and

Literature can pursue a career in teaching, translation or other sectors that require using English like newspapers, banks, hospitals, etc.

This site was selected for practical reasons in terms of data collection techniques and the researcher's knowledge of the setting of the context. First, access into the academic institution as a whole was facilitated due to being a faculty member at one of the language institutes at that same university. Second, in the previous years, I have taught some specialized modules in linguistics at the Department of European Languages and Literature, therefore I had a chance to make connections at that department where my research was situated. These connections have played a vital role in granting me access into this department and thus to the research participants.

As for choosing the specific context of my research sample, the sample would be L1 Arabic Saudi students majoring in English who are enrolled in their second year at the Department of European Languages and Literature and were currently enrolled in a reading class. A number of decisions influenced my choice for purposely selecting students majoring in English at this department. In general, it was motivated by the fact that English was the only medium of instruction in lectures as opposed to the other departments where Arabic is used. On the other hand, specifically/ purposely selecting participants enrolled in a Reading 102 module was a deliberate choice for a number of reasons. First, due to the nature of the courses, inferencing ability will not only enhance their reading fluency but also support their academic learning and scores on the module (Wesche and Paribakht, 2010). Second, the course served as a natural setting for what participants normally did as they read and comprehended words and texts, thus a natural transitional anticipation to the researcher's reading tasks. Finally, since lexical inferencing ability "can be a particularly important tool for readers who are studying through the medium of an L2 and thus may face more unfamiliar words than their fellow students reading in their L1" (Wesche and Paribakht, 2010:5). Thus, participants are already accustomed to encountering UNWs in their courses of study at the department. This was confirmed by their reading instructor who also showed me some samples of quizzes and exams, in addition to comprehension questions which included meanings of underlined UNWs from the text.

3.6.2 **Participants**

Participants were Saudi university females aged between 18-20 years, L1 speakers of Arabic who were second year students at the Department of European Languages and Literature at the time of data collection. All the participants had completed a preparatory one-year English foundation programme at King Abdulaziz University before taking an entrance exam and being accepted at

the department. Data collection began at the beginning of March 2016, at the time, there were four reading classes all taking Reading 102 given by two instructors. It was decided only two of these classes will serve as my population and through sequential stages of sampling, the final sample will be selected, which is explained in detail in the following section (3.6.3). Incentives, in the form of financial gift vouchers for a local bookstore were used to motivate the participants to take part and perform their best on the inferencing tasks. This was inspired by two studies, the first by Gardner and MacIntyre (1991), who reported that the financial rewarded group performed significantly better than their control on learning 24 of the 26 words. The second study was by Eysenck and Eysenck (1980) (cited in Crookes and Schmidt, 1991), who investigated the interaction between the process of monetary rewards and strength of connections between the words and their corresponding retrieval clues. There were two different types of retrieval clues; those with a sound connection to the learnt items while the second had a meaning connection. The findings found that high incentives items were recalled better than low incentive items regardless of the type of clue (sound or meaning).

3.6.3 Participant sampling techniques

There is no clear-cut answer for the correct sample size, the sample size is primarily informed by several research elements like research questions, objectives, design, the number of variables included, data collection instruments and analysis undertaken, cost constraints in terms of time, money, stress, available research resources and administrative support (time, effort, financial) (Dörnyei, 2007; Onwuegbuzie and Collins, 2007; Creswell and Clark, 2017; Cohen *et al.*, 2018). Determining an appropriate sample size is crucial for it determines the extent the researcher can make statistical/analytical generalizations (Onwuegbuzie and Collins, 2007). As opposed to quantitative research in which the principle 'the larger the sample size, the better' is followed, this is not the case in qualitative research. Sample sizes in QUAL research should not be too small leading to the difficulty in reaching data saturation and at the same time should not be so large making it difficult for the researchers to take an in-depth, case-oriented analysis (Sandelowski, 2000; Onwuegbuzie and Collins, 2007). In summary, sample sizes should generate sufficient data for the inquiry to allow thick descriptions, thus increasing descriptive and interpretive validity (Maxwell, 1992).

In the present study, the decision to have a sample of 15 participants was eventually reached through a number of considerations supported by the literature. First, regarding case study research Creswell and Poth (2018:226) recommend not to include more than 4-6 cases in a single study, for this "should provide ample opportunity to identify themes of the cases as well as conduct cross-case theme analysis" in which such analysis will be used. However, since I am

investigating the effect of participants' proficiency levels and role of learners' topic familiarity on the KS clues, LIFS and their degree of success, researchers like Dörnyei (2007), Borg and Gall 1979 (cited in Cohen *et al.*, 2018:204) suggest a sample size of 15 or fewer in causal-comparative and experimental procedures while 30 for correlation cases. Second, one of the aims of the current study is to achieve a depth of understanding rather than breadth not only through using a case study approach to fulfill this objective but also a small sample size. Since I chose not to sacrifice depth for breadth through a larger sample (Hennink *et al.*, 2020). This is advocated by Patton (2002:244) where "validity, meaningfulness, and insights generated from qualitative inquiry have more to do with the information richness of the cases selected and the observation/analytical capabilities of the researcher than with the sample size". Third, building from Patton's (2002) view, practical reasons to manage various issues like financial costs, time limitations in participant's availability also the time needed to transcribe, check, read and code/recode the data (Emmel, 2013) motivated this small sample size. Fourth, regarding embedded MMR designs according to Clark and Ivankova (2016:142), "if a quantitative method is embedded in a qualitative case study design, then the quantitative sample will likely be very small and purposefully selected because it is limited to those individuals who are part of the case". Finally, following Dörnyei's (2007:100) advice, that in selecting the final sample size, it is best to have a 'safety margin' in anticipation of unforeseen or unplanned circumstances e.g. participant withdrawal or drop out.

Sampling decisions are more complicated in MMR since sampling schemas must be designed for both the QUAN/QUAL components (Onwuegbuzie and Collins, 2007). Therefore, in the present study, a combination of non-probability (purposive) and probability (random) sampling were carried out, which have been associated respectively with QUAL and QUAN sampling techniques (Dörnyei, 2007; Cohen *et al.*, 2018) although this is seen as a false dichotomy since both can be used in each (Onwuegbuzie and Collins, 2007). In MMR, a number of sampling techniques have been proposed by many researchers. For example, Teddlie and Fen (2007) categorize MMR sampling into basic, sequential, concurrent and multiple sampling strategies. The combination of non-random sampling for the qualitative component(s) and random sampling for the quantitative component(s) in MMR is reported as the second most common combination after non-probability sampling for both QUAN/QUAL combinations (Onwuegbuzie and Collins, 2007).

To answer the research questions guided by the researcher's ontological and epistemological assumptions, the methodological approach to the inquiry, issues of time and cost, sequential MMR sampling was implemented. In sequential sampling, information from the first sample is required to draw the second sample. Thus sampling here "involves the qualitative phase first being conducted to inform the subsequent quantitative phase, or vice versa" (Greene *et al.*, 1989;

Kemper *et al.*, 2003; Collins *et al.*, 2007:276). In this study, the sequence order is driven by the researcher's philosophical stance, interpretivism, thus starting with the qualitative strand. My rationale behind this was that through using a combination of purposive and probability sampling entails more depth and breadth to the study. Purposive sampling provides greater depth to the inquiry from a smaller number of carefully selected cases while probability sampling leads to greater breadth of information from a larger number of units selected to represent the population (Patton, 2002). Thus a combination of these orientations allows the mixed-method researcher to "generate complementary databases that include information that has both depth and breadth regarding the phenomenon under study" (Teddlie and Fen, 2007:85). In this study, sequential sampling was applied through applying more than one sampling strategy (Figure 3-3), which is common for mixed methods research (Tashakkori and Teddlie, 1998).

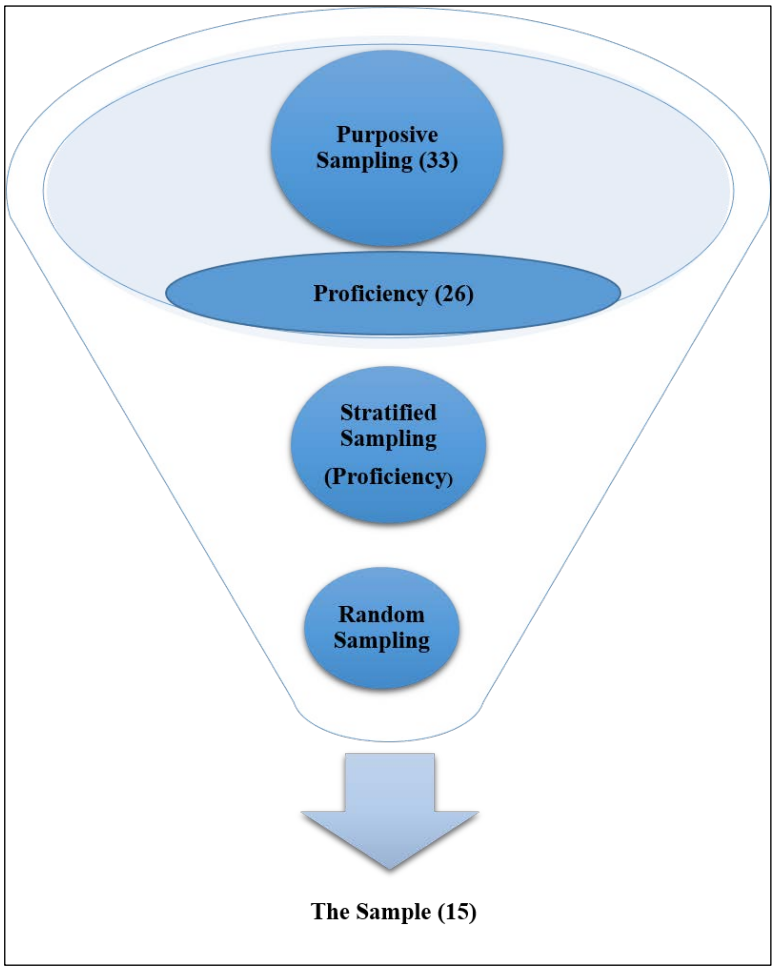


Figure 3-3 The study's sampling technique

The sequential sampling stages in this study were as follows:

1. In the first stage, purposive sampling was applied where "particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be gotten as well form other choices" (Maxwell, 2008:235).

For this reason, in most case studies, sampling is commonly purposive (Richards, 2003; Creswell and Poth, 2018). Furthermore, since the main aim of the study is to understand the process of lexical inferencing and "no attempt to generalize is desired. It is frequently the case for ethnographic research, action research or case study research."(Cohen *et al.*, 2018:217). Therefore, I had purposively selected individuals to fulfill the aim of providing a maximum understanding of the underlying phenomenon being studied (Onwuegbuzie and Collins, 2007). According to Patton (2002:40), in purposive sampling, cases are selected because they are "information rich and illuminative", they offer insights to the phenomenon in question. In this way, sampling aims at insights about the phenomenon not empirical generalizations from the sample to the population. To begin purposive sampling, the researcher "must first determine what section criteria are essential in choosing the people or sites to be studied" (Merriam, 2009:77). I had purposely included the participants that shared the following characteristics:

a. They were all Saudi
b. They had taken the compulsory foundation preparatory year programme at King Abdulaziz University.
c. There were majoring in English language and literature for their Bachelor's degree.
d. They were enrolled in a reading class at the time of data collection.
e. The willingness to participates, share information, being audio recorded, meeting the researcher multiple times due to the nature of the study was an important criterion.
f. Due to the gender segregated education system in Saudi Arabia, all participants were females.

At the time of the data collection, there was only one module of reading, READING 102, running in the second academic semester. There was a total of 4 classes taught by two different instructors. I was given the opportunity to introduce myself and why I was here in the four classes at the end of the class before beginning the sampling stage in the following week. I decided to select two classes taught by the same instructor my rationale was for practical reasons, high level of classroom attendance and questionnaire response rate, a cooperative instructor who later on facilitated access for the researcher to both her participants and coming lectures. All 33 participants in these two classes were given usernames and passwords and took the Oxford Online placement test in a language lab.

2. Next, stratified random sampling, a type of probability sampling, was applied. In this sampling technique, the sampling frame is divided into sub-sections or 'strata' comprising groups that are relatively homogeneous with respect to one or more characteristics (Cohen *et al.*, 2018).

Thus, participants representing the 3 cases (groups) (see 3.4) need to be sampled in terms of proficiency levels (PLs). This was fulfilled through applying stratified random sampling. After administrating the proficiency test and getting the results, the number of participants decreased from 33 participants to 26. This was because 3 participants had failed to complete the test in the allocated time and thus were excluded from the study for financial reasons. Since new licenses had to be purchased by the researcher in addition to time limitations in terms of participants' time and language lab availability. A further 4 participants who correspond to the A (1&2) proficiency band were excluded due to their small number compared to the remaining proficiency bands (C1, B2, B1). Furthermore, this level of proficiency is the weakest which might affect their performance. The 26 participants were grouped into 3 groups according to their PLs into C1, B2 and B3 from which 5 randomly selected participants from each group were selected by drawing their name out of a box. Participants were identified through pseudonyms which indicated their proficiency level followed by a dash and a number indicating their ordinal position within their same proficiency group, with 1 being the highest. In experimental studies, the effect of unknown variables due to randomization is distributed to all the study participants in an equal manner (Creswell, 2012). Thus, such sampling is a "combination of randomization and categorization" (Dörnyei, 2007:97). This would entail both qualitative and quantitative analysis to be undertaken, where "quantitative research can use statistical analysis, whilst qualitative research can target those groups in institutions or clusters of participants who might be approached to participate in the research" (Cohen *et al.*, 2018:216). The issue of the relationship between the QUAN and QUAL regarding sampling is also a critical decision for researchers. Onwuegbuzie and Collins (2007) classify four types of relationships; identical, parallel, nested, or multilevel (see source for an overview). In this current study, an identical relationship is carried out with the same sample of participants in both the quantitative and qualitative phases of the research.

3.7 Research methods

Research on language learner strategies has used various data collection methods to determine the used strategies among learners such as; validated test measurements, interviews, observation, verbal reports, questionnaires, focus groups, diary entries and eye-tacking (Schmitt, 1997; Dörnyei, 2007; Cohen, 2014; Cohen *et al.*, 2018; Conklin *et al.*, 2018; Rose *et al.*, 2019). As discussed in section 3.5.1, this is a qualitative embedded mixed methods case study in which a number of different types of data sources collected through different methods have been used. Using several methods provided me with an in-depth investigation of L1 Arabic EFL learners' lexical inferencing strategies in terms of their proficiency level and degree of

familiarity/unfamiliarity. This was achieved through using a mixed methods approach to the investigation as discussed in 3.5.

The table below outlines a summary for the present study which includes and links the research questions to their data sources, the research instruments used for collecting the data and the type of analysis used.

Table 3-1 Summary of the research

Research Questions	Data Source	Data Collection Methods	Type of Analysis
1. How do Saudi Arabic L1 speakers majoring in English infer meanings of unknown words while reading? 1.a. How do they approach the unknown words? 1.b. What are the range of knowledge sources clues do they tap into to uncover the meanings of the unknown words? 1.c. What are the range of lexical inferencing strategies do they resort to uncover the meanings of the unknown words?	Transcribed verbal report data (think-alouds & Immediate stimulated recalls) Reading texts (mark made by participants) Transcribed semi-structured interview data Researcher's notes Questionnaire responses	Think-Alouds - Immediate Stimulated Recalls Individual semi-structured interviews Audio recording- Field notes paper-based questionnaire	Abductive thematic analysis
2. How does topic familiarity of the text affect, if any, learners' lexical inferencing of unfamiliar words with respect to their proficiency levels? 2.a. What are the numbers of lexical attempts and responses made between the groups in the two texts? 2.b. What are the similarities/differences between groups in terms of knowledge source clues used when reading culturally familiar and unfamiliar topics and with what frequency? 2.c. What are the similarities/differences between groups in terms of lexical inferencing strategies employed when reading culturally familiar and unfamiliar topics and with what frequency?	Proficiency scores The reading texts Transcribed verbal report data Transcribed semi-structured interview data Researcher's notes	Think-Alouds - Immediate Stimulated Recalls Individual semi-structured interviews Audio recording Field notes Proficiency test	
3. In terms of successful inferencing, what is the role of learners' topic familiarity, if any, on their lexical inferencing? 3.a. How successful are the groups in their lexical inferencing attempts? 3.b. What are the knowledge source clues activated by the groups in both texts and with what frequency? 3.c. What are the lexical inferencing strategies used by the groups in both texts and with what frequency?	Proficiency scores – The reading text scores Transcribed verbal report data Transcribed semi-structured interview data Researcher's notes	Think-Alouds -Immediate Stimulated Recalls Individual semi-structured interviews Audio recordings- Field notes	

The following sub-sections outline and present a detailed description of the methods used in this embedded mixed methods multiple case study and their purposes.

3.7.1 Questionnaires

Questionnaires are extensively used in educational research to inquire and collect data about phenomena that are not directly observable or not readily available by other means, inner experience, opinion values (Gall *et al.*, 2003; Harkness, 2012). The advantages of questionnaires have been reported in terms of their efficiency of the researcher's time, effort, financial resources and their distribution to a large sample (Gall *et al.*, 2003; Dörnyei, 2010). According to Dörnyei (2010), questionnaires yield three types of data about the respondent; factual, behavioural and attitude. Factual questions aim at finding out who the respondents are and usually covers demographic characteristics (age, gender, nationality) "as well as any background information that may be relevant to interpreting the findings" of the study (Dörnyei, 2010). While behavioural questions are used to find out what participants have done in the past or are doing, for example, asking about life-styles, habits or personal history. Finally, attitudinal questions aim at uncovering what people think about certain topics which Dörnyei (2010) breaks down into; attitudes, opinions and believes, interests and values.

Questionnaires were used in this study for a number of reasons. The first, through using factual questions to collect some demographic information about the target sample (L1 Arabic Saudi university students) and most importantly, to identify and determine the type of culture they were unfamiliar with. Secondly, behavioural questions about their inferencing behaviours, approaches to the UNWs while reading and the difficulties they encounter that would be difficult to gain through other direct means like observation. In L2 literature, behavioural questions/items have been used in language learning strategy research inquiring about specific strategies and their frequency of usage (Schmitt, 1997; Dörnyei, 2010; Cohen *et al.*, 2018). Furthermore, since questionnaires can function as an exploratory tool (Bailey, 2008), they were used in both stages (preliminary and main) of the present study.

The questionnaires (online and paper-based) used in this study were a combination of both 'close-ended' and 'open-ended' items with more in favour of the latter. 'Close-ended' items are the most frequently used items in questionnaires since they make quantification and analysis of results easier (Gall *et al.*, 2003; Dörnyei, 2010). However, in this study 'close-ended' items were used in the form of multiple-choice and true/false items for the sole purpose of collecting factual information about the participants and identifying familiar/unfamiliar cultures from a given list of cultures.

While open-ended items, although-time consuming were used to understand, explore, and identify what respondents usually did when they encountered an UNW while reading. Since open-ended items allow participants freedom of expression, they are "gems of information" for they provide greater richness of descriptions of events and participants' perspectives or reflections about the inquiry not captured by closed-ended items (Dörnyei, 2007; Cohen *et al.*, 2018:475).

However, a disadvantage of open-ended questionnaire items is the unnecessary/irrelevant information in the responses due to participants misunderstanding the items (Dörnyei, 2007; Cohen *et al.*, 2018). In overcoming this openness, I adhered to Dörnyei's (2007, 2010) and Kenett's (2011) guidelines to add some sense of organization to the open-ended items and become 'partly open-ended' through using a sentence completion form. As the name suggested, a number of incomplete sentences or even single words are used to prompt participants to fill in with the first thing that comes to their minds (Oppenheim, 1998). This will also decrease the time spent responding to these items and allow some general comparisons to be found between respondents in terms of themes and issues questioned. Other issues were also taken into account during the questionnaire design; careful wording, avoiding ambiguous, loaded sentences/words since the loaded feature "may elicit an emotional reaction that may bias the answer" (Dörnyei, 2007:108). These were overcome by carefully piloting the preliminary online questionnaire before the final paper-based version, for piloting is a critical element in the success of a questionnaire (Dörnyei, 2007, 2010; Neuman, 2014; Cohen *et al.*, 2018) and to modify the paper-based version upon reaching the research field. In addition, using the partially-open responses in the preliminary questionnaire combined with the issues/themes from the LIFSs and guessing literature were adapted/consulted to modify the final English version of the paper-based questionnaire (Appendix D). The questionnaire formatting was in line with Dörnyei's (2007, 2010) proposed format considerations.

Questionnaires were used in both the preliminary and main stages of the study. In the preliminary stage, the online open-ended questionnaires were used to assist myself in determining the degree of topic familiarity of the chosen unfamiliar culture. From which a reading topic to represent the unfamiliar cultural reading text in this current study will be chosen. Thus, I had adhered to the commonly used method to indicate topic familiarity in lexical inferencing strategy research (Al-Shumaimeri, 2006; Atef-Vahid et al., 2013; Biria and Baghbaderani, 2015). In choosing the reading topic for unfamiliar culture for the second text, I used my cultural knowledge of the Saudi culture and context since I am an Arabic Saudi female, a member of the Saudi context and culture as the participants. Furthermore, my English teaching experiences at the university and my exposure to the range of language books taught also played a role. I was confident in the absence of topics

discussing British culture (e.g. Bonfire Night) in books, mainly because they are specialized editions for the Middle East. Furthermore, it is unlikely that participants would know about British cultural events through the Saudi TV channel, Channel 2, since it tends to be Americanized. Students would be more likely to know about Independence Day, the 4th of July, than Bonfire Night. Through using a preliminary online Arabic questionnaire (Appendix B, for English translation Appendix C) published through Survey Monkey to other students, who share similar characteristics to the targeted population of the study, I was able to further confirm the degree of their unfamiliarity with the British culture. Second, the preliminary online questionnaires helped me to identify and highlight certain patterns or themes expressed through the open-ended items which were of interest to the study. This allowed me to pay careful attention to them during the verbal report sessions, elicit further information from participants by asking questions or requesting more elaborations. Finally, the online questionnaires functioned as a pre-piloting stage to fine-tune the final paper-based version used in the main study though eliminated ambiguous or irrelevant items and improving the wording before finalizing the paper-based version given to the research sample (Dörnyei, 2007, 2010; Cohen *et al.*, 2018).

In the main study, the paper-based questionnaires provided the researcher with insights into the issues that Saudi Arabic EFL learners faced when encountering UNWs while reading. More specifically, questionnaire responses not only provided the researcher with insights to understand the context but also further shaped and modified the semi-structured interview questions used in the final stage of the study. Responses from the present study's research sample were further triangulated with their data from the remaining research instruments. In the present study, the online (preliminary) questionnaire was only given in Arabic, the respondents' mother tongue, to avoid any language difficulties that may emerge if English had been used. Harkness (2012) stresses that the quality of the obtained questionnaire data improves if presented in respondents' first language. On the other hand, the paper-based questionnaire, which was only given in the main stage of the study was only in English. This was because the respondents were majoring in English students and my presence during the distribution of the questionnaire to answer any inquiries from the respondents.

3.7.2 **Classroom observations**

In this present study, classroom observation and participant observation during the verbal report sessions (think-aloud & immediate simulate recalls) were used to understand the research context in the former and the participants' behaviour while inferencing the latter. That is why, observation has been a central method for qualitative inquiry in applied research through "insights into interactions, processes and behaviours that goes beyond the understanding

conveyed in verbal accounts" (Nicholls *et al.*, 2014:245). In educational research, it has become a powerful tool for gaining insights into situations(Cohen *et al.*, 2018). Mason (2018:139) notes that observations "usually refer to methods of generating data which entail the researcher immersing themselves in a research 'setting' or 'site' so that they can experience and observe at first hand a range of dimensions in and of that setting". Therefore, observations are "invaluable for providing descriptive contextual information about the setting of the targeted phenomenon" (Dörnyei, 2007:185). The merit of observational data is that they provide researchers with a more objective account of a participant's behaviour than second self-reported data (Patton, 2002; Dörnyei, 2007).

Researchers classify classroom observation into three types; structured, semi-structured and unstructured (Cohen *et al.*, 2018) while others into structured and unstructured (Dörnyei, 2007; Punch, 2014). Structured observations are highly fixed and structured which involve entering the classrooms with a specific focus, predetermined categories to observe and therefore, normally involve completing a detailed observation scheme (Dörnyei, 2007; Punch, 2014). On the other hand, unstructured observation does not include predetermined categories but observation in a more natural and open-way (Punch, 2014). Although I did have a specific idea in mind regarding what to observe in the classroom and during participants' verbal report sessions which were mainly issues related to lexical inferencing, I did not conduct structured observations for such observations will yield limited information about strategies in teacher-centred classrooms (Chamot, 1987). Furthermore, a disadvantage of structured observation is that by implementing closed categories to observe, investigators might easily miss some essential features (Dörnyei, 2007). This was a risk that I did not want to take, for such insights would later guide me to further modify my questions to participants during their immediate stimulated recall sections and their semi-structured interview later on. Thus, in this current study, I had implemented semi-structured observations, in which the researcher "will have an agenda of the issues but will gather data to illuminate these issues in a far less predetermined or systematic matter" (Cohen *et al.*, 2018:543). This gave me the flexibility to focus on predefined aspects or events related to lexical inferencing strategies but also other issues or events that I found interesting and relevant to how learners derive meanings of UNWs while reading that would come up during their verbal report sessions or their individual semi-structured interviews.

In the present study, observation was carried out in two stages; classroom observation and participant observation during the verbal report sessions. As mentioned at the beginning of this section, the reason for using classroom observation was to understand my participants and what they experienced through observing them in their reading classroom settings and how these classes were delivered. Schensul *et al.* (1999:91) view observation as the "process of learning

through exposure to or involvement in the day-to-day or routine activates of participants in the research setting".

While observing, researchers can take on a number of roles (Johnson and Christensen, 2016; Cohen *et al.*, 2018). A well-known classification is by Gold (1958), who identifies 4 roles on a continuum beginning with; complete participant, participant-as-observer, observer-as-participant, complete observer. In this present study, I took the following roles; 'observer-as-participant' and 'participant-as-observer'. During my classroom observations, I took the role of an ***'observer-as-participant'***, in which I was an observer much more than a participant in order to maintain objectivity and neutrality (Johnson and Christensen, 2016). This type of observation is carried out when the observer aims at a more formal, or occasionally interacts with participants or only has access to one observation and informs members that are being studied. Although Richards and Morse (2012:130) oppose such simplification arguing that "No observer is entirely a participant, and observing without some participation is impossible to observe in almost every nonexperimental situation without some participation". By not intervening or distorting the classrooms directly, I did in fact, indirectly participate through taking field notes (3.7.7), writing down my reflections of what I had seen, heard, felt and understood accompanied by my own explanations towards instances, especially related to lexical inferencing that occurred in these reading classes. Although my main objective of classroom observation was understanding the context in which my participants were situated as they dealt with new unfamiliar words while reading, how their teacher approached this issue during the reading class and how L1 Arabic students responded to it. I believe that initially beginning with classroom observation not only helped me to understand the context more but also to experience the inquiry as an outsider before getting closer to these learners, who some would later become my research participants and becoming an insider through close contact during the repeated verbal report sessions.

During the first week (3 lectures), I did not take any notes, for I knew that my presence would affect and bias participants' behaviour, a limitation of observational methods (Dörnyei, 2007). I decided to arrive early before the participants and their instructor, as not to disturb the class and sat at the back of the class as participants arrived. It was also to reduce the observer's paradox, where people would act differently if they know they were observed. Thus I aimed to ensure that my note-taking was not apparent to participants even if they knew why I was present (Richards, 2003). Students would walk in, notice me (not all did), greet me and would talk to each other, laugh, carry out conversations among themselves on various topics before the instructor arrived. Through this, I aimed at becoming one of them and thus would act as they normally would regardless of my presence. It was only until the second week, that I began to take field notes regarding what I observed in the reading classes, which were 3 lectures for each class per week

running between 40-45 minutes. Since audio recording of the observed classroom was not permitted due to the sensitivity of recording female voices in the Saudi culture and Saudi university laws prohibit this, my observations were combined with my field notes. Thus, in such situations, where field notes are the only source of data, the researcher should provide as much as possible, detailed field notes provided with full descriptions and reflections (Rose *et al.*, 2019).

Participant observation was also carried out during participants verbal report sessions (think-aloud & immediate stimulated recalls) in which according to (Gold, 1958), I took the role of ***'participant-as-observer'***, who due to spending a good deal of time in the field (opposed to the previous role, 'observer-as-participant') allowed an insider's perspective. In the role of 'participant-as-observer' the investigator takes the role of an insider and participants are informed of the purpose and identity of the researcher. The investigator spends a great deal in the field and becomes a full member of the group, participates in all their activities and develops a relationship with participants (Dörnyei, 2007; Johnson and Christensen, 2016). Furthermore, according to Johnson and Christensen (2016:522), "the researcher can obtain feedback about his or her observations and tentative conclusions from the people in the research study". Thus, this can strengthen the trustworthiness (3.12) of the present study, more specifically in terms of its credibility (internal validity) (3.12.1). During the verbal report sessions, I observed participants as they first read silently, turned to me for help through asking me to pronounce some words, how they held the pencil; some would point word by word, others would only jump to target words. Participants would underline or circle either the TWs or other words in the text, break up compound words or write the Arabic meanings above them. Observation allowed me "the opportunity to collect large amounts of rich data on the participants' behavior and actions within a particular context" (Mackey and Gass, 2016:227). Through such careful observations, it allowed me to build-up my own propositions, for example, if the participant has read the title, skimmed or read the whole passage or just directly jumped to the TWs without reading the text. Such questions would be asked during the immediate stimulated recall to further confirm this, ask for justifications and clarify such or other observed actions.

3.7.3 **Language tests**

This section discusses the two tests that were used in this present study; one to measure participants' proficiency level and the other their vocabulary size, as discussed in the following sections.

3.7.3.1 **Language proficiency test**

Participants' proficiency levels (PLs) were measured through Oxford's Online Placement Test which was used to categorize participants' PL from the A1-C2 levels. Since purposive sampling was used in the initial stage of sampling, the placement text was given to two classes that were taught by the same instructor, who were chosen from a total of 4 classes for practical reasons (3.6.3). This was followed by stratified random sampling resulting in the finalized research sample of 15 participants representing 3 different PLs (see Figure 3-3). Test licenses were purchased by myself, usernames and passwords were printed out on small slips of paper which were distributed in the language lab on the day of the test. A language lab was booked on two separate days for each of the two classes. I administered the test myself and helped students who had technical problems logging in. Participants' results were sent to my Oxford account, where they could be downloaded in the form of an Excel sheet. Next, decisions were made on the PLs and the number of participants to represent these groups which have been previously discussed in detail under sampling techniques, more specifically point 2, on page 103.

3.7.3.2 **Vocabulary Levels Test**

Devised by Nation in the early 1980s, this test derives its name from dividing groups of words, in terms of their frequency, into various levels. It is called the Levels Test since it focuses on words at four different frequency levels; 2,000, 3,000, 5,000, 10,000 and an academic vocabulary band. The Vocabulary Level Test (VLT) is a form recognition test which "is better used to supply a profile of learner's vocabulary, which is particularly useful for placement and diagnostic purposes" (Schmitt, 2010:198). The extent that this test gives us into the insights of learners' vocabulary size has led Meara (1996:38) to label it as the "nearest thing we have to a standard test in vocabulary". This has acknowledged the VLT as a potential measure that can examine a learner's vocabulary size (Read, 2000; Schmitt *et al.*, 2001). In this study, the modified, validated and updated version of the VLT by Schmitt *et al.* (2001:198) which combines Nation's original version with their new updated one was used. The test uses a form-recognition matching format where learners match the stem, which is the definition (on the right) with the given options, the target words. Each cluster of items has 3 definitions and 6 options and there are 10 clusters (i.e. 30 items) at each frequency level. The following is an example which is used in Schmitt *et al.* (2001:81);

1. business
2. clock _____ part of a house.
3. horse _____ animal with four legs
4. pencil _____ animal with four legs
5. profit
6. wall

The VLT is regarded as a breadth of vocabulary knowledge test, i.e. vocabulary size, as opposed to depth of vocabulary knowledge tests (see 2.11.2.2) (Schmitt, Schmitt and Clapham, 2001). The purpose of the VLT was to provide "an indication of whether examinees have initial knowledge of the frequent meanings of each word in the test" at each word frequency level (Schmitt *et al.*, 2001:62). Therefore, using it ensured that my participants had a comparative level of initial word knowledge required for reading the texts in this study (Hu and Nassaji, 2012). Furthermore, it was used as a method to profile learners' vocabulary at each level of 5 levels rather than a single-figure estimate of overall vocabulary size (Schmitt *et al.*, 2001). This would later help in explaining why some KS clues or LIFSs were used by some participants in the same/different group regardless of their proficiency level.

The proportion of correctly answered items at each level is taken to be the proportion of total words known at that level (Schmitt and Meara, 1997). Although the original cut-off point used by Schmitt *et al.* (2001) was 26/30 that some have followed like Stæhr (2008) while others have used different cut-off points, for example, 24/30 by Xing and Fulcher (2007). However, Schmitt (2016, personal communication, December 8th) asserts that "There is NO cut-point for mastery of each level" and that the level of mastery required depends on the investigator's own purposes. Thus, I have chosen 18 as the cut-off since it covers more than half the words which were reached by all participants in the 2,000 level except B1-4. This result indicated that L1 Arabic participants in this study had basic 2,000 level vocabulary knowledge which provides a coverage of 87.83% of the reading text (Nation, 2006). The results of the vocabulary levels test are illustrated by proficiency groups in Appendix E in which participants were identified by pseudonyms which indicat their proficiency level (see 3.6.3).

3.7.4 **The reading materials**

3.7.4.1 **Target word selection**

In the current study, real words were used than nonsense words in order to preserve a sense of authentic reading experience for the participants (Schmitt *et al.*, 2011). In vocabulary research, the use of nonsense words eliminates the need for a pretest where the objective of both is to test

if participants have pre-existing knowledge of a word (Nation, 2001; Schmitt, 2010; Schmitt *et al.*, 2011). Furthermore, real words were used rather than nonsense words due to what I had experienced in the first pilot study where a participant had successfully inferenced the TW ((infectious)). Upon inquiring, she mentioned she had never seen the word before but only heard it while playing 'Resident Evil" on her PlayStation. In other words, a word might be part of learners' receptive (passive) vocabulary but and not yet productive (active) vocabulary due to the incremental process of vocabulary learning (Nation, 2001; Schmitt, 2010). In the present study real words were used since one of the study's objectives is reporting the KS clues (linguistic & non-linguistic) and LIFSs used to infer the meanings of UNWs. Real words such as "infectious" fall into this category in order to explore how learners still made use of their previous vocabulary knowledge to verify their generated meanings. Furthermore, several studies have reported that learners were often influenced by the form of the word which led to incorrect inferencing (Bensoussan and Laufer, 1984; Laufer and Sim, 1985a). Therefore, since the study investigates the role of cultural context knowledge of the text, in addition to KS clues and LIFSs used to inference UNWs, it is crucial to examine the effect between the role of word form similarity and contextual background knowledge in inferencing. This was fulfilled through using real words as opposed to using nonsense ones.

Most studies reviewed by the researcher on lexical inferencing have failed to provide details as to the conditions that the TWs were selected upon or encountered in the text. Only Haastrup's (1991) study provided specific clue criteria that the TWs and their clues should meet. Schatz and Baldwin (1986) argue that most vocabulary studies looking at successful guessing from context are flawed since they incorporate a mixture of high-frequency and low-frequency words, especially in cloze tests, most of which are already known to the learners. Therefore, Nation (2001) advocates that to precisely measure the availability of contextual clues, researchers need to focus on UNWs at an appropriate level of frequency for the learners to be tested in. Therefore, in this study, the TW were selected from Coxhead's (2000a) New Academic Word List (AWL), which was based on compiling an Academic Corpus of consisting of 3.5 million running words from various academic sources. In this list, the issue of which unit to use as a base for counting the words is of vital importance "as different criteria can lead to different results" (Coxhead, 2000a:217). Coxhead's criteria revolved around using word families as a unit for counting word frequency in the corpus (for an overview see Coxhead, 2000a). The AWL contains 570 word families divided into 10 sub-lists, with sub-list 1 displaying the most frequent words and gradually descending to the least frequent in occurrence in sub list 10 (Coxhead, 2002). In choosing the TWs for the texts, the selection of words from the AWL were mapped onto a constructed target word criteria for the study listed as follows:

1. The TW must be unknown to all participants. Thus, to increase the chances of participants' unfamiliarity with the selected TWs, I initially based my selection on the second half of the AWL's sublists, 7, 8, 9, 10. However, by the second text it became challenging to select words from list 10 due to the small word families listed since it only contained 30 word families compared to 60 in the reaming sublists. For this reason, I substituted list 10 with 6, keeping list 10 as a standby word list in case I could not allocate a suitable TW in any of the texts from the finalized lists, 6, 7, 8, and 9.
2. To further ensure the unfamiliarity of the chosen TWs, the most frequent word in each word family, which Coxhead (2002) italicizes throughout each list, was excluded as a TW. For example, in her list the most frequent word of the word family of 'analyse' (list 1) is '*analysis'*, thus '*analysis'* would be excluded as a TW in this study.
3. If a TW appears in one text, it would not appear as a TW again in the remaining text (if possible).
4. In addition to using the frequency criteria according to the AWL to compare the TWs, they were also compared in terms of their syntactic categories. The TWs covered nouns, verbs, adverbs, adjectives and ranged from 1-5 syllables in length. All the word classes were distributed equally among the TWs
5. The TWs represented different word classes taken from specific lists were maintained throughout the two texts. For example, the TWs representing adjectives were from lists 6 and 9 in the first text continued to be so for the second text.
6. These words should invite participants to use a list of knowledge sources (linguistic and non-linguistic) and combinations of strategies (for example, using word affixes with local/global clues).

If words were correctly inferred in the pretest, they would be replaced by a set of preselected synonyms (Appendix F) which were selected from two online thesaurus websites; http://www.thesaurus.com and http://www.merriam-webster.com. A word was selected if it appeared in both these thesauri and was close to the original meaning of the replaced TW in terms of meaning. Although in some cases, it was difficult to choose an appropriate replacement, especially with the two dominant C1 learners since they seem to have a very high level of vocabulary as indicated by their VLT results. These two learners had the highest scores on all the 5 frequency bands. From which, I acknowledged that for such learners using nonsense words would be a great replacement for known TWs for my future research (7.5).

3.7.4.2 **The reading texts**

In the beginning, I had intended to use adapted authentic texts by integrating the TWs from the AWL representing different word categories. It was later concluded that it was difficult for a number of reasons. First, imposing words from AWL was successful in some parts of the texts in some categories but failed in others. I believe that this was related to the theme of the reading topics where imposing some words led to distortion of meaning or non-English sentences. Second, the composed reading texts were short in length, around 356-368 words, each divided into three paragraphs. Using adapted texts and shortening them to fit the previous criteria resulted in distorting the elements of text cohesion and coherence. This distortion is in terms of both the ideas of the texts, the supporting detailed clues and the general comprehension of the texts.

Learner's vocabulary size is a critical factor in successful inferencing for it will affect the density of unknown words in the text (see 2.11.1). Therefore, most studies on foreign/second language learners involve using simplified or adapted texts to reach the optimal ratio of UNWs to known words (Nation, 2001). Thus an alternative approach was decided to formulate the reading texts for the study. This was motivated and rationalized for several reasons. The first is related to the purpose of designing a guessing/inferencing study. Nation and Webb (2011) differentiate between two major rationales for designing a guessing study, one is to establish the likelihood of guessing success and perhaps how many words can be learnt from context. In this case, these scholars suggest that UNW should be used, the context used and conditions for guessing are structured to closely represent normal guessing strategies or procedures. The second type of guessing study design is one in which the skills and sources of information that the learners use to guess/infer are the main aim of the study. In this sense, "learners are given the opportunity to display a range of skills and choosing the texts to represent a range of conditions become more important" (Nation and Webb, 2011:81).

Since the interest of this study falls in the second type of vocabulary studies in which learners' skills and knowledge sources resorted to are the core, this "may result in the use of specially written or adapted texts, usual conditions for guessing" (Nation and Webb, 2011:81). This approach was also followed by Wesche and Paribakht (2010) who after selecting their TWs, passed them to a L1 English writer to compose their text. The second reason, which builds on the first, was to have the ability to manipulate the amount and type of linguistic and non-linguistic clues for the TWs. Since this is a guessing study and following the footsteps of Nation and Webb (2011) that in order to display a vast number of LIFSs, KS clues and learners' cognitive decisions, unusual conditions for guessing are needed. They illustrate one example of what they mean by

unusual conditions such as “seeing a series of contexts for the same word one immediately after the other, and having to introspect while guessing” (Nation and Webb, 2011p:81).

The third reason for constructing my own texts goes in favour of the researcher’s advantage that the texts could be controlled in terms of density of unknown words. This has been reported to be a critical factor for L2 learners and strongly affects their guessing (Bensoussan and Laufer, 1984; Nation, 2001) or resorts learners to then use ‘bottom-up’ linguistic clues in the text (Haynes, 1993). In order to successfully guess, various density ratios have been provided in the literature as previously mentioned. The final reason was to allow the low-level proficiency learners in this study to comprehend the text which was in line with Haastrup’s approach (1991:83) in which she adapted the text “to conform to the requirements of comprehensibility to low-proficiency learners”. The current study’s criteria for the reading texts were as follows:

1. The texts do not contain any cognate words that were used in participants’ L1. This was to eliminate any inferencing that could be based on using cognates since it has been reported that in cognate shared languages, a large portion of guessed words could be inferred by looking at the word forms (Seibert 1945 cited in Nation and Webb, 2011).
2. The texts were constructed around providing as many clues, locals and globally, for each of the TWs.
3. These were short reading texts between 356-367 words. Short texts were used to overcome some limitations which have surfaced in the first pilot study. In the pilot study, a longer text was used with 10 TWs and the researcher noticed that learners took a long time during the think-aloud sessions. These think-alouds for participants ranged between 45 minutes to an hour and a half. This time would not only stress the participants but would lead them to be cognitively drained for the immediate stimulate recalls which followed the think-alouds after a small break. The break was 5 minutes or more depending on when the participant informed the researcher of her readiness to begin with the immediate stimulated recall.

In this current study, since the researcher formulated her own texts revolving around the AWL and to further strengthen the readability and validity of the texts, they were reviewed by 2 native English speakers. These individuals were academic faculty members at the University of Southampton who were asked to judge and check the corresponding TWs in terms of their chosen word class, whether they were accurately represented in text with adequate supporting contextual clues either a word, clause or sentence. Furthermore, the overall coherence and cohesion of the texts. In light of the received feedback and comments, the texts underwent some modifications (1st modification). Upon reaching the research field, I also had two native English speakers (English and American) who were also members of the testing committee at my institute

look at the modified versions of the two texts as previously done in the first stage. Again, a few modifications were made before finalizing the 2 texts (Appendix G and Appendix H).

Although great caution was used to compose the two 2 texts to share similar features of length, sentence structure, formal schemata, reading difficulty, a balance between the known words compared to the unknown, this was difficult to maintain. This was due to a number of reasons in terms of how the ideas and their meanings were structured in each text, the number of clues that were needed to provide for each TW (local and global), the density of the unknown words and known words that could be problematic for the participant. Flesch reading scores were used to measure the readability of the texts. Scores range between 0-100, the higher the score, the easier reading the text becomes. The texts' readability were measured through two websites to ensure the accuracy of the readings and that 2 texts were similar in their degree of difficulty. Two websites ReadablePro (https://readable.io/) and Readability Test Tool at (http://www.webpagefx.com/tools/read-able/). Both websites produced relatively similar readability scores between them for the 2 texts with Eid al Fiter text being slightly easier (higher readability score) than Bonfire Night (Table 3-2 and Table 3-3). In addition, the density of the UNWs was also checked through the Compleat Lexical Tutor (http://www.lextutor.ca/). The outputs confirm that the majority of the words were within the first 1000 (K1) and second 2000 (K2) frequency words of English. This was further ensured by asking participants if there were other unfamiliar words to them in the texts other than the underlined TWs after they finished the session.

Table 3-2 Readability scores and known word density for Eid Al-Fiter

Text-1 Eid Al-Fiter				
Word list	**Percentages**	**Percentages of known words in the text**	**ReadablePro Score**	**Readability Test Tool**
K1	74.79%	83.01%	61	61.3
K2	8.22%			
AWL	3.68%			
Off-list	13.31%			
Total	100%			

Table 3-3 Readability scores and known word density for Bonfire Night

Text-2 Bonfire Night				
Word list	**Percentages**	**Percentages of known words in the text**	**ReadablePro Score**	**Readability Test Tool**
K1	76.23%	82.03%	58.7	59.9
K2	5.8%			
AWL	2.61%			
Off-list	15.36%			
Total	100%			

3.7.4.3 **Target word scoring**

Two sets of scoring were carried out, the first was a pretest to determine the degree of unfamiliarity of the TWs to the participants while the second was related to the outcome of the inferenced meanings of the TWs and their degree of correctness. Paribakht and Marjorie's (1993a) (Figure 3-4) Vocabulary Knowledge Scale (VKS) referred to as the "the best known and most widely-used depth-of-knowledge scale" Schmitt (2010:218) has been used in a number of LIFS studies for pretesting the familiarity of TW knowledge in either its original or adapted form (Paribakht and Wesche, 1999; Bengeleil and Paribakht, 2004; Wesche and Paribakht, 2010; Hu and Nassaji, 2012). Originally developed through their Paribakht and Wesche (1993b) study to measure and capture vocabulary and grammatical knowledge gains during reading, the VKS was proposed as "an attempt to capture different levels of self-perceived knowledge of specific words" (Paribakht and Wesche, 1993b:15).

I. I don't remember having seen this word before.
II. I have seen this word before, but I don't know what it means.
III. I have seen this word before, and I think it means (synonym or translation).
IV. I know this word it means _____ (synonym or translation).
V. I can use this word in a sentence: _____. (Write a sentence).
(If you do this section, please also do Section IV)

Figure 3-4 Paribakht and Marjorie's Vocabulary Knowledge Scale (1993b:180)

Regardless of the limitations of the VKS which have been in terms of measuring pre and post vocabulary learning gains (for an overview, see Bruton, 2009; Schmitt, 2010; Nation and Webb,

2011), vocabulary learning was not a part of this study since its implications are limited to **only** pretesting the degree of familiarity of the TWs before reading. Therefore, a modified version of the VKS (Table 3-4) was used in this study by combining the original levels III and IV since both of them require meaning in the sense of "think" and "know". These two labels have been reported as a source of confusion by Paribakht and Wesche (1993b). Since wording is critical in research instruments and instruction (Dörnyei, 2007; Cohen, 2014; Cohen *et al.*, 2018), I have used both words, underlined and separated by a forward slash to indicate to participants that both refer to and carry the same meaning.

Table 3-4 The study's modified Vocabulary Knowledge Scale

Self-report categories	
I	I don't remember having seen this word before
II	I think/know I have seen this word before, but I do not know what it means.
III	I think/know I have seen this word before, and I think/know it means _____. (synonym or translation)
IV	I can use this word in a sentence: _____. (Write a sentence) (*If you do this section, please also do Section III*)

In terms of scoring, both pretest and lexical inferencing responses, I have adapted the VKS to include small elements of vocabulary knowledge, multiple meanings of the TWs, synforms and grammatical knowledge (in sentence production) of the TWs. Table 3-5 displays my scoring criteria for the pre-test, where adaptations were made from Paribakht and Wesche's (1993a; 1993b) studies. Here I had classified the scoring into two general classifications depending on the reported data; *perception* and *production*. Furthermore, I sub-divided the *production* to represent two levels; vocabulary and sentence knowledge levels of the TWs. Scoring at the vocabulary level begins from the least important aspect (1) passing through other aspects of partial vocabulary knowledge until reaching the correct specific meaning of the TW in the text (3).

At sentence production level, as opposed to the previous scoring method, the scoring takes into account the grammatical accuracy of the TWs along with their semantic appropriateness. Although both grammatical accuracy and semantic appropriateness constitute partial knowledge of words, the aim of the pretest in this study focuses on determining **only** whether the meanings of the TWs are known (vocabulary level) not their grammatical knowledge. Therefore scoring starts from 4 in terms of grammatical accuracy and increases until both semantic appropriateness and grammatical accuracy are present in a sentence. However, this sentence production level and its scores only constituted further data to each participant's profile to explain their performance on LIFS during the study, if needed.

In summary, students' scores related to vocabulary production (level 1) were those obtained from the modified VKS. Only if the TW's specific meaning in the reading context was given (3) was it replaced with another for that participant in the text. Therefore a standby list was compiled for all the TWs across the two texts (Appendix F).

Table 3-5 Scoring criteria for pretests

	VKS categories	Scores	Meanings of scores
Perception			
I	I don't remember having seen this word before.	0	The meaning of the TW is unfamiliar or unknown.
II	I think/know I have seen this word before, but I do not know what it means.		
Production			
III	**Level 1:** **Vocabulary level** I think/know I have seen this word before, and I think/know it means _____. (synonym or translation)	1	Miscued form of meaning, i.e. synforms
		2	The word is partially familiar, a general association or meaning is given.
		3	The specific meaning of the TW in the reading context is given.
IV	**Level 2:** **Sentence level** I can use this word in a sentence: _____. (Write a sentence) (*If you do this section, please also do Section III*)	4	The TW is used with grammatical accuracy (inflected for person, tense,..) but lacks semantic appropriateness.
		5	The TW is used with sematic appropriateness but grammatical inaccuracy.
		6	The TW is used with both sematic appropriateness and grammatical accuracy.

In terms of scoring the inferencing process outcome, a three-point ranking system was used as illustrated below.

Table 3-6 Scoring criteria for the lexical inferencing responses

Scores	Meaning of Scores
0	Incorrect inferencing or no attempt to inference is made .
1	Partially correct appropriate response (meaning) of the TW, but distorts the sentence meaning (e.g., synonyms).
2	A correctly appropriate response (meaning) which does not violate the sentence meaning.

3.7.5 **Verbal reports**

Research methods in reading can be classified into two approaches; product-oriented and process-oriented techniques (Block, 1986; Alderson, 2005; Alderson *et al.*, 2015; Stevenson, 2015). Product-ordinated techniques provide information about the final product of reading, what

a reader has understood, i.e. comprehension. For example, the comprehension a reader displays in answering comprehension questions or summarizing the text and comparing it to the original (Alderson, 2005). Earlier reading research followed a product-process approach where researchers would design tests and then inspect the relationship between the results and the variables of interest (Alderson, 2005). However, the limitations of this approach are variations in the product and the methods used (Alderson, 2005).On the other hand, process-oriented approaches to reading focus on what readers do when reading, the interaction between the reader and the text, thus they infer and provide insights into readers' cognitive processes (Stevenson, 2015). Process-oriented techniques may infer processes through verbal reports, eye tracking, speed measurements to a stimulus and measuring the electrical activity of the brain (Stevenson, 2015). The process of reading is characterized as "normally silent, visible, internal to the reader and rarely externalized. It is also likely that the process of reading is more variable than the product: how a reader understood the text" (Alderson *et al.*, 2015:72). In this study, two process-ordinated techniques, think-alouds and immediate stimulated recalls, known as verbal reports, were used to tap into the readers' cognitive processing while inferencing the TWs.

Verbal reports (VRs) are verbal accounts of learners' thoughts, comments and reflections that are recorded during or after completing a task. Ericsson and Simon (1987:32) describe the underlying assumptions of verbal reports where:

> To obtain verbal reports, as new information (thoughts) enters attention, the subjects should verbalize the corresponding thought or thoughts. … the new incoming information is maintained in attention until the corresponding verbalization is completed.

Verbal reports have, if done accurately, provided valuable inside access to the underlying cognitive reasoning process, design making choices and influencing factors that affect how the language production appears in an individual (Cohen, 1996; Charters, 2003). Regarding the domain of learner strategies and VRs, Cohen (1996:13) explains that "verbal reporting is not one measure, but rather encompasses a variety of measures intended to provide mentalistic data regarding cognitive processing". Most of what we know about VR protocols in L2 learning-strategy has stemmed from the extensive use in L1 acquisition studies (Pressley and Afflerbach, 1995; Cohen, 1996). Cohen (2014) highlights that for 20-30 years, VR methods primarily reflecting self-revelation and self-observation have been employed as a means of describing strategies in learning and use in L2 research. Verbal reports are of great significance to understanding the internal reading processes activated while reading (Afflerbach and Johnston, 1984; Pressley and Afflerbach, 1995). Ellis (2004:263) views that collecting learners' verbal explanations seems "to

provide the most valid measure of learner's explicit L2 knowledge". Furthermore, Pressley and Hilden (2004:319) acknowledge the value of VRs and stress that "we know of no other method that reveals quite as much about active, strategic processes during reading. Although not a completely clear window on how the mind processes text, it is a window that admits a great deal of light".

Think-alouds and immediate simulated recalls are often referred to as VRs (Faerch and Kasper, 1987; Matsumoto, 1993). Some researchers use the labels 'verbal report" and 'introspection' interchangeability as a cover term to cover all types of verbal reporting investigating the mental processes (think-alouds, interviews, questionnaires) (Faerch and Kasper, 1987; Matsumoto, 1993). By contrast, other researchers have used different labels to refer to data collected while engaged with a language task, like "verbal reports", "verbal statements", "verbal data", and "verbal protocols" and between those collected at different points after the task (Cohen, 1987; Faerch and Kasper, 1987; Gerloff, 1987; Ericsson and Simon, 1993; Cohen, 2014). As a result, many classifications for VRs began to surface depending on various dimensions of the time of verbalization (i.e. during or after the task), the relationship between the heeded information and reporting, type of memory used and the time interval (Ericsson and Simon, 1980; Cohen, 1987; Faerch and Kasper, 1987; Ericsson and Simon, 1993; Matsumoto, 1993; Cohen, 1996, 2014).

Introspective methods involve tasks that require participants while they are engaging with the task "to look at their behaviour, thoughts and beliefs and communicate these actions and processes to the researcher" (Rose *et al.*, 2019:50). On the other hand, retrospective methods require participants to reflect inward on a recently completed past behaviour (Gass and Mackey, 2017; Rose *et al.*, 2019). That is to say, VRs which are collected as the task is in progress are introspective reports which are also labelled as 'online' or 'concurrent' reports while those collected after task completion are 'retrospective' reports (Bowles, 2010). In this study, VRs are used as an umbrella term to refer to both introspection and retrospection methods.

Ericson and Simon (1980; 1993) distinguish between reports that require subjects to verbalize their thoughts per se (as with the present study) and those that require subjects to verbalize additional information such as explanations and justifications. Bowles (2008; 2010) refers to the former verbalization, where verbalizations of thought per se as non-metalinguistic while verbalizations of explanations and justification as metalinguistic. In order to investigate the issue of reactivity in non-metacognitive VRs, Ericsson and Simon (1993) synthesized cognitive psychological studies comparing non-metacognitive verbalizations to silent groups. They reported that there was a relatively consistent pattern between the groups leading to conclude that the

non-metacognitive VRs are non-reactive for accuracy. This was also supported by Bowles (2008) who reported that metalinguistic verbalization lengthens the needed time to complete the task and seems to hinder item learning but simply thinking-aloud (non-metalinguistic) does not alter the underlying processes.

The underpinning assumption underlying introspection and retrospection methods is that it is possible to observe internal processes to a certain extent as we can observe external world events and that humans gain access to the internal thought processes at some level and thus can verbalize them (Gass and Mackey, 2017). Originally rooted in the fields of philosophy and psychology, they have been used in reading, writing, and testing and language acquisition research (Yoshida, 2008; Bowles, 2010). Due to the limitations of observation as a tool in language production and to overcome such ambiguity, researchers turned to VRs in their various forms to gain access to the cognitive process that are unavailable by other means (Bowles, 2010; Cohen, 2014; Gass and Mackey, 2017). Therefore, instead of solely depending on learner's language production as a source of data, spoken or written, researchers also investigate the verbalizations of their thoughts. This allows researchers more direct access to these processes (Faerch and Kasper, 1987) that underpin their internal cognitive processes as they interact in language production. This in turn, will shed more valuable insights on language strategies (learning and use).

Ericsson and Simon (1993:xi) state that "Concurrent and retrospective verbal reports are now generally recognized as major sources of data on subjects' cognitive process in specific tasks". Thus, in this study, introspective (concurrent) methods, think-alouds, followed by retrospective method, immediate stimulated recalls, can uncover and allow a deeper understanding of what type of clues including their knowledge sources (KS) and lexical inferencing strategies (LIFSs) learners resort to when encountering unknown words (UNWs) while reading. Furthermore, how learners approach the UNWs, form hypotheses about their meaning, test them and the role of the degree of topic familiarity/unfamiliarity. Building on the previous elements and factors that lead to the success/failure of inferencing are also deduced from the collected introspective data. This could shed light on why some strategies may be effective or not for a learner (Cohen, 1987) and provide pedagogical implications, like strategy training to improve overall LIFS.

3.7.5.1 **Concurrent think-aloud protocols**

Think-alouds are viewed as "a method to collect real time data on human thinking or cognitive processes" (Yang *et al.*, 2020). In reading research, as previously mentioned in section 3.7.5, concurrent think-aloud and immediate stimulated recalls are process-ordinated techniques that focus on the process of reading itself as opposed to product-oriented techniques, the final

comprehension. Concurrent (online) think-alouds (TAs) protocols are collected as subjects verbalize their thoughts while performing the task in question (Ericsson and Simon, 1993; Bowles, 2010; Gass and Mackey, 2017). TAs have become a wildly used method to gain information about cognitive processes which refer to a) search and storage mechanisms, 2) inferential mechanisms or 3) retrieval processes (Ericsson and Simon, 1980; Ericsson and Simon, 1993; Gass and Mackey, 2017). In language research, TAs have been used in studying reading comprehension processes (Block, 1986; Pritchard, 1990; Pressley and Afflerbach, 1995), writing (Yang *et al.*, 2020) and LIFSs (Haastrup, 1991; Chern, 1993; Huckin and Bloch, 1993; De Bot *et al.*, 1997; Bengeleil and Paribakht, 2004; Wesche and Paribakht, 2010; Hu and Nassaji, 2012; 2014).

One of the reasons for using that TAs in the present study was due to their advantage of tapping into learners' cognitive processes. Matsumoto (1994) broadly categorises the objectives of introspection in second language (L2) research into: (a) exploring the overall psychological dimension of L2 learning/ acquisition, (b) investigating learners' beliefs, attitudes and perceptions. Finally, point (c), which is of importance to the present study, introspection methods in the form of TAs are used to investigate L2 learners' cognitive processing, including strategies used in specific tasks (e.g., writing, reading and translation) set by the researcher. Therefore in this study, TAs were used to yield detailed accounts of the reader's behaviours and the complexity of their thoughts as reader-text interaction engagement is in process (Afflerbach, 2000; Lin and Yu, 2015). In terms of reading, TAs provide a direct view of the reader's ongoing mental activity, the thoughts, processes and decisions which are usually hidden (Block, 1986).

Thus, the second reason for using TAs in this current study is that they became "a window into the minds of learners as a means of capturing their internal thought processes" (Bowles, 2010:2). In the present study, learners' verbalization about their conscious thoughts and processes while engaging with the task provided the researcher with more information regarding the reading strategies, hypotheses, decisions and language sources used by learners that might have gone undetected if compared only to the final product. This allowed me to tap into learners' cognitive reading processes, decisions, strategies, difficulties encountered as they inferenced the UNWs while engaged in reading. These cognitive reading processes may be hard to capture through using questionnaires. Some lexical inferencing studies have reported differences between participants' self-perception stagey use and their observed behaviour by the investigator, for "perceived learning strategies do not always reliably reflect what strategies learners actually adopt" (Qian, 2004:167; Jelić, 2007). In addition, looking only at observations of learners' behaviour in classrooms or their production data (e.g. completion of a language task or construction of sentences) has its limits. Classroom observations regarding learners' behaviours

are generally limited to those who speak and yet not a lot is provided while capturing nothing about those who are quiet (Cohen, 1987).

Furthermore, many processes involved in language learning are not directly observable and cannot be understood only by what the learner says in the target language (Bowles, 2010). Production data is a significant source of information about L2 knowledge but it only captures directly observable events to what learners produce in speech or writing (Selinker, 1972). However, internal language processes are mostly indirectly observable and go unnoticed by researchers and participants (Leow and Bowles, 2005; Gass and Mackey, 2017). Thus learners' production data provides little evidence for the language-learning phenomena and that "reconstructing unobservable phenomena from performance data will always entail situations where ambiguity between product and process cannot be solved" (Faerch and Kasper, 1987:9). In language production data, there might be several explanations as to what and how learners used their knowledge of the target language, strategies and procedures to produce language (outcome) which could also differ from one learner to another. As Gass and Mackey (2017:23) pointed out, "understanding the source of second language production is problematic because often there are multiple explanations for production phenomena that can only be assessed by exploring the process phenomena".

Reading is a complex interactive dynamic process (Alderson, 2005; Grabe, 2009; Grabe and Stoller, 2013). Pressley and Afflerbach (1995:2) state that "reading is constructively responsive-that is, good readers are always changing their processing in response to the text they are reading. The result is complex processing". The current study aims at investigating why and how 3 groups of L1 Arabic learners at different proficiency levels infer meanings of UNWs in terms of KS clues, LIFSs, success/failure of responses, degree of topic familiarity and proficiency level. Also, the similarities and differences between the 3 groups in terms of their proficiency levels as they inference the UNWs. Thus, the third and final reason for using online TAs was to provide and gather rich information by capturing the groups' inferencing and reading strategies, their combinations, the changes and the challenges they faced. This helps to capture the complexity and multi-layered nature of the inferencing process by participants which would be further elaborated on through conducting immediate stimulated recalls (3.7.5.2) once the TAs were completed.

In this study, I followed Ericsson and Simon's (1980; 1993) classifications reflected in their Information Processing Model (IFM) which was for the purpose of aiding researchers to interpret verbal data obtained from respondents' VRs and the relation of these reports to their behaviour. This model builds on the underpinnings of the core principles common in most information

processing theories. Cognitive processing is seen as "a sequence of internal states successively transformed by a series of information processes" (Ericsson and Simon, 1980:223). Information is stored in several memories that are characterized by different capacities and accessing features (see Baddeley, 2003a, 2003b). Information that is currently conscious and attended to (heeded) in the working memory, characterized by its limited capacity and intermediate duration (Ericsson and Simon, 1993; Van Someren *et al.*, 1994), derives from two sources. The first is external stimulation from the environment, where it is received from the sensory organs and for a short time resides in the sensory memories (iconic and echoic) (Figure 3-5). Portions of the sensory memory are then directly organized and encoded with the aid of information already stored in the long-term memory (LTM). These associations are recalled from the LTM, the second source of information, into the working memory to recognize information stimulated from the sensory memory. Thus, in order to use information stored in LTM, it first needs to be heeded (attended to by the participant) by retrieving it in the working memory and thus activating it there (information retrieval).

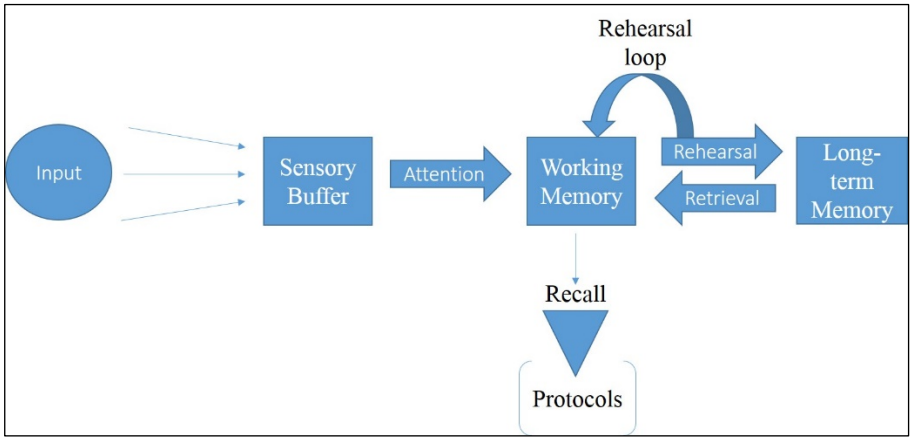


Figure 3-5 The Information Processing Model (adapted from Atkinson and Shiffrin (1968))

Information is transferred to the LTM from the working memory if it is rehearsed, if not, then it is forgotten and lost from the working memory through displacement or decay. Although the LTM has a large capacity and permanent storage, it has slow fixation and access times compared with the other memories (Ericsson and Simon, 1993). Information that is directly verbalized as it is being attended to in the working memory is referred to as 'concurrent verbal report' by Ericsson and Simon (1993:16) and regard them as "being the closest reflections of the cognitive processes", where states of heeded information are verbalized directly.

One issue that affects the validity of introspective data is the language of reporting (Cohen, 1996). Studies in which VRs were done in English might have hindered respondents with limited English proficiency, suggesting that there is a L2 threshold "below which attempts to provide verbal reports in the target language are counterproductive" (Cohen, 1996:17). Furthermore, reporting

in an L2 requires "more cognitive capacity than reporting in an L1 and thus limits the cognitive capacity for the task" given (White *et al.*, 2007:102). Furthermore, some subjects might aim at speaking correctly and thus operate under additional cognitive demands (Aguado, 2004 cited in White *et al.*, 2007:102). In L2 settings, issues like the context or L2 environment, learners' L2 proficiency in the language of reporting and giving the learners the preferences to choose the language of reporting need to be addressed (Gass and Mackey, 2017). In this present study, participants were free to verbalize either in Arabic (L1) or English, in any language they were comfortable with reporting in or even a mixture of the two. Since the nature of the given task (inferencing) and forcing learners to use English or any language during VRs adds to respondents' cognitive load (Cohen, 1996).

A second issue that effects the quality and validity of TAs and can strengthen them is through pre-training, or as I prefer to call them 'pre-warm ups', that are mostly conducted for online VRs rather than retrospective ones (Faerch and Kasper, 1987). Since TAs are not an everyday natural process, participants need precise instructions and training before they can be expected to produce useful data (Dörnyei, 2007). Ericsson and Simon (1980; 1993) advocate that to prevent the interference of the verbal reporting load with the task at hand, "warm-up procedures are used to train the subjects to conform to the think-aloud inductions**"** (1993:82). They suggest continuing with these TA warm-up trials until the participants produce clear reports without confounding them with explanations or justifications until all participants are using the same VR procedure. Thus, warm-ups can help uncover blurry areas of participants' misunderstandings, that researchers can further clarify to the participants and provide more warm-ups, resulting in valid data and strengthening the validity and reliability of results. Furthermore, investigators through such warm-ups can assess if participants are verbalizing according to the instructions given or whether they still find it hard to verbalize. If so, participants could then be reinstructed and given additional warm-up tasks (Ericsson and Simon, 1987). This could be a better approach than simply choosing learners who have been labelled as talkative, confident and outgoing by their teachers. These chosen learners might become quiet during TAs and do not verbalize enough, which was the case in Haastrup's (1987) study.

An ongoing debate by some scholars, who claim that warm-ups become a type of training, which might affect the produced VRs while others see the opposite (Matsumoto, 1993; Gass and Mackey, 2017). In this study, to overcome the debate of training and still implement it, before each text, all participants were given instructions read by the researcher, followed by the warm-ups in the form of a picture storytelling approach (Appendix I, I.1 and I.2). After the pretest, participants were informed that they have 5-10 minutes to think about the story (warm-up) and what they think is happening in the pictures by using any language they felt more comfortable

with. While they were preparing and formulating their ideas about the story, I went over the pretest responses, ranked them and replaced the correct TWs responses with the predetermined synonyms on the computer, printed them out. Then asked the participant to begin telling the sequence of her story.

After completing the warm-up task and before beginning the TAs for the main text, TA instructions (Appendix J) were read and explained to the participants. These instructions were adapted from the TA literature (Ericsson and Simon, 1993; Bowles, 2010) and were presented on an A4 paper for participants as advocated by Ericsson and Simon (1980; 1993). The TAs began after checking with participants that they have understood the instructions, if not, the researcher would explain the instructions again in Arabic. In some situations during TAs, participants were not verbalizing for more than a minute, it is "reasonable to prompt [processes] in order to assure that a sample of the target process will, in fact, be observed" (Pressley and Afflerbach, 1995:133). I encouraged learners to continue verbalizing through uttering a few necessary probes such as "*keep talking please*", "*what are you thinking of now*?" when long pauses of silence (over 20 seconds) occurred which have been reported in the think-aloud literature (Ericsson and Simon, 1993; Bowles, 2010). These probes were useful in minimizing long silences in the learners' VRs (Afflerbach and Johnston, 1984).

While learners were engaged with the TA task, I took notes (3.7.7) to validate the results obtained through comparing the TA protocols with my own contextualized observations to what I saw, interrupted and rationalized was happening. For example, if a participant began to read and after a short period of time suddenly begins inferencing, I would note that she might not have read the title or the whole text and would inquire about this during the immediate stimulated recall sessions after completing the TA sessions (McDonough and McDonough, 2014). During the verbal report sessions, I had organized my notes with headed information regarding the day, date, time and had devoted a number of pages for each participant, using their pseudonyms in which I list the previous headings in addition to the title of the text.

3.7.5.2 **Immediate stimulated recalls**

Think-alouds were followed by a second type of verbal reporting, immediate stimulated recalls (ISRs). Stimulated recalls are also referred to as "retrospective interviews" (Dörnyei, 2007) which are usually viewed as a subset of introspective measures (Faerch and Kasper, 1987; Cohen, 2014; Mackey and Gass, 2016; Gass and Mackey, 2017). More specifically, stimulated recalls are a subset of retrospective reports which aim at collecting data after the task/event being studied is completed in which a stimulus is used to improve the accuracy of participant recollections (Gass and Mackey, 2017; Rose *et al.*, 2019). The aim of stimulated recalls is to collect data on

participant's thoughts and behaviours on a given task while they are still fresh in the participant's memory and verbalize them out. According to Ericsson and Simon's (1993:xvi) processing model stimulated recalls are

> A subset of the sequence of thoughts occurring during performance of a task is stored in long-term memory. Immediately after the task is completed, there remain retrieval cues in short-term memory that allow effective retrieval of the sequence of thoughts.

Ericsson and Simon (1984; 1993) advocate that only VRs which immediately follow a thought process can accurately reflect conscious thought processes and researchers must ask for "immediate awareness" rather than delayed explanations after the task (Cooper, 1999). Stimulated recalls can be differentiated from TAs since they are not simultaneously carried out with the task/event. Furthermore, stimulated recalls are different from general interviews for they capture data surrounding a given task while interviews broadly capture experiences and thoughts (Rose *et al.*, 2019). Stimulated recalls have an advantage over simple posts hoc interviews that depend heavily on memory without prompts and do not require training the participants like TAs (Gass and Mackey, 2017).

Recalls are divided into immediate and stimulated. In immediate recalls, data related to a task is immediately elicited for recalling after task completion while stimulated recall, a recall may or may not immediately follow the event and requires a stimulus to recall from (e.g. audio/video recording, written product) (Cohen, 1987; Faerch and Kasper, 1987; Cohen, 2014; Mackey and Gass, 2016). Researchers have further characterized stimulated recalls into immediate with short time intervals between task completion and recall and those with longer intervals as delayed. Immediate recalls simultaneously presented with the stimulus adds to the validity of the obtained reports by minimizing the decay of information (Pressley and Afflerbach, 1995) (after a guess, a decision is reached) while the presence of a stimulus adds to the accuracy of recalls from the working memory. The presence of a stimulus also allows the participants to activate or refresh their recollections of thoughts or cognitive processes to accurately recall what they had verbalized (Gass and Mackey, 2017). The length of time between the event and the recalls is a key component. When the time between the carried out task in question and afterwards the act of reporting on the task is short, there is a greater likelihood that reporting will be accurate (Mackey and Gass, 2016). However, there is yet no consensus as to the element of time intervals between the two kinds of stimulated recalls. Whereas Cohen (1987; 2014) sets a one hour time frame for the immediate stimulated recalls (ISRs) to a few hours until a week after the event, others acknowledge the element of time without setting one (Mackey and Gass, 2016). In an attempt to verify the reliability of recall, in Bloom's experimental classroom study (1985 cited in Gass and

Mackey, 2017), learners were asked to recall events following an event on the recording. Bloom found that recalls were 95% accurate if they were prompted within 48 hours of the event. Through using stimulated recalls, “a subject may be enabled to relive an original situation with great vividness and accuracy, if he is presented with a large number of the clues or stimuli which occurred during the original situation” (Bloom, 1954 cited in Gass and Mackey, 2017:14).

As with TAs, ISRs offer access to insights of the mental process that cannot be accessed by other methods. In the current study, ISRs were considered the second main instrument after TAs and were implemented for a number of rationales. First, ISRs can help isolate particular events from the stream of consciousness to be further investigated by the researcher Gass and Mackey (2017). In the current study, ISRs helped me to isolate and inquire about the observations I have witnessed in the form of different strategies, clues, hypotheses about the TWs, participants’ decisions and their behaviours as they verbalized during their TA sessions. Thus, ISRs allowed the researcher with indirect access to the readers’ cognitive process, as they inferenced the UNWs’ meanings as they engaged with the texts.

TA’s have been criticized as incomplete records of all the knowledge sources and complex cognitive processes involved during task engagement (Ericsson and Simon, 1998). In order to cover this limitation, ISRs followed the TAs as soon as they were completed. This was the second rationale for conducting ISRs, to overcome the limitations of TAs. ISRs accompanied by a stimulus were conducted as soon as possible to probe into the informants' statements during TAs, thus improving the validity of the protocol data and its analysis (Haastrup, 1987; Bowles, 2010). Third, following TAs with ISRs produce a larger quantity of data than either of them in isolation, that is why TAs and ISRs often go hand-in-hand (Haastrup, 1987). Fourth, in this study, ISRs helped to determine how knowledge is being organized and applied (Gass and Mackey, 2017). More specifically, how different proficiency groups approached the same task whilst highlighting their similarities, differences, success, failure of inferencing the UNWs and reasons for this.

Fifth, ISRs can be used to help determine if and when specific cognitive processes, like search or retrieval are being employed (Gass and Mackey, 2017). Interestingly, most LIFS studies have not used immediate or stimulated recalls but only online TAs with some followed by interviews. From my perspective, this could result from adhering to positivist philosophical assumptions and alternatively stressing the quantitative aspects in these studies. From this stems the second reason, that stimulated recalls have been used to elicit data from a small number of participants (Alghamdi, 2010) as opposed to large quantitative sampling in order to generalize findings. In addition, it could be explained in terms of resources available, practical and financial. The final reason for using ISRs in the current study was triangulation which was also one reason for

adopting a mixed methods design (see 3.5). Triangulating the data collected through different methods from TAs, ISRs, participants' observation during the TAs, individual semi-structured interviews and my field notes helped provide the researcher with a deeper understanding of the topic than using only one method.

Although there is no agreed time interval to distinguish between immediate and delayed stimulated recalls, the quality of the recalls "inevitably suffers with the time lapse regardless of the nature of the stimulus prompt" (Dörnyei, 2007). In this study, to ensure the quality of the recalls, ISRs began immediately upon finishing the TA session. Ericsson and Simon (1980:226) stress the crucial element of time:

> If the subject is asked immediately after performing the process, the model predicts that some previously heeded information will still be in the short term memory, permitting direct reporting processes described earlier and facilitating retrieval of additional information stored in the LTM.

Although in the first pilot study (3.8.1.2) I had used stimulated recalls which were conducted the following day (less than 48 hours) after the TAs, I realized that in addition to being time consuming, the participants were bored which was also reported in Haastrup's (1987) piloting stage. However, I still intended to use them in the main study but upon facing the issue with participants' availability, I resorted to ISRs which were conducted immediately once the TA task was completed.

After participants completed the TA sessions and while the audio recording was still running, I began the ISR sessions. During the ISRs, I asked participants questions, requested further explanation or clarification on: a) the LIFSs they resorted to, b) KS clues used and c) how hypotheses made about the TW's meaning were reached. During TA sessions, I used my field notes to write down my observations on participants' non-verbal behaviour, their hypotheses made for each TW, the LIFSs and KS clues used. I began the ISRs by implementing the strategy of member checks with participants, where I summarized what a participant had verbalized during the TA sessions, what I had written down in my field notes on the meanings of the TWs, hypotheses formulated, KS clues, LIFS and contextual clues. The ISR method has allowed me to ask questions, ask for clarifications and explanations on the previous points from participants. Through which participants confirmed these summaries, added further additional information by elaborating or even clarifying misunderstandings of interpretations by the researcher (Lincoln and Guba, 1985). After the ISRs and before ending the session, I asked learners specific questions regarding if there were other words that were known/unknown to them, if they enjoyed reading

the text and their knowledge about its topic. This approach was also adapted by Haastrup (1991) and her research assistants regarding participants' knowledge of particular words.

3.7.5.3 **Challenges to the validity of verbal reports**

Although VRs provide more insights to processing stages than the final product, they have been labelled as "underdeveloped" and heavily criticized (Pressley and Afflerbach, 1995:119). This lies in a number of issues, the first is the immediacy of the VRs, in other words the quality or accuracy of the accounts in relation to the phenomenon in question. In their attempt to ensure immediacy of reports, Ericsson and Simon (1993) advocate collecting online concurrent TAs over other types of VRs, for the sake of the reliability of the data since it only asks questions about heeded information in the working memory as opposed to reconstructing past thoughts, as with retrospective methods.

However, as with any method, there are potential threats to the validity VRs, both concurrent (online) TAs and retrospective ISRs. For concurrent VRs, since verbalization is done while completing the task, reactivity is a threat (Ericsson and Simon, 1993; Bowles and Leow, 2005; Bowles, 2010). Since it is unknown if the act of verbalizing while completing the task acts as an additional task and alters cognitive processes than displaying true reflection of thoughts. Although verbalization can be reactive for latency (overall time solution) since verbalization increase the overall time of the solution through slowing down processing slightly, it still is a valid method in capturing individual internal thought processes (Ericsson and Simon, 1993; Bowles, 2010). These researchers summarize that online VRs will not react with the primary task if participants are instructed to report non-metalinguistic verbalizations rather than verbalize justifications and explanations (metalinguistic). While metalinguistic verbalizations may be more reactive not only showing down the process but also causing changes in cognitive processing. In this current study, the impact of reactivity was minimized through initial warm-ups to the TAs to acquaint participants with the nature of TAs, giving them preferences to choose the language of reporting, providing them with clear instructions and familiarizing them to the recording instruments (Ericsson and Simon, 1987; Dörnyei, 2007; Bowles, 2008; Cohen *et al.*, 2018).

On the other hand, for retrospective reports reactivity is not a validity threat but veridicality or memory decay is, since learners verbalize sometime after completing the task (Bowles, 2008). In other words, retrospective VRs might not accurately reflect what learners' thought processes were while they were engaged with the task. Since the learners simply might not actually recall their thinking as they were engaged with the task, in addition to incomplete reports (Bowles, 2010).In their review of research studies comparing silent controlled group versus verbalized additional information, Ericsson and Simon (1984; 1993) reported that the verbalized additional

information led to changes in the sequence of thoughts compared to their counterparts. Thus in this present study, by minimizing the delay between the end of the task and its retrospective verbalization accompanied by a stimulus, the possibility of veridicality is lessened (Ericsson and Simon, 1993; Bowles, 2010; Gass and Mackey, 2017). In their review of L1 reading studies, Pressley and Afflerbach (1995) listed variables which could lead to the validity (accuracy) of retrospective reports, for example, characteristics of the subjects, the material used, task criteria, instructions of the verbal reports, methods of analysis and inter-rater relatability checks.

3.7.6 **Semi-structured interviews**

Although qualitative researchers have a number of instruments at their disposal, however "the interview is the most used method in inquiries" to collect information usually between two people but sometimes can include more people (Bogdan and Biklen, 2007; Dörnyei, 2007:134). This is because interviews are a "flexible tool for data collection, enabling multi-sensory channels to be used: verbal, non-verbal seen, spoken, heard and, indeed with online interviews, written" (Cohen *et al.*, 2018:506). Interviews are a key method for exploring the ways in which individuals experience and understand their world, for they provide a unique access to the lived world of people "who in their own words describe their activities, experiences and opinions" (Kvale, 2008:9). Through conducting interviews, researchers gain insights into complex in-depth information to investigate and collect data on a phenomenon that is not directly observable or accessible through observation such as learner's beliefs, attitudes, motivation, perceptions (Wengraf, 2001; Blaxter *et al.*, 2010; Mackey and Gass, 2016). The objective of interviews is to explore and provide "data on understandings, opinions, what people remember doing, attitudes, feelings and the like, that people have in common (survey interviews)" (Arksey and Knight, 1999:2).

In the literature, interviews have been classified in terms of their number (single vs. multiple), participants (single vs. focused group), mode (face-to-face, telephone, online), purpose, format, and degree of structuring (Lincoln and Guba, 1985; Nunan, 1992; Dörnyei, 2007; Mackey and Gass, 2016; Mann, 2016; Cohen *et al.*, 2018). In terms of their degree of structuring, interviews are placed on a continuum ranging between; structured, semi-structured and unstructured. In structured interviews, the most controlled type, the researcher uses an 'interview schedule/guide' which allows him/her to ask a set of fixed pre-defined close-ended questions on a specific topic. Although it allows comparisons between the interviewees' responses since all the questions are fix, the interviewer controls the contents of the interview through close-ended questions leading to no room for variation and flexibility due to fixed structure (Bogdan and Biklen, 2007). Structured interviews are useful when the researcher is aware of what he/she does

not know and alternatively frames the questions to provide this knowledge (Lincoln and Guba, 1985; Cohen *et al.*, 2018). On the other hand, the opposite is true for unstructured interviews, which are used when the researcher is unaware of what he/she knows and therefore relies on the respondents' responses. Therefore, unstructured interviews allow the researcher a maximum degree of flexibility to follow the interviewee's unpredictable responses with minimal interference from the research agenda (Lincoln and Guba, 1985; Dörnyei, 2007). Finally, semi-structured interviews which are adopted in the present study as discussed below.

The term 'qualitative interviewing' usually refers to in-depth semi-structured interviews (Mason, 2018). According to Dörnyei (2007), Merriam and Tisdell (2015), most interviews in applied linguistic research are semi-structured since they offer a compromise between the two extremes. These interviews are suitable for situations where a researcher has enough good knowledge about a topic and is able to develop related questions in the direction of the interviewee's responses (Dörnyei, 2007). The format of the questions are open-ended and the interviewee is encouraged to engage and elaborate on issues in an exploratory manner (Dörnyei, 2007). An interview guide is also used with some board questions grouped into categories where the researcher asks the same questions to the participants but not necessarily in the same order or wording. Since it depends on the participants' responses, the flow of the dialogue and where the interview goes (Merriam and Tisdell, 2015). In case study research, semi-structured interviews are viewed as "the most important form of interviewing in case study research. Well done, it can be the richest single source of data" (Gillham, 2000:65).

In the present study, interviews were used for a number of reasons. First, my philosophical stance interpretivism (3.3) was one of the underlying rationales for selecting semi-structured interviews. Since knowledge is subjective within the participants, reality has many forms and is constructed, it is through interviews that participants are given the opportunity to present their individual understandings and experiences of the issue in question (King and Horrocks, 2010). Kvale (2008) uses two metaphors to express the role of the interviewer as a '*miner'* or a '*traveller'* during the interviewing process which represents different concepts of knowledge production. Researcher as a miner believes that "knowledge is understood as buried mental and the interviewer is a miner who unearths the valuable mental" while as a traveller, the researcher is seen as a traveler who "wanders through the landscape and enters conversations with people he or she encounters" (Kvale, 2008:19). The miner interview evokes a positivist approach in looking for the truth (i.e. knowledge) which is waiting to be found to the inquiry while the traveller interview adheres to a constructivist (interpretive) approach in which knowledge is socially constructed (Mann, 2016; Cohen *et al.*, 2018). Thus, during the semi-structured interviews with participants, I was a traveller listening to their stories and experiences which supports my philosophical research orientations

to the inquiry under investigation. This view is advocated by many researchers, for example, Mason (2018:118) advocates that qualitative interviewing should be seen as "involving the construction of knowledge more than the excavation of it". In other words, knowledge is created in the research interview by the interaction itself between the interviewer and interviewee (Seidman, 2006; Kvale, 2008).

The second reason for conducting semi-structured interviews was to explore issues in-depth to see how and why individuals construct certain ideas, beliefs, values, motivation and displayed certain behaviours. Thus interviews can be used as an explanatory tool to provide insights into the data (Hochschild, 2009; Cohen *et al.*, 2018). Therefore, the purpose of conducting semi-structured interviews was to elicit more detailed information from participants based on their responses to the paper-based questionnaires combined with my field notes on what I had observed during the classroom observations and the verbal report sessions. These two aspects along with what I had read in the lexical inferencing literature, were combined and modified to compose a set of questions grouped into related themes. The third reason for adopting semi-structured interviews was due to the flexibility of semi-structured interviews (Miles and Gilbert, 2005).For through the flexibility of these interviews, I was further able to integrate new themes, related sub-questions on issues and displayed behaviours I initially observed during classroom observations and verbal report sessions. This was due to implementing flexibility by the researcher which King and Horrocks (2010:25) advocate that:

> Flexibility is the key requirement of qualitative interviewing. The interviewer must be able to respond to the issues that emerge in the course of the interview in order to explore the perspective of the participant on topics under investigation.

In semi-structured interviews, flexibility is present since the researcher does not only follow a set of preset questions but also additional ones in response to the participant's comments and reactions while the interview guide helps maintain a systematic coverage regarding the topic in question (Dörnyei, 2007; Edwards and Holland, 2013; Savin-Baden and Major, 2013). Furthermore, in addition to allowing participants to lead the interaction, the questions have a tendency to move from general to specific and do not necessarily follow predetermined wording or order of questioning as structured interviews (Dörnyei, 2007; King and Horrocks, 2010). However, they do provide some structure for comparison across interviewees by covering the same topics or questions (Edwards and Holland, 2013; Merriam and Tisdell, 2015; Cohen *et al.*, 2018).

In this present study, the audio taped semi-structured interviews lasted between 30-40 minutes with participants having the freedom to reply in either Arabic or English. During each interview,

the two reading texts were neatly placed in front of the interviewee to stimulate participants' reflections on their inferencing process. From which I asked questions related to the degree of cultural topic familiarity, events or behaviours I had recorded in my field notes during both classroom observations and the VR sessions that I wanted to further explore. Furthermore, questions were also generated to what I had noticed after some participants had left the room after having completed the VR sessions. Participants would immediately text me to inform me of the correct meaning of a TW and compare it to what they actually wrote (inferenced), which was usually incorrect. I wrote down the frequency of such behaviour and included intentional vocabulary learning of TWs as a theme in my interviews that I wanted to investigate further. Although the study did not investigate the retention of TWs through reading, it is a concept related to lexical inferencing in the literature (Hulstijn, 1992; Bengeleil, 2001; Nassaji, 2003a; Jelić, 2007) (see 2.8.2). During the interviews, some participants mentioned trying to learn new vocabulary from reading (pleasure reading, during a reading test) which prompted me to ask about their motivations for choosing to check the meaning of an UNW as they read and what further steps they use to learn this word.

To keep track of the themes and their sub-questions, I designed and used an interview guide/schedule (Appendix K) which serves as a checklist of topics/themes covering the major areas of the present inquiry and research questions. Therefore, using an interview guide provides a clear set of instructions for interviews and can provide reliable comparative qualitative data for analysis (Cohen and Crabtree, 2006; Merriam and Tisdell, 2015; Robson and McCartan, 2016). Interview questions can range between different types and purposes, initial questions (descriptive, narrative, structural), in-depth questions (contrast questions, evaluative, comparative) and follow-ups (verification questions, prompts follow-up, closure) (Dörnyei, 2007; Savin-Baden and Major, 2013). Furthermore, a strength of semi-structured interviews is that it "allows the researcher to decide how best to use the limited time available and keeps the interaction focused", especially when researchers only have one limited opportunity to interview participants or when collecting several interviews for the same project (Savin-Baden and Major, 2013:359). This was one of my objectives since time limitation of participants' availability occurred in the TA session arrangements and continued to do so for the interviews (due to participants' final examinations). In terms of limitations of interviews, they range from being time consuming, requiring good communications skills on the part of the interviewer, resource intensive, issue of subjectivity of researcher's recordings, effect of participants attitude due to the halo-effect (Savin-Baden and Major, 2013; Mackey and Gass, 2016; Cohen *et al.*, 2018).

3.7.7 **Researcher's field notes**

Researcher's notes can contain richly descriptive detailed narratives that are rooted in participants' data in terms of what they have said or displayed in their non-verbal behaviours or even in their settings (Richards, 2003; Locke *et al.*, 2009). Such descriptions, which are generated and developed from the researcher's observations in the field site, are known as 'field notes'. Bogdan and Biklen (2007:118-119) define them as "the written account of what the researcher hears, sees, experiences, and thinks in the course of collecting and reflecting on the data in a qualitative study".

Although field notes are an integral part of ethnographic studies (Wolfinger, 2002; Dörnyei, 2010; Rose *et al.*, 2019), they have been used in other types of qualitative research. In qualitative research, Dörnyei (2007:160) highlights that:

> almost anything can be perceived as potential data, and hence there is no reason why the researcher's field notes, real time comments, memos, and annotations would be exceptions. Personal agency is an important part of qualitative inquiries and the 'metadata' generated by the researcher offer valuable insights into the projects.

According to Rose *et al.* (2019:98), field notes can include "records of the settings, participants and their conversation, as well as researcher's impressions and reflections of the phenomena observed. These field notes serve as primary data and are coded for analysis". In the process of note-taking as described by Grbich (1999:134), "[t]he researcher acts largely as a camera, scanning and recording detail wherever she/he happens to be focusing, while also recording sounds and spoken language from a broader range".

In the present study, field notes were used with my classroom semi-structured observations (3.7.2) and participants' individual concurrent TA sessions (3.7.5.1). As mentioned in (3.7.2), field notes were my primary source for taking notes during classroom observations since recording, even audio was prohibited. On the other hand, field notes were a vital tool during the VR sessions, for they allowed me to write down my assumptions on what participants did during their TAs through what was reported in the lexical inferencing literature. For example, if they had read the whole text or not since the time between reading the text and beginning to inference the TWs was very short (nearly 2 minutes). It also allowed me to question participants' non-verbal behaviour, for example, why a learner would underline or circle another word (not a TW) or write its meaning in Arabic in the text or the sentence of a TW. From the notes I took during the TAs, I was able to inquire, clarify my assumptions and raise questions to ask participants regarding their previous TA behaviour during the ISR sessions conducted immediately after the TA tasks were

completed. In this way, field notes "allow researchers to revise and refine their original thoughts, to analyze language use in greater depth, and to make the research available to other researchers who may want to examine and analyze the data" (Leow and Bowles, 2005:75). Therefore, field notes were taken during both classroom observation and VRs sessions, where I wrote down a reflective narrative account on what I had observed by jotting down keywords or phrases which are used by researchers to jog their memory later (Savin-Baden and Major, 2013). Another reason for using field notes in this study is that these notes provided me with a log that helped me to keep track of the procedures of the data collection process, analysis and remain aware of how I, as a researcher, have been influenced by the data (Bogdan and Biklen, 2007).

Field notes based on observations vary in format but what is critical is that the format should allow the researcher to find the desired information easily (Merriam and Tisdell, 2015). Researchers suggest different classifications and guidelines for taking notes (Wolfinger, 2002; Richards, 2003; Bogdan and Biklen, 2007; Creswell, 2012). Bogdan and Biklen (2007) divide field notes into two types, descriptive and reflective. In descriptive field notes, the researcher aims at recording an objective account of the details regarding the events he/she has witnessed, that is why descriptive field notes tend to be longer than reflective ones. Descriptive field notes can include portraits of the subjects, their physical settings, account of particular events, description of activities, the observer's behaviour since he/she themselves "are the instrument of data collection" and effect the data that is gathered and analyzed (Bogdan and Biklen, 2007). On the other hand, reflective field notes are more focused on the researcher through providing a reflective personal account on the course of the research inquiry. Such notes can include the researcher's subjective assumptions of what he/she sees, understands, reflections on assumptions, speculations, methods and analysis, strategies and problems encountered during the study, issues that need clarification and ethical concerns.

In this study, I took both descriptive and reflective field notes in a notebook which became my research journal. I had divided the notebook into two main sections for my field notes; the first was devoted to each research instruments (as mentioned under each research instruments). While the second was devoted to my reflective notes. In organizing my field notes in the first section (for the instruments), I used a double page entry where the left page was devoted for my descriptive notes while the right for my reflective ones. Each entry had the day, date, participant type of text, settings and some description of the event in action.

As for my reflective notes, they also became part of my reflective journal throughout the research. The ongoing problem of bias in qualitative research or as Denzin (1994) (cited in Ortlipp (2008:695) labels "the interpretive crisis", can be acknowledged through reflexivity. A reflexive

approach to qualitative research is widely accepted (Ortlipp, 2008) through which researchers are encouraged to implicitly express "their presuppositions, choices, experiences, and actions during the research process" (Mruck and Breuer, 2003:23). One strategy to facilitate reflexivity during the research process is keeping a self-reflective journal (Ortlipp, 2008) through which researchers examine/reflect upon the thoughts, values, experiences and interpretations that have shaped their research. Qualitative researchers can make credible claims by taking into account where their meanings, ideas, theories and interpretation originally emerged (Richards, 2015). Ortlipp (2008) reflects on how, through maintaining a self-reflective journal and going back to her writings, she was able to acknowledge the experiences, feelings and opinions that influenced her research topic. Furthermore, it also guided her in decisions about the research design, articulating ideas about conceptual frameworks for analysis of the data and its interpretation. Some have suggested a daily journal (Lincoln and Guba, 1985), the printout of which becomes a part of the audit trail (3.12) for the study (Erlandson et al., 1993).

Silverman's (2013) organizational framework was used to organize the journal into four categories; (a) observational (field) notes, (b) methodological notes on how the data was collected and instruments used, (c) theoretical notes regarding my hypotheses, hunches and propositions and (d) personal notes containing feeling statements. My reflexivity was present and acknowledged in each research stage of the present study, which guided me during my data analysis and interpretation phases later on. Although it is advisable for a researcher to plan a regular time and place to write the field notes, preferably after the activity to ensure accuracy (Savin-Baden and Major, 2013), most of my field notes were taken during the observation and VR sessions. More details and elaborations were added immediately after the class was over for the classroom observation field notes while for the VR sessions, as soon as learners finished the sessions and left the room. Some of my field notes allowed me to create a personal account of the events that happened along my research journey that allowed further reflection on the data collection and research process.

To summarize, the process of taking notes kept me constantly engaged and in a state of reflection throughout the inquiry. Field notes were used in combination with other instruments and were a vital method that I depended on for a number of reasons. First, they were my primary source of reference regarding classroom and participants' observation since recording was prohibited as previously mentioned. Second, field notes also helped me to reflect on my own reflexivity throughout the research in terms of my thoughts about themes/interpretations (Wolfinger, 2002; Savin-Baden and Major, 2013). My reflections, confusion, explanations of what I assumed was happening as I observed participants inferencing approaches, their success/failure in terms of my

initial propositions built on the lexical inferencing literature were all recorded (Appendix L). All these elements would further guide me to think about certain aspects in my data analysis phase.

3.8 Data Collection and study procedures

3.8.1 Pilot studies

A pilot or preliminary study is "a procedure in which the researcher makes changes in an instrument based on feedback from a small number of individuals who complete and evaluate the instruments" Creswell (2012:390). Through pretesting the research instruments, researchers can highlight the problematic areas and improve them before the main study (Dörnyei, 2007). Pilot studies are essential "means of assessing the feasibility and usefulness of the data collection methods and making necessary revisions before they are used" in the main study (Mackey and Gass, 2016:52). Therefore, pilot studies strengthen the research quality and eliminate threats of validity and reliability in quantitative research and issues of trustworthiness for qualitative research (Dörnyei, 2010; Cohen *et al.*, 2018; Rose *et al.*, 2019). Gass and Mackey (2017:53) explain that pilot testing "can help avoid costly and time-consuming problems during the data collection procedure …[as well as] the loss of valuable, potentially useful, and often irreplaceable data". Piloting has allowed me to practice and develop my interviewing skills through asking and listening to participants in the pilot studies and highlighting the difficulties that participants had during the sessions.

In this present study, two small pilot studies were carried out before the main study which had the aim of testing and refining the study's data collection instruments and procedures. They are discussed in the following sections.

3.8.1.1 The first pilot study

This was conducted from the 23rd of May until the 20th of April 2015 at the targeted university, where I am a lecturer. Upon asking for volunteers, I was lucky to have 3 female learners who were enrolled in a Reading 102 class (the same sample population as the actual study) at the Department of English and European Languages. At this stage, the aim was only to test the VR instruments through familiarizing myself with them and ironing out problems, especially with the issue of training participants and familiarizing them with TAs, since it is not an everyday activity. Participants' consent forms were signed after all their inquiries were answered by the researcher. They were given the freedom to use either English or Arabic as the language of reporting in the research. The pilot study was conducted in two phases on different days due to participants' availability. In phase one, the session started with audio recording the pre warm-up TAs in the

form of a picture storytelling sequence activity followed by practicing TAs on a reading text. This was only conducted once for the whole pilot study, thus no warm-up TAs tasks would exist for the second phase. In phase 2, TAs were conducted without any warm-ups on the main two reading texts (each on a different day) selected for this pilot study. Verbal report data (think-alouds & stimulated recalls) were gathered in the same session.

A number of methodological considerations were extracted from this piloting study, which helped refine the research questions, modify the research methods and later guide data analysis. First, I realized participants needed more than one session of TA warm-ups before being presented with the main reading text. This was due to the fact that warm-up TAs (pictures & texts) were given once in phase 1, a few days before the actual reading texts. This was evident in the number of long pauses during participants' TAs and the researcher's constant reminders to "keep talking". The issue of increasing the number of TA warm-ups also extends to having more practice texts before the actual text as some previous studies carried out (Riazi and Babaei, 2008; Hu and Nassaji, 2012; Hu and Nassaji, 2014). Here, I had only given one warm-up for the TAs, a picture storytelling sequence warm up and a text before participants were presented with the main reading text for inferencing a few days later. However, by using texts as warm-ups one could train participants on inferencing, thus some investigators resorted to using mathematical problem-solving tasks as warm ups. However, having both a picture storytelling sequence and texts as TA warm-ups, which is already demanding on participants' cognitive load before the main TAs, might affect the validity of the data by increasing its reactivity as mentioned on p:134. From the outcomes of this pilot study, it was decided to only have a picture storytelling sequence as warm-ups in the actual study.

The second, was that some of the TWs in the texts were partially or previously known to some of the participants, making it harder to display what knowledge sources or even contextual clues were used to infer the meanings of UNWs. This was the second lesson gained here upon which a method for pretesting the degree of familiarity of the TWs by participants was needed. Furthermore, it was decided to have a list of preselected synonyms, which have been carefully selected through specific a criteria; in terms of their degree of appropriateness and closeness to the actual meanings of the TWs in the text, as substitutes for the known TWs. Related to this was the spelling of the words, either in British or American English. In the main text used in this pilot study, which had been adopted from Haastrup's (1991), one participant pointed that the word ((**aeroplane**)) was strange, although she uttered its meaning in Arabic but was puzzled why it was spelled that way. Thus, spelling conventions between the varieties of British and American English were taken into account in the main study.

The third issue was related to playing back participants' audio recorded TAs which were the stimuli used for the stimulated recall sessions. I found that these sessions to be longer due to the continuing instances of playing, pausing and discussing parts of the recordings, furthermore participants were not fully engaged. In fact, they were bored which was also observed in Haastrup's (1987) piloting stage which she later omitted from the actual study. This might explain why the majority of LIFS research used only audio recorded TAs or interviewed some participants but not stimulated recalls. Although I had used audio recorded TAs as part of my piloting, I decided not to in the main study and instead would use my field notes that I had written while learners verbalized during the TA sessions followed my immediate stimulated recalls.

Fourth, I found taking notes to be interesting since they provided me with insights throughout the actual TAs and stimulated recalls. For example, when a participant turns to the researcher for help to pronounce a word or to ensure that they have pronounced it correctly, or if they read line by line or simply jumped to the bolded TWs. These observations became the basis for further questioning and elaboration in the stimulated recall sessions. Field notes also included jotting down keywords as to how the meanings of the TWs were deduced, which I summarized to participants after finishing the inferencing task as an overall review. This was so participants could further add, clarify and elaborate more on the knowledge sources and strategies they used or if I had misunderstood some points they made. I found that carrying out the previous procedures could be a form of member checks (Lincoln and Guba, 1985), which is beneficial in terms of helping me clarify unclear interpretations or misunderstandings I had made and thus ensuring the trustworthiness of the present study (3.12).

3.8.1.2 **The second pilot study**

In order to finalize the modified research instruments after the first pilot study, and before choosing the research participants and conducting the main study, a second pilot study was conducted immediately two weeks before the main (1st of March 2016). In which a picture storytelling sequence warm-up activity was followed by the TAs of the actual inferencing texts, both audio recorded. The decision I made to omit the TA audio playback for the stimulated recall sessions provided to be appropriate. For I discovered that the participants (pilot & actual sample) ranged in their degree of availability, ranging between 45 minutes to an hour and a half every day, with some only attending university three days a week. Thus, resorting to immediate stimulated recalls carried out immediately after finishing the TAs and using the reading text as a stimulus along with participants' notes on the text and my field notes.

3.8.2 Main study procedures

The data collection for the main study required 5 stages to complete (Figure 3-2). Stage 1 began by introducing myself to the 4 reading classes and distributing the paper-based questionnaires. In Stage 2, Oxford's online proficiency test and unstructured classroom observations were conducted on the two chosen reading classes. Participants for the study were selected through stratified random sampling (3.6.3), a sample of 15 participants representing 3 groups of proficiency levels were selected and consent forms were distributed in Stage 3. Stage 4 and 5 represented the core stages of the data collection process. In Stage 4, verbal report sessions were conducted and began by pretesting the TWs to the participants through using the adapted Vocabulary Knowledge Scale (see Appendix M for an example). After this, participants were given instructions by the researcher in English and Arabic for the TA warm-up sessions which were through a picture storytelling sequence and given 5-7 minutes to prepare a story. While participants were busy with the TA warm-up task, I went through their pretest and replaced the TWs that learners had correctly provided meanings to with substitutes (Appendix F). Next, the TA warm-ups began along with the audio recordings. Upon completing the TA warm-ups, instructions to the main TA task and reading were read to participants. Participants began to verbalize as they inferenced the meanings of the bolded underlined words (see Appendix N for an example of a participant's inferencing sheet). While participants were verbalizing, I took notes on what I had seen and heard, interesting comments or gestures that I wanted to investigate further and understand in the ISRs as participants were engaged with the task. In the same session, immediately after the TAs were completed, ISRs began where I had the chance to asked more about what I had observed, notice and was intrigued by during the TA sessions. This was carried out for both the reading texts. Finally, in Stage 5, individual semi-structured interviews were conducted to further investigate and elaborate on the KS clues, LIFSs used during the inferencing task and approaches to reading texts by the participants.

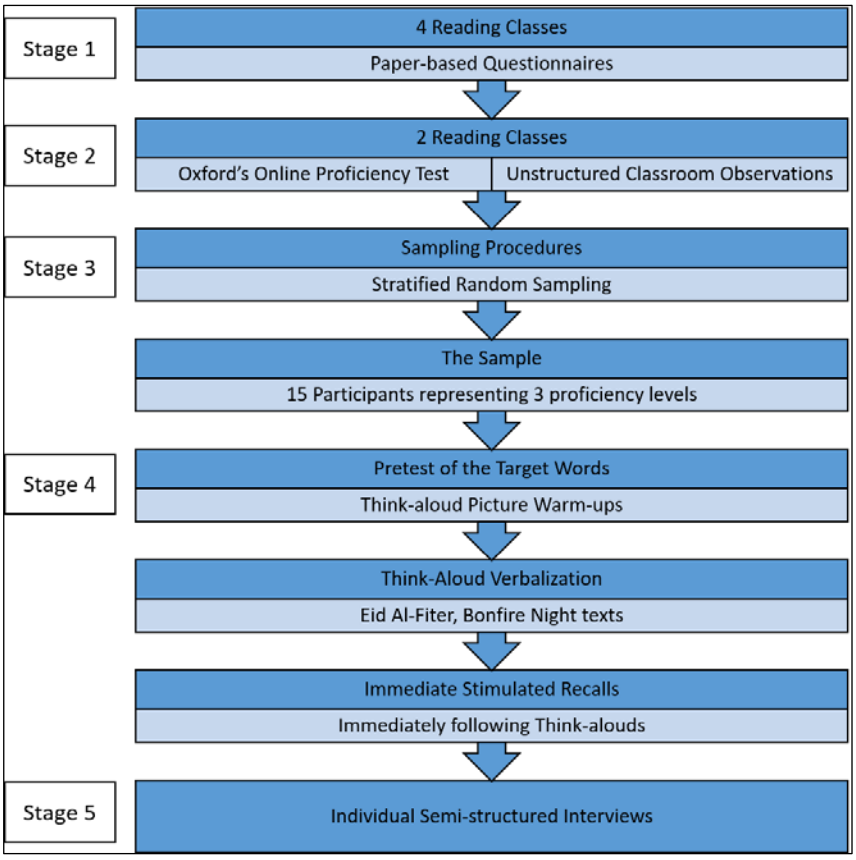


Figure 3-6 The main stages of the study

3.9 Data analysis procedures

In the following sections, I outline the analytical strategies and processes that I had followed beginning with preparing, organizing, transcribing and translating the data. Next, the approaches to coding the data, generating codes and themes are discussed, followed by how Nvivo, a qualitative software, was used in the study for coding and coding management. Finally, the last section discusses code and theme development

3.9.1 Data preparation, management, transcribing and translating

Quality is a vital aspect in qualitative research (Erlandson *et al.*, 1993; Patton, 1999). Before starting to analyse data, it must be prepared and organized (Flick, 2014:39). Preparing data is part of "data management", a term which refers to "the systematic, adequate storage and retrieval of data and preliminary analysis" (Boeije, 2010:72). According to Hennink *et al.* (2020:232) "Data preparation and code development form the foundation for subsequent data analysis, therefore ensuring the quality of data preparation task is important". In preparing for data analysis, I adhered to Boeije's (2010) aspects for data analysis addressed below.

3.9.2 Recordings and document organization

The first aspect is the organization of various data files and their storage. During analysis, it is crucial with large amounts of data that a researcher is able to easily identify, retrieve needed documents related to the analysis, so a clear system is vital (Patton, 2002; Boeije, 2010). I came up with a neat archive to prevent many hours of searching for one verbal report or an interview. At the end of each day during my fieldwork, all audio recordings were uploaded on my laptop and labelled through a personal coding system to indicate the participant's code, proficiency level and text given. These files were further classified under folders according to each text, with subfolders representing each proficiency group. As with the recordings, the names of participants were written on their reading papers and then organized into a large pocket folder, divided by proficiency level. Through such a referencing system, it was easy and time effective pulling out a participant's reading sheet during coding and data analyse. In terms of keeping track of my participants' verbal reports on the two texts and the semi-structured interviews, I used a detailed table to follow these tasks (Appendix O). It was also used to track if the verbal reports and interviews have been transcribed, coded and analysed.

3.9.3 Transcription and translation

Preparing the data for transcriptions is the second aspect in Boeije's (2010) data preparation guideline. Preparing data for analysis involves 3 main tasks: precoding a verbatim transcript of the interview, a translation of the transcript (if required) and removing identifiers from the data to preserve participants anonymity (Hennink *et al.*, 2020). The first, transcription, is the process of turning spoken words into written form and has been characterized as "a time-consuming and demanding task" (King and Horrocks, 2010:119). However, if one is doing their own transcription (as myself) and not as a team, it "enables one to maintain a link between the raw data (your tapes) and your transcripts" and is seen as the first step in the analysis itself (Langdridge, 2004:266).

3.9.3.1 Transcription

Transcription is a "powerful act of representation" (Oliver *et al.*, 2005) in qualitative research, a critical component of the analysis is influenced by the purpose of the research, its analysis which varies from one methodological position to another and researchers' assumptions about the data (Oliver *et al.*, 2005; Hennink *et al.*, 2020). Thus, transcription is not a simple process since various decisions need to be undertaken before this process begins (Langdridge, 2004; Boeije, 2010; Flick, 2014). As a consequence of this, various approaches to transcription; systems of transcription, degree of detail surfaced, for there is no universal system/approach for transcription (Langdridge

and Hagger-Johnson, 2009) but is the researcher's role to "decide on an approach that will best serve research needs" (Richards, 2003:199). According to some scholars (Langdridge, 2004; King and Horrocks, 2010), two key issues need to be adhered to before the transcription process, whether every second and every word (verbatim) is transcribed and to what level of detail is embedded in the transcription.

In this study, I have adapted a word-for-word verbatim transcription (King and Horrocks, 2010), also known as orthographic (Braun and Clarke, 2013), which focuses on the information content of the interview or the social meanings attached to the content of what participants have to say rather than how it was said. This aims to capture all the attempts, transitional processes strategies they apply/indicate, hypotheses about meanings of the TWs, knowledge source clues and LIFs they mention in the verbal reports and semi-structured interviews. This is in line with Hennink *et al.* (2020:213) view that:

> We suggest that a verbatim transcript includes everything that is said in the interview, and that researchers make their own decision about any further level of detail that is needed in relation to the purpose of the project.

In terms of the level of detail, since meaning construction is my objective and not how participants use the language to express themselves while fulfilling the task, I resorted to a basic level of detail as opposed to a more detailed one that includes length of pauses, intonation, overlapping speakers, intonation as offered through different transcription systems proposed by various researchers (Silverman, 2006). Details of non-verbal behaviour was embedded in some transcripts, when a participant resorted to non-verbal gestures, using hands, as she hypothesised about the meaning of the word before writing down the answer. Furthermore, I aimed at transcribing what was uttered in English as accurately as possible, which in qualitative research, according to Langdridge (2004:264), "involves no attempt to correct what was said. That is, grammar is not corrected, nor are any colloquialisms, mispronunciations and so on".

Although it is advised that transcription can begin as soon as the first interview is completed or after all the data has been gathered, the advantages are in favour of the former (Hennink *et al.*, 2020). First, it allows one to identify new issues which might be explored in subsequent interviews, information from interviews may direct participant recruitment. Second, the point of data saturation, when the researcher is confident that no new ideas/themes are emerging (Rose *et al.*, 2019) can be identified. Finally, it enables the researcher to check on the quality of the data and correct any problems during the data collection process (Hennink *et al.*, 2020). However, due to the limited period of authorized fieldwork from the Saudi Cultural Bureau, this led to a very busy schedule for myself while participants' limited availability before their final exams was

another. Thus, I only began to transcribe electronically in mid-June 2016 upon completing the fieldwork phase and returning to the UK.

The was a total of 21 hours and 56 minutes of audio recordings; 15 hours and 38 minutes for verbal reports while 6 hours and 18 minutes for semi-structured interviews. The transcription process was long and slow and took me nearly 6 months to only transcribe the verbal report data. Transcription was carried out through InqScribe software (V.2.2.3) which allows pausing, playbacks at different speeds, inserting timelines upon request and exporting the file into a TXT format. However, a disadvantage of this programme was the unavailability to export into a Word document format, thus the contents of the transcription needed to be copied and pasted into a Word template. After that, the "processed data", data that has been transcribed and translated (Wengraf, 2001) was ready for coding. After transcribing the data, a clean tidier version was produced since the spoken form of language is almost always messier than it is in writing for it includes false starters, hesitations, mangled grammar, incomplete sentences etc. King and Horrocks (2010:149) label this as 'tidying up" and advocate that "we would expect that it is sometimes appropriate to carry out minor tidying up in order to aid comprehension" for the readers when it comes to quotes. At the same time, they caution that "This should be done with great care, to minimize any distortion of meaning". Thus, the aim here was not to produce a correct version of what was uttered but rather an accurate one that also included translations of Arabic utterances after they have been validated to facilitate comprehension.

3.9.3.2 **Translation**

Transcription and translation were conducted simultaneously by myself which is a common approach in translating recorded interviews (Hennink *et al.*, 2020). Although it was at their disposal to use either Arabic or English to minimize cognitive demands during verbal reports while engaged in the task, participants regardless of the proficiency group, tended to use English for the majority of their verbal reports and interview sessions. When using Arabic they would use either a single word, a short phrase or a few sentences to express their inferencing strategies and knowledge source clues, including providing explanations in Arabic. Since Arabic utterances carry such rich additional information related to the study's research questions, I decided to include them by translating them into English and identifying acts of translation by italics between parentheses during transcription.

According to Newmark (1988b:7), translation is "a craft consisting in the attempt to replace a written message and/or statement in one language by the same message and/or statement in another language". It is a process where the meaning of a text is rendered into another language in the way the author intended in the text (Newmark, 1988a). The process of translation can

become both time consuming and resource intensive, especially if a large quantity of data is collected and analysed (Halai, 2007). Regarding the qualitative data, before embarking on the transcription/translation processes began, researchers should consider a number of issues (Regmi *et al.*, 2010; Marshall and Rossman, 2016); (a) whether to identify the translations instances/acts in the research reports, (b) if it matters that the researcher is also the translator and (c) if a translator is involved, should he/she be involved in the analysis, too. I followed Newmark's (1988a:47) "Communicative Translation Approach" which aims to "render the exact contextual meaning of the original in such a way that both content and language are readily acceptable and comprehensible to the readership". According to Newmark (1988b:39), the main objective of this approach is to "to produce on its readers an effect as close as possible to that obtained on the readers of the originals" Thus, he characterizes the communicative translation to be simpler, clearer, smoother, more direct, and more conventional.

Second, since simultaneous translation and transcription may lead to some loss of detail in the translated transcript and may be more prone to translation errors (Hennink *et al.*, 2020). It was critical that translations of the participants' Arabic utterances in the present study are "checked for accuracy and appropriateness by individuals familiar with the language and culture of the study" (Hennink *et al.*, 2020:217). In fulfilling the previous objective, to confirm the translation accuracy, 3 Saudi colleagues were contacted for this stage. All the raters (2 females and 1 male) were Saudi academics with at least an MA degree in applied linguistics (only the male rater was a PhD student) were provided with detailed instructions as to this process. Each word given in Arabic was placed in a table with four rows, which contained the sentence of the target word in the text, the participants' verbal report in which the Arabic meaning of the TWs were uttered, my translation, followed by the rater's translation and feedback.

3.10 Data analysis framework

After the stage of data preparation, transcribing and translation was completed, the coding and data analysis process guided by the research questions began. In case study analysis, all the information (data) about the case should be brought together (Merriam and Tisdell, 2015). In the current study, I began coding and analysing with the verbal reports (TAs & ISRs) first by case, i.e. by participant, beginning with the highest proficiency and descending onwards. Upon finishing coding and analyzing the 15 participants' verbal report data for the familiar text, Eid Al-Fiter, the same previous steps were applied to the unfamiliar Bonfire Night text. After coding the verbal report, the semi-structured interviews were coded and analyzed, once again, by participants' proficiency level. The first stage of the coding process began with coding the verbal report data followed by semi-structured interviews as follows;

1. Verbal report data (TAs & ISRs) were coded for the following:
    a. The outcome responses (correct-partially correct-incorrect).
    b. The number of hypotheses made about each of the 16 TWs.
    c. The type of KS clues and LIFSs used for each TW by the 15 participants in the two texts.
2. Semi-structured interview data was coded for :
    a. The difficult challenges that participants reported when reading English texts and their general approaches to reading.
    b. Justifications and elaboration on why participants used certain KS clues and LIFS or why they neglected using them. This was guided by my field notes taken during the verbal report sections (TAs & ISRs) for each participant while reading the two texts.

In order to analyse that textual data, I adopted both a thematic analysis followed by a semantic and latent analysis before finishing with a comparative analysis as detailed below.

3.10.1 Thematic analysis

There are various analysis strategies, Crabtree and Miller (1999:17) note as "nearly as many analysis strategies exist as qualitative researchers". Although there are many approaches to analysis (e.g., content analysis, discourse analysis, grounded theory), I decided to use thematic analysis, "a method for identifying, and analysing and reporting patterns (themes) within data. It minimally organizes and describes your data set in (rich) detail" (Braun and Clarke, 2006:79). I followed the principles of Braun and Clarke's (2006) thematic analysis approach (Table 3-7) for these scholars have been wildly acknowledged for bringing some order through establishing guidelines to conduct thematic analysis in a more deliberate and rigorous way in foreseeing and avoiding potential pitfalls.

Table 3-7 Braun and Clarke's stages of thematic analysis (Braun and Clarke, 2006:87)

Phase	Description of the process
1. Familiarizing yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes:	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Furthermore, they provide a checklist for conducting good thematic analysis, that has become my point of reference to ensure the reliability of each stage (Table 3-8). This approach was chosen

due to its flexibility since it is not tied to any discipline or pre-existing theoretical framework making it a widely used approach (Braun and Clarke, 2006; Ritchie *et al.*, 2014).

Table 3-8 Braun and Clarke's checklist criteria for good thematic analysis

Process	No.	Criteria
Transcription	1	The data have been transcribed to an appropriate level of detail, and the transcripts have been checked against the tapes for 'accuracy'.
Coding	2	Each data item has been given equal attention in the coding process.
	3	Themes have not been generated from a few vivid examples (an anecdotal approach), but instead the coding process has been thorough, inclusive and comprehensive.
	4	All relevant extracts for all each theme have been collated.
	5	Themes have been checked against each other and back to the original data set.
	6	Themes are internally coherent, consistent, and distinctive.
Analysis	7	Data have been analysed – interpreted, made sense of – rather than just paraphrased or described.
	8	Analysis and data match each other – the extracts illustrate the analytic claims.
	9	Analysis tells a convincing and well-organized story about the data and topic.
	10	A good balance between analytic narrative and illustrative extracts is provided.
Overall	11	Enough time has been allocated to complete all phases of the analysis adequately, without rushing a phase or giving it a once-over-lightly.
Written report	12	The assumptions about, and specific approach to, thematic analysis are clearly explicated.
	13	There is a good fit between what you claim you do, and what you show you have done – ie, described method and reported analysis are consistent.
	14	The language and concepts used in the report are consistent with the epistemological position of the analysis.
	15	The researcher is positioned as *active* in the research process; themes do not just 'emerge'.

The second reason for using thematic analysis lies in the fact that researchers can determine themes in a number of ways, either preconceived from the literature, a theory or deriving from the data. After organizing and immersing myself in the data by reading and rereading it numerous times to become familiar with the material (Marshall and Rossman, 2016), I began the initial coding process. Marshall and Rossman (2016:222) define this process as "Generating names and labels for phenomena identified in the data-themes, categories-is coding. Coding is the representation of analytical thinking, it is not analytic thinking itself". The process of coding is part of the analysis (Miles and Huberman, 1994) in which codes refer to a feature that the researcher finds interesting and indicates "the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon" (Boyatzis, 1998:63). Saldaña (2015:4) adds that "a code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data". Similarly related codes are then organized into themes (Braun and Clarke, 2006) also called categories or families (Saldaña, 2015) (theme hereafter) where a theme "captures something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set" (Braun and Clarke, 2006:82). The effectiveness of a theme does not necessary lie in quantifiable measures, but more crucially "if it captures something important in relation to the overall research question" (Braun and Clarke, 2006:82).

In this study, codes came from two sources; themes derived from the lexical inferencing literature known as **theory-generated codes** while the other set emerged from the actual data, **in vivo codes** (Marshall and Rossman, 2016). Such coding is in-line with my abductive analysis approach to the data, a combination between top-down' or theoretical driven (deductive) and 'bottom-up' or data-driven approach (inductive) (Braun and Clarke, 2006). Deductive analysis is driven by the researcher's preconceived coding frame "according to the existing framework" theoretical or conceptual. In contrast, inductive analysis aims at discovering patterns, themes and categories in the data without trying to fit the data to a preexisting coding frame (Boyatzis, 1998; Patton, 2002). Theoretical analysis has the disadvantage of presenting the data with less description of the overall data and more detailed analysis of some aspect of the data based on the initial theory (Boyatzis, 1998; Braun and Clarke, 2006; Javadi and Zarea, 2016).

In considering my criteria regarding counting the occurrence of a KS clue, I had modelled the approach used by Bengeleil (2001) where any KS clue is salient, irrespective of the number of times it was reported during the verbal reports. My current decision also falls in line with Ames (1966:60) argument that:

> The fact that one mature reader used a particular type of contextual aid would be considered sufficient evidence that such an aid existed, had possible unity, and should be taken into account in any attempted classification scheme of contextual aids

I have also extended the same argument to my approach to coding the LIFSs in the verbal reports, too.

3.10.2 Semantic and latent analysis

Furthermore, another decision during the analysis was determining the level at which the themes needed to be identified either at a semantic or latent level (Boyatzis, 1998). In a semantic approach, themes are detected at the surface semantic level, where the researcher does not go beyond what the participant has said or written (Boyatzis, 1998; Braun and Clarke, 2006). Thus, displaying the simplest and most evident themes with the aim of showing patterns that exist in the data "which have simply been organized to show patterns in semantic content, and summarized, to interpretation" (Braun and Clarke, 2006:84). On the other hand, latent (interpretative) themes penetrate the semantic level by identifying and underpinning ideas, factors and assumptions that might have shaped the semantic content level of the data accompanied by the researcher's interpretation (Braun and Clarke, 2006).

Summarizing the previous part, a semantic approach to themes is after literal meanings while a latent (analytical) one requires moving from a mere description or surface level to “detecting and testing beliefs, presumptions and conceptualization” from the semantic content of the data along with the researcher’s interpretation (Javadi and Zarea, 2016:35). In my data analysis approach, both semantic and latent coding were applied since they are in line with my research questions. These research questions not only investigate the types of KS clues and LIFSs used but also what prompted learners to use or neglect them which does not reside directly at the data’s semantic surface level. Furthermore, in order to investigate the factors that lead to the success/failure of inferencing, using certain KS clues or LIFSs, I needed to penetrate the data to discover related themes and link them back to the reported literature and my conceptual theoretical framework.

Throughout the analytical process, I also wrote notes, reflective memos, and my thoughts which are regarded as “invaluable for generating the unusual insights that move the analysis from the mundane and obvious to the creative” (Marshall and Rossman, 2016:221). Through writing, the analyst identifies, defines categories that can guide in highlighting linkage between the coded data. My memos, which were thematic, methodological and theoretical, were jotted on the margins of the transcription page. Thematic memos were used to summarize key ideas that codes signified, reasons why I clustered one code under theme X and not Y, confusion regarding attaching a code to theme X or Z or to a new one. Methodological memos represented notes on the methods used, their effectiveness/ineffectiveness, interaction between the instruments, participants and myself (Marshall and Rossman, 2016). Theoretical memos displayed my thoughts on the ways that the theory and related literature (conceptual framework) explained or did not explain what was emerging in the data. As the coding proceeded, some codes were either clustered together, further sub-divided or became a separate entity. At this stage, I started looking at the relationship between codes and different themes, their different levels (main overarching themes and sub-themes), combining themes which represent the same feature. I also had a ‘Miscellaneous” theme where I placed all the codes that at the initial stage of analysis did not belong to any themes or seemed problematic since they can be added to a number of themes.

The data gathered from the TAs, ISRs, semi-structured interviews and my field notes were triangulated during the analysis phases. ISRs further provided the researcher with more insights into what, how and why questions regarding what participants were doing during their TA sessions (Table 3-9). On the other hand, interviews provide me with more explanations to what learners normally do when encountering an UNW and allowed for more themes to emerge that were not found in the verbal reports. Using participants' reading answer sheets also provided

additional information to what they had underlined, added or wrote in Arabic, this was helpful when listening to the recordings and making notes on such points.

In order to use the ISR data effectively, I adapted Gass and Mackey's (2017:83) approach to data layout and coding in which they stress that "Coding sheets for stimulated recalls differed from many other types of coding sheets in that one must keep track of two different events". As displayed in Table 3-9, the ISR data is used to further prompt what the learner has said in her TA for the TW ((**co-operative**)). This method was mapped onto Nvivo through linking both TA and ISR data together for the participant and then using an Nvivo memo to write my reflections and interpretations.

Table 3-9 A sample of the coding process

TW	Time	Concurrent Think-Alouds	Speaker	Immediate stimulated recalls	Coding categories
Co-operative	[00:04:04.06]: Part-B1-1	"Co-operative "since I know this word previous, so it means like working together something like this. So it feels also in the sentence also feels like the same meaning. Working together.	**R:**	Ok why did you say working together? (although she wrote doing an activity together))	Preconceived notion (STG)
					Inferencing meaning
			Part	Because working is like working in something formal but doing an activity together, so they are like moving, they are doing an activity. They are doing something but it's not like work.	Justification by comparing between word meanings (working formal activity VS doing an unformal activity like helping each other activity)
			R:	Ok so what made you say it meant, that meaning? So you know the word "Co-operative", before (part: yeah) so where have you heard this word before or seen it?	
			Part:	Sometimes in like in producers, who are going to co-operative with a singer, so something like this.	Previous Background Knowledge (knowledge sources)
			R:	How did you make sure that it means the meaning that you said in this context?	Local clue
			Part:	"actions" ...so ((reads)) co-operative of actions.	Checking with context (STG)

3.10.3 **Computer-assisted data analysis**

Boeije's (2010) final element of data preparation is the manipulation of data with computers. This was in the form of using computer-assisted qualitative data analysis software (CAQDAS). Such software programmes can assist the researcher in transcription, coding, using multiple sources of data for analysis and organizing purposes. In terms of coding, coding can be performed manually or through using a CAQDAS. However, the massive amount of compiled data and issues of organization was a compelling reason for me to resort to the second. Large and varied amounts of data, as Ozkan (2004) stresses, require a researcher to use programmes to increase speed and flexibility in coding, storing and retrieving data or research memos, storing and linking data. Furthermore, such software offer a formal systematic structure in writing memos, editing them, comparing and displaying data sets, analyzing content, linking data, constructing graphics, mapping and writing reports in order to develop the analysis to support more conceptual and theoretical thinking about the data (Barry, 1998; Dörnyei, 2007; Marshall and Rossman, 2016). The software is only a mean to organize the data but the analysis is the responsibility of the researcher since it is "only a tool to help with some of the mechanical and management aspects of analysis; the hard analytic thinking must be done by the researcher's own internal hard drive!" (Marshall and Rossman, 2016:228).

After transcribing (3.9.3.1) and translating (3.9.3.2) the verbal data (TAs, ISRs & semi-structured interviews), Nvivo Pro 11 qualitative software was used to code and analyze the data. In the current study, Nvivo Pro 11 was used to fulfill a number of objectives. First, it allowed me to integrate all the different data collected from the TAs, ISRs and semi-structured interviews in one place. Thus, providing the flexibility to display, code and move between the three different sources of data. Second, it provided the researcher with a number of features and strategies to examine the data. In the current study, this ranged from using text searches, matrix queries, retrieving instances of a theme, displaying all a participant's data from the different sources of the data collection instruments and also making notes (Bazeley and Jackson, 2013; Silver and Lewins, 2014). While I was coding, Nvivo allowed me to reflect on my thoughts, assumptions, initial explanations of what I was uncovering in the data and linking them to my theoretical framework. This was through attaching memos, either to what I had coded or the themes that began to surface and my personal reflective memos. These generated memos in Nvivo also became part of my audit trail (Dörnyei, 2007) to ensure the present study's trustworthiness (3.12). In terms of coding in Nvivo, I had the flexibility to code extracts, delete, recode, combine codes that were representing the same concept or even creating sub-codes in a single parent code (Figure 3-7).

Third, I was able to use Nvivo to calculated and provide the frequency of each LIFS and KS clue for each TW within-groups and across-groups for the 3 different proficiency levels in the two texts. Since, as I mentioned in 3.10, I had used Nvivo to code the outcome of inferencing responses (correct-partially correct- incorrect) for the TWs including the LIFS and KS clues used with each response reported in verbal report data. Furthermore, it allowed me to display the different combinations of the LIFSs and KS clues used by the 3 groups in terms of successful inferencing.

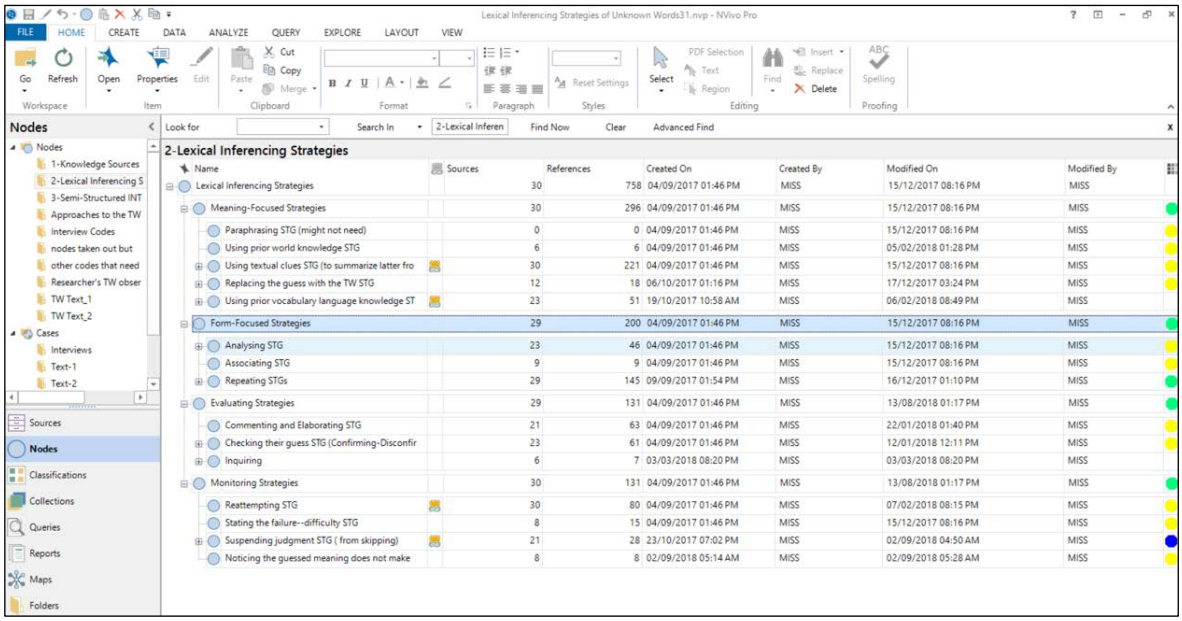


Figure 3-7 Screenshot of the LIFS categories and their sub-codes

In order to answer the 2nd and 3rd RQs, matrix queries were ran in Nvivo for each of the 8 TW in each text for all participants to retrieve; the type of KS clues and LIFS that were used, including their frequency of usage with each TW and participant. Different matrix queries were ran for each of the clues and their knowledge sources for each TW separately (for an example, see Appendix P for the TW 'abandon'). The process was once again repeated for each of the 16 TWs, LIFSs and the outcome of their inferencing responses (correct-partially correct- incorrect). These long iterative steps were applied a number of times since it was impossible to run all the 8 TWs in a text with the previous requirements in a single matrix query due to the massive amount of data collected. This was also used as a step to ensure confirmability (objectivity) for inter-rater reliability later on by a colleague after the analysis stage was completed. Upon completing all the queries, they were exported as Excel sheets where further frequency of usage and percentages were calculated. In the Excel sheets, LIFS and KS clues that participants used were divided into different excel tabs depending on the outcome of their inferencing responses (correct-partially correct- incorrect) for each TW (see Appendix Q for an example).

3.10.4 Constant comparative methods

In order to see the similarities/differences in the usage of KS and LIFS in the two texts between the three different proficiency groups to fulfill one of the current study's objectives (see 1.3), a constant comparative method approach was used in the analysis. This method was originally developed for use in grounded theory methodology by Glaser and Strauss (2017) but now it is applied more wildly as a method of analysis by qualitative researchers (Leong *et al.*, 2010; Johnson and Christensen, 2016). Constant comparative method is an approach to coding data used for categorizing, organizing and comparing qualitative data which is an "ideal analytical tool" for qualitative or mixed methods researchers or multi-data sources (Mathison, 2005:81; Bogdan and Biklen, 2007). In this method, the researcher compares one piece of data against the emerging categories and themes that capture the recurring patterns from the data (Creswell and Poth, 2018). The objectives of using the constant comparative method were to fulfill a number of objectives at different levels of data analysis;

1. At the level of participants' degree of topic familiarity, to compare the type and frequency of KS clues and LIFSs used in each text.
2. At the level of participant's proficiency, to compare the type and frequency of KS clues and LIFSs used between the 3 groups.
3. At the level of correct inferencing, to compare how the 3 groups used KS clues and LIFSs including their frequency with successful inferencing.

3.10.5 Code and category development

Upon finishing coding the verbal reports and the semi-structured interviews for the 15 L1 Arabic participants, I began the second stage of coding, where the objective is to reduce codes to a smaller manageable number and remove redundant ones (Creswell, 2012). In this study, it was the process of grouping the sub-clues according to their nature/type and organising them into their knowledge sources. While for the inferencing strategies, it was grouping sub-strategies according to their function in the overarching strategy categories.

In this study, as previously mentioned in 2.10, ***'Knowledge sources'*** (KS) refer to the higher categories that represent clues which are organized into different categories in terms of the nature (type) of the clue which learners use to infer meanings of UNWs. The nature that these clues belong to can be semantic, morphological, grammatical, discourse, world or L1 knowledge (Nassaji, 2003a). In order to identify the overall spectrum of clues and their KSs utilized by all participants regardless of their inferencing responses in the two texts, the clues were identified through an abductive coding approach to the data where I had adapted both Haastrup's (1991)

and Wesche and Paribakht's (2010) taxonomies (deductive). At the same time, I was also open to what my data generated through rereading the transcripts, using my field notes and research journal, where I wrote down my reflections and subjective thoughts to what I experienced for each participant both during and after each session (inductive). The qualitative data analysis revealed that participants used a variety of KS clues.

In developing and classifying the taxonomy of clues and their KSs in this study, I classified them following Wesche and Paribakht's (2010) classification, where clues were mainly categorised into linguistic and non-linguistic sources. In their classification, linguistic clues were organized according to the three major hierarchical categories of written language; word, sentence and discourse–depending on the clues' location. Based on the current study's data, the learner's stock of vocabulary knowledge was added as a linguistic category. On the other hand, non-linguistic clues referred to world knowledge which is also a crucial source in the current study.

The themes of the main categories of KSs and the type of clues they displayed in this study are shown in Table 3-10. While the sub-clues that learners resorted to for each KS are listed in Table 3-11. The definitions for the sub-clues of each KS are defined and illustrated in Chapter 4.

Table 3-10 Knowledge sources categories and their clue types

Source type	Clue sources	type of the clue
Linguistic clues	**Vocabulary knowledge**	In these clues, participants used their Vocabulary Knowledge as a clue to compare the TW to words they already knew as part of their stock of English vocabulary.
	Word level	These clues refer to clues within the TW itself, either morphologically or semantically.
	Sentence level	Such clues are located beyond the TW word itself and extend to the sentence level. These clues were divided into sentence level grammar, meaning and punctuation.
	Discourse level	Knowledge about the text genre (formal schema) and meaning relationships beyond the TW sentence level.
Non-linguistic clues	**World level**	Using knowledge or experience about the topic of the text or general knowledge about the world.

Table 3-11 A taxonomy of knowledge source and their sub-clues

A. Linguistics Sources

1. Vocabulary Knowledge

1. Stating never seeing the TW before.
2. Stating not knowing the TW's meaning.
3. Stating encountering the TW before:

a) Stating hearing the TW before

- Stating hearing the TW only without seeing its written form.
- Stating hearing the TW's stem before.
- Stating hearing the TW before and trying to recall its meaning.

b) Stating previously encountering the TW

- Starting they might have seen the TW before.
- Stating that they have come across the word but unsure of its meaning.
- Stating seeing negative meanings of the TW before.
- Stating where they have encountered the TW before:
    - Listening/Speaking
    - Reading/Writing

c) Stating already knowing the TW's meaning

- Already knowing before what the TW means.
- As a stem without affixes.
- Realizing that they know the TW but have mispronounced it.
- The TW has a few meanings.
- Knowing the TW but can't remember its meaning.
- Knowing the word but unsure of its meaning.

2. Word level clues

a) Word Morphology: resorting to morphological analysis of the TW using knowledge of:

- Prefixes.
- Stems.(removing inflections implicitly /explicitly).
- Part of speech.
- L2 perceived near homonymy (word form).

b) Word Semantics (Meaning): using knowledge of the TW in the form of the TW.

- Antonyms.
- Synonyms.
- Semantic relationships (word association/collections).

3. Sentence Level clues:

a) Sentence Level Grammar: knowledge of the syntactic properties of the TW sentence.

- Word order

b) Sentence Level Meaning:

i. Immediate Local Sentence Boundaries of the TW (Local Clues): resorting only to the TW's sentence.

- Pointing to specific words in the sentence.
- Resorting to definitions or descriptions.
- Using a part or phrase of the sentence.
- Using the meaning of the whole sentence.
- Using sentence conjunction.

ii. Distant Global Sentence Boundaries of the TW (Global Clues): using sentence beyond the TW sentence:

- Backward sentence + the TW sentence.
- TW sentence + Forward sentence.

c) Punctuation: Knowledge of the rules of punctuation of the TW sentence.

4. Discourse Level clues:

a) Paragraph Knowledge (Discourse Meaning Level):

i. TW paragraph: using the paragraph containing the TW.

- Using the location of the TW sentence as a topic sentence (clue) for the paragraph.
- Using the TW sentence and its whole paragraph

b) Formal Schema: Knowledge of the macrostructure of the text types, text patterns and organization.

B. Non-Linguistic Sources

World Knowledge: using one's general knowledge of the world (cultural knowledge, beliefs, values, factual information and their personal experience).

- Topic Knowledge.
- World Knowledge.

Next, I began to organize and classify the LIFSs in terms of their function as to how learners used and applied different strategies to make use of the various KS clues as displayed above. The data revealed that participants applied various strategies through using both linguistic and non-linguistic clues they located or activated in the texts. For example, learners would use a sentence level clue to either to infer the meaning of a TW (Meaning-Focused Strategy) or to check their guess (Evaluating Strategy) or notice if their guess distorts the TW sentence (Monitoring

Strategy). As with the KSs, LIFS were coded through an abductive approach through adapting Hu and Nassaji's (2012; 2014) taxonomies and using codes generated from my data. The rationale behind this was to capture all the strategies participants employed to constitute a taxonomy of LIFSs. The four main strategy groups are defined in Table 3-12 while a detailed view of their sub-strategies is displayed in Table 3-13. In the following chapter, each strategic category and their sub-strategies are presented along with examples from the data

Table 3-12 Lexical inferencing strategy categories and definitions

Stagey type	Strategy	Definition
Cognitive Strategies	**Meaning-Focused Strategies**	These are the strategies that are based on the contextual clues in the text itself or non-contextual clues (world knowledge).
	Form-Focused Strategies	These are strategies that are based on the TW's word form.
Metacognitive Strategies	**Monitoring Strategies**	These are strategies that are applied to indicate learners' awareness of the inferencing task.
	Evaluating Strategies	These are strategies that are applied to verify or examine the generated meaning of the TWs.

Finally, regarding the themes that emerged from the semi-structured interviews they revolved around three major themes; judging the importance of UNW, intentional vocabulary learning and the nature of learners' reading texts. These are discussed and illustrated in the following chapter (4.5).

Table 3-13 A taxonomy of lexical inferencing strategies and sub-strategies

A. Cognitive Strategies

1. Meaning-Focused Strategies:

- Using textual clues.
- Using vocabulary Knowledge.
- Using prior world knowledge.
- Replacing the TW with the guess in English/Arabic to see fit it fits the meaning.

2. Form-Focused Strategies:

- Repeating.
- Analysing.
- Associating.

B. Metacognitive Strategies

3. Monitoring Strategies:

a) Suspending judgment (skipping):

- By the learner:
  - with a guess.
  - without a guess.
- By the researcher after reminding learners of skipping
  - with a guess.
  - without a guess.

b) Reattempting.

c) Noticing the guess distorts the meaning of the TW sentence.

d) Stating failure/difficulty of inferencing.

4. Evaluating Strategies:

- Commenting and elaborating.
- Inquiring:
  - Inquiring about the TW.
  - Inquiring about their inferences.
- Checking the guess:
  - Falling on their world knowledge or experience of the topic.
  - Resorting to textual information.
  - Replacing the TW in the sentence with a guess in English/Arabic.
  - Replacing the TW with one guess out of two in English and choosing between them.
  - Replacing the TW with a guess and rejecting it since the guess is already in the TW sentence.

3.10.6 **Data analysis representation**

Qualitative research reporting is characterized by more freedom, diversity and disagreement than its quantitative counterpart (Dörnyei, 2007). In other words, there are no fixed formats or templates of how studies should be reported. Miles and Huberman (1994:229) refer to these as 'canons' that "as qualitative data analysts, we have few shared canons of how our studies should be reported". Cohen *et al.* (2018) list seven way of organizing and presenting data; by responses either by individuals or by groups, by theme (issue), by research questions, by instrument, by cases or by narrative (chronological, logical, thematic analysis) stories about the research findings. At the level of case studies, there are diverse ways in which themes or issues can be presented. Themes can be organized chronologically, analysed across cases for similarities and differences or presented as a theoretical model (Creswell and Poth, 2018). In this study, the findings are presented in terms of the research questions into; qualitative and quantitative results. The qualitative findings answer the first research question in Chapter 4 while the quantitative findings for the second and third research questions are discussed in Chapter 5. This helps draw together all the relevant data from the data collection instruments and highlights the research questions to the readers before presenting the findings (Cohen *et al.*, 2018). Within each of these chapters, a second layer of data organization in terms of the KS clues, LIFSs and semi-structured interview themes are applied.

In the current study, LIFSs and KS clues used by the 3 proficiency groups and reading texts are presented in figures and tables (Chapter 5). The advantage of such a method is that it "groups the data and enables themes, patterns and similarities to be seen at a glance" including differences (Cohen *et al.*, 2018:661). Dörnyei (2007:297) suggests that in longer works such as postgraduate thesis/dissertations, dividing/separating the findings from discussion into different chapters than merging them into one "might add to the clarity of the presentation of the findings if we divide the Results and Discussion into thematic chapters in which the various phases of data analysis are described together". Thus, after presenting the results of each research question, a single separate discussion chapter is followed in which themes and their findings are presented and discussed across the 3 groups in terms of topic familiarity and linked back to the literature and theoretical framework.

In multiple case studies, there are two types of analysis; with-in case analysis and cross-case analysis (Duff, 2008; Yin, 2014; Merriam and Tisdell, 2015). The first is a detailed description of participants in each case (proficiency group) as a whole, followed by the second where the different cases (groups) are compared between each other (as a whole) for similarities and differences (Johnson and Christensen, 2016), both are used in this study. The current study aimed

to triangulate the data obtained from participants' TAs, ISRs and semi-structured interviews with their inferencing scores (successful and unsuccessful) on both texts to further explain why such KS clues and LIFSs were used with such responses.

3.11 Inter-rater reliability

Regardless of the coding scheme used, "it is essential that researchers calculate and report inter-rater-coder reliability on at least a subset of think-aloud data" (Bowles, 2010:136). In the current study, in order to establish inter-rater reliability in coding the clues along with their KS, LIFSs, inferencing outcome responses in the verbal reports (TAs and ISRs) and interviews, transcripts were randomly selected and printed (codes were used for participants). They were given to a second rater, who is a PhD student at the faculty of Humanities. This student, who had some experience with coding in his own research, was given a copy of the codebook (which I had generated in Nvivo) and the description of response criteria for the outcome of responses (correct-partially correct-incorrect response). The rater was instructed to read and identify the outcome of inferencing response scores, KS clues and LIFSs according to their definition in the codebook. Inter-rater reliability agreement between the two protocols was 94%.

Inter-rater reliability was also carried out for grading participants' inferencing responses (answers) to the TWs. After I had graded these responses, results were entered into an excel sheet. Due to the small sample size (15), number of TWs in each text (8) and to further ensure the reliability of scores, I decided to have all the TW responses rated by the same rater.A percentage-agreement figure was calculated due to its advantages as being easy to calculate, explain, and having a strong intuitive appeal (Stemler, 2004). Through percentage agreement, it was found that there was a high average agreement of 93% for each text between raters. Kappa Measurement of Agreement (Cohen, 1960) was used to estimate the portion of agreement between the two raters which takes into account the amount/degree of agreement that might have occurred by chance (Pallant, 2016). The statistical analysis was ran through using IMB SPSS Statistics software, version 24. The outputs for measuring the agreement between raters are displayed in Table 3-14 and Table 3-15, which lies between 0.858 and 0.865 with a significant of $p < .005$.

Table 3-14 Kappa Values for Eid Al-Fiter (Text 1)

Symmetric Measures for Text 1 Eid Al-Fiter

		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Measure of Agreement	Kappa	.858	.043	12.020	.000
N of Valid Cases		120			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Table 3-15 Kappa Values for Bonfire Night (Text 2)

Symmetric Measures Text 2 Bonfire Night

		Value	Asymptotic Standard Error[a]	Approximate T[b]	Approximate Significance
Measure of Agreement	Kappa	.865	.042	11.086	.000
N of Valid Cases		120			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

In terms of interpreting the Kappa results, there is a wide variation in its interpretation, thus serval proposed attempts have been made to assign meaning to calculate Kappa values (Gisev, Bell and Chen, 2013). However, the most compressive and widely cited interpretation is the one prosed by Landis and Koch (1977), where Kappa values between 0.081-1 indicate an almost perfect agreement between the two raters. Since the Kappa Measurement of Agreement between raters in both texts (0.858 and 0.865) lies within this range, thus a strong almost perfect agreement between the raters' scores of the target word responses for the texts. On the other hand, disagreement between raters on the remaining words where no agreement was found was resolved through discussion before finally agreeing on a unified score for these words.

3.12 Issues of trustworthiness

Researchers, regardless of their research stance need to ensure the quality and rigor of their work. In doing so, positivists stress two central concepts reliability and validity to strengthen the quality of their findings. The former refers to the consistency of methods while the latter determines whether the research truly measures what it was intended to measure, the truthfulness of the research results. However, these concepts stemming from a quantitative perspective may not be applicable to qualitative research for they "are viewed differently by qualitative researchers who strongly consider these concepts defined in quantitative terms as

inadequate" (Golafshani, 2003:599-600). In other words, since qualitative methods differ from quantitative ones in terms of methods used due to philosophical positions, there exists a need for a framework to establish rigor in qualitative research (Noble and Smith, 2015). Lincoln and Guba (1985) introduced the concept of 'trustworthiness' as an umbrella term for credibility, transferability, dependability and confirmability in qualitative research as substitutes for internal validity, external validity, reliability and objectivity existing in quantitative research. For qualitative researchers, trustworthiness is their answer to validity (Dörnyei, 2007) to evaluate naturalistic studies in which the underpinning function is "How can an inquirer persuade his her audiences (including self) that the findings of an injury are worth paying attention to, worth taking account of?" (Lincoln and Guba, 1985:290).

3.12.1 **Credibility**

Credibility or 'truth value' refers to the researcher's confidence in the truth of the findings. Lincoln and Guba (1985) list techniques to increase the credibility of the produced findings; prolong engagement in the field, persistent observation, triangulation, negative case analysis, peer debriefing, referential adequacy and member checking. Some of which were used in this study. First, prolonged engagement not only provides a researcher with an opportunity to build trust and develop a rapport with respondents (Erlandson, Harris, Skipper, Allen, 1993) but also to render him/her to detect and take account of multiple influences or distortions (personal, methods, respondents) that might impinge upon the issue investigated or creep into the data (Lincoln and Guba, 1985). Distortions, intended or unintended, can be introduced by the respondents. The former is intended to deceive or confuse while the latter, which is more likely to occur, like pleasing the investigator by supplying what he/she wants to hear and emotional distortion. (Erlandson et al., 1993). Credibility was fulfilled by spending enough time, nearly 3 months in which distortions due to the impact of my presence on the context, own biases and the effect of seasonal events (a 3-day sandstorm in the first month of data collection) were overcome.

Second, persistent observation was implemented, the purpose of which is to identify those features/elements that are most relevant to the problem or solving a particular issue by focusing on them in depth. For example, how intentional vocabulary learning became a theme in the current study and interviews (see 3.7.6). Prolonged engagement provided scope for the investigation while persistent observation provided depth (Lincoln and Guba, 1985). Triangulation was discussed under the study's research design (3.5) and how it would ensure a deeper understanding of the phenomenon in question through providing explanations from different angles/perspectives gathered by different data sources and methods. Triangulation is regarded as

the most well-known strategy to ensure internal validity (Dörnyei, 2007; Merriam and Tisdell, 2015).

Another method for ensuring credibility is negative (or deviant) case analysis, this involves searching for those cases within the study that either contradict or oppose patterns or explanations that emerge from the data. Therefore, researchers constantly refine their data generated hypotheses "until it accounts for all the known cases without exception" (Lincoln and Guba, 1985:309). This was first conveyed through taking account of all the deviant instances that emerged in the data in terms of KS clues and LIFSs used between learners and penetrating these deviant cases to find explanations for what was displayed in the data by some cases (participants or groups) in the literature.

Finally, member checks also called respondent validation (Merriam and Tisdell, 2015) is regarded as the most important technique to ensure credibility (Lincoln and Guba, 1985), where participants have a chance to confirm or clarify constructions made by the investigator. Maxwell (2013:126-127) reflects on its importance as:

> This is the single most important way of ruling out the possibility of misinterpreting meaning of what participants say and do and the perspective they have on what is going on, as well as being an important way of identifying your own biases and misunderstanding of what you observed.

The underlying principle is that the investigator returns to the participants in order to receive feedback on preliminary analysis or findings by clarifying their truthfulness with respect to their constructions, from the participants view, if not, then clarifying blurry issues or misunderstandings in the data. While I was still in the research field, member checks were conducted during all verbal report sessions and interviews through either summarizing what inferencing strategies, knowledge sources and contextual clues participants used. In addition to asking for further explanations (e.g., what do you mean? Can you explain this more?), quoting their exact words or paraphrasing them, explaining what I had understood by them, awaiting participants' confirmation or clarification. Member checking and triangulation might seem identical but in reality they are not. According to Lincoln and Guba (1985), the objective of member checking is carried out with respect to constructions made in terms of their accuracy. On the other hand, triangulation is a process carried out with respect to the data by checking one data source against other sources to judge the accuracy of the data.

3.12.2 **Transferability**

Transferability refers to the generalizability of results to other situations and contexts. Due to their philosophical stances, interpretivists oppose the existence of generalizations (as opposed to positivists), for observations are defined by the specific contexts in which they occur (Erlandson et al., 1993). They argue that as opposed to quantitative research, which depends on variables and scientific methods, the issue of transferability is difficult. Lincoln and Guba (1985:316) argue that transferability of results depends upon the similarity between contexts, thus a naturalist researcher:

> Cannot specify the external validity of an inquiry; he or she can provide only thick descriptions necessary to enable someone interested in making a transfer to reach a conclusion about whether transfer can be contemplated as a possibility.

These descriptions can range from the setting, participants, data to detailed descriptions of the findings with quotes from participants' interviews, documents, etc. (Merriam and Tisdell, 2015). However, Maxwell (1992) distinguishes two types of generalizability, internal and external with the former referring to the generalizability of a conclusion within the underlying setting or group, while the latter pertaining to generalizability beyond the group, setting, time, or context. According to Maxwell (1992), internal generalizability is typically more important to qualitative researchers than is external generalizability. In this current study, thick descriptions were details on how various decisions were taken through the stages of the research process; design, instruments, analysis and interpretations. Such effective descriptions draw readers vicariously into the context being described, allowing their personal self-reflection and experience to transfer to their contexts (Erlandson et al., 1993). According to Stake (2005:454), generalization takes place when:

> Researchers' narratives provide an opportunity for vicarious experiences, readers extend their memories of happenings. Naturalistic, ethnographic case materials, at least to some extent, parallel actual experiences, feeding into the most fundamental process of awareness and understanding.

Another technique is through purposive sampling, which was first used in the study's sampling procedure followed by stratified random sampling (3.6.3). For interpretivists seek to maximize the range of specific information (opposing repressiveness in random sampling) that can be obtained from and about a context, thus have a need to seek typical and divergent data to maximize the range of information about the context (Erlandson et al., 1993). For this purpose of transferability, Merriam and Tisdell (2015) suggest either a single case or a small purposeful sample is selected to

understand the topic in-depth as opposed to discovering what is generally true for many. As Wolcott (2005:167) points out, “every case is, in certain aspects, like all other cases, like some other cases, and like no other case”.

3.12.3 **Dependability**

Dependability refers to the stability or consistency of the inquiry processes used over time. Dependability mirrors reliability in quantitative research. In quantitative research, reliability is a critical element, for there cannot be validity without reliability, alternatively no credibility without dependability in qualitative research (Lincoln and Guba, 1985). Simply put, if validity is demonstrated then it is enough to establish reliability. However, this is opposed by Lincoln and Guba (1985), who propose that dependability (reliability) is to be dealt with separately, thus proposing the strategy of ‘*inquiry audit’,* commonly known as the *‘audit trail’*. Since this strategy can be used in both dependability and conformability to differentiate its role between them, it is called a dependability audit. Through an audit trail, qualitative researchers establish the rigor of their studies by providing details of the data analysis and decisions that build-up to the findings. An audit trail describes in detail how the data was collected, through what methods, how decisions were undertaken through the ongoing process regarding data analysis, and how categories were derived (Wolf, 2003; Merriam and Tisdell, 2015; Mertens, 2015). To construct an audit trail, Merriam and Tisdell (2015:252-253) advise the investigator to keep “ a research journal or records memos on the process of conducting the research as it is being undertaken”. The more consistent the researcher has been in this research process, the more dependable are the results (Williams, 2011). While some see this process as carried out by calling in an auditor to examine the process and products of the accounts (Lincoln and Guba, 1985), others view this in terms of the researcher, by keeping a record memo, field notes or research journal (Williams, 2011; Mertens, 2015) whist undertaking the investigation.

In this investigation, to establish dependability I have taken field notes during the verbal report sessions in which I would jot down keywords regarding what participants did in terms of their non-verbal behaviour, LIFSs and KS clues as they inferenced the meanings of the TWs while reading. This also included Nvivo created memos (3.10.3). In addition to my research journal, which contained personal reflections during the research process, instant ideas or insights that would suddenly appear while a participant was conducting her verbal report or while I was reflecting on decisions regarding the instruments, data collection, coding, analysis and interpretation. Such a strategy provides evidence for others (researchers and readers) to review and verify the path the investigator took from the raw data to reaching the final results (Wolf,

2003). If the researcher does not maintain any kind of audit trail, the dependability cannot be assessed and the trustworthiness of the study is diminished (Williams, 2011).

3.12.4 Confirmability

Finally, the last standard of trustworthiness is confirmability which reflects the extent to which the study's findings are due to the focus of its inquiry and not to the researcher's bias. In which some previously mentioned techniques, like audit trail and triangulation can also be used to ensure this objectivity. Another technique is keeping a reflexive journal (3.7.7) which supports all the four concepts of trustworthiness (Erlandson et al., 1993).

3.13 Ethical considerations

Ethics in qualitative research is more challenging than other types of research. For qualitative research methods aim to understand personal perceptions, beliefs or sensitive issues like sexuality or violence, all of which require establishing trust and rapport between the researcher and the participants (Dörnyei, 2007; Hennink *et al.*, 2020). In addition, individual research methods like audio/video recording and observation, which are used in this present study, raise issues in qualitative research (Webster *et al.*, 2014). Adhering to various ethical guidelines in the literature (Dörnyei, 2007; Creswell, 2012; Thomas, 2013, 2016; Cohen *et al.*, 2018), ethical considerations were addressed at an early stage in this study. This was fulfilled by gaining access approval from the targeted department on the one hand, while applying and uploading all the essential paperwork through the University of Southampton's ERGO online system.

Upon arriving at the research site during my first visit to classrooms, I introduced myself as a researcher and a faculty member at the university. I overtly explained the purpose of my classroom visit, research area and motivation for carrying out this research. I also indicated that the research results would be used in improving pedagogical approaches to improve reading skills, especially vocabulary related issues for L1 Arabic EFL university learners. Furthermore, participants would be able to view the complete research findings, if they were curious about the results. All the students were informed on how the research sample would be chosen, the type of language tests they would take, what would be asked of them if they were part of the research sample, their right to withdraw at any stage of the research and the benefits/rewards for taking part.

The chosen informants were given the Participant Information Sheet (Appendix R) in English to read and the opportunity to raise any questions or points, which were not fully understood by them before signing the Consent Form (Appendix S). Participants' privacy was maintained and

secured through two forms; anonymity and confidentiality, which requires researchers to separate participants' identities for their responses (Neuman, 2014). Participants' anonymity was maintained through pseudonyms, consisting of letters and number, whose identity was only known to the researcher. On the other hand, for confidentiality, the gathered information will only be used by the researcher who is also the only person who can track down its origins (the participants). As it was indicated on the research information sheet, that other researchers might be used for establishing intra-rater reliability of coding, in which participants' pseudonyms would be used. This was also orally explained in Arabic to the participants before signing the consent forms. Since audio recordings of females is still a sensitive issue in the Saudi context, it was crucial to explain how the confidentiality and anonymity of their recordings is maintained.

The location of carrying out the investigation was also considered, all the sessions with the informants were conducted in a well-lit air-conditioned office on campus, which was chosen due to its closeness, a 1-minute walking distance from the participants' department. This office was shared by close colleagues of mine and rarely used since its current members had administration duties carried out in other buildings or from home. To ensure that the office was vacant during my data collection sessions, I took the office hours of these members and did my best to choose participants who were free during those times. This was done through referring to the 'Participants Available Timing Sheet' (Appendix T) that I had formed in an attempt to manage the numerous sessions. This would serve as an input for the second daily table, 'Participants' Session Timing Sheet' (Appendix U), where a clean sheet would be used, week by week to arrange the meetings at the end of each day where I would confirm/rearrange tomorrow's sessions through WhatsApp messages with participants. This organization has been of great benefit regarding making use of time especially on one or two occasions where participants don't turn up for their sessions or apologize, I would then text participants who were free referring back to the availability timesheet.

It is worth mentioning that, during the 3 months of fieldwork, building relationships with participants, as I have come to discover personally, is critical to the success of data collection in case studies. Such relationships can be used to ensure the credibility of findings (internal validity), which is discussed in detail under trustworthiness. For this reason, a number of techniques were implemented. Right from the initial sessions, participants were treated as equals rather than 'subjects' (Hammersley and Traianou, 2012; Cohen *et al.*, 2018), I aimed to establish a friendly relationship with these learners, for not only do these learners have enough on their hands at the university, each one of them will meet me 5 times (signing the consent form, the 2 TA sessions, semi-structured interview and an optional session to check/see their answers) in between their lectures. This was for the sake of keeping participants eager to engage through different stages of

the fieldwork. Before beginning the TA sessions, I would ask participants how their day has been so far and if they had a test on that day, how did they do. I also ensured that they could ask me questions as well, which they did. Their questions ranged from asking about some language difficulties they faced, how to improve their English, my educational background and work experience at the university before beginning with the TA warm-ups. This can strengthen the researcher/researched relationship and create opportunities to share ideas and information (Savin-Baden and Major, 2013). To ensure that my participants were as conformable as possible during our meetings, I would always have some refreshments (biscuits, cakes, doughnuts, water or juice) on a table by the door. For I noticed in the initial sessions that some students, especially the morning sessions, would not have had breakfast. Sweets and water were always present in front of the participants during the sessions.

In addition to the previous details, my flexibility was also an element in terms of adjusting my meeting times with participants. At the end of every day, participants for the following day were contacted through WhatsApp Messenger to confirm their availability time depending on the information they filled in the availability form. Participants would either confirm, if not, suggest/ask for another time slot. There have been a number of times when participants would not show up but later would text to apologize, explain why they could not attend and suggest another time. In such cases, I assured them it was quite alright and plan another time. From that point, I decided to stay in the office from 7 am-3 pm every day and informed participants that if they suddenly had nearly an hour's worth of free time, they are welcomed to come to the office but must text me before so I can confirm/disconfirm the time. I was also considerate of a participants' well-being, if I noticed a participant was tired or was not in the mood during our friendly conversations at the start of the session (before the TAs) I would ask her if she wanted to continue or rearrange a better time. The two common responses were either they were hungry or have an exam later in the day or had just finished one or have one or tomorrow. These approaches helped me establish a strong rapport and bond with the participants, for "Trust is fragile, and the researcher must be extremely careful, for one mistake can instantly destroy trust" (Erlandson et al., 1993:134).

3.14 Summary

The first part of the chapter presented a detailed overview of the study's research design, it began with an overview of the study's research questions and objectives followed by the researcher's philosophical stance to the inquiry, Interpretivism. Next, the rationale for choosing a multiple case study approach for my methodological framework is discussed and justified. The discussion moves on to the current study's research design, an embedded mixed methods multiple case study and

why this design has been chosen before finally presenting the research site, participants and the sampling procedures used.

The second part of the chapter was devoted to the methods and data collection processes used, their underpinning rationales and how they were implemented in the study. This section also included reporting the findings of two pilot studies, their rationale, results and what lessons I have learnt from them. The final section of this chapter discusses the data analysis procedures beginning from data preparation to coding and analysis. This was followed by reporting the strategies that were taken to ensure the trustworthiness of the findings before concluding with the present study's ethical considerations.

Chapter 4 A Taxonomy of Knowledge Source Clues and Lexical Inferencing Strategies: Findings of Qualitative Data Analysis

4.1 Introduction

The results of this instrumental, explanatory and descriptive embedded mixed methods case study are organized into two chapters according to the nature of the data, qualitative and quantitative, for each research question. In Chapter 4, the findings from the qualitative data analysis are presented, followed by quantitative data analysis in Chapters 5 where; differences/similarities in terms of clues and strategies used between the 3 proficiency groups and cultural topic familiarity are presented.

In Chapter 4, qualitative results were obtained from triangulating the data collected through the different sources of research instruments; think-alouds (TA), immediate stimulated recalls (ISRs), semi-structured interviews and my field notes to address the first research question. The chapter begins with how the learners approached the target words (TWs) during the inferencing task and their motives behind this. Next, the following section describes in-depth all the different clues categorized in terms of the type of knowledge source (KS) they represent and their sub-clues that learners tapped into as they inferenced the TWs. This is followed by displaying and presenting the lexical inferencing strategies (LIFSs) categorized according to their function and sub-strategies learners resorted to as they made use of the clues they identified. Since the first research question aims at identifying the range of KS clues and LIFS displayed in the data, thus I was only concerned with identifying the range of clues and strategies that participants used as they uncovered the meanings of the TWs regardless of the outcome of responses (correct, partially correct, incorrect). A taxonomy of KS clues, LIFS and their sub-divisions used by participants in this study was presented in chapter 3 (Table 3-11 &Table 3-13). These KS clues and LIFS are outlined, discussed and illustrated through examples extracted from the triangulated data. Through presenting two reading texts, which differ in their familiarity to participants, the data attempts to answer the study's first research question:

1. How do Saudi Arabic L1 speakers majoring in English infer meanings of unknown words while reading?
   1.a. How do they approach the unknown words?

1.b. What are the range of knowledge clues do they tap into to uncover the meanings of the unknown words?

1.c. What are the range of lexical inferencing strategies do they resort to uncover the meanings of the unknown words?

4.2 Approaches to reading texts and target words

1.a. How do EFL learners approach the unknown words?

During the individual TAs, ISRs and through my field notes on what I had observed during these sessions, I noticed patterns in terms of how participants approached the texts and the TWs. In terms of approaching the text, all participants but one, B1-5 (see 3.6.3 for pseudonym identification), read Eid Al-Fiter (Text-1) silently. One explanation is that this learner had the lowest proficiency level of all the sample. During the TA sessions, while participants read silently, I would begin taking notes on how participants carried out the reading task. Some would place the pen under/or hover over each word as they read word by word, while others only used the pen to write their answers. More importantly, I was able to notice how participants approached the reading texts if they had read all the text before inferencing or not. Reading time was audio recorded during the TAs since recording began after the warm-up task was completed. Reading the texts took between 10- 15 minutes, if a participant finished reading too quickly, I would hypothesize that she did not read the text but instead stopped at the sentence of the first TW she encountered. This was confirmed by asking the participant if she had read the whole text after the ISR was conducted.

Participants varied in terms of deciding whether or not to read the whole text first before inferencing or just to begin inferencing immediately. In Eid Al-Fiter, only 8 participants of the sample initially read the text, 2 C1 learners (C1-2, C1-5), 3 B2 learners (B2-1, B2-4, B2-5) and 3 B1 learners (B1-2, B1-4, B1-5). The same number was also found for Bonfire Night; with 8 learners, 4 learners representing the C1 group (C1-2, C1-3, C1-4, C1-5), only one B2 learner (B2-4) and 3 B1 learners (B1-2, B1-3, B1-4) who expressed reading the whole text. While only 5 learners, C1-2, C1-5, B2-4, B1-2 and B1-4, reported reading both texts before inferencing.

Upon questioning the participants who did not read the whole text, various reasons were put forth by learners. Some learners reported they just skimmed for the TW sentence and read a sentence before and after it, as illustrated in the following excerpts.

1. **Example:**

R: You did not read the whole text, right? You kind of read until you...

C1-1: I started to read and then I looked for the words, that was it.

R: So you read the text the first time, or you just read until you reached that word (pointing to a TW) and then stopped?

C1-1: Yes.

R: So you didn't read the whole text?

C1-1: I would read a sentence before and after.

R: That's it? But you wouldn't read the whole text.

C1-1: No.

R: You just look at the underlined word?

C1-1: Yes.

This was also echoed by another C1 participant, Example 2, who reveals that she resorts to the initial part of the TW sentence until the TW itself to infer the meaning. If she is successful, she moves to the next TW word without continuing to read the remaining TW sentence. However, if she is unsuccessful, she completes the sentence.

2. **Example:**

C1-4: I just met the bold words, and then I looked for the full stop, before the bold. Like I know this is the start, and then read from the start till the bold word, if I understand them, that's it. If not I continue to the full stop.

Some participants reported immediately jumping to the TW and reading a little beyond it in order to see if the following part of the sentence is related to the TW or not.

3. **Example**

R: So you read the whole text?

B2-3: No. for example, this word, I read its sentence, and I read after it a little. To see it is related to it or not.

On the other hand, others explained that they only focused on the words required by the task, as the following example illustrates;

4. **Example**

R: Did you read the whole text?

B1-3: No.

R: Why not?

B1-3: (A)[3] Only the words that I have to get their meanings

Another reason for only focusing on the TW was due to the text's length, as participant B1-1 explains.

5. Example

R: Did you read the whole passage?

B1-1: No.

R: Why?

B1-1: It feels a bit long, but I just want to know the meaning of the words, so

R: So you stopped at the first word? You stopped at ((bonds))?

B1-1: I start from every full stop before the sentence. So like here this full stop then I started reading, to know the meaning of **((collaboration))**

R: That means you just read until here, and then you just kind of focused on the meaning, but you didn't read the whole sentence.

B1-1: yeah.

In terms of approaching the TWs, participants also displayed various patterns of behaviour as they approached the TWs once they began to inference the meanings, which was present in both the audio recording TA sessions and my notes during these sessions. There were mainly two approaches to the TWs, a linear ordered approach, which followed how the words were presented on the task, while the second was choosing any word to begin with. In text one, the majority of students began their task by starting with the first word **((bonds))** and gradually moving their way towards the list. However, during this approach, some would skip a word and move to the next or choose another word to work on. Only a handful of participants went through the TWs without skipping or choosing; C1-2 in Eid Al-Fiter while C1-3, B2-1, B2-5 and B1-1 for Bonfire Night.

4.3 Knowledge sources clues used during lexical inferencing

1.b. What are the range of knowledge source clues do they tap into to uncover the meanings of unknown words?

The second part of the research question aims to identify the overall spectrum of KS clues utilized by all participants regardless of their inferencing responses in the two texts. A total of 351

[3] (Arabic) = uttered in participant's L1, Arabic

instances of resorting to clues were coded in the verbal protocols as learners tapped into their language knowledge while engaging with the tasks. The findings displayed in Figure 4-1 illustrate that learners depended heavily on linguistic sources in the form of Sentence Level KS (62.39%), followed by Word Level KS (15.67%), then their Vocabulary Knowledge (14.53%) and seldom used Discourse Level KS (1.42%). Furthermore, learners resorted to the non-linguistic source, World Knowledge only 5.98% which was even more than Discourse Level clues.

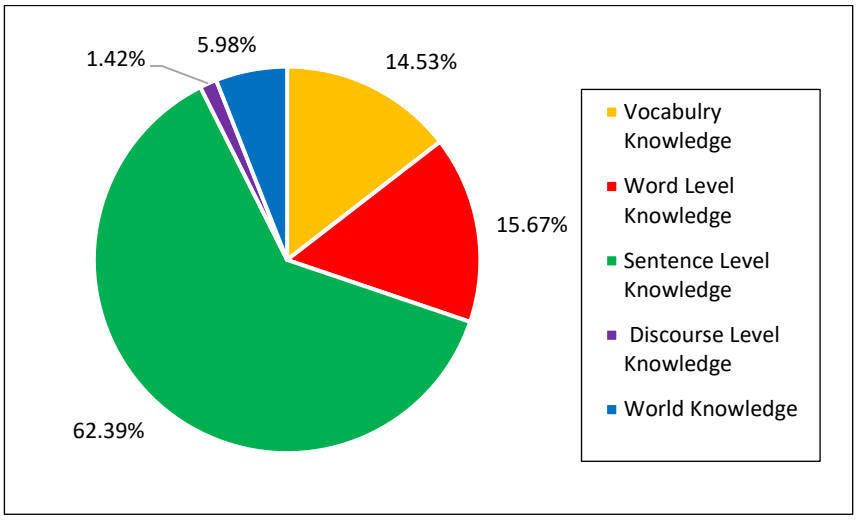


Figure 4-1 Frequency of the Knowledge Sources used for both texts combined

This taxonomy is illustrated by a description of each clue and its category, KS, followed by an excerpt from the verbal protocols (see Appendix V for transcription conventions). As previously mentioned, in some examples participants tended to use multiple clues and sources, thus an underlined bold utterance displays the type of clues and strategies used according to their classification subheadings in this chapter. In the following section, the knowledge sources here are listed beginning with the linguistic sources followed by the non-linguistic ones. Regarding linguistics sources, they begin with learners' Vocabulary Knowledge and gradually expanding as we move down the taxonomy until the non-linguistic sources.

4.3.1 **A. Linguistic sources**

As mentioned in the previous chapter (3.10.5), linguistic KSs include clues at the level of learner's vocabulary knowledge, word, sentence and discourse levels.

4.3.1.1 **Vocabulary knowledge sub-clues**

One of the main findings of the present study is how learners used their vocabulary knowledge as a clue while inferencing the meaning of the TW. In this current study, vocabulary knowledge

refers to the "size of vocabulary or the number of words the meaning of which one has at least some superficial knowledge" (Qian, 1999:515), i.e. vocabulary breadth. In the current study, participants used their vocabulary knowledge as a clue to compare the TW to words they already knew as part of their vocabulary knowledge. Sometimes, learners tapped into their vocabulary knowledge without checking their guess in light of the text. This knowledge source directly emerged from the inductive approach to the data and was used 14.53% which took one of the following forms;

A. Stating never seeing the TW before.
B. Stating not knowing the TW's meaning.
C. Stating encountering the TW before.

A. Stating never seeing the TW before.

Stating never seeing the TW before or that it is new was used as a clue by 1.14% mostly by 3 advanced learners, C1-1, C1-3, C1-5, and one B1-5 learner. In the following example, the learner indicates that the TW sentence is describing the people but she is still unable to figure out the meaning. After trying to generate a guess, she directly states that she has never seen the word before.

6. Example ((shrewd))

C1-1: It looks like a, describing a kind of people but I don't know the exact meaning of it. **Never seen it before**.

B. Stating not knowing the TW's meaning.

Stating not knowing the TW as a clue was used twice only by two advanced learners, C1-1 in Eid Al-Fiter and C1-5 in Bonfire Night, by.0.57%. When learners tapped into their vocabulary knowledge, they would try to search for the TW's meaning if they already knew the word. If they did not know the TW, they would state not knowing it and would begin to move away from their vocabulary knowledge clues and try to locate other clues as illustrated below.

7. Example ((rational))

C1-5: (A) this one I don't know, [[based on the]] read it please.

R: ((rational))

C1-5: [[explanation of the letter]] maybe here [[explanation]], maybe **(A)** (mofa9al) <*detailed*> explanation for what is in the letter.

R: What helped you to say **(A)** (mofa9al) <detailed>?

C1-5: [[explanation of the letter]], **(A)** yes because this has to be an adjective or something.

C. Stating encountering the TW before.

In instances when learners mentioned having encountered the TW before, it was applied through three main approaches, either by:

1. Stating hearing the TW before.
2. Stating previously encountering the TW.
3. Stating already knowing the TW's meaning.

1. In terms of hearing the TW before, there were only 3 instances (0.85%) which took one of the following forms; hearing the TW without ever seeing its written form before (Example 8), having previously heard the TW's stem (Example 9) and trying to recall the meaning upon hearing the TW before (Example 10).

Reporting having only heard the TW was only reported once (0.28%) by the most advanced C1-1 learner of the sample. In the following example, the learner compares the TW to the word *'cooperative'* but is however unsure. After asking if she has come across this word before, she explains that she has only heard the TW but never its written form.

8. Example ((co-operative))

C1-1: [co] [operative], I don't know, in my mind.

R: And what the word that you know?

C1-1: Cooperative, it's the same right?

R: Have you seen it written in this way or...?

C1-1: **I've never seen it, I only think I heard it but I have never seen it written.**

Reporting having only heard of the TW's stem was reported in Eid Al-Fiter by one learner, B2-4 by (0.28%) as illustrated in the example below.

9. Example ((Predominantly))

B2-4: This word also I think I can break it.

R: How would you break it?

B2-4: ((pre-)) and ((dominant)).

R: So what do you think it would mean?

B2-4: **I have heard of ((dominant)) but I am not sure of the meaning**.

In the beginning, the learner relied on dividing or in her own word 'breaking' the TW into a prefix and a stem as a clue (see 4.3.1.2 below). Upon asking the learner if she knew the meaning of the stem, she elaborates by tapping into her vocabulary knowledge that she has previously heard of the stem but not quite sure of its meaning.

Finally, the last sub-clue listed under previously hearing the TW was trying to recall its meaning upon hearing the word which was used by 0.28% again by the same learner and text in the previous example. In the following example, after the learner compares the TW to the stock of words in her vocabulary knowledge, she expresses that she has heard of the word before and is trying to recall its meaning. She was not even sure when asked if the TW sentence helped in recalling the word's meaning.

10. **Example ((devotion))**

R: So what do you think it might mean?

B2-4: I don't know yet.

R: Any ideas? Thoughts?

B2-4: **I have heard of it before, so I am trying to remember the meaning**.

R: Didn't the sentence help you?

B2-4: No… I don't know.

2. The second group of sub-clues under vocabulary knowledge was stating that the TW has been previously encountered by the learners. Here, participants tapped into their vocabulary knowledge of the word by stating they have encountered the TW though the following forms; they might have seen it before (Example 11), have seen the TW but are unsure of its meaning (Example 12), stating seeing negative meanings of the TW (Example 13) and indicating where they have encountered the TW in the four language skills (Example 14).

Only 3 learners, B2-3, B2-3 and B1-4, reported having previously seen the TW (0.58%) interestingly only in the familiar text. In the following example, the data showed that the learner resorted to comparing the TW to her stock of words in her vocabulary knowledge and also sentence level clues.

11. **Example ((bonds))**

R: You have the first word **((bonds))**, and why did you say that?

B2-5: **I think I have seen it before** and from the sentence also.

Only one instance of tapping into vocabulary knowledge but uncertain about the meaning of the TW was reported in the familiar text only by B2-3 (0.28%). This is illustrated in the following example where the learner only resorted to the vocabulary knowledge without using any clues in the TW sentence. The learner used her vocabulary knowledge in terms of encountering the TW but was unsure of its meaning without resorting to the TW's sentence.

12. Example ((bonds))

R: You have the word **((bonds))** left.

B2-3: **(A) I really didn't know** it, that strange. **I think I have seen it but nothing is coming out of my brain**. I feel it doesn't make sense.

Stating seeing negative meaning for a TW was used once (0.28%) only by C1-2. In her ISR, she elaborates that she had used her vocabulary knowledge as a clue as well as sentence level clues (see 4.3.1.3) to determine the TW's meaning as illustrated below;

13. Example ((shrewd))

C1-2: For the next one, **((shrewd)),** [[shrewd people]], **I feel like I have seen negative meanings of this word before**, but here it's, it basically gives the meaning, where it says [[shrewd people are those who have prepared early]], so right there, in this context, that what it means, <people who are early or prepared early>.

Finally, the last sub-clue under vocabulary knowledge as a knowledge source was indicating where learners have encountered the TW before in the four language skills. These clues were used only 1.42% by B2-1, B2-2, B2-3 in Eid Al-Fiter, while C1-1 and B2-3 used them for Bonfire Night. In the following example, the learner tapped into her vocabulary knowledge twice for clues, the first was stating hearing the TW but uncertain of its exact meaning. The second clue was stating where she has come across the TW which she explains was while reading novels.

14. Example ((impulse))

C1-1: ((impulse)), I have heard it before, I don't remember the exact meaning but it's probably like <on command> but like <without thinking>. This action happened on impulse without thinking.

R: Where do you think you have heard this word before?

C1-1: I've read it before, I've read novels and I've seen this word before.

R: So what did you say it meant?

C1-1: Like <taking action without thinking> (*writes down the meaning).

3. Finally, stating that they already know the TW before as a vocabulary knowledge clue, although they failed to do so on the pretest, was the last type of vocabulary knowledge clue found in this study. This was sometimes done without referring back to the text. Learners expressed previously knowing TW through the following sub-clues; previously knowing what it means (Example 15), knowing it as a stem without any affixes (Example 16), they know the TW but might have misread it (Example 17) the TW has a few meanings (Example 18), they can't remember the meaning (Example 19) or are unsure about it (Example 20).

The most frequently used clues here were expressing that learners already know what the TW means which was used 6.27%. This clue was used by all learners except B2-2, B2-3, B1-2 and B1-4.

In the extract below, when the learner was asked if any other words or clues guided her in inferencing the TW's meaning, she denied it because she already knew the meaning of the TW before. Although this TW was unknown in the learner's pretest and was also incorrectly inferenced on her reading sheet.

15. Example ((successively))

C1-5: This is like what I said [[they managed to smuggle large]], I don't know how to explain it to you in English, I will write it in Arabic.

R: If there are any words that helped you, underline them.

C1-5: (A) No, because **I know the meaning of this word from before.**

Learners also tapped into their stock of vocabulary knowledge when comparing the TW to words they already know through relying on the basic form of the TW, its stem without any affixes. This was only used twice (0.57%) by two learners from the same group, B2-2 and B2-3, both in the familiar text. In the example below, the learner compared the stem of the TW to the list of words in her vocabulary knowledge and also used sentence level clues (see 4.3.1.3) from the TW sentence. When asked if she had come across this word, she confirmed but only in terms of the stem without the prefix [in-].

16. Example ((indefinitely))

B2-2: Here I felt, it's (indefinitely) the same **(A)** (be al takeed) <definitely>. That it will definitely continue.

R: How did you know it means **(A)** (be al takeed) <definitely>?

B2-2: From [will] [continue to grow].

R: ((indefinitely)), you said it means <definitely>, have you come across this word?

B2-2: (A) yes, but without the [in-].

The data also revealed that learners might realize knowing a TW after reading it correctly. This was only used once (0.28%) by C1-3 in the familiar text as illustrated below.

17. Example ((co-operative))

C1-3: ((co-operative)), I don't know what that means [[displays of co-operative actions between family]], like hold on a minute... (*learner reads) it's a completely new word. I am gonna try to guess it.

R: So what are you doing to kind of guess?

C1-3: I read the lines before, (*learner reads). Like amm, **((co-operative))**, maybe, because here it says [[feelings of hate or anger disappear. Displays of co-operative actions]] like when they are just <helping each other>.

R: What gave you the sense that it means <helping each other> and you said that it's completely a new word for you?

C1-3: I **think I do know what it means. I just read it wrong.**

In the above excerpt, the learner initially declares not knowing the word and confirms this after reading the TW in the sentence. It seems that only when the TW is unknown does this learner attempt to inference rather than depend on her vocabulary knowledge. This has been confirmed and supported through her verbal report data. Upon providing an answer and asked about the clues she had used, the learner explains that she knew the word but had misread the word.

Another sub-clue under learner's vocabulary knowledge as a knowledge source during inferencing is acknowledging the TW has multiple meanings. Interestingly, there were only 3 instances (0.85%) of this clue used by the advanced C2-2 learner in both texts.

18. Example ((ties))

C1-2: Well starting with the first word **((ties))**, [[social ties are strengthened**]], so obviously ties has a few meanings** but here I think it means, <social ties> like relationships are strengthened. Because of the word [[social]] and [[strengthened]].

R: Ok you said the word relationships because you had the word **((ties))**, right? So you said **((ties))** has different meanings.

C1-2: So, I mean it could mean the clothing item, and then relationship wise, or like maybe like connection or something.

In the previous illustration, after reading the TW sentence, the learner tapped into her vocabulary knowledge and explains that **((ties))** has multiple meanings which she lists a few of when asked. She then narrows these meanings through resorting once again to the sentence and eliminating these multiple meanings before settling on one.

The last two sub-clues refer to the TWs which learners highlighted their knowledge of but either cannot remember/recall their meaning or were unsure of its meaning. The first type of clue was only used twice (0.57%), once by B2-5 who used it in the familiar text while B1-4 used it in the unfamiliar one (see example below).

19. Example ((predominantly))

B2-5: I think this word mean like it's not <obviously> but something like.

R: Why did you say obviously?

B2-5: Because it's talking about al Eid, it's [[a day for renewing family ties]]. It is not <obviously>.

R: Ok, so what do you think it means?

CB2-5: Maybe like, <the part>. **I know dominant but I can't just remember the meaning**.

In this example, after reading the sentence and generating a hypothesis, the learner resorts to her vocabulary knowledge and states she knows the TW's stem but is unable to recall its meaning. Finally, the last clue in this KS which is similar to the previous one but in this clue learners were

unsure about the generated meaning of the TW. This clue was used only once (0.28%) by one advanced learner C1-3 in the familiar text.

20. Example ((innovate))

C1-3: ((innovate)) is like when you make something new, like to do something <new>? ((innovate)). [[innovate ideas for their homes]]. (*writes down the meaning).

R: What kind of helped you to guess that it's <new>?

C1-3: **I think I know the meaning**. **(A)** Insha Allah (I hope) I know the meaning.

In the above example, although the learner read the TW's sentence but when asked about the clues she used she replied already knowing the word but was unsure of its meaning. Although she failed to provide the TW's meaning on her pretest, she writes down the meaning although she is unsure of its meaning in her vocabulary knowledge.

4.3.1.2 **Word level knowledge sub-clues**

Word level clues refer to clues, morphological or semantics, which are associated with the TW itself that learners used/activated from their knowledge of morphology or semantics (meaning). A list of these categories and their sub-clues that emerged from the data are listed below:

A. Morphology level clues:
   - A1. Word parts clues (prefixes–stems).
   - A2. TW's part of speech.
   - A3. L2 perceived near homonymy (word form).

B. Meaning level clues:
   - B1. Antonyms.
   - B2. Synonyms.
   - B3. Semantic relationships (word collocation –word associations).

A. Morphology level clues:

At the TW morphological level, participants made use of their morphological knowledge of the target language (TL). More specifically, their knowledge of word parts (stems and affixes), parts of speech and homonymy (word form).

A1. Word parts clues (prefixes–stems)

When participants morphologically analysed the TW's word parts, they identified two clues two. The first was highlighting the prefixes attached to the TW (Example 21) or resorting to TW's stem (Example 22).

21. Example ((inescapably))

C1-3: ((inescapably)) is like when there is <no exit>. I know [[escape]]and I know that **[[in]] is like when you reverse something**, that's what I have.

In this example, the learner C1-3 used her knowledge of the prefix '***un-***' and provided its meaning. She also stated knowing the base of the word and was able to add the meaning of the prefix to the word's stem. These clues made up 0.85% of the 351 clues used by only 3 advanced learners, C1-5 and C2-1 in the familiar text while C1-3 in the unfamiliar one. They were also the least used clues at the morphological level of the TW.

Learners also resorted to focusing on the stem of some TWs and ignoring their prefixes which was resorted to much more than using prefixes as a clue (Example 22). This clue was the most frequently used clue in both texts at the morphological level, composing 7.98% and resorted to by all learners except C1-5, B1-1 and B1-5.

22. Example ((undeniably))

B1-4: (A) Actually, **it may be <deny> which came to my mind.**

From the example above, the participant was able to propose a meaning for the TW **((undeniably))** though focusing on the stem of the word without referring to the prefix ***'un-'*** during her ISRs.

A2. TW's part of speech clues

Learners also tapped into the TW's word class in order to guide them to generate a meaning for a TW. These clues were found in both texts only by 2 learners, B1-1 in both texts and C1-5 only in Bonfire Night, and represented only 1.42% of all the clues used. In the extract below (Example 23), although this B1-1 learner did not know the TW's part of speech but through analysing its function is the sentence she labelled it as an adverb.

23. Example ((predominantly))

B1-1: Well for this word, **I know it's an adverb, I think, or an adjective**? Maybe it is like <basically>? This word

R: Ok, what gave you the sense?

B1-1: Because the author is describing what is happening, so I think the best word is <basically> like he is just describing it in a basic way. So it feels it goes with it.

R: What helped you to kind of guess <basically>?

B1-1: First because I felt it's like an adverb. So it feels like it goes with <basically> coz it's also an **adverb and here he is just describing, it feels like it's not a new adjective or something.**

A3. Learner's perceived near homonymy (word form)

Some authors have distinguished between ***homographs***, words with the same written form and

homophones, with the same spoken sounds but different spelling (Saeed, 2016). In this study, perceived near homonymy will refer to clues in which EFL learners used their knowledge of phonetic or orthographic similarities between the TW and other familiar words they generated. Thus, assuming they are either perceived homographs or homophones. The data revealed that these clues were used 1.99% by only 6 learners; B2-2, B2-4, B2-5, B1-1 and B1-2 in the unfamiliar text while only B2-3 in the familiar one. Interestingly, all advanced C1 learners refrained from resorting to these clues. The data showed that in some cases, homonyms were helpful clues (Example 24) while the opposite in others (Example 25).

24. Example ((motive))

B2-4: Ok, the first (**(motive)), I think it came from the word motivate**, so I think it means this.

R: So what do you think it would mean?

B2-4: Like <purpose>, I think.

On the other hand, this clue did not always lead to successful inferencing as illustrated below.

25. Example ((bulky))

B2-5: Here it might mean **(A) (**blok**)** <bricks>.
R: Why did you say **(A)** (blok) <bricks>?
B2-5: (A) may be the word <blok> (bricks). (*draws a line to break the word).
R: Ah... so you divided the word?
B2-5: Yes... here [[large **(A)** (blok) <bricks> barrels]], I think it means like a barrier.

In this previous example, B2-5 depended on the phonetic similarities between the TW's stem in English and a close Arabic word which means *'red building bricks'*. Thus, leading to an incorrect meaning.

B. Meaning level clues:

At TW meaning level clues, participants used their knowledge of lexical relationships of the TWs in the form of antonyms, synonyms, semantic relationships (word associations/collocations).

B1. Antonyms

This clue was the lowest meaning level clue used (0.28%), for it was used once by the dominant C1-2 in the unfamiliar text. In the extract below, the learner used her knowledge of antonyms as a clue. Her verbal report reveals she also used her vocabulary knowledge in terms of knowing the opposite of the word as a clue, too.

26. Example ((inescapably))

C1-2: ((inescapably)), I know that it means, **like the opposite of [escapable], like <can't escape>.**

R: And how did you know what? Do you know it from before?

C1-2: Yeah but here it means like [[a lot of people would have lost their lives if Monteagle had kept the letter]]. So they wouldn't have been able to escape their death coming because he will do it.

R: So what would you think, **((inescapably))** means?

C1-2: [as a result] or [unable], not [unable], they <wouldn't be able to escape their death>.

B2. Synonyms

Synonyms are different phonological words that have the same or very similar meanings. Interestingly, this clue was used only twice (0.57%) once per text, only by the most proficient learner in the sample, C1-1.

27. Example ((desert))

C1-1: [[had to **desert** a guy in the cellars]], **I know this word, it's like another word for** <abandon>.

On the pretest, this learner knew the word TW ((abandon)) and thus it was replaced with another TW ((desert)). In this example, the learner explains that she not only tapped into her vocabulary knowledge stock but also knew that the TW **((desert))** is also a synonym for the *'abandon'*.

B3. Semantic relationships (word collocations–word associations)

Since the focus of this current study is to identify the clues and KSs used more than word relationships between the TWs and participants' generated responses [4] Thus, semantic relationships was an umbrella term to cover word collocations and associations found in the data between the TWs and the other words learners generated as clues while they inferenced. Word collocations "are combinations of words which occur naturally with greater than random frequency" (Lewis, 1997:25). Lewis (1997:25) further adds that collocation is a linguistic feature not thematic, in other words, "Collocation is about words which co-occur, not ideas or concepts" In this study, only lexical collocations were used 1.71% and were resorted to only in the familiar Eid Al-Fiter text, by 6 learners; C1-5, B2-1, B2-3, B2-4, B2-5, B1-3.

28. Example ((social))

[4] These generated words were checked through Sketch Engine (https://www.sketchengine.eu), an online website that enables researchers to search for word collocations in different languages and corpuses, for this study, the Britch National corpus (BNC) was used. On the other hand, word associations were checked through and Word Association Network website 9 https://wordassociations.net/en).

R: So what are you thinking of, what's in your head related to that word?

C1-5: (A) Trying to find any word, or thinking what is celebrating Eid other than the people, [social] what? **Media?**

[Social media] No it has nothing to do with it.

In the above example, the learner was trying to activate a network of words related to the TW **((social))** which are appropriate for the Eid Al-Fiter context. She brings forth the collocation *'social media'* but then rejects it since it does not fit with the ideas of the text.

Learners also used word associations, "links that connect or relate words in some manner in a person's mind" (Schmitt and Meara, 1997:20) with the TWs as a clue by evoking other related words in their mental lexicon. Word associations were used by 0.58% only in the familiar texts by 3 learners, C14, B2-2, B1-1, who used word associations as clues to inference the meanings of the TWs. In the example below, the learner associated the TW with the concept of attachment through illustrating this with an example of her phone before writing down *'attachment'* as her answer.

29. **Example ((bonds))**

C1-4: It means like, <something connected> me with the environment. People, things like I have strong **((bonds))** **with my phone my phone really, I feel like it's my child**.

4.3.1.3 Sentence level knowledge sub-clues

Participants also made use of clues beyond the TW word level in the form of sentence level clues according to their grammar, meaning and punctuation. The clues are categorised into 3 main types as follows:

A. Sentence level grammatical clues:
   A1. Word order.
B. Sentence level meaning clues:
   B1. Local clues.
   B2. Global clues.
C. Punctuation.

A. Sentence level grammatical clues

Under sentence grammatical knowledge, only word order was found to be used twice as a clue (0.57%) by two learners, B2-5 in the familiar text while C2-2 in the unfamiliar one. In the example below, B2-5 used the word order of the TW sentence in order to infer the meaning of the word **((predominantly))**. By using her knowledge of the word order in English, she was able to point and work out that the TW is referring to Eid Al-Fiter.

30. Example ((predominantly))

B2-5: Maybe it's just the meaning of Eid.

R: So you're saying this [[is]] refers to Al-Eid?

B2-5: Yeah.

R: So what could it mean?

B2-5: **Like this word (*points at) [[is]], is describing this one (*points at the TW)**

R: Ok, so the whole word describes Al-Eid, right?

B2-5: Yes

R: So what do you think it is saying about Al-Eid?

B2-5: Like it is saying, the most important thing in Al-Eid, or what's coming on Al-Eid is like.

B. Sentence level meaning clues:

As for sentence level meaning clues, they were classified into two main categories; local and global clues. Local clues refer to the clues that learners tapped into only within the boundaries of the TW sentence. As opposed to previous LIFS studies that have looked at clues while inferencing, this current study goes beyond only classifying them into local clues but further identifies the type of sub-local clues used. The data showed that at local sentence level, learners made use of the following sub-clues:

1. Pointing to specific words in the sentence.
2. Resorting to definitions or descriptions.
3. Using a part or phrase of the sentence.
4. Using the meaning of the whole sentence.
5. Using sentence conjunction.

1. Pointing to specific words in the sentence

One of the local clues that learners mentioned in their verbal reports was pointing to specific words in the text as a clue by 12.82%. This clue was used by all learners in both texts regardless of their proficiency levels as illustrated below. In the excerpt below, the learner points to a specific word within the TW sentence, [[ideas]], as a clue to generate her guess.

31. Example ((innovate))

C1-5: The next, [[people but to clothes, innovate ideas]], [[<create> ideas]].

R: Why did you say <create>?

C1-5: Because of the word **[ideas]**, what are they doing.

2. Resorting to definitions or descriptions

The next local sub clues used were resorting to definitions or descriptions in the TW sentence, which was only used by 1.99%. These were only used in the familiar text by C1-1, C1-2, B2-2, B1-1, B1-2, B1-4 and B1-5.

32. Example ((shrewd))

C1-2: For the next one, **((shrewd))**, [[shrewd people]], I feel like I have seen negative meanings of this word before, but here it's, **it basically gives the meaning, where it says [[shrewd people are those who have prepared early]], so right there, in this context , that what it means**, [people who are early, or prepared early].

In the previous example, this advanced learner, who is the second in line in proficiency, explains that she used the definition of the TW in the text. This definition explains shrewd people and writes down her answer as *'well-prepared people'*.

3. Using a part or phrase of the sentence

The most frequent type of clue resorted to was using a part or phrase of the TW sentence which was used by nearly 24.79% by all learners in both texts. In the following example, the learner explains that her guess was based on only referring back to the first part of the sentence before the TW

33. Example ((induces))

R: Why did you say **(A)** (ya7oth) <urges>?

B1-3: (A) Because of the sentence [[since a lot has to be done before this day, this induces]], so this **(A)** (ya7oth) <urges>.

4. Using the meaning of the whole sentence

In addition to the previous sub-local clues, the data revealed that Arabic learners also used the meaning of the whole TW sentence as a clue while inferencing the TW. This was the second most frequently used clue after using a part or phrase of the TW sentence and used 17.38%. Furthermore, it was used by all learners except C1-3 in both texts. In the following example, the learner explains that she had relied on the whole meaning of TW's sentence and points to it.

34. Example ((infer))

B2-2: Because he said [[to find out, we need to go back in time and infer what happened then]], to <make sure> what happened in the past**.** (*writes down the meaning).

R: What helped you in the sentence?

B2-2: From here, [[to find out]] like the whole sentence.

5. Using sentence conjunctions

Finally using sentence conjunctions which were used only by 3, advanced learners, C1-1, C1-2 and C1-3, in the familiar text (0.85%). These learners made use of their knowledge of the conjunction 'or' in the following sentence:

Since a lot has to be done before this day, this **yields** or prompts the need for early preparations, which start in the last week of Ramadan.

In the following example, C1-2 explains the lack of synonyms for the TW but through knowing the meaning of the conjunction 'or' was able to generate a guess.

35. Example ((shrewd))

C1-2: I don't know, I am not too familiar with the different meanings for it but in this particular paragraph or sentence, it shows me the meaning, where it says [[or prompts]], so like just in case, I am not sure about the meaning, I can just look over where it says **[or] coz that basically a synonym**.

Learners also used global clues in which clues that are located beyond the TW sentence were used. These clues took two forms; ***backward clues and forward clues.*** Clues located in a preceding sentence of the TW sentence are known as ***backward clues*** (Example 36) while clues located in the following sentence after the TW sentence are ***forward clues*** (Example 37). Learners used backward clues by 3.13% which were more than forward clues that were only tapped into by 0.57%. Backward clues were used in both texts by all learners regardless of proficiency levels except by C1-1, B2-2, B2-3, B2-4, B1-1 and B1-2.

36. Example ((devotion))

R: Why did you say **(A)** (mo5'talef) <different>?

B1-3: (A) Because of the previous sentence. [[Eid Al-Fiter differs from any other breakfast during the year]].

R: So you mean that **((devotion))** means from the previous sentence <different>? (*writes down the meaning). Ok, so here you depended on the previous sentence and not the same sentence that has the word?

B1-3: (**A**) **Yes, I also did. I did, on the sentence that has** [[a sense of devotion]].

In the previous example, the learner clarified that she not only found clues within the boundaries of the sentence of the TW but also used the previous sentence as a clue while inferencing.

On the other hand, sentence global forward local clues were only found twice in the data, once in each text by two advanced learners, C1-2 and C1-5. In Example 37, the learner explains that in formulating her guess, she used the sentence following the TW sentence. This forward sentence pictures the gunpowder barrels covered with firewood and straw which the learner used and writes her answer for the TW as *'hidden'*.

37. Example ((bulky))

R: So what do you think ((bulky)) means?

C1-5: (A) <hidden>, because here it says [[were covered]], so that they found it. It was hidden and [[covered with firewood and straw]]. (*writes down the meaning).

R: So write <hidden> and put a line.

C1-5: **Even if it was in the following sentence,** it's normal?

R: Yes, even in the following one.

C. Punctuation.

Finally, punctuation was used only once (0.28%) by one learner in this study, B2-3. This learner surprisingly inserted her own comma on the reading sheet to help comprehend a TW sentence she struggled with.

38. Example ((bonds))

R: So what would you put?

B2-3: (A) Even if I wanted to create anything, what is [[social bonds are strengthened]]? [[everyone]]? And [[social bonds]], how can this be?

R: Do you mean that you can't say everyone and social bonds?

B2-3: (A) I mean [[and social bonds]] should be a sentence on its own, right? Not everyone and something else. **I mean here there, (*places a comma), should be a comma, that this is a sentence on its own.**

4.3.1.4 Discourse level knowledge sub-clues

At discourse level, participants made use of their knowledge about the relationships and meanings beyond the TW sentence level. In other words, their knowledge about the discourse structure, organization and relationships with the parts of the text through the following type pf clues;

A. Paragraph knowledge clues:
   A1. Using the location of the TW sentence as a topic sentence of the paragraph.
   A2. Using the TW sentence and its whole paragraph.
B. Formal Schema.

The data revealed that two TW paragraph level discourse clues were identified which made up 0.57% of the total of clues used. The first clue was using the location of the TW sentence as a topic sentence (Example 39) while the second was using the whole TW paragraph as a clue

(Example 40). Interestingly, these clues were used only once by the advanced proficiency learner, C1-2 only in the familiar Eid Al-Fiter text.

39. Example ((substantially))

R: Next you have, **((substantially))**, which you said it means <overall>.

C1-2: <overall> yeah I feel like <overall>, **also the fact that it's the beginning of the first sentence of the paragraph also makes sense, to the meaning, too**.

R: That it's <overall>?

C1-2: That it means <the overall>, or kind of yeah.

R: So because it's the first sentence of the paragraph? What does that mean?

C1-2: Like I feel it makes sense, for it to be in the beginning because it's ... Coz I know it means <overall> or **like the main, kind of the main idea of the paragraph**.

Here, the learner justified her answer by resorting to the location of the sentence of the TW, which happens to be the first sentence in the last paragraph of the Eid Al-Fiter text. Through her knowledge of discourse structure, she states that it is the main idea of that paragraph, i.e. the topic sentence.

40. Example ((fondness))

C1-2: [[sense of fondness in terms of shared feelings, traditional costumes and customs]], for this one, umm, **I looked at the sentence also, then kind of the whole paragraph, this paragraph because I feel like it just ties together with meaning.**

R: For this word, you looked at the whole paragraph?

C1-2: Yeah coz I feel like it is expressed earlier and then, it goes back to... **I feel like it's expressed in a few of the sentences.**

The second type of sub-discourse level clues was resorting to the texts' formal schemata, knowledge about the rhetorical organization and underlying structure (see 2.5.1.2). Using formal schema was only found in the unfamiliar text by 2 B1 learners, B1-1 and B1-5, which made 0.85% of the total of the clues used.

41. Example ((infer))

R: Why did you say **(A)** (yektashef) <discover> or (yet3araf) <to know>?

B1-5: (A) Because here, **the beginning of the story**, is unknown, and then here, what happened to the burning man? Then [[to find out, we need to go back in time]], we must go back in time, or [know] to [discover] what had happened during that time.

Both learners used their knowledge of the story structure for the TW **((infer))** in the unfamiliar Bonfire Night text. In the example above, the learner reported that since it was a story, then every story has a beginning and generates her answer as *'discover or to know'*.

4.3.2 B. Non-linguistic sources

These refer to clues beyond the text which in this study derived from either topic knowledge of the reading text or world knowledge. In this study, world knowledge clues represented 5.98% of the total of the clues used during inferencing. Participants also made use of their knowledge/experience about the topic of the text (Example 42) and their general knowledge about the world (Example 43) while inferencing the TWs. World knowledge was used by all learners except C1-3, C1-5, B2-1 and B1-2. Furthermore, it was tapped into more in the familiar text as illustrated in the following example:

42. Example ((innovate))

R: Then you have this word, **((innovate)),** what do you think it would mean?

C1-4: <came up with new ideas or new things>, you know because it's Eid, people come visit me and of course they want to see something new, and something sweet, especially for this day.

This learner tapped into her cultural topic knowledge regarding Eid Al-Fiter's traditional preparations and also reflected on her experience of what happens on that day. On the other hand, others resorted to their own world knowledge. For example, C1-2 explained that she had generated her answer as *'discussion'* for the TW **((debate))** based on some inconstancies people share regarding historical events or knowledge which is still true in today's world.

43. Example ((debates))

R: For the word **((debates))**, you said what helped you in the sentence to say it meant <discussions>.

C1-2: Basically like, the last section, so I feel like with history things like that, not everybody is going to go with the story they've been told.

4.4 Lexical inferencing strategies and their sub-strategies

1.c. What are the range of lexical inferencing strategies do they resort to uncover the meanings of the unknown words?

The final part of the first question research aims at identifying the range of lexical inferencing strategies (LIFSs) that participants used regardless of their responses. These strategies were built on the clues that were identified in the verbal protocols, where a clue can be applied either as a

single strategy or as part of a combination of strategies. As mentioned in 3.10.5, learners applied various strategies to the clues they located. The data revealed that participants applied various strategies through using both linguistic and non-linguistic clues they located or activated in the texts. For example, learners would use a sentence level clue to either infer the meaning of a TW (Meaning-Focused Strategy) or to check their guess (Evaluating Strategy) or notice if her guess distorts the TW sentence (Monitoring Strategy). In the current study, a total of 758 instances of strategy usage were identified in the participants' verbal protocols.

At the strategy level, Cognitive Strategies, Meaning-Focused and Form Focused Strategies, were more frequently used than Metacognitive Strategies, Monitoring and Evaluating (Figure 4-2). Meaning-Focused Strategies were used 12.66% more than Form-Focused ones while the remaining Metacognitive strategies were equally used (17.28%).

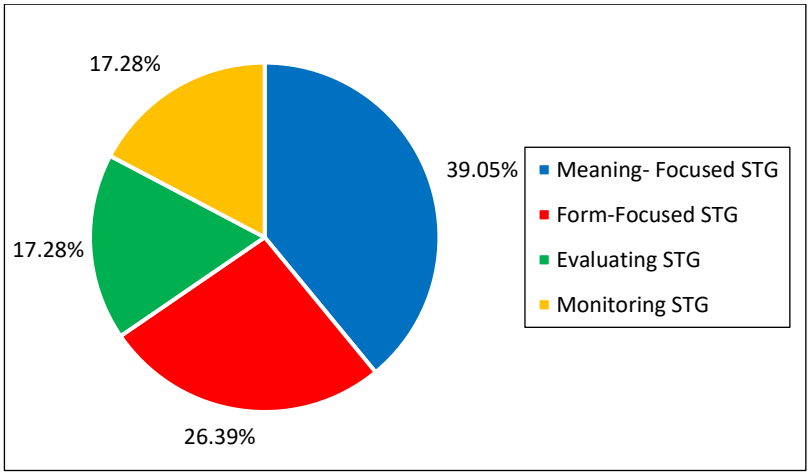


Figure 4-2 Frequency of the Major Strategy Categories used for both texts combined

The following section outlines each strategic category through presenting its sub-strategies along with examples from the data. It begins with the Cognitive Strategies first followed by the Metacognitive ones.

4.4.1 Meaning-Focused strategies

Meaning-Focused strategies (MFSs) constitute the strategies in which inferences were made by resorting to contextual (linguistics) clues (Hu and Nassaji, 2012). In this study, non-contextual (non-linguistic) World Knowledge was also part of MFSs since participants would recall/activate their experience/knowledge from the text to infer the meanings of the TWs. MFSs were applied through using the following:

A1. Textual clues.

A2. Vocabulary Knowledge.

A3. Prior World Knowledge.

A4. Replacing the TW with a guess in English/Arabic to see if it fits.

A1. Using textual clues

First, textual clues included sentence level (both local and global) clues (see 4.3.1.3) and paragraph knowledge clues (see 4.3.1.4). All learners who located and tapped into sentence level clues used them as MFSs. TW local clues (immediate TW sentences) were used 26.78% by all learners in both texts (Examples 31-35). In terms of the local clues sub-clues, using a part /phrase of the TW was used the most (11.48%) as a MFS followed by using the sentence meaning as a clue (8.05%). On the other hand, pointing to a specific word in the TW sentence covered 5.94% in this strategy category. Next, resorting to definitions or descriptions in the TW sentence was only used 0.92% while conjunctions were used 0.40%. On the other hand, global (backward and forward) clues, which are beyond the TW sentence, were used 1.72% (Examples 36 & 37) with backward global clues covering 1.45% while forward clues 0.26%. Finally, paragraph knowledge clues were used as a MFS only 0.66% (see Examples 39-41) which was the least used clue type used in this strategy group.

A2. Using Vocabulary Knowledge

Learners who tapped into their Vocabulary Knowledge clues all used them as a MFS in this study (see 4.3.1.1), stating encountering the TW before was used 5.94% (see Examples 8-20). While reporting never seeing the TW before was 0.53% (see Example 6).and finally not knowing the meaning of the TW 0.26% (see Example 7).

A3. Using World Knowledge

In this study, resorting to World Knowledge was categorized as a MFS since participants would resort to their experience/knowledge from the textual context to infer the meanings of the TWs. As a clue, World knowledge was used by all learners except C1-3, C1-5, B2-1 and B1-2 (see 4.3.2, and for Examples, see 42 & 43). This was because some learners used their World Knowledge as an Evaluating Strategy (see 4.4.4 below). However, using World Knowledge to generate the initial meaning of the TW, i.e. a MFS, was only used 0.79% by 6 learners; B1-5, B1-1, B2-2 in the familiar text while B1-4, C1-4 and B2-2 applied them in the unfamiliar text.

44. Example ((bulky))

C1-4: But here like it say [[large]], if it's like, if I said <big> then what the point of saying the word [[large]], too. So it may have a different meaning, not <big>.or <small>.

R: Ok, so what do you think it would mean?

C1-4: [[barrels]], what are the characteristics of [[barrels]]? <heavy>, I said <heavy> not <big>.

R: You said <heavy>, in the beginning.

C1-4: <heavy> (*writes down the meaning).

R: So why did you say <heavy>?

C1-4: [barrels]], because [[barrels]], [[barrels]] are woods, and when you put something in [[barrels]] they ...ah maybe they are big maybe wine when you say [[barrels] because they put wine in [[barrels]], too**.**

R: But does it say it's speaking about wine?

C1-4: No, no its not, I mean that why they didn't suspect them.

R: And what made you think of the word <heavy>?

C1-4: [[large]] and [[barrels]], [[barrels]] become heavy when they put something in them I am not sure but.

In the previous excerpt, the learner went through a series of generated hypotheses for the TW before she finally settled on *'heavy'*. When asked how she reached her guess, she explains that the barrels might be full of wine and become heavy. She further explains that since they might be full of wine, that is why the plotters were able to avoid suspicion. Furthermore, when placing objects in barrels, they become heavy. This learner used her World Knowledge of Western culture regarding storing/transporting wine in barrels which she might have known through the media or travelling abroad on holidays.

A4. Replacing the TW with a guess in English/Arabic

Finally, replacing a guess with the TW was either used as a Meaning-Focused or Evaluating Strategy in terms of its purpose. It was used as the first strategy category when participants used replacing as a strategy to ***initially*** generate a hypothesized guess as opposed to using it as a checking stagey to check a guess they had already generated by other means of strategies, thus an Evaluating Strategy (see 4.4.4).

Replacing the TW with a generated guess to see if it fits the TW sentence was carried out either in Arabic or English. The TW was replaced more in English (1.85%) by 10 learners. It was mostly used in the unfamiliar text by C1-4, C1-5, B2-2, B1-4, B1-1 while C1-4, C1-5, B2-1 and B1-3 for the familiar text. In the following example, the learner began by proposing a hypothesis of the TW's meaning and goes further by replacing the TW with her generated hypothesis in the sentence before reading it. When asked why she proposed her answer as *'difference'*, she tapped into sentence level clues (4.3.1.3), more specifically local clues (p: 193), pointing to specific words in the sentence.

45. Example ((controversies))

B2-2: There is a [[**<difference>** between people's opinions]].

R: <difference> why did you say that?

B2-2: Because he said [[opinions]].

Replacing the TW in Arabic was a MFSs used only 0.53% in the unfamiliar text by B2-3, B1-2 and B2-3. In the following example, after the learner explains that she reached her guess by replacing the TW with the Arabic guess in the sentence before reading it. The learner began reading the sentence in English and upon reaching the TW, she inserts her guess in Arabic, reads it in Arabic then switches to English to read the remaining segments of the sentence.

46. Example ((controversies))

B2-3: (A) Maybe (fawarq) <differences>.

R: What made you say **(A)** <fawarq> (differences)?

B2-3: [[between people's options]], **I even put it in Arabic is goes,** [[there are **(A) <**fawarq> (differences)]] in their thinking, that [[burning a doll]] is not like burning a person.

4.4.2 Form-Focused strategies

This set of sub-strategies were used to make inferences based on the word-form properties in the text (Hu and Nassaji, 2012). Form-Focused strategies (FFSs) had three sub-strategies:

A1. Repeating.
A2. Analysing.
A3. Associating.

A1. <u>Repeating strategies</u>

Repeating here refers to the observed behaviour of how participants first encountered and approached the TW when they ***first began*** to inference its meaning. Repeating took three similar forms, either repeating the TW only (Example 47), repeating a phrase including the TW (Example 48), or not repeating at all but asking the researcher to pronounce the word (Example 49).

Repeating only the TW was the most frequently used approach to the TWs (13.46%) and was displayed in both texts and used by all learners. The data also revealed that sometimes learners would utter the TW more than once. In the following excerpt, after uttering the word once, the learner generated a hypothesis for the TW, **((infer))**. Upon asking the learner what guided her to generate this guess, she reads the TW sentence but this time without uttering the TW. Instead, she replaces her guess with the TW and reads which is another LIFS (Evaluating Strategy, 4.4.4).

47. Example ((infer))

B1-5: (A) ((infer)), I expect it means (yektashef) <discover> or (et3araf) <to know>.

R: Why did you say **(A)** (yektashef) <discover> or (yet3araf) <discover>?

B1-5: (A) Because here, the beginning of the story, is unknown, and then here, what happened to the burning man, then [[to find out, we need to go back in time]], we must go back in time, or <yet3araf> to <discover> what had happened during that time.

Another repeating sub-strategy was repeating the TW within a phrase from the sentence. This was resorted to nearly 5.67% and used by all the participants except B2-2, B2-3, B2-4 and B1-3. In the following example, B2-1 repeated the TW with another word from the TW sentence before stopping and understanding them together. She then views 'social' in terms of blood relationships like with a cousin. Next, she expands her repetition of the TW into a phrase extracted from the TW sentence from which she generates her hypotheses as *'relationships get stronger'*. When asked which clues she tapped into, she referred to local clues within the TW sentence itself B1 (p:193).

48. Example ((bonds))

B2-1: (A) [[social bonds]], I think their cousins and like**, [[social bond are strengthened]],** it means the social [relationships get stronger].

R: (A) Why did you say that the social relationship get stronger?

B2-1: Coz [[social]] [[are strengthened]].

Some learners refrained from repeating the TW in any of the forms above but turned to the researcher for this, as illustrated below. This was the least used repeating strategy (0.66%) used only by C1-5 and B2-2 in the familiar text while B2-4 and B2-3 used it in the unfamiliar one.

49. Example ((inevitably))

B2-3: How do you pronounce it?

R: ((inevitably)).

B2-3: (A) Ok, I have come across this word but I don't remember.

R: You can leave it and go to the next one.

B2-3: (A) I am trying to remember, we took in last semester. I think we took it in reading, but in listening and speaking we have taken it for sure, **(A)** (meen al mo7tamal) maybe <probably>.

In the previous example, the learner asks the researcher to pronounce the word upon which the learner declares knowing the word through tapping into her vocabulary knowledge of words as a clue (4.3.1.1). More specifically, she indicated that she could not recall its meaning first, then later

confirms meeting the word in her listening and speaking course (p:185).

A2. Analysing strategies

Analysing strategies were used either at word or sentence levels. At word level, participants resorted to analysing the TWs through either their; prefixes, stems, the part of speech, or homonymy (Word form) (see p:188). Word part clues were discussed as morphological clues at word level on page 188. In terms of resorting to the TW's prefix, this was used as a strategy only 0.40% by only 3 advanced learners, C1-5, C2-1, C1-3 (see Example 21). On the other hand, in resorting to a TW's stem, participants displayed two approaches; either explicitly breaking the TW into a stem and prefixes (affixes) as in Example 50 or doing this implicitly as in Example 51. Explicitly breaking the TWs into their prefixes and stems was restored to less frequently, 1.45% by only by C1-1, C1-3, B2-1, B2-2, B2-4, and B1-4. In the following example, when prompted about why she used this strategy, the learner explicitly replies, "*because you can break it*" before marking this on her reading sheet.

50. Example ((insightful))

R: So what do you think it means?

B2-4: I think it's <something with insights and full>.

R: Why did you say it's <insights and full>?

B2-4: Because you can break ((insightful)).

R: Can you break it for me? Where did you break it? (*puts a mark on the TW).

While implicitly breaking the TW to its stem and prefix was used 2.24% in both texts by all learners except C1-5, B1-1, and B1-5. In the following excerpt, B2-5 replaces the TW with her Arabic generated guess in the sentence to check the guess before reading it. When asked how she had reached this answer, she implicitly removed the prefix and only mentioned the TW's stem in her answer.

51. Example ((successively))

B2-5: (A) Here it's (benaaja7) (successfully), [[they successfully managed to smuggle]].

R: Why did you say **(A)** <benaaja7> (successfully)?

B2-5: (A) From success.

Analysing the TW's part of speech (p:189) was used 0.66% in both texts by 2 learners, B1-1 and C1-5, as discussed and illustrated in Example 23. Finally, the last analysing strategy at word level was analysing the TW through L2 learner's perceived near homonymy (word form) (see p:189).

This strategy was used 0.92% by only 6 learners; B2-2, B2-3, B2-4, B2-5, B1-1 in the unfamiliar text and B1-2 in the familiar one (see Example 24).

Analysing at sentence structure level was only found through resorting to word order analysis or punctuation. Analysing through their knowledge of word order was applied 0.26% by C2-2 (Text 2) and B2-5 (Text 1) (see Example 30). Regarding resorting to punctuation, this strategy was used once (0.13%) only by B2-3 (see Example 38) in the familiar text.

A3. Associating strategies

The clues displayed how learners here used their knowledge of TW word level clues in the form of semantic relationships, i.e. word association and collocations as associating strategies to inference the meaning of the TWs (see p:191 for a discussion and Examples 28 & 29). This strategy was used 1.19% only in the familiar text by all learners except C1-1, C1-2, C1-3, B1-2, B1-4 and B1-3.

4.4.3 Monitoring strategies

These strategies are used to indicate awareness of the inferencing process and text features (Nassaji, 2003a). Monitoring strategies (MSs) had four sub-strategies:

A1. Suspending judgment (skipping).
A2. Reattempting.
A3. Noticing that the guess distorts the meaning of the TW sentence.
A4. Stating the failure of inferencing.

A1. Suspending judgment (skipping)

Although suspending judgement or skipping has been reported in the LIFS literature, the present study further found that skipping was applied in two different ways. Skipping was either applied without any attempts to generate hypotheses or learners skipped after providing a hypothesis but were not confident enough to write their answers. These two strategies were either at the learner's sole decision or prompted by the researcher. The data revealed that L1 Arabic learners resorted to skipping as a MSs by 3.69%, which is the second most frequently used MS sub-strategy after reattempting (see next section).

Skipping in terms of the learner's decision was applied either without a guess (Example 52) or with a guess (Example 53). Skipping without providing a guess (10.6%) was used only by 8 learners; C1-1, C1-4, C1-5, B2-2, B2-3, B2-4 in the familiar text while B1-2, B1-4 in the unfamiliar

one as illustrated below.

52. Example ((bonds))

B2-3: (A) Hld on, doesn't ((bonds)) means <bones>?

R: This is ((bonds)).

B2-3: **(A)** Ah, ok, I **skipped this one, so the next one is**

In this excerpt, the learner had just started the inferencing task with the first TW **((bonds))** in the familiar text. She then realizes that the TW is **((bonds))** and not *'bones'* and decides to skip to the next TW.

The second approach to skipping was after generating a hypothesis but not quite sure enough to write it as their final answer. This strategy was used less than the previous one, nearly 0.66% only by 5 learners, C1-4, C1-5, B2-1, B1-1 in the familiar text while only B1-3 used it in the unfamiliar text. In the next example, the learner generates a guess, *'important'*, *r*eplaces the TW with her guess in English in the TW' sentence and reads it, which is a MFS. Later she doubts that her guess could be correct and there might be another meaning, thus decides to skip without writing her answer.

53. Example ((predominately))

C1-4: If I would replace this word, by <important> it would not make sense, if I said [[Eid is <important> a day]], so I don't think it means <important>.

R: What made you think it might mean <important> anyway?

C1-4: Because like Eid, you know, everyone, like around family and strength bonds, and you know get happy and work together and help each other, so it's <important>.

R: Eid is important for us, that's why your saying this, because you have experienced Eid a lot.

C1-4: Yeah but I don't think, here **((predominantly))** means important, because if I would replace it, say [Eid is important a day], I guess it has another meaning. But maybe it is close to <important>, I don't know.

R: What would you write?

C1-4: I don't know what I would write, **can I skip?**

R: Yeah, sure.

Another approach to skipping was initiated only after the researcher reminded participants about their choice to skip. The researcher only reminded learners upon observing a sense of frustration or demotivation by some learners on a TW.

As with skipping under the learner's decision, skipping after being reminded by the researcher was either without a guess (Example 54) or with a guess but not confident enough to establish it

as a final answer (Example 55). Skipping without a guess after the researcher reminded learners was used 1.45% by C1-1, C1-5, B2-2, B2-4 and B1-2 in the familiar text while C1-4, B1-2 and B1-4 in the unfamiliar one.

54. Example ((collaborative))

R: So what would you write?

B1-2: I don't know, what's the means of [[displays]]?

R: [[Displays]] means **(A)** (e6'har) (to show), **if you want you can leave it and go back to the next word**, don't worry.

B1-2: I don't know about this word.

R: So you can do the ones you think you can workout and leave the ones at the end. (*learner skips the TW and moves to the next).

In the previous example, the learner, after spending some time on the word without generating any hypotheses, inquires about the word *'displays'*. The researcher then reminds the learner that she can move to another word and return to it later. The learner, instead of trying to propose another guess, states that she does not know the word. The researcher reminds the learner once again of moving to another word which she takes up.

Deciding to skip with a generated a guess after being reminded by the researcher was used less than the previous strategy. More specifically, it was the least used skipping strategy among all the types of skipping strategies. It was only used 0.53% by only 4 learners; C1-2, C1-5 and B2-2 in the unfamiliar texts while only B1-2 used it in the familiar one. In the example below, although the learner provides a guess, she is still unsure about whether to write it as her final answer, even though she refers back to the text to check her answers. She skips after being reminded by the researcher without writing her guess.

55. Example ((bulky))

R: So what do you think the word **((bulky))** means?

C1-5: <a lot>

R: Why did you say <a lot>?

C1-5: (A) Because there is no, no, it has nothing to do with it.

R: You can skip it, and come back to it if you want to. (*learner skips the TW and moves to the next).

A2. Reattempting

In this study, reattempting is defined as a monitoring strategy where an old inference is discarded and a new one is generated (Hu and Nassaji, 2014). In this study, reattempting was identified when participants generated several hypotheses and in light of the clues and KSs activated,

discarded some of these hypotheses before they proposed a final answer (see 5.2). Reattempting was the most frequent monitoring strategy used by all learners used in both texts by 10.55%.

56. Example ((infer))

B1-2: ((infer)), maybe [[in order to find out, we need to go back in time and infer what happened then]]. Like they mean by **((infer))** like they want to <discover> what happened in the past. So they know why this has happened [[back in time]], <discover> something.

R: Ok, so what do you think **((infer))** means?

B1-2: [[to find out, we need to go back in time and infer what happened then]]. I am not sure.

R: What's going on in your mind?

B1-2: <discover> or <show> maybe.

R: Ok, so which one would you choose to put down?

B1-2: <discover>.

In the previous example, the learner first proposes her guess as *'discover'* but upon reading the TW sentence again, is not sure of her guess. She later puts forth a second guess *'show'* but later disregards it and writes down her first guess. In this study, learners generated a number of hypotheses, with 5 being the highest (5.2).

A3. Noticing that the guess distorts the meaning of the TW sentence

Learners used noticing to highlight instances of miscomprehension if their guess distorted the sentence meaning of the TW as in the following example. This strategy was used 1.06% by only 7 learners B2-1, B2-2, B2-3 in the familiar text while C1-3, C1-5, B2-1, B2-4 and B1-1 in the unfamiliar text.

57. Example ((rational))

B2-4: ((rational)), I think it came from the word, [ratio].

R: Ok, what does [ratio] mean?

B2-4: It mean **(A)** (nesba) (percentage).

R: So what helped you in the sentence to guess it means **(A)** (nesba)?

B2-4: Just the word.

R: Just the word, ok, so what would you say that word means? So you just said **((ratio))** because you know the word **((ratio))?**

B2-4: Yes.

R: That you didn't look at the sentence.

B2-4: No.

R: Ok, which word are you looking at now?

B2-4: The same word, I don't think it means <ratio>.

R: Ok, why not?

B2-4: Because it says [[the rationale explanation]] doesn't make sense if it's the word <ratio> so I think it means something else.

In the previous example, TW is derived from the word 'ratio' which means percentage. When questioned about how she reached the answer, the learner only tapped into her vocabulary knowledge without resorting to any clue in the text. Since the learner did not write down her answer, the researcher assumed that the learner might have moved to another word to inference. However, the learner was still focusing on the same TW, where she realizes that her guess distorts the meaning of the TW sentence. By mapping her generated guess against the TW sentence, she was able to notice that her guess violated the sentence meaning.

A4. Stating the failure /difficulty of inferencing

As part of their monitoring strategies, participants used their awareness of their inferencing by stating the difficulty or failure of deriving the TW's meaning. Interestingly, this strategy was only found in Eid Al-Fiter text in which it was used 1.98% by only 8 learners, C1-1, C1-4, C1-5, B2-2, B2-3, B2-4, B1-2 and B1-4. In the excerpt below, the learner states not knowing the word even through using the TW sentence. Upon finishing inferencing the rest of the TWs in the text, the learner returns to the TW again. This time she resorts to sentence level clues and is able to uncover the gist of the sentence but again states that she does know the meaning.

58. Example ((shrewd))

R: Next, you have the next word.

C1-1: Hmm, **I didn't know what this one is, not even from the sentence.**

((*After finishing all the TWs the learner returns to **((shrewd))** the remaining TW))

R: Ok, so you had the word **((shrewd))** left, what do you think it means?

C1-1: It looks like a, describing a kind of people but I don't know the exact meaning of it. Never seen it before.

4.4.4 Evaluating strategies

Strategies here are used to examine or verify the appropriateness of the TW's inferred meaning (Nassaji, 2003a). Evaluating Strategies (ESs) employed here are divided into three main types:

A1. Commenting and elaborating.

A2. Inquiring.

A3. Checking the guess.

A1. Commenting and elaborating

In this strategy, learners would make evaluative comments regarding their inferencing either on the TW or what they have comprehended through the text so far. This strategy was used 8.31% by 9 learners, C1-4, C1-5, B2-1, B2-3, B2-4, B2-5, B1-1, B1-2 and B1-5 in the familiar text. While more learners (12) used this strategy on the unfamiliar text by C2-1, C2-2, C1-4, C1-5, B2-1, B2-2, B2-3, B2-5, B1-1, B1-2, B1-4 and B1-5. In Example 59, the learner had generated a guess for the TW by using word association clues (see p:191). When asked about her answer, she reports by commenting and evaluating it through falling back on the text to verify her answer.

59. Example ((Bonds))

R: So which word are you trying to...?

C1-4: ((bonds)), it means like, <something connected> me with the environment. People, things like I have strong **((bonds))** with my phone my phone really, I feel like it's my child.

R: What do you think **((bonds))** means?

C1-4: [Connection between people] in this text, and its strength, **it gets stronger by visiting and celebrating doing something together**.

A2. Inquiring

Inquiry was used 0.92% making it the least resorted to ES. In this study, learners made an inquiry or questioned either the TW (Example 61) or their inferences (Example 63). Inquiring about the TW was either through inquiring about its part of speech, morphological word form, or its orthographic form.

Inquiring the TW's meaning through its part of speech was used once (0.13%) only by B1-1 in the familiar text as illustrated below. In this example, the learner evaluates her guess through inquiring about TW's part of speech since she is confused about whether it is an adverb or adjective.

60. Example ((predominantly))

B2-1: Well for this word, I know it's an adverb, I think, or an adjective? Maybe it is like <basically>? This word <heavy>.

Inquiring about the TW was also carried out in terms of its word form (0.13%) only by B2-2 in the familiar text. In the next example, the learner questions herself regarding the stem of the TW, then removed the prefix and relied on the meaning of the stem.

61. Example ((predominantly))

B2-2: (A) Does it come from [dominate]?

R: Ok, so what did you do here?

B2-2: (A) I took (pre-), but <dominate> means <control> or an important day or I don't know <important>.

Finally, inquiring about the TW was also conveyed through the TW's orthographic form. i.e. learners' perceived near homonymy (p:189). This strategy was used as an ES only twice (0.26%) only by the advanced learner, C1-2 only in the unfamiliar text. In the next example, the learner compares the TW to 'rational' and thus inquires about the orthography of TW. Her data reveals that this learner is aware that there are differences between the orthography of the TW and 'rational' and thus turns back to the TW sentence for more clues.

62. Example ((rationale))

C1-2: ((rationale)), <u>I am not sure about this one, but I feel like it comes from (rational), but at the same time, I know it looks slightly different. and then here it says</u> [[based on the rationale explanation of the letter]].

Inquiring about their generated inferences was used only 0.40% by C1-1 and B2-3 in Eid Al-Fiter while only C1-4 for Bonfire night. In the next example, the learner inquires about her three guesses for the TW, *'heavy, big and small'*. She logically inquires about each of her guesses before finally settling on one. First, she proposed the meaning of *'heavy'* but then justifies that in order to put gunpowder then the meaning is *'big'* Then she reads the second part of the TW sentence and reasons that the TW might mean *'small'* since the plotters were not seen. Finally, she explains that since the barrels were covered with firewood and straw and thus cannot be *'small'* and finalizes her answer as *'heavy'*.

63. Example ((Bulky))

C1-4: [[36 large bulky barrels of gunpowder]] [[bulky barrels]], I think it means <heavy> barrels, I don't know but like [[36 large bulky barrels of gunpowder**<u>]], if you are going to put gunpowder, it means <big>, right?</u>** [[without being seen over the summer months]]. **<u>but like if it's <big> and they do it ((successively)) without being seen, then it's not <big>?</u>** [[the barrels were covered with firewood and straw]]. No, it not <big> its <small>.

A3. <u>Checking the guess</u>

Checking the guess through confirming or disconfirming their inferences was the final strategy of the ES category, which was fulfilled through a number of sub-strategies. To check their answers, learners would either use their World Knowledge (Example 64), resort to textual information from the text itself (Example 65) and replace the TW with a generated guess (Examples 66-69).

As mentioned in Meaning-Focused Strategies (4.4.1), World Knowledge was used as a strategy to first generate a guess or hypotheses for the TW (see Example 44). The findings of the current study also found that World Knowledge was also used as an Evaluating Strategy after learners

generated a hypothesis through other forms of strategies. World Knowledge was used more by learners, 1.98%, as an Evaluating Strategy to check their guesses than a Meaning-Focused one (0.79%). In the familiar text, it was used by C1-2, C1-4, B2-2, B2-4, B2-5 and B1-3 while in the unfamiliar text, it was only used by the proficient learners C1-1, C1-2 and C1-4.

64. **Example ((invalid))**

C1-5: Valid means **(A)** (al 9la7eya) <validity>.

R: Ok, what made you say **(A)** (al 9la7eya) <validity>?

C1-5: No, ((valid)) means, <exist>, it's there **because I remember when I was playing a game** and I was accidentally pushed a button, it's an attack button and the voice said to me **''INVALID TARGET'', so there is no one actually, no enemy, in front of me. So I think ((valid)) is there**, like the message.

In the previous expert, the learner resorted to the TW's stem and provided a meaning for it in Arabic. She later disregards her guess and proposes a new one, *'exist'* and evaluates this through using her background knowledge of gaming. She also explains that it is through video gaming that she has encountered the TW and tries to recall scenes from the game to confirm her guess.

The second set of checking strategies was through resorting to the text itself. The study reported that resorting to the information in the textual clues as an ES was only through the TW sentence (local clues). Furthermore, it was found in the familiar text by 1.98% and only resorted to by 6 learners; C1-2. C1-4, C1-5, B2-3, B2-4 and B1-1. In the example below, after generating a guess, the learner was asked how she had confirmed her guess. She replies by identifying words in the TW senesces itself.

65. **Example ((collaborate))**

B1-1: ((collaboration)) since I know this word before, so it means like, <working together>, something like this. It feels also in the sentence also, feels like the same meaning. (*writes down the meaning).

R: What made you say it meant that meaning? so you know the word **((collaboration))** before? So where have you heard this word before? Or seen it?

B1-1: So times in like producers who are going to **((collaborate))** with a singer, so something like that.

R: And how did you make sure that it means the meaning that you said, in this context.

B1-1: [[actions]], so [[collaboration of action]].

Finally, the last set of evaluating strategies was replacing the TW with the guess which took a number of forms. The first form was replacing the TW with their guess in Arabic or English. Replacing the TW with an English guess was used more (4.22%) than replacing it in Arabic. It was used by C1-2, C1-3, C1-5, B2-1, B1-1 and B1-3 in both texts. On the other hand, B2-3 and B1-4 used it only in the familiar text while B2-5, B1-2 and B1-5 in the unfamiliar one. Regarding

replacing the TW in Arabic, it was resorted to 0.26% by only B1-3 in the familiar text and B2-5 in the unfamiliar one.

In the next two sets of examples, after the learners generate their guess in English (Example 66) or Arabic (Example 67), they replace the TWs with their guesses in the sentences, then read them to evaluate their guess.

66. Example ((indefinitely))

B1-3: (A) It's like the word <absolutely>

R: Why did you say **((indefinitely))** means <absolutely>?

B1-3: **(A)** Because [[it will <absolutely> continue to grow]] ((* puts a line under the word and writes down the meaning)).

67. Example ((controversies))

R: So what does ((controversies)) mean?

B2-5: That they **(A)** (e5'teelaf) <differ> [[there are controversies]], [[there are **(A)** (e5'teelaf) <differ>]].

The second form of replacing the TW with a guess was when learners generated a number of guesses, tested them and finally selected one. In the next example, the learner replaces the TW with her guesses in the sentence before reading them. Through this strategy, she disregards one guess and puts her final answer as <shows>.

68. Example ((induces))

R: Why did you say <shows>?

B2-3: (A) Because I don't feel it's <starts> I don't know why.

R: Why don't you think it is <starts>?

B2-3: (A) Because it is not [[starts the need]], [[shows]] can come [[shows the need for]].

R: So you tied it up with this word, and [[shows the need]], I can't say [[starts the need]].

B2-3: Amm.

The final replacing strategy was rejecting a guess when it was substituted by the TW since the guess was already found in the sentence. This strategy was only used 0.26% by B1-4 in the familiar text and C1-5 in the unfamiliar one. In Example 69, the learner proposed *'continue'* as her guess, she goes a step further to evaluate it and replaces her guess with the TW in the sentence. It is only when the sentence is read does she notice that her guess *'continue'* is already a part of the TW sentence. She rejects her guess and explains that the same word can not be repeated twice in the sentence.

69. **Example ((undeniably))**

R: That this word means <continue> why did you say it means <continue>?

B1-4: [[will <continue> to grow]] but here there is [[continue]]. So it won't fit there can't be repetition.

R: Oh, you mean that this meaning **((undeniably)),** <continue> but it can be [[<continue> continue]].

B1-4: Not it's meaning, it can be this is what came across my mind that ...but it won't fit.

4.5 Strategic awareness

Triangulating the data from the verbal reports, individual semi-structured interviews and field notes with participants allowed further insights, elaborations and explanations to understand what learners did while inferencing. Data analysis revealed a major theme, 'learners strategic awareness' which was an umbrella for the following sub-themes; judging the importance of the TW, intentional vocabulary learning and reading approaches towards the TW on tests. These themes are discussed and illustrated in the following sections.

4.5.1 Judging the importance of an unknown word

During the first part of the interview, learners were asked about how their approaches to reading texts in general (see the interview guide, Appendix K). During the interview, learners expressed different responses regarding the criteria they used to judge the importance of the presence of an unfamiliar or UNW as they read, upon which they would decide to either ignore the TW or inference it. The present interview data showed that some learners would decide to inference an unknown word (UNW) depending on its importance in terms of the reading comprehension questions. In other words, learners would need to know the meaning of the TW in a test, whether it was found in the reading question itself or was part of the answer to the question, in order to answer correctly. In the following example from the semi-structured interview, the learner was asked about how she deals with UNWs that are not bolded or underlined beyond those that are required on the task. She responded that she would ignore the unfamiliar words which are unimportant and inference only those which are important. In judging the importance of the remaining unfamiliar words, she is guided by the reading comprehension questions required by the reading task. In other words, if these unfamiliar words are either part of a question or its answer, she labels them as important and thus needed to be inferenced.

70. **Example**

R: (A) If your time has finished, if you read and you got a word in the text, which is not underlined or bolded or anything, when do you skip this word, after you tried, and when do you say this word is not important?

B1-4: (A) I just ignore it

R: (A) If you felt that this word is important, it will help you to understand

B1-4: (A) I will try to understand it.

R: (A) Ok, how can you judge that this word is important?

B1-4: (A) I won't know that it's important except from the questions, I read the questions first, if it's there, I try to understand it

R: (A) So the importance of the word depended on its relation to the question if it is part of the question you mean?

B1-3: Yeah.

The importance of the UNW in the text also falls on the degree that the learner understands the text. In the first extract below (Example 71), the UNW is judged as important if the learner knows all the words in the text but still doesn't understand the passage.

71. Example

R: How do you judge that this word is important?

C1-5: If I didn't understand the passage and I knew all the words except this word.

Another approach to determine the importance of the UNW is based on its location in the sentence. This was either the location of the TW (either beginning-middle-end) in the sentence. In the following excerpt, the learner's response to not knowing the meaning of an UNW is to ignore it. She further justifies that she might ignore a word that has no importance, for example, if the word is located at the end of the sentence since it would not help in deducing the TW's meaning.

72. Example

R: (A) And if you didn't know the meaning?

B1-5: (A) if I didn't know its meaning, if I ignore it might be a word which has no importance or like at the end of the sentence, I feel that it has no importance to lead to the meaning or I am just wasting my time

Furthermore, the importance of the UNW is judged by whether it is part of a main (central) idea or supporting details. In the following example, the learner expresses her view that an UNW is important if it is part of the topic sentence as opposed to a supporting idea.

73. Example

R: How do you judge that this word is important?

C1-5: From its place if it's in the beginning, in the end or middle. Maybe it's a supporting idea or something, it's not a main idea in the paragraph.

R: So you think it's important if it was in the main idea?

C1-5: Maybe.

4.5.2 Intentional vocabulary learning

The data also revealed how some participants were strategic in terms of looking up the meanings of the UNWs after finishing the reading texts, thus strengthening their learning of these words. This was through applying various approaches to learn the TWs via mobile applications or webpages. Some learners reported checking these words through applications and their features, like synonyms, as expressed in the following example. In this example, the learner discusses how she checked the TW **((infer))** in the Bonfire Night.

74. Example

B1-1: Yes, I loved **((infer))** and I saw it a lot in our exams and I checked it.

R: So you checked it with an online dictionary or an application or Google?

B1-1: An application

R: Do you know the name of the application?

B1-1: I think "the source" something like this and it gives synonyms.

An interesting example is where a learner reported that she would choose a word from the text to memorize in her head or write it down on her hand in order to check her answer after finishing the task.

75. Example

R: You check in Google or you have a specific application?

C1-4: (A) Look, if I had a dictionary, I would go for the dictionary. Like book but I don't have it because it's not available. So I go back to Google but if I had Google and a dictionary, I would choose the dictionary. The dictionary is better because my eye will fall in other words. So it will teach me other things beside that word but the app would only give me the word itself and that's it.

R: So when you google the word, do you put it as a favourite, do you safe it?

C1-4: (A) There is, it will be recorded on your history and I can go back to the history.

R: And you don't clear your history.

C1-4: No of course not.

Her choice of using a dictionary over the application and going back to her browsing history was strategic, for through this, she will be exposed to more meanings and can revise them. This could further strengthen and increase intentional vocabulary learning (Nation, 2001). This learning was not limited to a specific proficiency level, for it was found at every level with different approaches to looking up the meaning of the word.

Some learners reported different ways of saving and using the words they have learnt. During her interview, one learner reported saving only the words that are important which she might use in

the future as mobile notes. She later explains she tends to revise these words before her writing exams.

76. Example

R: Do you check from time to time the meanings of the words you saved in the application?

C1-5: No, I know its meaning and that's it.

R: How do you judge its import?

C1-5: I don't know, from its meaning. If I need it, if it's more profile than the word I use, I write them in the mobile notes. I got them out of the application, their meaning and then I write them in the notes. If it was deleted or something.

R: Do you check your notes from time to time?

C1-5: No, when I need them if I have a test or something. I go back and revise them again, in writing because writing depends on my own words

4.5.3 Inferencing and multiple choice questions

Using multiple choice questions (MCQs) and matching items were common approaches to evaluate learners on their texts and exams in their reading modules. It was interesting to see how learners would talk about the reading MCQs and how they approached them.

77. Example

R: What are the strategies that you do on a text when you have an unknown word?

C1-1: Ahh it depends on the question, if it's asking me to explain what it means, I try to understand the sentence itself, like what is it asking? What does it mean? For multiple choices, she has a strategy that I've noticed, there are two similar and there is one different.

R: You have three choices?

C1-1: Three choices. So if I didn't know, there is usually a similarity between the ones that are different, ok, and then there is the one correct one. So I sort of try and understand the strategy (*laughs).

R: Is that a pattern in every test?

C1-1: Kind of.

In the above excerpt, the most proficient participant seems to be strategic in terms of finding her own way around the MCQ format and choosing the correct meaning of the UNW other than using the text. It seems that she has uncovered a pattern regarding the MCQ distractors which she labels herself as a 'strategy '.

In the next excerpt, another learner discusses her approach to MCQs, she tends to compare the words in the MCQ choices to words in the text. That is when she knows that her answer is correct. She also adds that the grammatical structure of the MCQs helps, especially if they differ in the grammatical tense from the text.

78. Example

C1-3: If I have multiple choices, and I have words up top, if I guess this answer is right, if it's in the past and this sentence is in the present, that's when I know it's not right.

R: Ok, so when you have multiple choices you look at the grammar?

C1-3: Ammh.

R: So if you have multiple choices and you have the same grammatical structure, you kind of take a word and replace it in the sentence to make sense?

C1-3: No, I don't replace it, the teacher is not going to put something in the past, if you put it there, it's not gonna fit grammatically.

During interviews, learners also reported their difficulties during inferencing on their reading exams. The learner in the following example explains that due to the nature of the reading comprehension questions, choosing and matching, she just reads her choice to make sure of her answer. When asked if she did not have such questions, she replies she does not know. Since most of the questions are "always like choosing or matching".

79. Example

R: How do you check your guess?

B1-1: Well, I don't know, you know if it's like a question matching or choosing the answers, just reading the answers is gonna make me sure of it, but if it's like to write the meaning by myself, I don't think that I am going to be sure about it until I look on a dictionary, something like that.

R: But what if you're on a test and you can't use something like that?

B1-1: I don't know, actually I didn't use this a lot but.

R: So you never check your guess?

B1-1: Yeah, especially because our vocabulary questions are always like choosing or matching but I think if sometimes I had a question like write the meaning of this word, I might go back to the text read it again and if goes with the text so I can write it.

4.6 Summary

In this chapter, the results of the qualitative data analysis were presented. The first part of the analysis highlighted how participants differed in their approach to reading texts and TWs. The majority of learners did not read the whole texts but instead jumped to the TW sentence. The second part of this chapter presented the clues along with their knowledge sources and lexical inferencing strategies used by participants to infer the meanings of the TWs while reading. Furthermore, a description of the taxonomies for both knowledge source clues and lexical inferencing strategies, along with illustrative examples from the verbal protocols were presented. Finally, semi-structured interview data provide further elaboration to what learners have reported in their verbal report sessions and provided insights into new issues related to the

learners. These issues covered how learners approached the unknown words, with some being strategic in their approaches, intentionally learning a word, then recycling it and how multiple choice questions were viewed by learners in reading exams.

Chapter 5 Topic Familiarity, Proficiency and Lexical Inferencing: Findings of Quantitative Data Analysis

"Whatever exists at all exists in some amount. To know it thoroughly involves knowing its quantity as well as its quality" (Thorndike, 1918 cited in Koschmann, 2011:14)

5.1 Introduction

The previous chapter presented a taxonomy of the main knowledge Sources (KSs) and lexical inferencing strategies (LIFSs) used by Saudi EFL learners as they inferenced meanings of unknown words (UNWs) while reading. Chapter 5 aims at answering the remaining quantitative research questions, the second and third research questions through using participants' verbal protocols; think-alouds (TAs), immediate stimulate recalls (ISRs) and inferencing scores. This chapter is divided into two main sections, the first section aims at addressing the second research question which reports the findings of participants' lexical inferencing attempts and the responses made by the three groups in the familiar and unfamiliar texts. Furthermore, it presents the type and frequency of usage for both KS clues and LIFSs used by the groups while reading both texts. This view integrates all the inferencing responses (correct-partially correct-incorrect) in order to display the range of KS clues and LIFSs used. The second part of this chapter aims to answer the third research question which addresses the effect of topic familiarity in terms of participants' **'successful'** inferencing regarding the type of KS clues and LIFSs employed by the 3 groups in both texts. As with the previous chapter, the results for each sub-question will be presented separately with respect to data used, analysis performed and results obtained. The chapter begins with answering the study's second research question below;

RQ-2 How does topic familiarity of the text affect, if any, learners' lexical inferencing of unknown words with respect to their proficiency level?

2.a. What are the numbers of lexical attempts and responses made between the groups in the two texts?

2.b. What are the similarities/differences between the groups in terms of the knowledge source clues used when reading culturally familiar topics and with what frequency?

2.c. What are the similarities/differences between groups in lexical inferencing strategies employed when reading culturally familiar and unfamiliar topics and with what frequency?

5.2 Topic familiarity and lexical inferencing attempts and responses

5.2.1 Inferencing attempts and topic familiarity

2.a. What are the numbers of lexical attempts and responses made between the groups in the two texts?

This section presents the findings of the above research question, the lexical inferencing attempts made for the two different texts in terms of their degree of topic familiarity. In order to see if topic familiarity for learners plays a role in the number of inferencing attempts they made, a comparison was needed between texts. By coding learners' individual inferencing attempts from their initial generated hypotheses to their final answers, followed by using Nvivo's Matrix query, a total of 356 lexical inferencing attempts were found for both texts combined (130 for Eid Al-Fiter and 147 for Bonfire Night). Figure 5-1 shows that there were more inferencing attempts for all groups in the unfamiliar Bonfire Night.

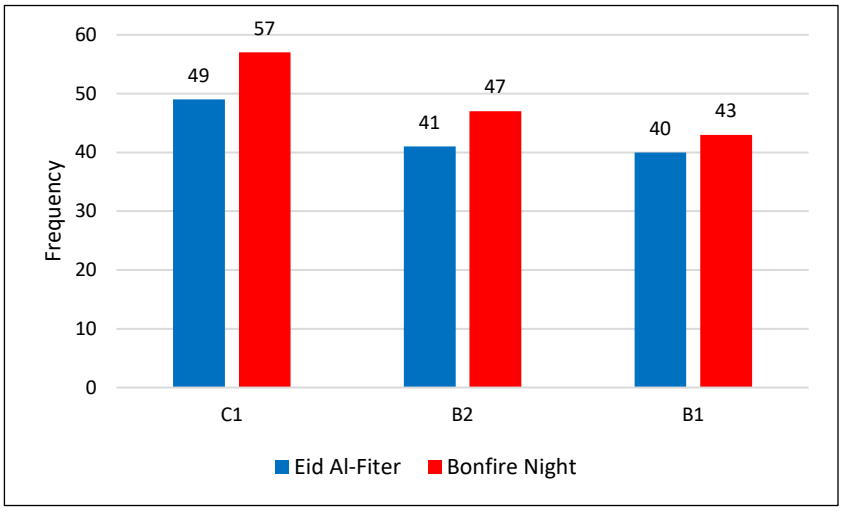


Figure 5-1 Lexical inferencing attempts for both texts combined

At a group level, the advanced groups had the highest number of lexical attempts, 106, followed by B2 with 88 attempts and B1 not so far with 83 attempts. However, a comparison of lexical attempts at a group level can hinder us from other underlying individual differences among the participants within the same group. Through looking more closely at each individual participant, differences between them start to emerge in terms of their inferencing behaviour towards the TWs. While coding the verbal report data, I noticed that there were different approaches to how participants decided on their final answer and wrote them down. The first approach was immediately writing down the ***only answer*** they came up with as their final answer without generating any hypotheses regarding its meanings. The second was listing one or more

hypotheses, then through resorting to their KS clues and applying LIFSs, participants either rejected some of their hypotheses until settling on a final answer. Thus, I returned once more and recoded the lexical inferencing attempts, where the former was now coded "**Final Answer: without a hypothesis**" while "**Final Answer: with a single/multiple hypotheses**" was used for the latter. It was found that Bonfire Night had slightly more TWs with a final hypothesis (Table 5-1). Here, participants, regardless of their proficiency level (PL), all displayed both the two types of approaches to their answers, with the majority of words falling under the first type in both texts.

Table 5-1 Summary of the number of TWs and types of final answers used by groups

	Eid Al-Fiter TWs with:		**Bonfire Night TWs with:**	
Groups	**Final Answer without hypotheses**	**Final Answer with hypotheses**	**Final Answer without hypotheses**	**Final Answer with hypotheses**
C1	25	15	23	17
B2	26	14	26	14
B1	30	10	31	9
Total of TWs	**81**	**39**	**80**	**40**

A closer look at the previous table displays that the advanced C1 group had more final answers for the TWs generated with hypotheses than the remaining groups in both texts. On the other hand, the lowest PL group, B1, had more TWs answered without a guess in both texts which slightly increased by one TW in Bonfire Night. While for the C1, answering through generating multiple hypotheses increased by 2 TWs for Eid Al-Fiter. Interestingly the intermediate group, B2, approached the TWs in the same way in both texts (For a detailed view for each participant, see Appendix W).

Regarding lexical inferencing attempts, in Eid Al-Fiter there was a total of 130 inferencing attempts made by the 3 groups. However, the highest number of generated attempts was performed by the advanced C1 group. All the C1 learners generated at least 2 hypotheses (Table 5-2). From this group, only C1-1 and C1-2 generated 3 hypotheses (in green cells). On the other hand, all the remaining members of the other groups did not go beyond generating one hypothesis except for B2-3. This learner behaved like members of the advanced C1 group by generating 2 hypotheses for a TW.

Table 5-2 Total of participant's inferencing attempts in Eid Al-Fiter text

Participants	Inferencing attempts:				Total number of inferencing attempts
	Target words without a hypotheses	Target words with hypotheses			
		Hypothesis 1	Hypothesis 2	Hypothesis 3	
C1-1	**6**	**2**	**1**	**1**	**10**
C1-2	**4**	**4**	**2**	**1**	**11**
C1-3	6	2	1	-	9
C1-4	5	3	1	-	9
C1-5	4	4	2	-	10
B2-1	5	3	-	-	8
B2-2	6	2	-	-	8
B2-3	**4**	**4**	**1**	-	**9**
B2-4	6	2	-	-	8
B2-5	5	3	-	-	8
B1-1	7	1	-	-	8
B1-2	5	3	-	-	8
B1-3	5	3	-	-	8
B1-4	7	1	-	-	8
B1-5	6	2	-	-	8
Total	**81**	**39**	**8**	**2**	**130**

In Figure 5-2 below, the highest number of hypotheses generated was by the highest proficiency participants, C1-1 and C1-2, who generated a third hypothesis (in yellow) for one TW they encountered. Interestingly, these two learners also differed in the type of final answers they provided; C1-1 tended to have more words without a hypothesis while C1-2 had more words generated through hypotheses. While the remaining C1-3, C1-4 and C1-5 only generated two hypotheses

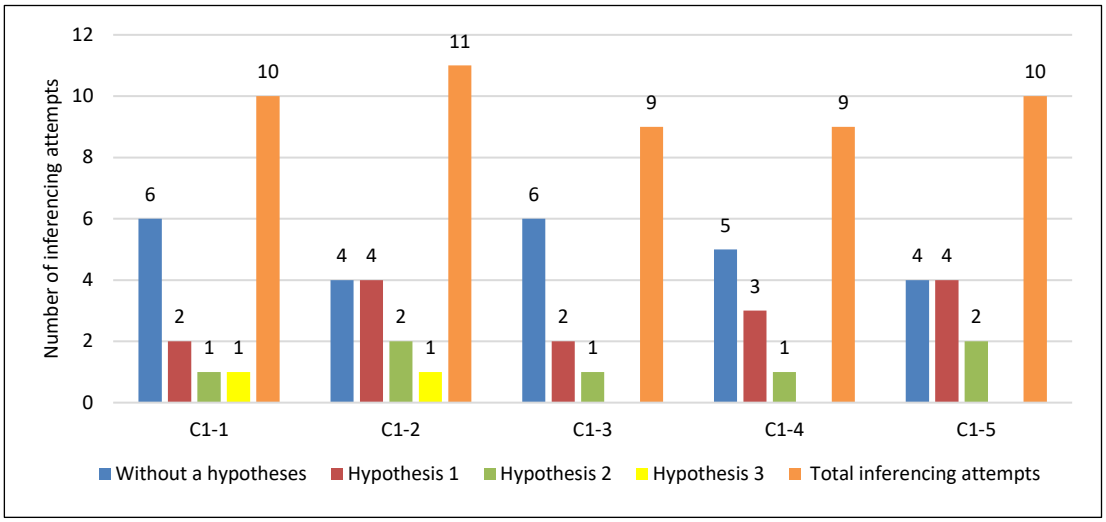


Figure 5-2 C1 groups' lexical inferencing attempts in Text-1

Surprisingly, between the two remaining groups, participant B2-3 was the only one to present a second hypothesis (in green) for a word she encountered (Figure 5-3). Thus, behaving like the entire C1 group in terms of generating a second hypothesis. Thus, she had the most lexical inferencing attempts in her group.

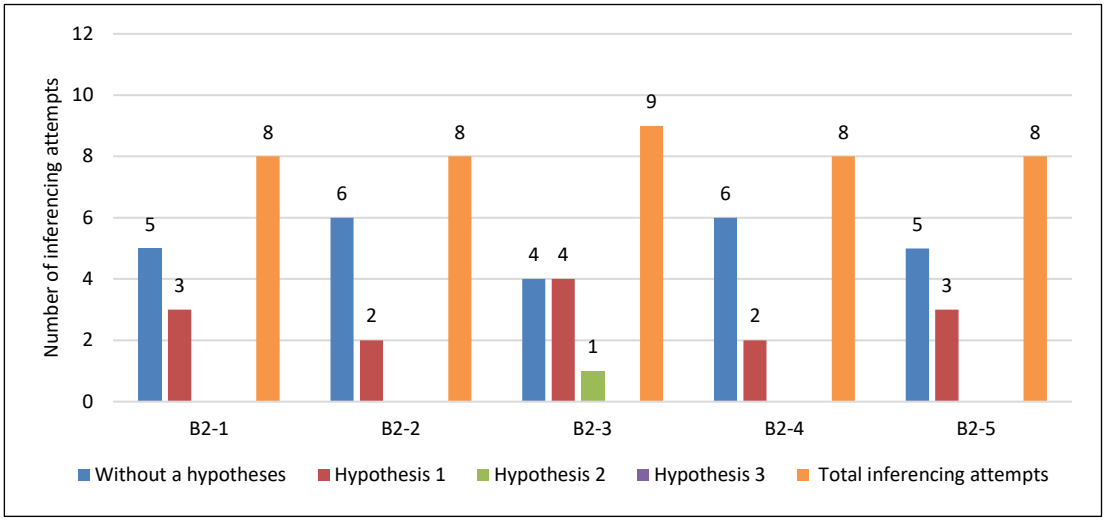


Figure 5-3 B2 groups' lexical inferencing attempts in Text-1

Finally, all B1 members refrained from generating a second hypothesis (Figure 5-4). This group tended to write their answers without a hypothesis for most of the TWs (in blue) while the remaining TWs (in red) only had one hypothesis. Therefore, this group had the lowest level of lexical inferencing attempts while the advanced C1 group had the highest.

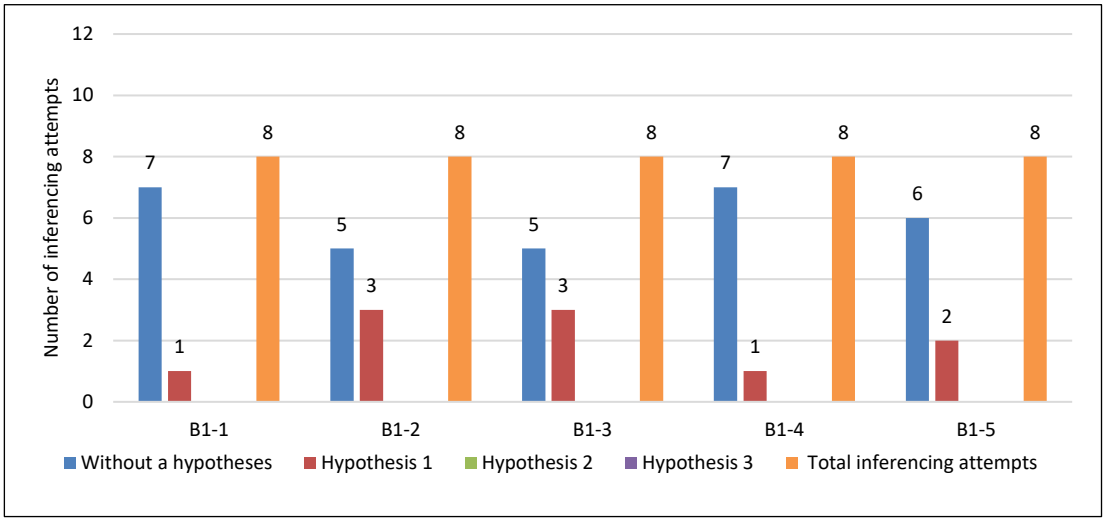


Figure 5-4 B1 groups' lexical inferencing attempts in Text-1

On the other hand, there was a total of 147 lexical attempts in Bonfire Night (Text-2), with 17 attempts more than Eid Al-Fiter as displayed in Table 5-3. Here, the maximum number of hypotheses generated was 5 compared to 3 in Eid Al-Fiter. As with Eid Al-Fiter, more hypotheses were generated by the C1 group. However, as opposed to Eid Al-Fiter, the two dominant learners in the C1 group did not behave in the same manner regarding the number of hypotheses they generated, but the last two students in that group did. Where C1-4 had 4 hypotheses for a word while C1-5 had 5. Interestingly, once again. B2-3, still behaved like some members of the C1 group as she did in Text-1. Through generating a third hypothesis and this time, she was joined by her next in line in terms of proficiency, B2-4. On the other hand, all the B1 learners, except for B1-2 and B1-4, still preferred a single hypothesis for all the TWs as they did in Eid Al-Fiter. On the other hand, B1-2 and B1-4 differed from their group since they generated at least 2 hypotheses for a number of TWs.

Table 5-3 Total of participant's inferencing attempts in Bonfire Night text

Participants	Inferencing attempts:						Total number of inferencing attempts
	Target words without a hypotheses	Target words with hypotheses					
		Hypothesis 1	Hypothesis 2	Hypothesis 3	Hypothesis 4	Hypothesis 5	
C1-1	6	2	-	-	-	-	8
C1-2	2	6	5	2	-	-	15
C1-3	6	2	-	-	-	-	8
C1-4	**2**	**6**	**3**	**2**	**1**	**-**	**14**
C1-5	**7**	**1**	**1**	**1**	**1**	**1**	**12**
B2-1	5	3	1	-	-	-	9
B2-2	6	2	2	-	-	-	10
B2-3	**4**	**4**	**1**	**1**	**-**	**-**	**10**
B2-4	**5**	**3**	**1**	**1**	**-**	**-**	**10**
B2-5	6	2	-	-	-	-	8
B1-1	7	1	-	-	-	-	8
B1-2	**5**	**3**	**2**	**-**	**-**	**-**	**10**
B1-3	6	2	-	-	-	-	8
B1-4	**7**	**1**	**1**	**-**	**-**	**-**	**9**
B1-5	6	2	-	-	-	-	8
Total	**80**	**40**	**17**	**7**	**2**	**1**	**147**

As previously mentioned, all the C1 members except C1-1 and C1-3 generated more than 1 hypothesis (Figure 5-5). More specifically, C1-4 and C1-5 had the highest number of inferencing attempts, with C1-5 generating 4 hypotheses while C1-5 (the highest) had 5. While the second most proficient learner in this group, C1-2 only generated 3 hypotheses but still had the highest number of total inferencing attempts. This was because this learner tended to generate more attempts through proposing more hypotheses for the majority of her TWs.

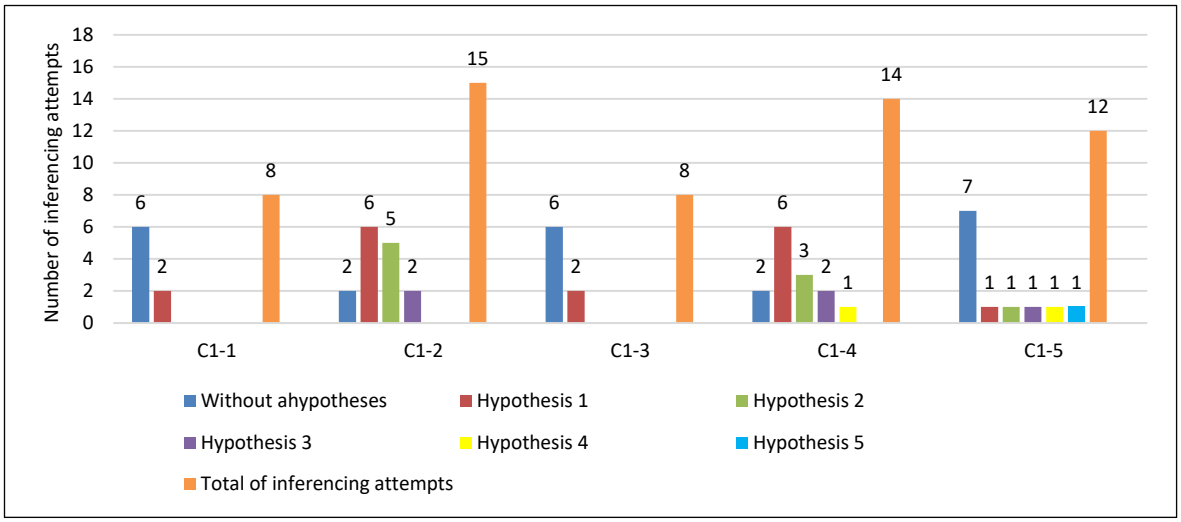


Figure 5-5 C1 groups' lexical inferencing attempts in Text-2

In the next group, B2 members all generated more than 2 hypotheses except the least proficient member in the group, B2-5, who generated only 1 hypothesis for two words she encountered (Figure 5-6). Only B2-3 and B3-4 attempted a third hypothesis for one TW they came across.

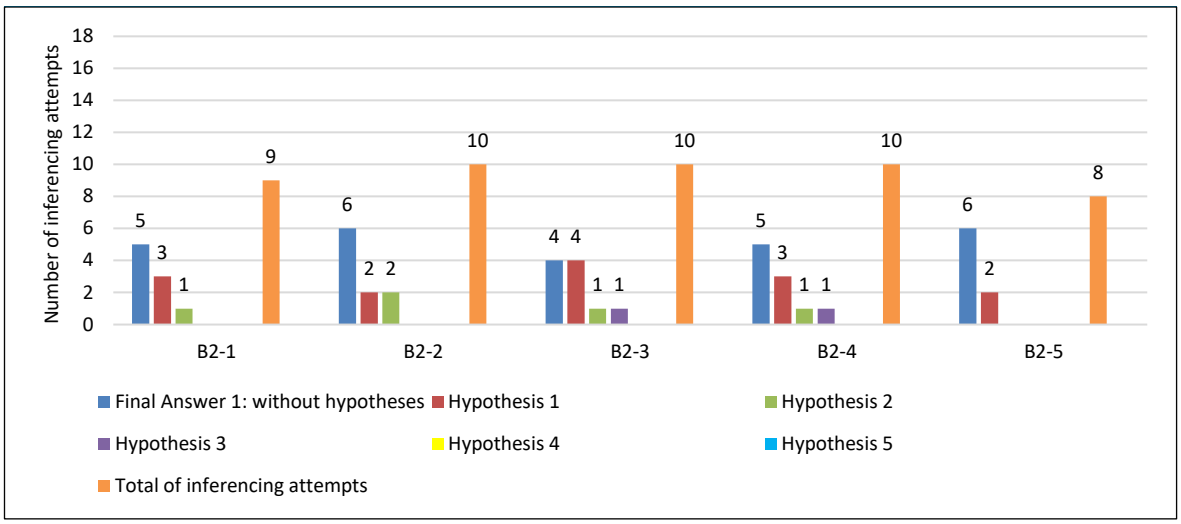


Figure 5-6 B2 groups' lexical inferencing attempts in Text-2

Finally, all the members of the B1 group, except B1-2 and B-1-5, tended to generate one hypothesis as they did in Eid Al-Fiter (Figure 5-7). However, as opposed to their inferencing behaviour in Eid Al-Fiter, B1-2 and B1-5 generated 3 hypotheses for a TW they encountered in Bonfire night.

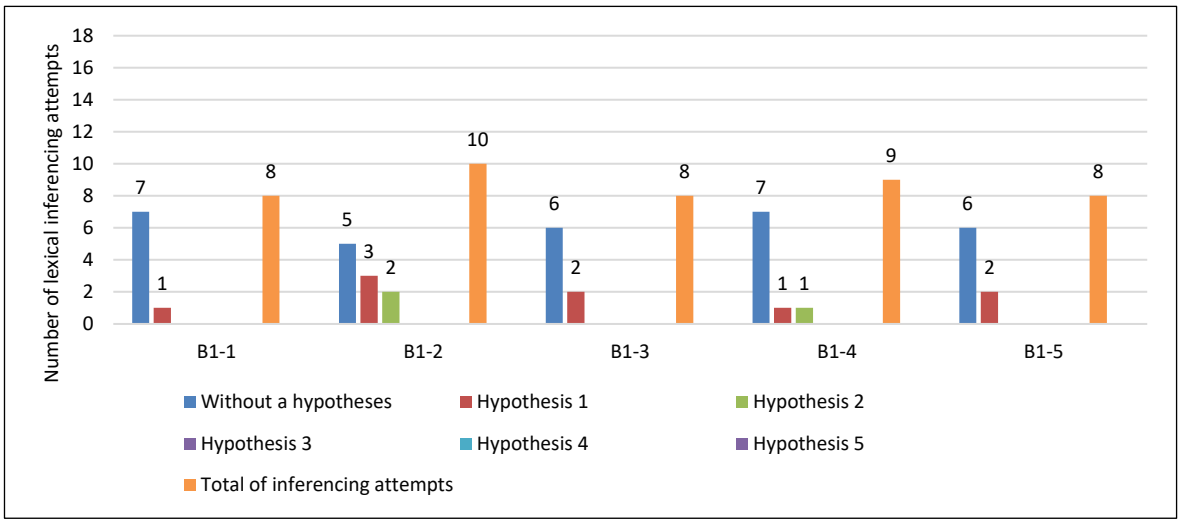


Figure 5-7 B1 groups' lexical inferencing attempts in Bonfire Night Text-2

5.2.2 Lexical inferencing responses and topic familiarity

This section presents the findings of the second part of the research question, **2.a**, the lexical inferencing responses made in terms of learners' degree of topic familiarity of the texts. There was a total of 240 Target Words (TWs) from both texts. Furthermore, there were no missing responses since participants were encouraged to provide attempts to the TWs they struggled with rather than leaving empty answers. Figure 5-8 shows that the larger portion of responses, just slightly over half the responses, 51.25%, were in favour of correct successful inferencing, while the remaining 8.33% were for partially correct answers and the rest for incorrect ones.

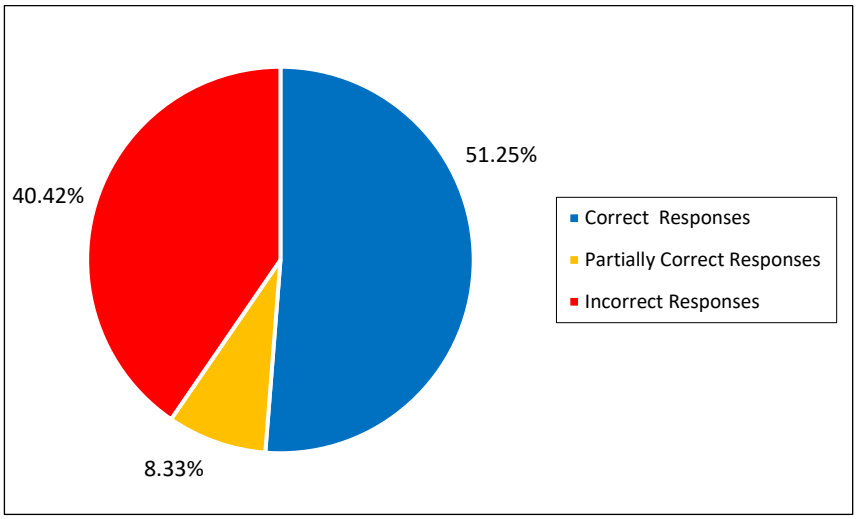


Figure 5-8 A summary of all inferencing responses

Next, the overall frequencies and percentages of the three types of TW responses were calculated for each group in terms of their PL in Table 5-4. As the table displays, a total of 123 (51.25%) TWs were correctly inferenced from both texts. Most of these correct responses, 49 (20.42%) were by the dominant C1 learners, followed by B2, who made just 2 correct responses more (0.83%) than the last group. As for partially correct answers, all the groups had less than 10 inferences, with the B2 group slightly more than the C1 by one response. Finally, incorrect answers were scored less by the dominant group while there were slight differences between the remaining two groups.

Table 5-4 Proficiency level and inferencing response

		Total of TW's Inferencing Success Rate		
		Correct	**Partially Correct**	**Incorrect**
C1 Group	Number of responses %	49 20.42%	7 2.92%	24 10%
B2 Group	number responses %	38 15.83%	8 3.33%	34 14.17%
B1 Group	number of responses %	36 15%	5 2.08%	39 16%
Total	**number of responses %**	**123 51.25%**	**20 8.33%**	**97 40.42%**

In terms of responses at text level, in Eid Al-Fiter, participants had more than half of their responses as correct, nearly 52.50% (Figure 5-9). This was followed by 11.67% of partially correct responses and finally incorrect responses, 35.83%, which were the second frequent type of responses.

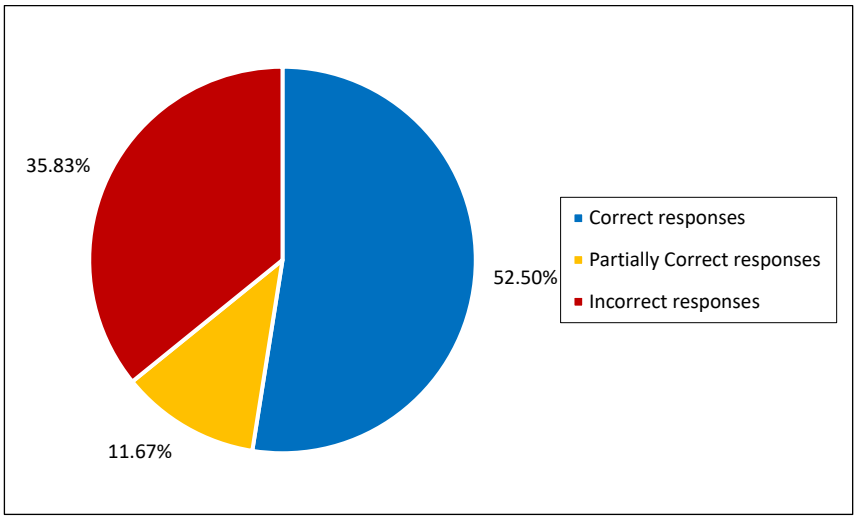


Figure 5-9 A summary of Eid Al-Fiter inferencing responses

On the other hand, in Bonfire Night as with Eid Al-Fiter, half the responses were correct ones (Figure 5-10) but less than Eid Al-Fiter (52.50%). Furthermore, only 5% of responses were partially correct, again less than Eid Al-Fiter (8.33%). Finally, as opposed to Eid Al-Fiter, there were more incorrect responses, 45%, which is 9.17% more than Eid Al-Fiter.

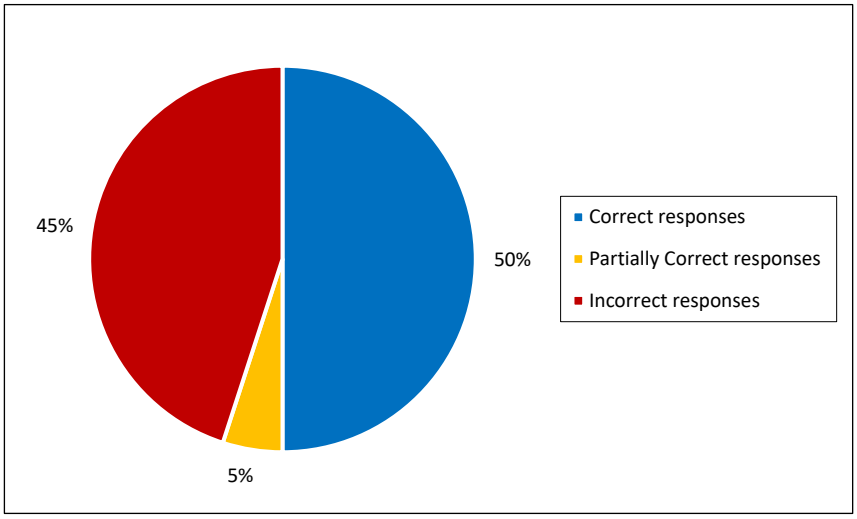


Figure 5-10 A summary of Bonfire Night inferencing responses

Lexical inferencing responses varied with the degree of topic familiarity of the text, with more correct responses in Eid Al-Fiter while more incorrect ones for Bonfire Night for all groups. In terms of responses by proficiency groups, all groups did slightly better in the familiar Eid Al-Fiter text except the least proficient group, B1 (Figure 5-11). Interestingly, this group had the same number of correct responses for both texts regardless of its topic. On the other hand, the dominant C1 group's correct responses differed from the culturally distant text by one TW more for Eid Al-Fiter. The same was for the B2 group with 2 TWs more for Eid Al-Fiter.

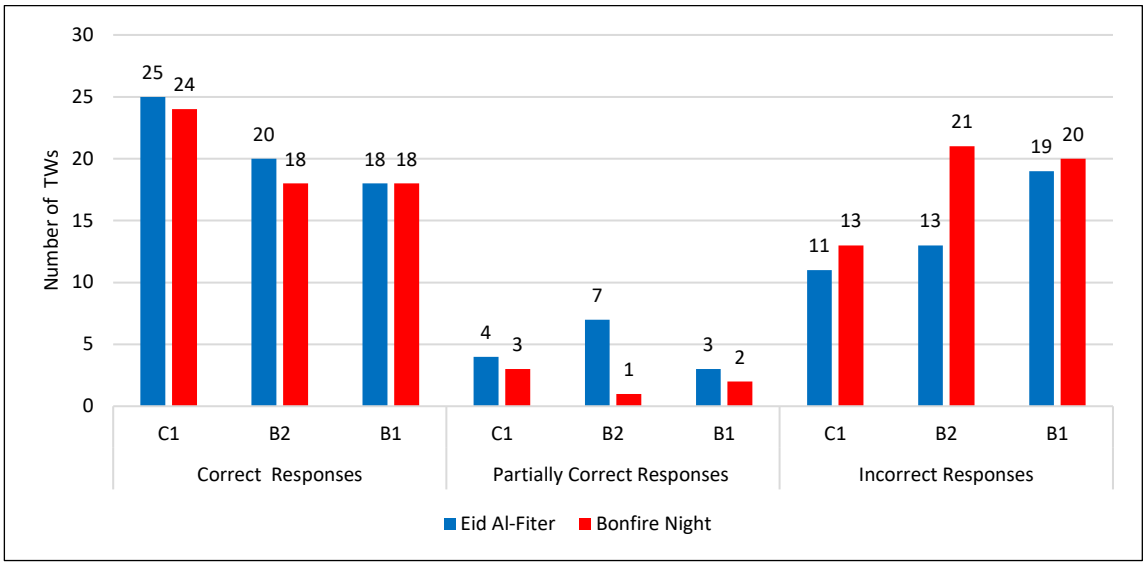


Figure 5-11 Types of inferencing responses by groups at text level

Regarding partially correct responses, in which a participant's answers are judged to be appropriate out of context but distort the meaning within the reading text, a similar pattern appeared across the three groups. There were more partially correct answers on the familiar reading topic than the unfamiliar one, with a noticeable difference for the B2 participants compared to the remaining groups. There were 6 more partially correct TWs for this group in the familiar text compared to the unfamiliar one. While for the remaining groups, it was one partially correct TW more in Eid Al-Fiter compared to Bonfire Night. Due to participants' cultural unfamiliarity with Bonfire Night, there were more incorrect answers across the three groups than Eid Al-Fiter, with B1 learners scoring the highest. This led to more correct responses in Eid Al-Fiter and more incorrect ones for Bonfire Night for all groups.

5.3 Knowledge sources and topic familiarity

2.b What are the similarities/differences between the groups in terms of the knowledge source clues used when reading culturally familiar topics and with what frequency?

This section answers the second part of the second research question, the role of topic familiarity and the Knowledge Source (KS) clues used in both texts. It begins by summarizing the overall KSs used in the two texts as a whole. Next, a detailed summary is presented of the linguistic and the non-linguistic KS clues used in both texts. As mentioned in 4.3, a total of 351 instances of resorting to clues were found in learners' verbal protocols while they inferenced the TWs. Overall, in terms of the inferencing clues as a whole, 193 (54.99%) of these clues were associated with Eid Al-Fiter while 158 (45.01%) with Bonfire Night (Figure 5-12).

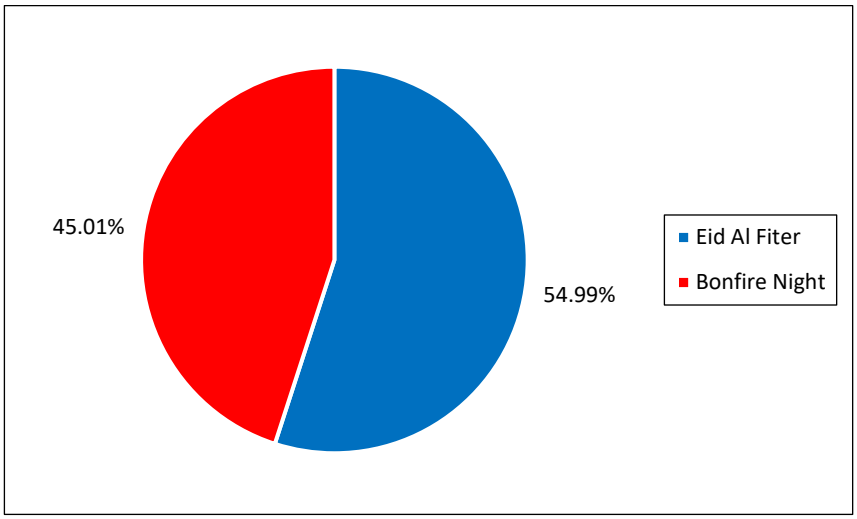


Figure 5-12 Percentages of clues used by participants by text

It was mentioned in 4.3 that participants relied mostly on linguistic sources in the following order (see Figure 4-1): Sentence Level KS (62.39%), Word Level KS (15.67%), Vocabulary Knowledge (14.53%) and seldom used Discourse Level KS (1.42%). They resorted to the non-linguistic source, World Knowledge only 5.98% which was more than Discourse Level clues.

At text level, Table 5-5 presents a summary of the 5 KS clues activated regardless of inferencing responses in each text. Word Level, Vocabulary and World knowledge clues (in green) were activated more in Eid Al-Fiter while for Bonfire Night, Sentence and Discourse Level clues were used more. Although sentence level clues were activated more in Eid Al-Fiter (116) than Bonfire Night (103), due to the discrepancy in the total of clues used in both texts, the overall weight of sentence level clues in Bonfire Night (65.19%) was more than Eid Al-Fiter (60.10%).

Table 5-5 Distribution of the total number of KS clues used by texts

Major Knowledge Source clues		**Eid Al-Fiter** (familiar text)	**Bonfire Night** (unfamiliar text)	**Total of KS clues**
Vocabulary Knowledge	Instances %	**29** **15.03%**	22 13.92%	51
Word Level	Instances %	**32** **16.58%**	23 14.56%	55
Sentence Level	Instances %	116 60.10%	**103** **65.19%**	219
Discourse Level	Instances %	2 1.04%	**3** **1.90%**	5
World Knowledge	Instances %	**14** **7.25%**	7 4.43%	21
Total	**Instances** **%**	**193** **100%**	**158** **100%**	**351**

The following section looks at the type of KS clues used and their frequency at the level of text topic familiarity (i.e. text level). Regardless of the outcome of inferencing responses, there were slight differences in the frequency and type of clues used between the texts.

5.3.1 Linguistic sources

5.3.1.1 Vocabulary knowledge clues

In this current study, one of the main findings of this study is how learners tapped into their Vocabulary Knowledge source as a clue (see 4.3.1.1). Previously encountering the TW before was the highest approach that learners resorted to as they tapped into their vocabulary knowledge (Figure 5-13). The data revealed that regardless of their proficiency levels, all learners except B1-2 stated previously having encountered the TW through a number of sub-clues (p:186-188). Although on their pretest learners reported having met these TW before, yet the majority of the pretest results discomforted that learners knew these TWs. Due to their familiarity with the Eid Al-Fiter text, learners reported either having encountered the TW before or never encountered it more than the Bonfire Night text. On the other hand, reporting not knowing the TW's meaning was the least tapped into vocabulary knowledge clue used once in each text.

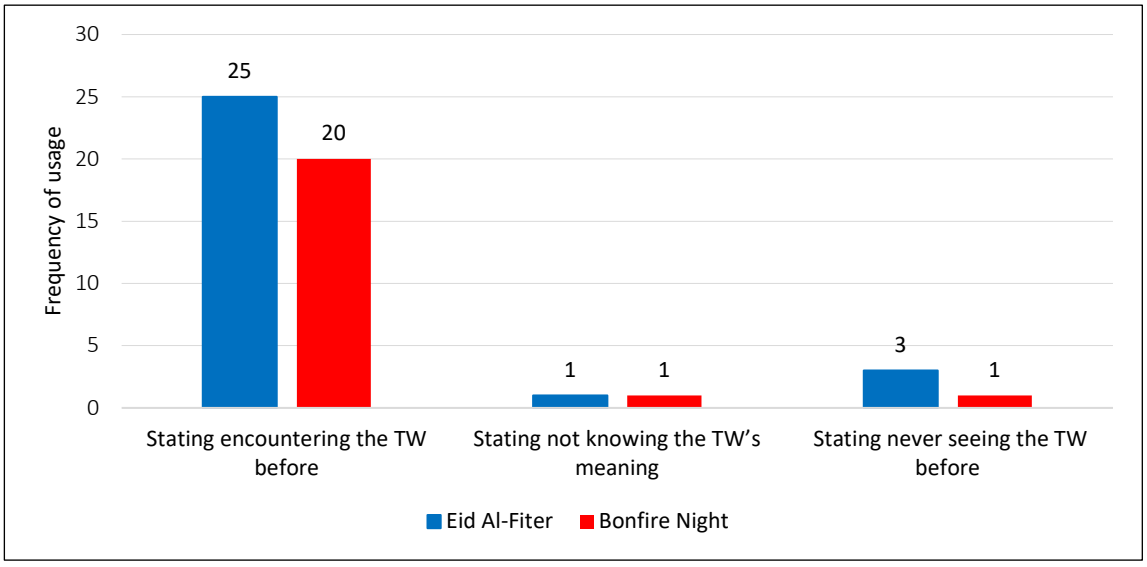


Figure 5-13 Distribution of participants' Vocabulary Knowledge used by texts

In terms of proficiency, Table 5-6 displays that the C1 group were the highest group to frequently tap into their vocabulary knowledge in both texts compared to the remaining groups. In terms of encountering the TW before, B2 were the highest group to use this clue in Eid Al-Fiter followed by the most dominant proficiency group. However, interestingly C1 used this clue the most in Bonfire Night which was slightly one clue less than Eid Al-Fiter. While for the remaining groups, it was

used by half in Bonfire Night compared to Eid Al-Fiter. Only the advanced group, specifically C1-1 in Eid Al-Fiter and C1-5 in Bonfire Night, tapped into their vocabulary knowledge and compared the TWs to the stock of words they know before both stating they do not know the TWs. Finally, only the highest and lowest proficiency groups reported never seeing the TW, i.e. it was new to them, in Eid Al-Fiter while only C1 continued to use this clue in Bonfire Night (for individuals see p:182).

Table 5-6 Learner's Vocabulary Knowledge used by groups

		1. Learner's Vocabulary Knowledge					
		Eid Al-Fiter			**Bonfire Night**		
		C1	**B2**	**B1**	**C1**	**B2**	**B1**
1.1. Stating encountering the TW before.	Instances **%**	11 5.70%	12 6.22%	2 1.04%	10 6.33%	6 3.80%	4 2.53%
1.2. Stating not knowing the Tw's meaning.	Instances **%**	1 0.52%	-	-	1 0.63%	-	-
1.3. Stating never seeing the TW before.	Instances **%**	2 1.04%	-	1 0.52%	1 0.63%	-	-
Total by groups	**Instances %**	**14 7.25**	**12 6.22%**	**3 1.55%**	**12 7.59%**	**6 3.80%**	**4 2.53%**
Total by text	**Instances %**	**29 15.03%**			**22 13.92%**		

5.3.1.2 **Word level knowledge clues**

Participants resorted to TW clues through their knowledge of morphological properties and/or semantic meaning. Regarding morphology, removing TW affixes was the highest clue activated in both texts with more in favour of Eid Al-Fiter (Figure 5-14). Perceived near homonymy (word form) was the second morphological clue at word level that was used 5 times more in Bonfire Night compared to Eid Al-Fiter. Next, the TW's part of speech was used slightly more in the unfamiliar text while using prefixes were also slightly used more in the familiar text. At meaning level, interestingly, resorting to semantic relations was only present in Eid Al-Fiter. Knowledge of synonyms about the TW was used once per text while knowledge of antonyms as a clue was used only in Bonfire Night.

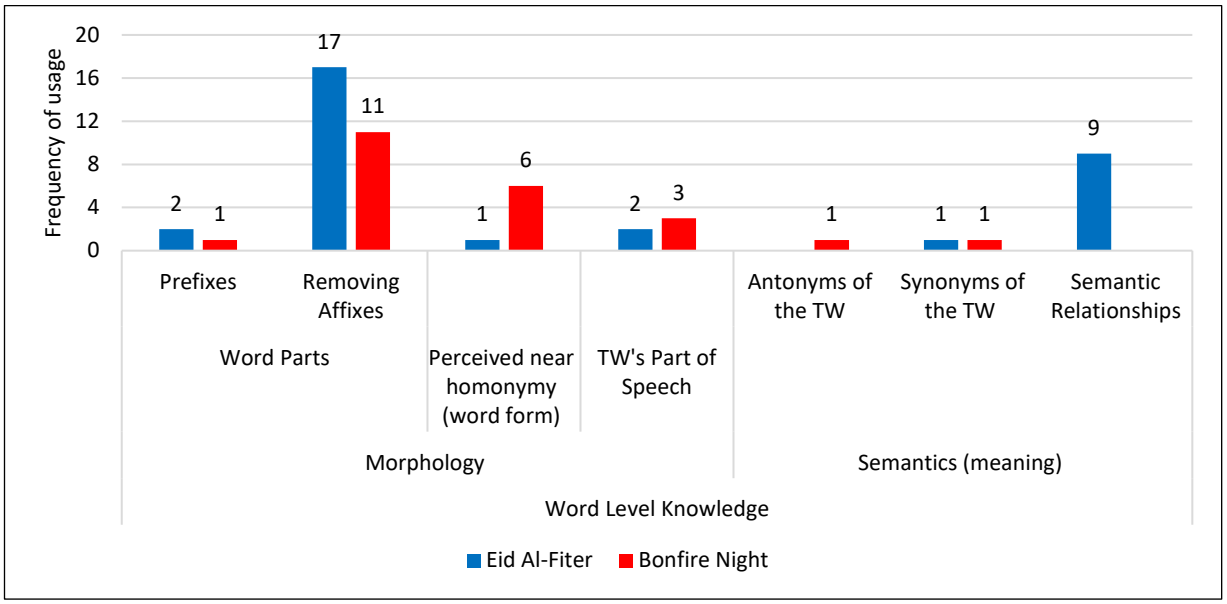


Figure 5-14 Distribution of Word Level clues used by Texts

Overall, a total of 55 word level clues were activated for all the inferencing responses, with more reported for Eid Al-Fiter (32) than Bonfire Night (23) (Table 5-7). In terms of proficiency level, B2 members tend to use the most morphological clues at TW level in both texts, followed by C1 and then B1 learners (see p:188 for details). At semantic (meaning) TW level clues, all groups used these clues in Eid Al-Fiter (see p:190). Interestingly, only the dominant C1 learners, more specifically, C1-1 and C1-2, were the ones to use word meaning level clues respectfully as synonyms and antonyms in Bonfire Night (see p:190).

Table 5-7 Word Level clues used by groups

		2. Word Level Knowledge					
		Eid Al-Fiter			**Bonfire Night**		
		C1	**B2**	**B1**	**C1**	**B2**	**B1**
2.1. Morphology	Instances %	6 3.11%	12 6.22%	4 2.07%	7 4.43%	9 5.70%	5 3.16%
2.2. Semantics (meaning)	Instances %	3 1.55%	5 2.59%	2 1.04%	2 1.27%	-	-
Total by groups	Instances %	**9** **4.66%**	**17** **8.81%**	**6** **3.11%**	**8** **5.70%**	**9** **5.70%**	**5** **3.16%**
Total By text	Instances %	**32** **16.58%**			**23** **14.56%**		

5.3.1.3 **Sentence level knowledge clues**

This was the most frequently used KS of all, with the majority of clues being at sentence level meaning. In both texts, learners relied heavily on sentence meaning level clues, more specifically

in the form of local clues (within the TW sentence) rather than global ones (beyond the boundaries of the TW sentence) (Figure 5-15). On the other hand, sentence level grammar in the form of word order was tapped into once in each text while punctuation was only used in the familiar Eid Al-Fiter text.

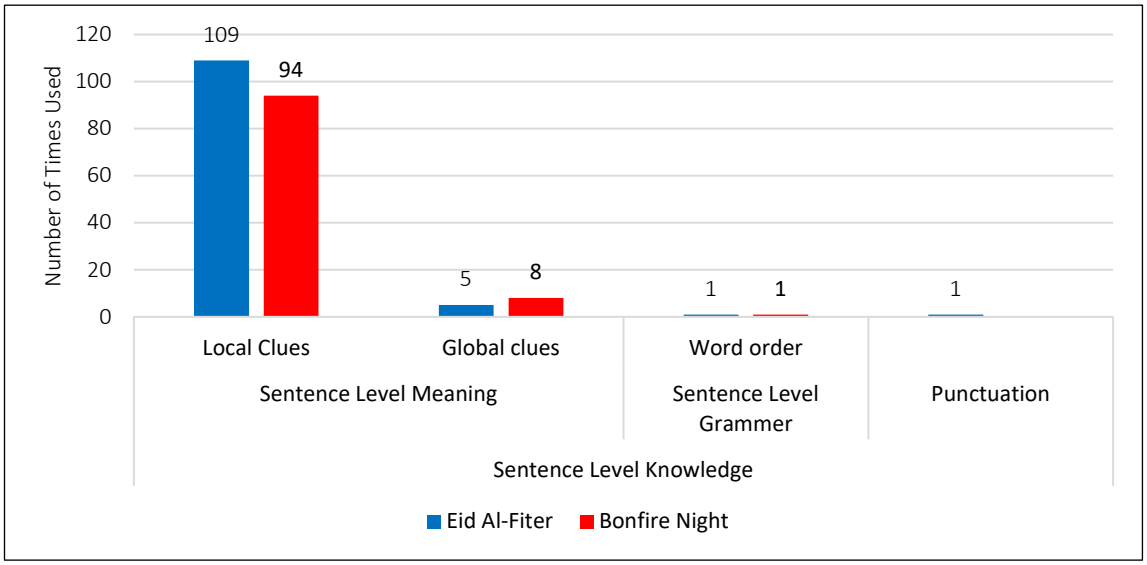


Figure 5-15 Distribution of Sentence Level clues used by texts

Regarding clues at group level, local clues were slightly more used by B2 learners in Eid Al-Fiter while for Bonfire Night, B1 used them more (Table 5-8). On the other hand, global clues (see p:195) were only used by C1 and B1 learners in Eid Al-Fiter but interestingly in the unfamiliar text, they were used more by all groups except C1, who maintained the same frequency in both texts. Sentence word order was used once by B2-5 in the familiar text while C2-2 used it in the unfamiliar one. Finally, punctuation was used once in Eid Al-Fiter by B2-3.

Table 5-8 Sentence Level clues used by groups

			3. Sentence Level Knowledge					
			Eid Al-Fiter			Bonfire Night		
			C1	B2	B1	C1	B2	B1
3.1. Sentence Level Meaning	Local clues	Instances %	35 18.13%	38 19.69%	36 18.65%	29 18.35%	31 16.62%	34 21.52%
	Global clues	Instances %	3 1.55%	-	2 1.4%	3 1.90%	2 1.27%	3 1.90%
	Total by groups	Instances %	38 19.69%	38 19.69%	38 19.69%	32 20.25%	33 20.89%	37 23.42%
	Total by text	Instances %	114 59.07%			102 64.56%		
3.2. Sentence Level Grammar	Total by groups	Instances %	-	1 0.52%	-	1 0.63%	-	-
3.3. Punctuation	Total by groups	Instances %	-	1 0.52%	-	-	-	-
Total by groups		Instances %	**38 19.69%**	**40 20.72%**	**38 19.69%**	**33 20.89%**	**33 20.89%**	**37 23.42%**
Total Sentence KS by text		**Instances %**	**116 60.10%**			**103 65.19%**		

5.3.1.4 Discourse level knowledge clues

Since learners depended more on local clues than global ones, this explains why they did not attempt to go beyond the TW paragraph. Figure 5-16 shows that TW paragraph level clues were only used twice in Eid Al-Fiter text while formal schema was only tapped into 3 times in the Bonfire Night text.

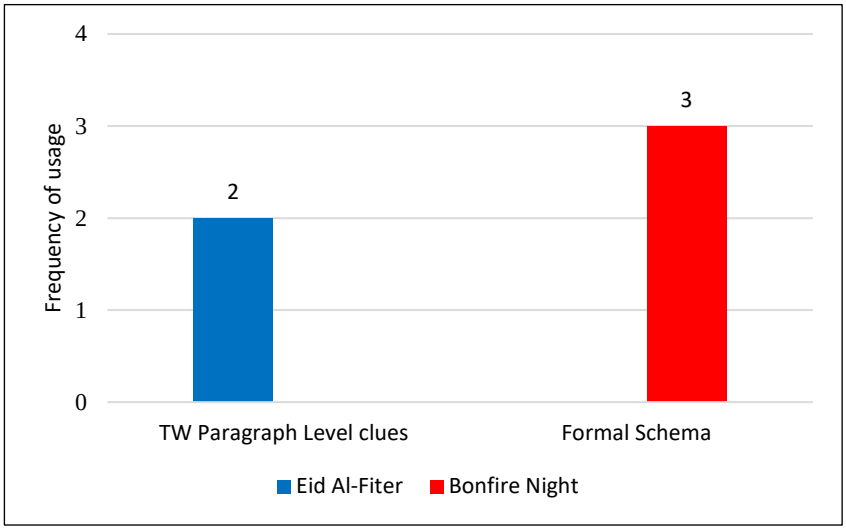


Figure 5-16 Distribution of Discourse Level clues used by texts

Through a closer look at group level results displayed in Table 5-9, TW paragraph level clues were only used by the advanced group in the familiar text, more specifically only by C1-2. While formal schema was only activated in the unfamiliar text only by the B1 group 3 times, twice by B1-2 and once by B1-5.

Table 5-9 Discourse Level clues used by groups

			4. Discourse Level Knowledge					
			Eid Al-Fiter			**Bonfire Night**		
			C1	**B2**	**B1**	**C1**	**B2**	**B1**
4.1. TW paragraph Level clues	Total by groups	Instances %	2 1.04	-	-	-	-	-
4.2. Formal Schema	Total by groups	Instances %	-	-	-	-	-	3 1.90%
Total by groups		**Instances %**	2 1.04					3 1.90%
Total of Discourse clues by text		**Instances %**	**2 1.04**			**3 1.90%**		

5.3.2 Non-Linguistic sources

Learners, regardless of their proficiency level, tapped into their world knowledge or their personal experience as a clue while inferencing. This knowledge was used as a clue twice as much in the familiar text compared to the unfamiliar one, as displayed below in Figure 5-17.

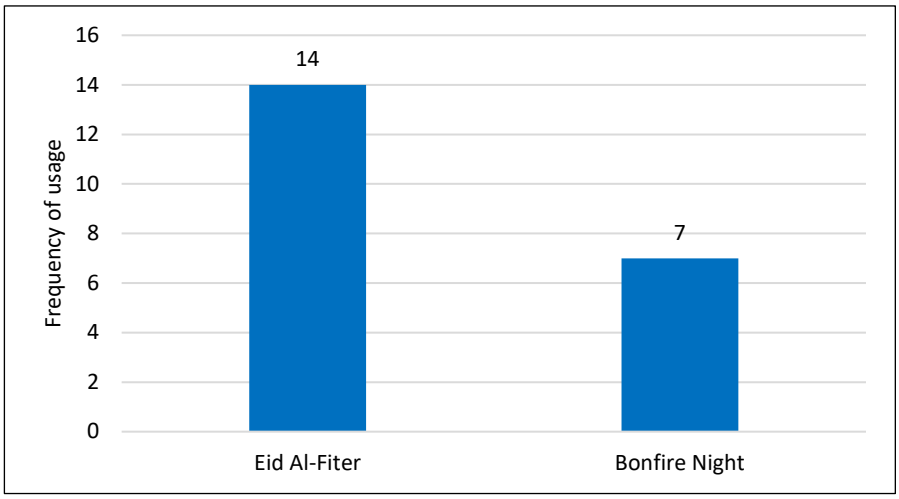


Figure 5-17 Distribution of World Knowledge clues used by texts

All groups used this knowledge as a clue in Eid Al-Fiter, with the C1 group using it the most (Table 5-10). Although Bonfire Night was completely unknown to all students, only the C1 group applied

their world knowledge the most as they attempted to inference the TWs. As mentioned in 4.3.2, only C1-3, C1-5, B2-1 and B1-2 refrained from using this KS as a clue.

Table 5-10 World Level clues used by groups

		5. World Knowledge					
		Eid Al-Fiter			Bonfire Night		
		C1	B2	B1	C1	B2	B1
Total by group	Instances	6	5	3	4	1	2
	%	3.11%	2.59%	1.55%	2.53%	0.63%	1.27%
Total of World Knowledge clues by text	**Instances**	**14**			**7**		
	%	**7.25%**			**4.43%**		

Thus, to summarize, groups varied in the type of clues and the number of times they resorted to them as they inferenced the TWs. In terms of the summary of the frequency of KS clues used, regardless of the outcome of responses, the following pattern for both the two texts beginning with the most KS clues used is as follows:

Sentence Level> Word Level> Vocabulary knowledge> World Level> Discourse Level clues

5.4 Lexical Inferencing Strategies and Topic Familiarity

2.c. What are the similarities/differences between groups in terms of lexical inferencing strategies employed when reading culturally familiar and unfamiliar topics and with what frequency?

This section aims to answer the final part of the second research question, the role of the learners' proficiency and their topic familiarity on the lexical inferencing strategies (LIFSs) applied while inferencing the target words (TWs). It begins by summarizing the overall strategies used followed by a detailed summary of the 4 major strategy categories. As mentioned in 4.4, there was a total of 758 instances of resorting to LIFSs identified in participants' verbal protocols (think-alouds and immediate stimulated recalls). Furthermore, learners relied more on Cognitive Strategies than Metacognitive ones (see Figure 4-2). These strategies were used in the following order; Meaning-Focused (39.05%), Form-Focused (26.39%) (Cognitive Strategies) while both Metacognitive Strategies, Evaluating and Monitoring, were used the same (17.28%). However, in terms of strategies used at text level, there were more strategies in Eid Al-Fiter, nearly 52.77% (400), while the remaining 47.23% (358) were found in Bonfire Night (Figure 5-18).

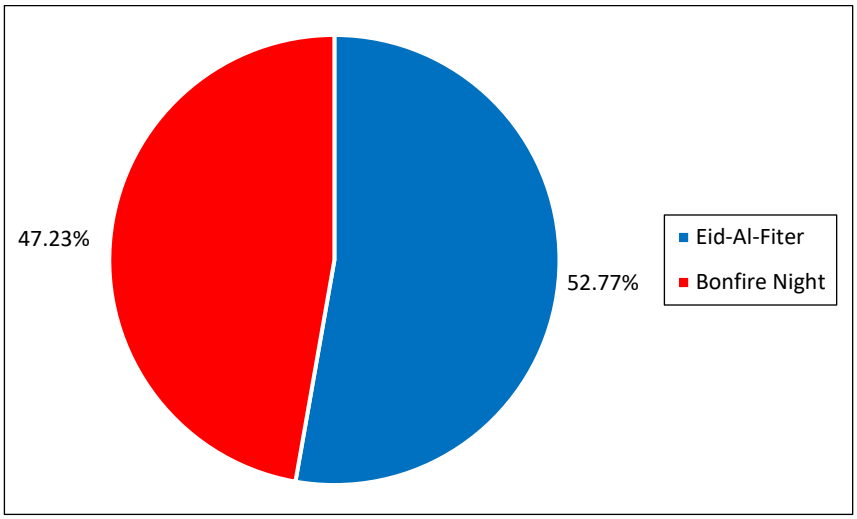


Figure 5-18 Percentages of strategies used by text

At text level, Table 5-11 displays the summary of the major strategy categories used in each text with more strategies applied in Eid Al-Fiter. In terms of strategy category, Form-Focused and Monitoring Strategies (in green) were used more in Eid Al-Fiter while Meaning-Focused and Evaluating Strategies were used more in Bonfire Night (in green).

Table 5-11 Major inferencing strategy categories used at text level

Major Strategies used		**Eid Al-Fiter (familiar text)**	**Bonfire Night (unfamiliar text)**	**Total of STGs**
Meaning-Focused Strategies (MFS)	Instances %	153 38.25%	**143** **39.94%**	**296**
Form-Focused Strategies (FFS)	Instances %	**109** **27.25%**	91 25.42%	**200**
Monitoring Strategies (MS)	Instances %	**73** **18.25%**	58 16.20%	**131**
Evaluating Strategies (ES)	Instances %	65 16.25%	**66** **18.44%**	**131**
Total	**Instances** **%**	**400** **100%**	**358** **100%**	**758**

The following section reports on the 4 main strategy categories beginning with the Cognitive Strategies presented in descending order in terms of their frequency of usage, followed later by the Metacognitive ones.

5.4.1 Meaning-Focused strategies

This was the most resorted to LIFS among the remaining categories. At text level, regardless of topic familiarity, learners heavily depended on textual clues compared to the remaining sub-strategies in this category (Figure 5-19). Resorting to their vocabulary knowledge was the second highest MFS after textual clues and was used more, as mentioned earlier in this chapter (5.3.1.1) in the familiar text. One of the findings of the present study, which was not reported in the previous lexical inferencing literature, was replacing the TW with a guess, in English or Arabic, which was used as either a Meaning-Focused or Evaluating Strategie (see A4). It was also found that not only was replacing a guess in Arabic less frequently used but was also absent in the familiar text while world knowledge was equally shared between the texts.

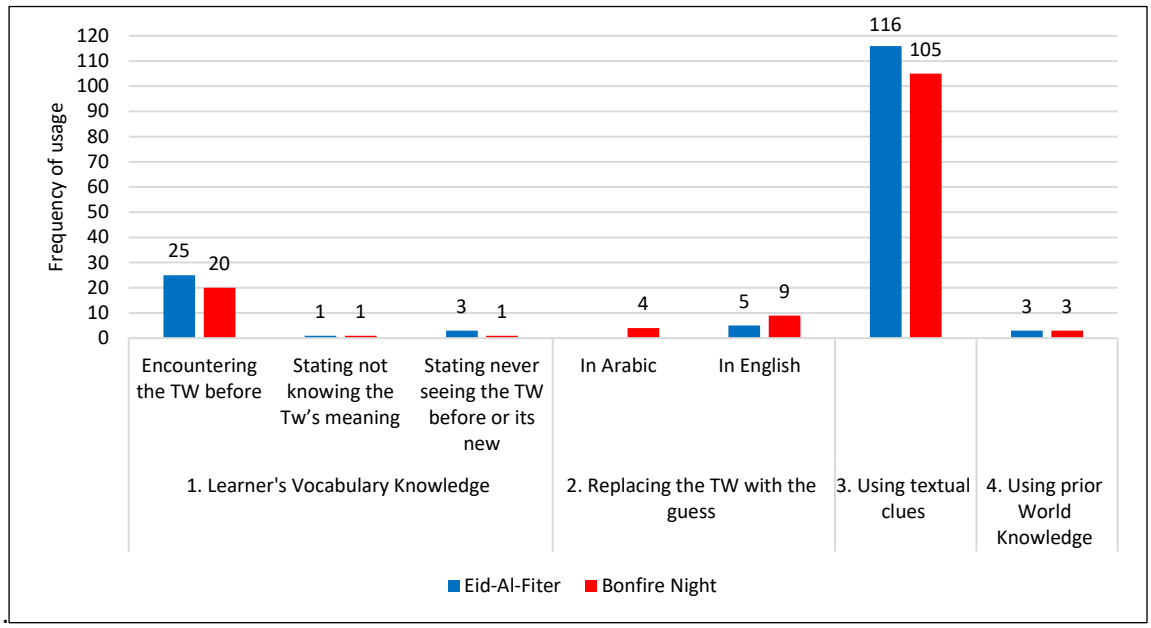


Figure 5-19 Meaning-Focused sub-strategies at text level

All groups used textual clues more in Eid Al-Fiter except B1 who slightly used them more in Bonfire Night (Table 5-12). On the other hand, all groups tapped into their stock of words, vocabulary knowledge, more in the familiar text with C1 learners using their vocabulary knowledge the most among the groups in both texts. Using world knowledge to generate a hypothesis for the TW was used in both texts by all groups except by C1 who refrained from using them in the familiar text (see A3). Finally, replacing a TW with a guess in English was not only used more in Bonfire Night but interestingly, it was used the most by the least proficient group (for individuals see A4).

Table 5-12 Meaning-Focused Strategies used by groups

Meaning-Focused Strategies		Eid Al-Fiter			Bonfire Night		
		C1	B2	B1	C1	B2	B1
1.Using textual clues	Instance %	40 10.00%	38 9.50%	38 9.50%	32 8.94%	33 9.22%	40 11.17%
2.Learner's Vocabulary Knowledge	Instance %	14 3.50%	12 3.00%	3 0.75%	12 3.35%	6 1.68%	4 1.12%
4.Using World Knowledge	Instance %	-	1 0.25%	2 0.50%	1 0.28%	1 0.28%	1 0.28%
2.Replacing the TW with a guess	Instance %	3 0.75%	1 0.25%	1 0.25%	4 1.12%	3 0.84%	6 1.68%
Total by Group	Instance %	**57 14.25%**	**52 13.00%**	**44 11.00%**	**49 13.69%**	**43 12.01%**	**51 14.25%**
Total by text	Instance %	**153 38.25%**			**143 39.94%**		

5.4.2 Form-Focused strategies

This was the second most frequently used set of inferencing strategies where learners resorted to either the word-form properties of the TW, the sentential context or both. The sub-strategies found were repeating, analysing and associating. Overall, repeating was slightly more used in Eid Al-Fiter (76) than Bonfire Night (69), with TW repeating as the most frequently used strategy between the repeating strategies (Figure 5-20). In terms of analysing sub-strategies, TW level analysis was used more than sentence level analysis. Resorting to the TW stems, by either removing them explicitly or implicitly, was used more in the familiar text compared to the unfamiliar one. Under TW analysis, perceived near homonymy (word form) was interestingly used more in the unfamiliar Bonfire Night text which was the second most applied strategy after resorting to the TW's stem. On the other hand, the least used TW analysing sub-strategy was analysing prefixes, used only 3 times by the advanced learners; C1-1, C1-3 and C1-5 who applied them slightly more in the familiar text. This was followed by analysing the TW's part of speech which was reported 5 times and used slightly more in the unfamiliar text (see p:189). Finally, associating the TWs with other similar words was only present in the familiar Eid Al-Fiter by all groups.

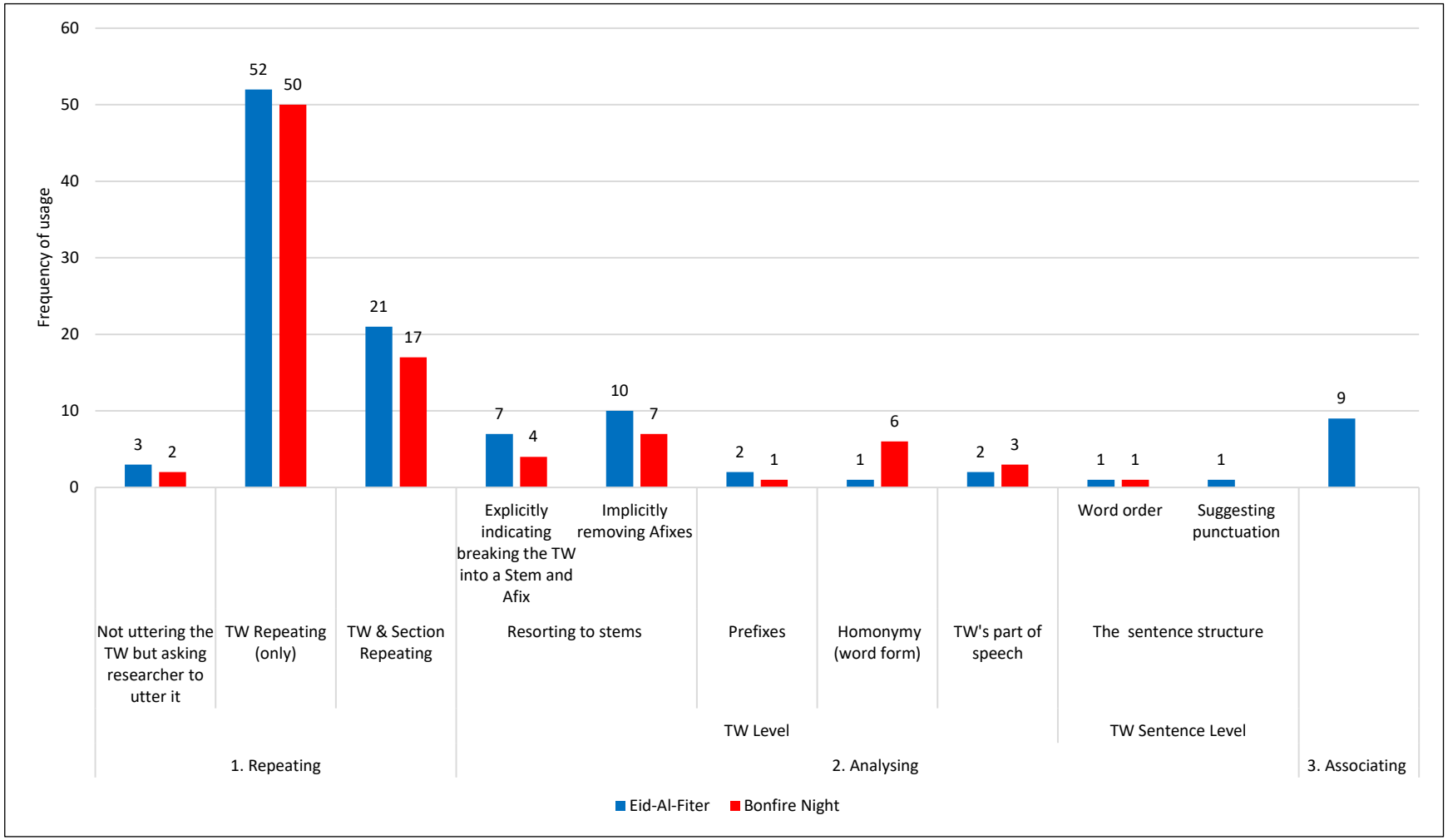


Figure 5-20 Form-Focused sub-strategies at text level

Repeating as a LIFS was the most dominant frequently consulted FFS used by all the three groups and used more in the familiar text by all groups (Table 5 13). The data reported that repeating was mostly resorted to by the advanced groups while B2 used them the least. In terms of analysing, not only was TW analysing used by all groups but was used the most by the intermediate B2 group in Eid Al-Fiter while only C1 and B1 used them slightly more in the unfamiliar text (for individuals see p:202). Finally, associating was used by all groups in Eid Al-Fiter by 6 learners; C1-5, B2-1, B2-3, B2-4, B2-5, B1-3 but was absent in Bonfire Night due to its unfamiliarity.

Table 5-13 Form-Focused Strategies used by groups

Form-Focused Strategies		**Eid Al-Fiter**			**Bonfire Night**		
		C1	**B2**	**B1**	**C1**	**B2**	**B1**
1.Repeating	Instances	36	14	26	34	13	22
	%	9.00%	3.50%	6.50%	9.50%	3.63%	6.15%
2. Analysing	Instances	6	14	4	8	9	5
	%	1.50%	3.50%	1.00%	2.23%	2.51%	1.40%
3. Associating	Instances	2	5	2	-	-	-
	%	0.50%	1.25%	0.50%			
Total by Group	Instances	**44**	**33**	**32**	**42**	**22**	**27**
	%	**11.00%**	**8.25%**	**8.00%**	**11.73%**	**6.15%**	**7.54%**
Total by text	Instances	**109**			**91**		
	%	**27.25%**			**25.42%**		

5.4.3 Monitoring strategies

These strategies were used to indicate awareness of the inferencing processes and text features. Reattempting to generate a new hypothesis and disregard the previous ones was the most frequently consulted strategy in both texts (Figure 5-21). Learners used reattempting slightly more in the unfamiliar text compared to the familiar one. Skipping was the next frequently resorted to Monitoring Strategy (MS) after reattempting, which was used more in Eid Al-Fiter (16 instances) compared to Bonfire Night (12 instances). As previously mentioned in Chapter 4, skipping took two main approaches (see p:205). Interestingly, more skipping occurred in the familiar text than the unfamiliar. More specifically, deciding to skip only after being reminded by the researcher without a guess was the most frequent type of skipping approach used. This was followed by learners' acknowledging the difficulty/failure of their inferencing attempts which was only present in the familiar Eid Al-Fiter text. Finally, some learners (C1-1, C1-3, B2-1, B2-2, B2-4, and B1-4) noticed that their guess distorted the meaning of the TW sentence which indicated that some participants weighed their guess against the context this occurred slightly more in Bonfire Night than Eid Al-Fiter.

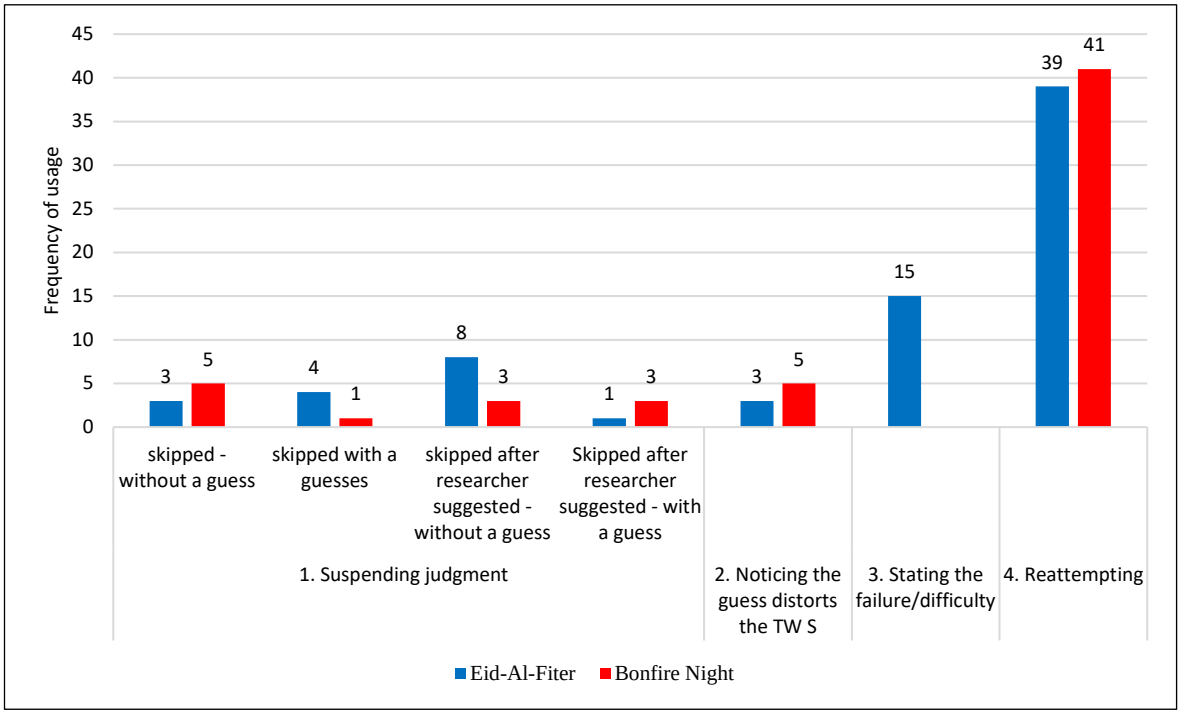


Figure 5-21 Monitoring sub-strategies at text level

At the level of learners' proficiency level (PL), suspending judgment or skipping was used more by all groups in the familiar text (Table 5-14), with members of C1 using it the most with 10 instances (for individuals see p:205). While monitoring their inferences, some learners noticed that their generated guess distorted the meaning of the TW's sentence, which was displayed more in the unfamiliar text. It was only used by some of the B2 members (B2-1, B2-2, B2-3) in Eid Al-Fiter while all groups used this strategy in the unfamiliar text (see p:208). Interestingly, stating the difficulty of inferences was reported by all groups only in Eid Al-Fiter and was absent for Bonfire Night. This MS strategy was used the most by C1 members while the intermediate, group B2, used it the least. Finally, reattempting was used more by all members of the group (see p:207) in both texts. However, as PL descended so did the number of reattempting strategies in the unfamiliar text.

Table 5-14 Monitoring Strategies used by groups

Monitoring Strategies		Eid Al-Fiter			Bonfire Night		
		C1	B2	B1	C1	B2	B1
1.Suspending judgment (skipping)	Instances	6	5	5	4	4	4
	%	1.50%	1.25%	1.25%	1.12%	1.12%	1.12%
2.Noticing the guess distorts the TW sentence	Instances	-	3	-	2	2	1
	%		0.75%		0.56%	0.56%	0.28%
3.Stating the failure/difficulty of inferencing	Instances	7	3	5	-	-	-
	%	1.75%	0.75%	1.25%			
4.Reattempting	Instances	15	14	10	17	14	10
	%	3.75%	3.50%	2.50%	4.75%	3.91%	2.79%
Total by Group	Instances	**28**	**25**	**20**	**23**	**20**	**15**
	%	**7.00%**	**6.25%**	**5.00%**	**6.42%**	**6.42%**	**4.19%**
Total by text	Instances	**73**			**58**		
	%	**18.25%**			**16.20%**		

5.4.4 Evaluating strategies

Finally, Evaluating Strategies (ESs) which in this study were used by learners to examine or verify the appropriateness of their generated inferenced meanings. Checking their guesses either at word, sentence and world level was the most frequently consulted LIFSs which were used more in Eid Al-Fiter than Bonfire Night (Figure 5-22). Replacing the TW with a guess in Arabic or English was the most commonly used sub-checking strategy in which replacing a guess in English was used more in Bonfire Night compared to Eid Al-Fiter. This was followed by checking through consulting and falling back on their world knowledge which was used more in the familiar topic. The last checking strategy was resorting to the immediate (local) TW sentence where it was only found in the familiar text. Commenting and elaborating was the second most frequently used ES in this category used nearly twice as much in Bonfire Night than the familiar Eid Al-Fiter. Finally, inquiring about the TWs was the least ES used by learners which was used slightly more in the familiar text.

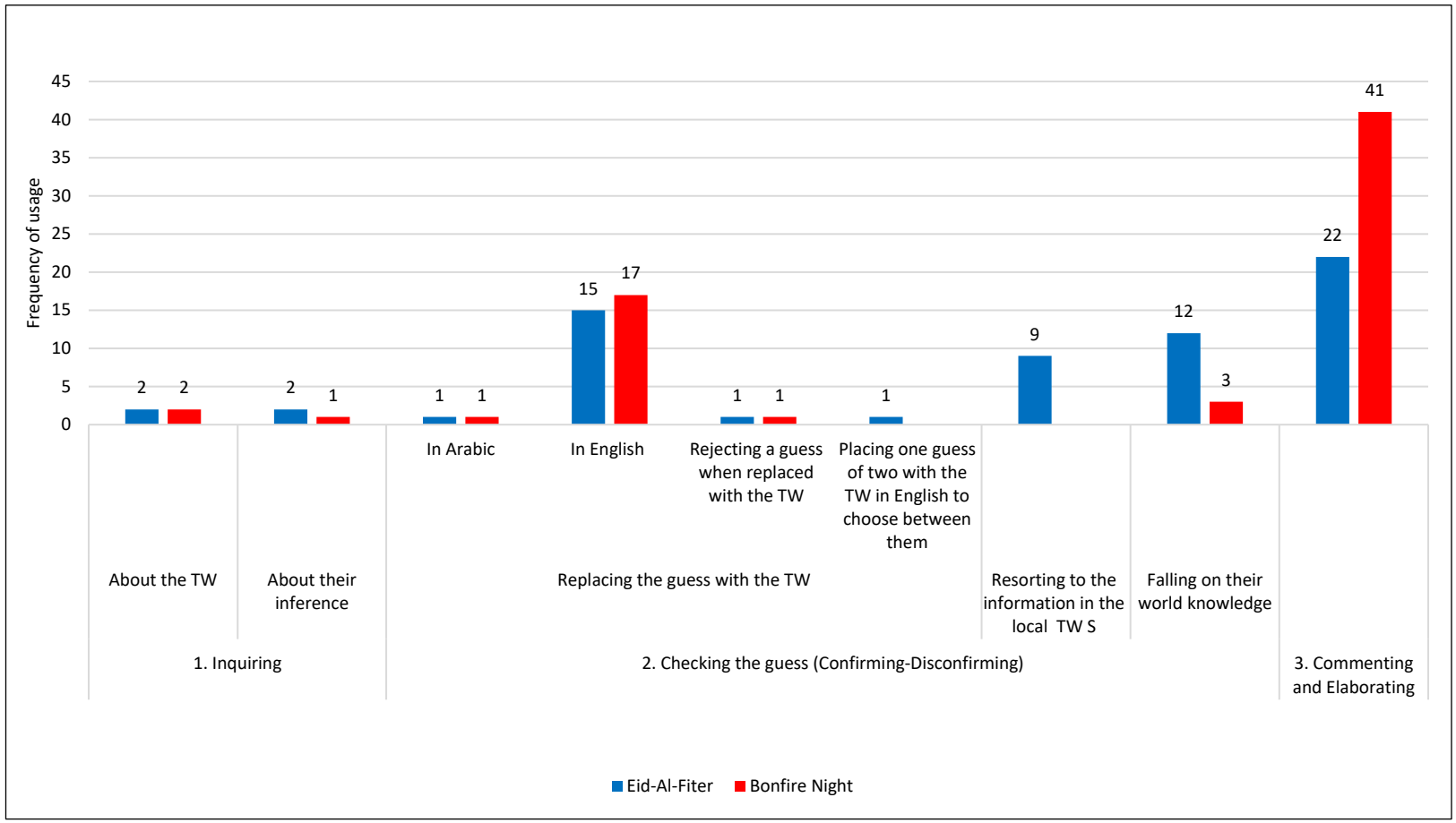


Figure 5-22 Evaluating sub-strategies at text level

All three groups used inquiring, the least applied ES strategy, in the familiar text with B2 using them slightly more than the remaining groups (Table 5-15) (for individuals see p:210). On the other hand, in the unfamiliar text it was only the dominant group that continued to use them (C1-2 (twice) and C1-4). Regardless of their PL, learners tended to evaluate their guess mostly through resorting to checking strategies (see Figure 5-22 above) compared to the two remaining ESs. All three groups except B1 used checking strategies more in Eid Al-Fiter than Bonfire Night, with the advanced group using it the most in both texts. Finally, commenting and elaborating strategies were used by all the groups with more in favour of the least proficient group B1 who had the highest instances in both texts.

Table 5-15 Evaluating Strategies used by groups

Evaluation Strategies		**Eid Al-Fiter**			**Bonfire Night**		
		C1	**B2**	**B1**	**C1**	**B2**	**B1**
1. Inquiring	Instances %	1 0.25%	2 0.50%	1 0.25%	3 0.84%	-	-
2. Checking the guess	Instances %	20 5.00%	12 3.00%	7 1.75%	9 2.51%	5 1.40%	8 2.23%
3. Commenting and elaborating	Instances %	6 1.50%	7 1.75%	9 2.25%	12 3.35%	14 3.91%	15 4.19%
Total by Group	Instances %	**27** **6.75%**	**21** **5.25%**	**17** **4.25%**	**24** **6.70%**	**19** **5.31%**	**23** **6.42%**
Total by text	Instances %	**65** **16.25%**			**66** **18.44%**		

In summary, regarding the frequency of LIFSs used regardless of the outcome of responses, two different types of strategy frequency patterns were found for each text beginning with the most frequent category used:

Eid Al-Fiter: Meaning-Focused> Form-Focused> Monitoring> Evaluating Strategies

Bonfire Night: Meaning-Focused> Form-Focused> Evaluating> Monitoring Strategies

In both texts, the frequency for the first two sets of lexical inferencing Cognitive Strategies were the same. Learners tended to use Meaning-Focused Strategies the most, followed by Form-Focused Strategies. However, a difference was found in the lexical inferencing Metacognitive Strategies used. In the familiar text, learners used more Monitoring Strategies over Evaluating Strategies while the opposite Metacognitive Strategy pattern was found in the unfamiliar text.

5.5 Topic familiarity and successful inferencing

The second remaining part of this chapter reports on the findings that help answer the third research question which focuses on successful inferencing, topic familiarity and proficiency level.

In terms of successful inferencing, what is the role of learners' topic familiarity, if any, on their lexical inferencing?

3.a. How successful are groups in their lexical inferencing attempts?

3.b. What are the knowledge source clues activated by the groups in both texts and with what frequency?

3.c. What are the lexical inferencing strategies used by the groups in both texts and with what frequency?

The section begins by answering the first sub-question which aims at answering the number of successful inferenced TWs.

3.a. How successful are the groups in their lexical inferencing attempts?

There was a total of 123 correct inferencing responses distributed among the three groups with the success of inferencing increasing as proficiency increased (see Table 5-4). Regarding topic familiarity and the outcome of inferencing responses, there were slightly more correct answers (1.25%) in favour of Eid Al-Fiter compared to Bonfire Night (Table 5-16). Furthermore, the familiar topic had more partially correct answers (3.33%) and fewer incorrect responses (4.58%) than Bonfire Night.

Table 5-16 Type of inferencing responses in the two texts

		Inferencing outcomes			
		Correct	**Partially Correct**	**Incorrect**	**Total**
Eid Al-Fiter	Count % of total	63 26.25%	14 5.83%	43 17.92%	120 50%
Bonfire Night	Count % of total	60 25.00%	6 2.50%	54 22.50%	120 50%
Total	Count % of total	123 51.25%	20 8.33%	97 40.42%	240 100%

In terms of successful inferencing and proficiency level, it was found that correct responses increased as proficiency increased (Table 5-17). Overall, C1 members had the highest score of correctly inferenced TWs between the groups and had successfully inferenced 11 TWs word more than the next in line proficiency group, the B2 group. While the differences between the B2 and B1 groups in terms of correct TWs were only two TWs more in favour of B2.

Table 5-17 Number of successfully inferenced TW by groups

	Groups			
	C1	**B2**	**B1**	**Total**
Eid Al-Fiter TWs	25 39.68%	20 31.75%	18 28.57%	63 100%
Bonfire Night TW	24 40.00%	18 30.00%	18 30.00	60 100%
Total of corret responsces	49 39.84	38 30.89%	36 29.27	123 100%

At the level of texts, there were slightly more correct inferenced TWs in Eid Al-Fiter compared to Bonfire Night. Most correct responses were displayed by the C1 group, followed by the remaining groups, B2 then B1. In terms of Bonfire Night, all groups except B1 slightly underperformed compared to their scores in Eid Al-Fiter. On the other hand, surprisingly B1 members maintained the same number of correct TWs in both texts (For an overview of percentages of TW success, see Appendix X).

5.6 Successful inferencing and knowledge sources

3.b. What are the knowledge source clues activated by the groups in both texts and with what frequency?

As mentioned in 4.4 and5.3, a total of 351 instances of clues were used with all inferencing responses. However, only 183 of these clues were associated with successful responses mostly used in Eid al Fiter (108) compared to Bonfire (75) (Table 5-18). As for partially correct answers, more clues were reported for the familiar text compared to the unfamiliar one while the opposite was true for the incorrect responses with more activated in the unfamiliar text.

Table 5-18 Total of Knowledge Source clues used with all inferencing responses

	Total of Knowledge Source clues used with			**Total of KS clues used in text**
Text	**Correct responses**	**Partially correct responses**	**Incorrect responses**	
Eid Al-Fiter	108	27	58	193
Bonfire Night	75	8	75	158
Total	**183**	**35**	**133**	**351**

Regarding the type of knowledge source (KS) clues used with correct inferencing responses, it was found that participants used Sentence Level clues for more than half of the total number of all the

clues they used with correct answers regardless of text type (Figure 5-23). Interestingly, they tapped into their Vocabulary Knowledge Level more than TW Word or Discourse Level clues, or World Level Knowledge. Thus, for successful responses in both texts, learners used clues in the following order; Sentence, Vocabulary Knowledge, Word, World and Discourse Levels.

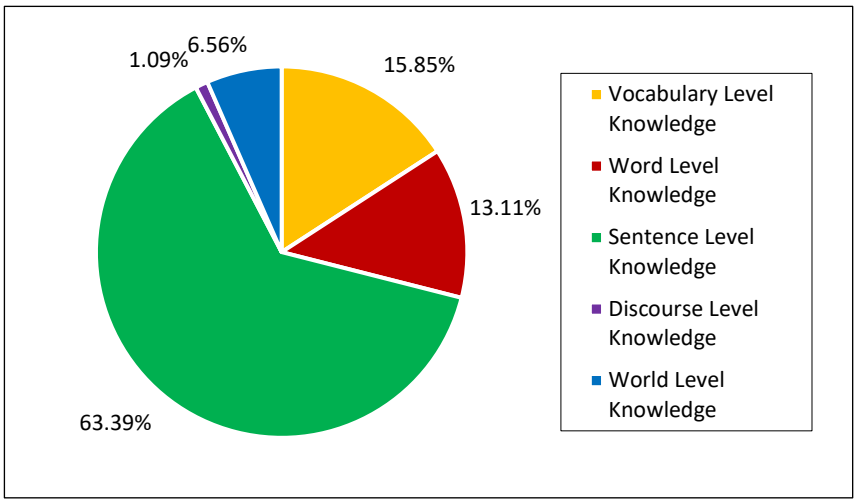


Figure 5-23 Knowledge Sources percentages used for correct responses

In terms of topic familiarity and correct responses, Table 5-19 shows that at text level, all KS clues (in green cells) were used more in Eid Al-Fiter, except for Discourse Level and Sentence Level clues which had more weight in Bonfire Night.

Table 5-19 Summary of Knowledge Sources used with successful inferencing by texts

Major Knowledge Source clues		**Eid Al-Fiter** (familiar text)	**Bonfire Night** (unfamiliar text)	**Total of KS clues**
Vocabulary Knowledge		**21** **19.44%**	8 10.67%	**29**
Word Level	Instances %	**17** **15.74%**	7 9.33%	**24**
Sentence Level	Instances %	60 55.56%	**56** **74.67%**	**116**
Discourse Level	Instances %	1 0.93%	**1** **1.33%**	**2**
World Knowledge	Instances %	**9** **8.33%**	3 4.00%	**12**
Total	**Instances** **%**	**108** **100.00%**	**75** **100.00%**	**183**

5.6.1 Topic familiarity and knowledge sources used in successful inferencing responses

The following sections present the findings of the RQ3.b, where the KS clues are presented in terms of text and group proficiency levels.

5.6.1.1 Vocabulary Knowledge Clues

Participants tapped into their vocabulary knowledge of the language to compare the TWs against the words they know, which was fulfilled through a number of clues (see 4.3.1.1). As mentioned earlier in this chapter, learners used a total of 29 vocabulary knowledge clues for Eid Al-Fiter (19.44%) and 22 for Bonfire Night (10.67) (see Table 5-6 and Figure 5-13 for details of the number of instances in terms of groups and texts). The number of these clues decreased with successful inferencing responses to 21 for Eid Al-Fiter while 8 for Bonfire Night as displayed in Table 5-20 below.

Table 5-20 Results of Vocabulary Knowledge clues used in successful inferencing responses

			1.-Vocabulary Knowledge					
			Eid Al-Fiter			**Bonfire Night**		
			C1	**B2**	**B1**	**C1**	**B2**	**B1**
1.1 Previously encountering the TW	1.1.1 Stating hearing the TW before.	Instances %	1 0.93%	-	-	-	-	-
	1.1.2 Stating previously encountering the TW.	Instances %	-	8 7.41%	1 0.93%	-	-	-
	1.1.3 Stating already knowing the TW.	Instances %	7 6.48%	2 1.85%	1 0.93%	4 5.33%	2 2.67%	2 2.67%
	Total of previously encountering the TW by groups	Instances %	**8 7.41%**	**10 9.26%**	**2 1.85%**	**4 5.33%**	**2 2.67%**	**2 2.67%**
1.2. Stating not knowing the TW's meaning.		Instances %	-	-	-	-	-	-
1.3. Stating never seeing the TW before.		Instances %	1 0.93%	-	-	-	-	-
Total of Vocabulary Knowledge clues used by groups		Instances %	**9 8.33%**	**10 9.26%**	**2 1.85%**	**4 2.19%**	**2 1.09%**	**2 1.09%**
Total of Vocabulary Knowledge Source clues used by text		**Instances %**	**21 19.44%**			**8 10.67%**		

Tapping into their vocabulary knowledge and reporting knowing the TW was the most frequently used clue in this KS category. All groups varied in the number of times they activated these clues with all their responses (Table 5-6). In Eid Al-Fiter, B2 members had the least differences between the total of clues they reported (12) and those they used with successful inferencing responses (10). On the other hand, the advanced group had the largest differences between the total of clues they activated regarding encountering the TW before (11) and those integrated with correct inferencing responses (8). The data also revealed that all the clues tapped into by the B1 group,

which were 2, were all used with successful inferencing. On the other hand, in Bonfire Night all groups had less than half their activated vocabulary knowledge clues used with successful responses except B1, who had half their clues with correct responses. On the other hand, there was a total of 2 clues for stating not knowing the TW's meaning used once in each text by C1, while none were found with successful inferencing responses. Finally, although stating never seeing the TW before or that it is new, was reported by 3 times by the C1 group (twice for Eid Al-Fiter and once for Bonfire Night) and one B1 learner (once for Eid Al-Fiter) only one clue was found with a successful response by the advanced group in Eid Al-Fiter.

Overall, vocabulary knowledge clues were used more with correct responses in the familiar text compared to the unfamiliar one. In terms of groups, C1 had slightly the most reported vocabulary knowledge clues (13) followed by B2 (12) then B1 (4). Furthermore, the data revealed that the B2 group used vocabulary knowledge clues the most in Eid Al-Fiter while the C1 group used them the most in Bonfire Night and B1 used them equally across the two texts.

5.6.1.2 **Word Level Clues**

Although there was a total of 55 instances of resorting to TW level clues in this study, with 32 clues found in Eid Al-Fiter and 23 for Bonfire (see Table 5-7 and Figure 5-14 for details of the number of instances in terms of groups and texts). This number dropped with successful inferencing responses to 24. The data revealed that there were more TW level clues used with correct responses in the familiar text (17) compared to the unfamiliar one (7).

At TW morphology level clues, using word parts was the dominant clue among the sub-morphological clues. This clue which was tapped into by all 3 groups more in the familiar text compared to the unfamiliar text where all groups, except the B1 group in Bonfire Night, used word parts as a clue with a successful response. As the table belows shows, learners ' perceived near homonymy (word form) was mostly used by the B2 group (3) who used them more with successful responses in the unfamiliar text than B1 (1). Resorting to the TW's part of speech was the last and least tapped into morphological level clue which was only found with one correct response in the familiar text by the B1 group while none were found in the unfamiliar text.

Table 5-21 Results of Word Level clues used in successful inferencing responses

			2. Word Level Knowledge					
			Eid Al-Fiter			Bonfire Night		
		Instances %	C1	B2	B1	C1	B2	B1
2.1. Morphology	2.1.1 Word parts of the TW (prefixes & stems).		5 4.63%	5 4.63%	1 0.93%	1 1.33%	1 1.33%	-
	2.1.2. L2 perceived near homonymy (word form).	Instances %	-	1 0.93%	-	-	2 2.67%	1 1.33%
	2.1.3. Resorting to the TW's part of speech.	Instances %	-	-	1 0.93%	-	-	-
	Total of Word Morphological clues by groups	Instances %	**5 4.63%**	**6 5.56%**	**2 1.85%**	**1 1.33%**	**3 4.00%**	**1 1.33%**
	Total of Morphological clues by text	**Instances %**	**13 12.04%**			**5 6.67%**		
2.2. Semantic (meaning)	2.2.1. Antonyms of the TW.	Instances %	-	-	-	1 1.33%	-	-
	2.2.2. Synonyms of the TW.	Instances %	1 0.93%	-	-	1 1.33%	-	-
	2.2.3. Semantic relationships.	Instances %	1 0.93%	1 0.93%	1 0.93%	-	-	-
	Total of Word Meaning clues by group	Instances %	**2 1.85%**	**1 0.93%**	**1 0.93%**	**2 2.67%**	-	-
	Total of Word Meaning clues by text	**Instances %**	**4 3.70%**			**2 2.67%**		
Total of Word Level clues used by groups		Instances %	**7 6.48%**	**7 6.48%**	**3 2.78%**	**3 4.00%**	**3 4.00%**	**1 1.33%**
Total of Word Knowledge Source clues used by text		**Instances %**	**17 15.74%**			**7 9.33%**		

On the other hand, in terms of semantic clues at TW word level with all responses, only a total of 12 TW meaning level clues were found with 10 clues located in Eid Al-Fiter while only 2 for Bonfire Night. This number of TW word level semantic clues decreased to less than half for successful responses, with 4 for Eid Al-Fiter while it remained the same for Bonfire Night (2). The findings show that the advanced group, C1 turned to the TW's semantic clues more than the remaining groups who each used them once. Furthermore, C1 was the only group to have TW meaning level clues, associated with correct responses in the unfamiliar Bonfire Night text. Antonyms of the TWs were only used once by the advanced group in Bonfire Night and were part of a successful response. This was also true for using synonyms of the TWs which were used once in each text by the advanced group and both instances were associated with correct answers. Finally, semantic relationships in the form of word associations were the most used semantic clue with successful responses (3). Overall, there were 9 instances of tapping into word associations clues which were displayed by all groups C1 (2), B2 (5) and B1 (2) used only in Eid Al-Fiter. However, only 3 were found with successful responses, with one for each group.

In summary, word level clues were used with more successful responses in Eid Al-Fiter than Bonfire Night. At the level of groups, word level clues with successful responses were used the most by the advanced and intermediate learners who both had a total of 10 TW level clues. Both groups used these clues more in Eid Al-Fiter (7). On the other hand, the least proficient group only used 4 of these clues with the majority of clues (3), as with the previous groups, in Eid Al-Fiter.

5.6.1.3 **Sentence Level Clues**

Sentence level clues were not only the most used clues among all the KS clues activated but were heavily used in both texts with more weight in favour of Bonfire (65.19%) than Eid Al-Fiter (60.10%) (see Table 5-8 and Figure 5-15 for details of the number of instances in terms of groups and texts). In the present study, a total of 116 sentence level clues were taped into for Eid Al-Fiter while 103 for Bonfire Night. However, clues associated with successful responses were only 60 for Eid Al-Fiter while 56 for Bonfire Night. (Table 5-22). In terms of sentence level grammar and successful responses, resorting to word order was found twice in the present study. Both clues were associated with correct responses by the B2 group in Eid Al-Fiter and the C1 group in Bonfire Night.

As for Sentence Meaning level clues, local (intermediate) clues were used more with correct inferences by all groups more than global clues. There was a total of 13 global sentence level clues used by all groups, C1 (6), B2 (2) and B1 (5), 8 of which were successfully associated with correct responses. Regarding global clues, they were used more with correct responses in Bonfire Night (5) compared to Eid Al-Fiter (3). In successful inferencing, backward clues were used the most in both texts, with more found in Bonfire Night by all groups. On the other hand, although forward clues were used once in each text only by the C1 group, none were found with correct inferencing responses. Immediate TW sentence level clues were the most tapped into KS clues in this study and were used heavily in both texts, with 109 instances reported for Eid Al-Fiter while 94 for Bonfire Night. However, only 55 instances of these clues were found in Eid Al-Fiter with correct inferences and 50 instances for Bonfire Night. In both texts, C1 members had the highest number of local clues with correct answers (40) followed by B2 (33) and B1 (32). Finally, punctuation at sentence level was not only used once by one learner (B2-3) in the familiar text but was also part of a successful response.

Table 5-22 Results of Sentence Level clues used in successful inferencing responses

			3. Sentence Level Knowledge					
			Eid Al-Fiter			Bonfire Night		
3.1. Sentence Level Grammar	3.1.1. Using word order.	Instances %	**C1**	**B2**	**B1**	**C1**	**B2**	**B1**
			-	1 0.93%	-	1 1.33%	-	-
	Total of Sentence Level Grammar clues by text	**Instances %**	**1 0.93%**			**1 1.33%**		
2.2. Sentence Level Meaning	**3.2.1. Sentence Boundaries of TW (Global Clues)**							
	3.2.1.a. Backward S + TW S	Instances %	2 1.85%		1 0.93%	2 2.67%	1 1.33%	2 2.67%
	3.2.1.b. TW S + Forward S	Instances %		-	-	-	-	-
	Total Global Clues by group	**Instances %**	**2 1.85%**		**1 0.93%**	**2 2.67%**	**1 1.33%**	**2 2.67%**
	Total of Global Clues	**Instances %**	**3 2.78%**			**5 6.67%**		
	3.2.2. Immediate TW Sentence (Local clues)							
	3.2.2.Pointing to specific words in the TW S.	Instances %	7 6.48%	6 5.56%	5 4.63%	2 2.67%	7 9.33%	1 1.33%
	3.2.2.b. using a definition/description as a clue in the TW S.	Instances %	-	-	1 0.93%	-	-	-
	3.2.2.c. using a part/phrase of the TW sentence.	Instances %	6 5.56%	9 8.33%	4 3.70%	12 16.00%	4 5.33%	7 9.33%
	3.2.2.d. the sentence (meaning) of the TW itself.	Instances %	7 6.48%	3 5.56%	6 3.28%	5 6.67%	4 5.33%	8 10.67%
	3.2.2.e. using conjunctions [OR].	Instances %	1 0.93%	-	-	-	-	-
	Total of Local Clues by groups	**Instances %**	**21 19.44%**	**18 16.67%**	**16 14.41%**	**19 25.33%**	**15 20.00%**	**16 21.33%**
	Total of Sentence Level Meaning clues by text	**Instances %**	**55 50.93%**			**50 66.67%**		
Total of all Sentence Level clues by groups		Instances %	**23 21.30%**	**18 16.67%**	**17 15.74%**	**21 28.00%**	**16 21.33%**	**18 24.00%**
Total of all Sentence Level clues by texts		**Instances %**	**58 53.70%**			**56 30.60%**		
2.3. Punctuation clues by groups		Instances %	-	1 0.93%	-	-	-	-
Total of Sentence Knowledge Level clues by groups		**Instances %**	**23 21.30%**	**20 18.52%**	**17 15.74%**	**22 12.02%**	**16 8.74%**	**18 9.84%**
Total of Sentence Level Knowledge Source clues by text		**Instances %**	**60 55.56%**			**56 74.67%**		

Overall, sentence level clues at text level had more weight with successful answers in Bonfire Night. The advanced group used these clues the most (45) across both texts. On the other hand, the B2 group had a total of 36 sentence level clues that were used more in Eid Al-Fiter while the B1 group had 35 clues that were slightly used more in Bonfire Night.

5.6.1.4 **Discourse Level Clues**

This knowledge source and its clues were the least used KS tapped into by learners in this study. Although this KS was tapped into 5 times (see Table 5-9 and Figure 5-16 for details of the number of instances in terms of groups and texts), only two clues were associated with successful responses. Using the TW sentence as a topic sentence for the paragraph as a clue was used once only in the familiar text (Table 5-23) by the C1 group, more specifically by the second proficient learner in the group and study, C1-2. On the other hand, using the formal story schema was used once only by the B1 learner, B1-5, in Bonfire Night.

Table 5-23 Results of Discourse Level clues used in successful inferencing responses

			4. Discourse Level Knowledge					
			Eid Al-Fiter			**Bonfire Night**		
			C1	**B2**	**B1**	**C1**	**B2**	**B1**
4.1. TW paragraph Level clues.	Total by groups	Instances %	1 0.93%	-	-	-	-	-
4.2. Formal Schema.	Total by groups	Instances %	-	-	-	-	-	1 1.33%
Total of Discourse Knowledge clues by group			1 0.93%	-	-	-	-	1 1.33%
Total of Discourse Knowledge clues by text		**Instances %**	**1 0.93%**			**1 1.33%**		

5.6.1.5 **World Knowledge Clues**

All groups resorted to their non-linguistic background world knowledge as they inferenced the TWs (see Table 5-10 and Figure 5-17 for details of the number of instances in terms of groups and texts). However, not all these clues were associated with correct responses. From a total of 21 instances of tapping into world knowledge clues while inferencing, only 12 clues were used with correct responses (Table 5-24). Interestingly, the C1 learners used all 6 instances of depending on their world knowledge in Eid Al-Fiter correctly as opposed to the remaining groups. Furthermore, the C1 participants outperformed the remaining groups in Eid Al-Fiter and were also the only group to use this clue with successful responses in Bonfire Night text.

Table 5-24 Results of World Level Clues used in successful inferencing responses

		5. World Knowledge					
		Eid Al-Fiter			Bonfire Night		
		C1	B2	B1	C1	B2	B1
Total of World Knowledge clues by groups	Instances %	6 5.56%	2 1.85%	1 0.93%	3 1.64%	-	-
Total of World Knowledge Source clues used by text	**Instances %**	**9 8.33%**			**3 4.00%**		

5.7 Number of knowledge sources activated

Learners used both single and combinations of different knowledge source (KS) clues with successful inferencing responses. In terms of the total of correct answers, the majority of responses, regardless of the reading topic, were associated with using 4 different types of KS clues from the total of 5 KS clues found in this present study (Figure 5-24). Using combinations of 3 different KS clues (40.44%) was the most common type of approach with successful inferencing responses followed by activating 4 different KS clues (25.68%). This is followed by integrating 2 different KS clues (19.67%) while the least approach tapped into was using only one KS clue (14.21%).

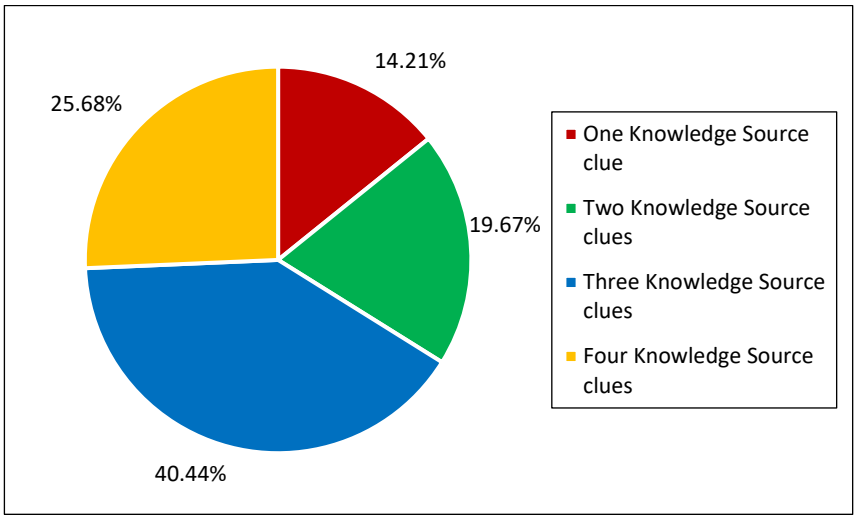


Figure 5-24 Number of Knowledge Source clues used in successful inferencing

Interestingly, regarding KS combinations and their patterns associated with successful responses, the study found differences between the two texts. In Eid Al-Fiter, learners used more KS combinations from at least 3 and 4 different KS clues than 3 KS clues in Bonfire Night. In other words, learners were able to locate and activate more clues due to being culturally familiar with

the topic as opposed to Bonfire Night. In Eid Al-Fiter, learners equally used more combinations of 3 (43.52%) and 4 (43.52) KS clues with their successful responses as illustrated in Figure 5-25. This was followed by using clues from two different KSs (7.41%) while using one type of KS clue was the least used with successful answers in the familiar text

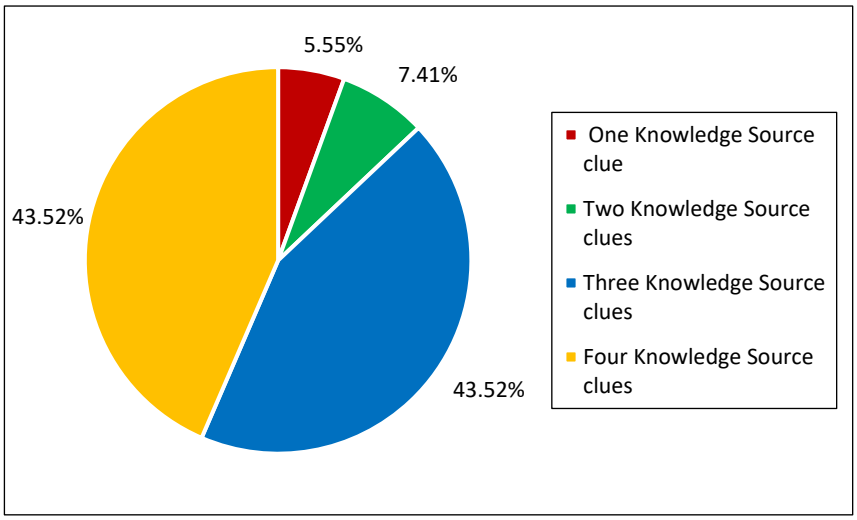


Figure 5-25 Number of Knowledge Source clues used in successful inferencing in Eid Al-Fiter

As oppose to Eid Al-Fiter, only integrating 3 different KS clue combinations were found in the Bonfire Night text as displayed in Figure 5-26 below. Learners tended to tap into 2 KS clues which was the highest approach (37.33%) used even slightly more than using 3 KS clues by 1.33%. Integrating 3 different KS clues with successful inferencing response was the second highest combination, followed by tapping into 1 KS clue (26.67%) which was the least used.

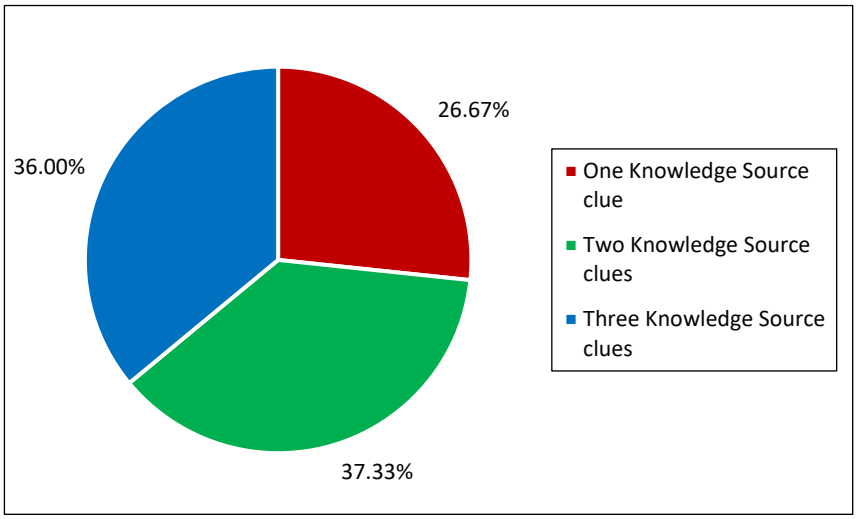


Figure 5-26 Number of Knowledge Source clues used in successful inferencing in Bonfire Night

The number of KS clue combinations and their percentages used with successful inferencing in each text is displayed in Table 5-25 below. Using a single KS clue was distributed among all the groups with more clues activated in favour of Bonfire Night. It was found that the least proficient

group used one type of KS clue the most with 4 instances in Eid Al-Fiter while 10 for Bonfire Night. Next, combining two clues from 2 different KS was also used in both texts by all groups except for the C1 group in Eid Al-Fiter. Integrating clues from two different KS was used by groups more in Bonfire Night, and as with one KS clue, the least proficient group used 2 KS clues the most (18 instances) with their successful responses.

Table 5-25 A summary of the number of Knowledge Source clues and their combinations-used with successful inferencing

	Eid Al-Fiter			**Bonfire Night**		
Number of Knowledge Sources used	**C1**	**B2**	**B1**	**C1**	**B2**	**B1**
One Knowledge Source	(1) 0.55%	(1) 0.55%	(4) 2.19%	(3) 1.64%	(7) 3.83%	**(10)** **5.46%**
Two Knowledge Sources	-	(2) 1.09%	(6) 3.28%	(9) 4.92%	(7) 3.83%	**(12)** **6.56%**
Three Knowledge Sources	(15) 8.20%	**(19)** **10.38%**	(13) 7.10%	**(20)** **10.93%**	(7) 3.83%	-
Four Knowledge Sources	**(30)** **16.39%**	(17) 9.29%	-	-	-	-
Total of Knowledge Sources used by groups	**(46)** **25.14%**	(39) 21.31%	(23) 12.57%	**(32)** **15.43%**	(21) 11.43%	(22) 13.71%
Total KS by Text	**108** **59.02%**			**75** **40.98%**		

*(n) = Total of clues used

In both texts, integrating three clues from 3 various KSs was used by all groups except B1 in the unfamiliar text. These clues were mostly used by the B2 group in Eid Al Fiter while the C1 members used them the most Bonfire Night. Only the two highest proficiency groups made use of 4 different KS clues found only in the familiar text, used more by the advanced group. Overall, more clues from different KS were used in successful inferencing in Eid Al-Fiter by all groups compared to Bonfire with integrating clues from different KSs increasing as proficiency increases.

5.8 Patterns of knowledge sources combinations

In both texts, groups displayed similar and different types of KS clue combination patterns with correct responses. When learners relied on a single KS clue, they always turned to Sentence Level clues (Table 5-26). On the other hand, when resorting to two clues from 2 different KS groups shared a combination of ***Word Level + Sentence Level clues*** found in both texts. However, groups also differed in resorting to other combinations (in **bold**). In Eid Al Fiter, B1 members had another combination of ***World knowledge + Sentence Level clues*** due to the topic's familiarity. Interestingly in Bonfire Night, all groups shared another combination when using two clues from 2

different KSs in the form of ***Sentence Level +Vocabulary Knowledge clues***. Both the two previous KS combinations were used once for one TW (see the number of TWs between brackets).

Table 5-26 Knowledge sources combination patterns with successfully inferenced responses by groups

	Eid Al-Fiter			**Bonfire Night**		
KS combinations	**C1**	**B2**	**B1**	**C1**	**B2**	**B1**
One KS	S (1)	S (1)	S (2)	S (2)	S (3)	S (4)
Two KSs	-	W-S (1)	W+S (1) **WLD+S** (1)	W+S (1) S-VK (1)	W+S (1) S+VK (1)	W+S (1) S+VK (1)
Three KSs	W+S+VK (1) **WLD+S+VK** (1)	W+S+VK (3)	W+S+VK (2)	W+S+VK (1) **WLD+S+VK** (2)	W+S+VK (1)	-
Four KSs	W+S+WLD+VK (3) **W+S+WLD+ DIS** (1)	W+S+WLD+VK (2)	-	-	-	-
Total of correct TWs	7	7	6	7	6	6

W= word, S= Sentence, VK= Vocabulary Knowledge, WLD= World, DIS= discourse, (X) = number of TWs

For the combinations of integrating clues from 3 KS clues, the combination of ***Word level + Sentence Level+ Vocabulary Knowledge clues*** was shared by all groups in both texts, except for B1 only in Bonfire Night, where it was absent. This pattern was used the most with the B2 group with 4 successfully inferenced TWs, followed by the C1 and B1 groups with 2 correct TWs each. However, the advanced proficiency group also had another combination with their correct responses which they used in both texts, ***World Knowledge + Sentence level + Vocabulary Knowledge clues***. This combination was used with three 3 TWs, one in Eid Al-Fiter while two for Bonfire Night. Finally, integrating four clues from 4 different KSs with successful inferencing was used only by two groups, C1 and B2, in Eid Al-Fiter while none were found in Bonfire Night. Both groups shared their combination of ***Word Level + Sentence Level + World Knowledge + Vocabulary Knowledge clues*** with C1 using it with more (3 TWs) compared to B2 (2 TWs). The C1 group, as they did with using 3 KS clues, had another combination pattern only shared by them, ***Word Level + Sentence Level + -World Knowledge + Discourse Level Clues***. This combination was used to successfully inference one TW.

Groups differed in terms of the number of successfully inferenced TWs used by integrating different clues from the four KS. For example, in Eid Al-Fiter, the highest number of correctly inferenced TWs was 4 through using clues from 4 different KSs for the C1 group while for the B2 group it was 3 TWs by integrating 3 clues from 3 KSs. On the other hand, the least proficient group had evenly spread their 6 correctly inference TWs across one, two, and three KS clue combinations with 2 TWs in each KS combination. On the other hand, for Bonfire Night, the highest number of successful inferenced TWs for the advanced group was turning to three clues from 3 different KS which were used with three TWs. Interestingly, both B2 and B1 had the highest number of correct TWs through using one KS clue, with three TWs for B2 and four TWs for B1.

Thus to summarize this section on successful inferencing and KS clues before moving to the next section on successful inferencing responses and lexical inferencing strategies. This study found that with correct responses regarding the frequency of KS clues used, the same pattern was found for both texts beginning with the most frequent KS clues used:

Sentence Level> Vocabulary Knowledge> Word Level> World Level> Discourse level clues

5.9 Successful inferencing and lexical inferencing strategies

3.c. What are the lexical inferencing strategies used by the groups in both texts and with what frequency?

As mentioned in 5.4, there was an overall total of 758 coded instances of lexical strategy use for both texts combined across the two texts regardless of inferencing responses. Table 5-27 displays the distribution of the strategies used by text and the type of responses. There were more LIFSs used with successful responses with the Eid Al-Fiter text (200) compared to Bonfire Night (175). As for partially correct responses, there were more LIFSs for the familiar text compared to the unfamiliar one. On the other hand, the opposite was true for LIFSs used with incorrect responses in Bonfire Night.

Table 5-27 Total of lexical inferencing strategies used with all inferencing responses

	Total of Lexical Inferencing Strategies used with			Total of strategies used in text
Text	**Correct responses**	**Partially correct responses**	**Incorrect responses**	
Eid Al-Fiter	200	56	144	400
Bonfire Night	175	20	163	358
Total	**375**	**76**	**307**	**758**

In terms of the distribution of all the 375 instances of inferencing strategies used with correct responses, the majority were Cognitive Strategies, where Meaning-Focused Strategies (MFSs) complied the largest weight (41.07%) followed by Form-Focused Strategies (FFSs) (24.47%) (Figure 5-27). On the other hand, Evaluating Strategies (ESs) (18.93%) were used more than Monitoring Strategies (MSs) (12.53%) for Metacognitive Strategies.

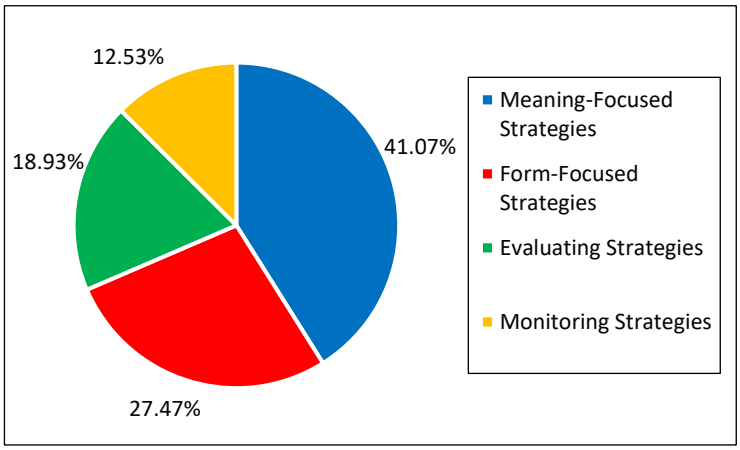


Figure 5-27 Lexical Inferencing Strategies used for correct responses

At text level, Meaning-Focused and Form-Focused Strategies were used more in Eid Al-Fiter than Bonfire Night (in green cells) (Table 5-28). The opposite occurred for Bonfire Night, where learners resorted to more Monitoring and Evaluating Strategies than the familiar text due to their lack of background knowledge about the reading topic.

Table 5-28 Summary of Lexical Inferencing Strategies used with successful inferencing by texts

Strategy Category		Eid Al-Fiter	Bonfire Night	Total of STG
Meaning-Focused STG	Instances	**83**	71	**154**
	%	**41.50%**	40.57%	
Form-Focused STG	Instances	**59**	44	**103**
	%	**29.50%**	25.14%	
Evaluating STG	Instances	36	**35**	**71**
	%	18.00%	**20.00%**	
Monitoring STG	Instances	22	**25**	**47**
	%	11.00%	**14.29%**	
Total	**Instances**	**200**	**175**	**375**
	%	**100.00%**	**100.00%**	

5.9.1 Topic Familiarity and lexical Inferencing strategies used in successful inferencing

The following sections report on the findings of the RQ3.c, where the LIFS categories are presented in terms of text and groups' proficiency levels.

5.9.1.1 Meaning-Focused Strategies

As mentioned earlier in this chapter, the findings of this study found that Meaning-Focused Strategies (MFS) were used with a total of 153 MFS (38.25%) for Eid Al-Fiter while 143 strategies (39.94%) for Bonfire Night (Table 5-12 and Figure 5-19 for details of the number of instances in terms of groups and texts). However, the opposite was found with successful inferencing responses, for there were slightly more (0.93%) MFS associated with correct inferencing responses in Eid Al-Fiter (41.50%) than Bonfire (40.57%) (see Table 5-29). The majority of MFSs were turning to the texts themselves for information to guide learners as they inferenced the TWs. At text level, this strategy had more weight and usage with successful answers in the Bonfire Night (31.43%) compared to the Eid Al-Fiter (29.50%). Furthermore, this strategy was used slightly more in Eid Al-Fiter by all groups except B1, who used them more in Bonfire Night.

Table 5-29 Meaning-Focused Strategies used with correct responses

Meaning-Focused Strategies		Eid Al-Fiter			Bonfire Night		
		C1	B2	B1	C1	B2	B1
1. Using textual clues.	Instances %	24 12.00%	18 9.00%	17 8.50%	21 12.00%	16 9.14%	18 10.29%
2. Using Vocabulary Knowledge.	Instances %	9 4.50%	10 5.00%	2 1.00%	4 2.29%	2 1.14%	2 1.14%
3. Using prior World Knowledge.	Instances %	-	-	1 0.50%	1 0.57%	-	-
4. Replacing the TW with a guess in							
in Arabic	Instances %	-	-	-	-	1 0.57%	1 0.57%
in English	Instances %	1 0.50%	-	1 0.50%	1 0.57%	1 0.57%	3 1.71%
Total of replacing the TW with a guess by groups	Instances %	**1** **0.50%**	-	**1** **0.50%**	**1** **0.57%**	**2** **1.14%%**	**4** **2.29%%**
Total Meaning-Focused-Strategies used by groups	Instances %	**34** **17.00%**	**28** **14.00%**	**21** **10.50%**	**27** **15.43%**	**20** **11.43%**	**24** **13.71%**
Total of Meaning-Focused-Strategies by text	Instances %	**83** **41.50%**			**71** **40.57%**		

The next frequently used MFS by learners was tapping into their vocabulary knowledge, which was used more in Eid Al-Fiter due to learners' familiarity with the topic. The intermediate group used it slightly more than the advanced group in the familiar text but overall, C1 used them the most compared to the remaining groups. Although using prior world knowledge as MFS was reported in Eid Al-Fiter (3) and Bonfire Night (3) by all groups except C1 in the Eid Al-Fiter, it was only found with one correct answer by the B1 group in the familiar text and the C1 group in the unfamiliar text. Thus, making it the least used MFS with correct inferencing responses.

Finally, replacing the TW with a guess in Arabic or English was used more with successful answers in Bonfire Night (4.00%) than Eid Al-Fiter (1.00%), with replacing the TW with an English guess used more in both texts, especially Bonfire Night. In terms of replacing the TW with an Arabic guess, the study found there was a total of 4 instances of using this strategy in Bonfire Night while it was absent for Eid Al-Fiter (see Figure 5-19). These were used twice by the B2 and B1 groups but with successful answers, only one instance of these clues were found for each group. On the other hand, the study also found that replacing the TW with an English guess was used 14 times (5 instances for Eid Al-Fiter while 9 instances for Bonfire Night). Replacing the TW in English was used mostly by the advanced group C1 (7), followed by B1 (5) then B2 (2). However, with successful responses it was only found once by the C1 and B1 groups in the familiar text while all groups used it in the unfamiliar text with more instances displayed by the least proficient group.

In summary, regarding the overall usage of MFSs with successful responses used by groups, the advanced learners used these strategies the most in both texts (61). This was followed by the B2 (48) group, who used them more in Eid Al-Fiter and the B1 group, who used them more in Bonfire Night (45).

5.9.1.2 **Form-Focused Strategies**

Data from the verbal reports revealed that 200 Form-Focused Strategies (FFSs) were used by learners, with 109 (27.25%) applied in Eid Al-Fiter while 91 (25.42%) for Bonfire Night (see Table 5-13 and Figure 5-20 for details of the number of instances in terms of groups and texts). This number dropped slightly over than half for Eid Al-Fiter (59) with correct responses while slightly less than half for Bonfire Night (44) as displayed in Table 5-30. Repeating was the most dominant used strategy used among all the FFSs in both texts. Overall, it was used slightly more with successful answers in the familiar text (41) compared to the unfamiliar one (38). More specifically, it was used more with correct inferencing responses by the C1 and B1 groups in both texts. Regarding the sub-repeating strategies, TW repeating was the dominant type of repeating strategy regardless of topic.

Analysing as a FFS was found in this study at two levels; word and sentence levels. At TW level analysis, it was through removing the TW stems either explicitly or implicitly. Implicitly removing stems (8) was used slightly more than explicitly removing them (7). Implicitly removing stems was used mostly by the C1 and B2 groups in the familiar text with only C1 using them in the unfamiliar text. Learners also used their L2 near perceived homonymy (word form) as a TW analysing strategy with a total of 7 instances, 5 for the B2 group (1 for Eid Al-Fiter 4 for Bonfire Night) while the B1 group used it twice (in Bonfire Night). However, it was only found once with a correct response by the B2 group. Using the TW's part of speech was used 5 times; twice by the B1 group in the Eid Al-Fiter while three times in Bonfire Night by the B1 (once) and C1 (twice) groups. However, it was only found with a single correct response by B1 in Eid Al-Fiter. Finally, the last sub-TW analysis was using prefixes that were only found 3 times by the dominant group, twice with Eid-Al Fiter and once in Bonfire Night. This number decreased to one instance with a correct response in the familiar text.

Table 5-30 Form-Focused Strategies used with correct responses

Form-Focused Strategies		Eid Al-Fiter			Bonfire Night		
		C1	B2	B1	C1	B2	B1
1.Repeating							
a. Asking the researcher to utter the TW	Instances %	1 0.50%	-	-	-	-	-
b. Section repeating	Instances %	6 3.00%	2 1.00%	5 2.50%	7 4.00%	-	3 1.71%
c. Repeating only the TW	Instances %	15 7.50%	4 2.00%	8 4.00%	13 7.43%	5 2.86%	10 5.71%
Total of repeating by groups	**Instances %**	**22 11.00%**	**6 3.00%**	**13 6.50%**	**20 7.43%**	**5 11.43%**	**13 7.43%**
2. Analysing							
A. TW analysis							
1.Implicitly removing stems	Instances %	3 1.50%	3 1.50%	1 0.50%	1 0.57%	-	-
2.Explicitly removing Stems	Instances %	1 0.50%	2 1.00%		-	3 1.71%	1 0.27%
- **Total of TW analysis by groups**		**4 2.00%**	**5 2.50%**	**1 0.50%**	**1 0.27%**	**3 1.71%**	**1 0.27%**
3. Perceived near homonomy (word form).	Instances %	-	1 0.50%	-	-	-	-
4.TW's part of speech	Instances %	-	-	1 0.50%	-	-	-
5.Prefixes	Instances %	1 0.50%	-	-	-	-	-
B. Sentence analysis							
B.1.Word order	Instances %		1 0.50%			1 0.57%	
B.2.Punctuation	Instances %		1 0.50%				
3. Associating	Instances %	1 0.50%	1 0.50%	1 0.50%			
Total by Group	Instances %	**28 14.00%**	**15 7.50%**	**16 8.00%**	**22 12.57%**	**8 4.57%**	**14 8.00%**
Total by text	Instances %	**59 29.50%**			**44 25.14%**		

On the other hand, in terms of analysing at the sentence level, analysing through word order was applied twice in the study by only the B2 group, which were both used with two correct responses. The study found only one instance of using punctuation by the B2-3 learner, which was used with one correct response. Finally, although associating was used 9 times only in Eid Al-Fiter, only 3 instances were found with successful inferencing responses distributed among the three groups.

To summarize, learners used different FFSs with their correct responses, with all groups applying these strategies more in the familiar text. Regarding the total number of FFSs used, the dominant

group used them with correct responses the most in both texts (50), followed by the least proficient group B1 (30) and finally the intermediate groups B2(23).

5.9.1.3 **Evaluating Strategies**

Overall, the data revealed that there was a total of 131 strategies used as Evaluating Strategies (ESs) with 66 strategies for Bonfire Night (18.44%) and 65 for Eid Al-Fiter (16.25%) (See Table 5-15 and Figure 5-22 for details of the number of instances in terms of groups and texts). The number of ESs used with correct responses dropped slightly over half, with more slightly located in Bonfire Night as displayed in Table 5-31 below. In terms of sub-ESs used with successful inferencing responses in this category, checking their guess was the most frequently consulted strategy used 34 times with more activated in the Eid Al-Fiter (21) compared to Bonfire Night (13). Checking their guess was used the most by the advanced group compared to all the groups. In terms of text, the C1 and B2 groups used checking more in Eid Al-Fiter while B1 members used it more in Bonfire Night.

Table 5-31 Evaluating Strategies used with correct responses

Evaluating Strategies		**Eid Al-Fiter**			**Bonfire Night**		
		C1	**B2**	**B1**	**C1**	**B2**	**B1**
1. Checking the guess	Instances %	13 6.50%	6 3.00%	2 1.00%	6 3.43%	3 1.71%	4 2.29%
2. Commenting and elaborating	Instances %	3 1.50%	4 2.00%	5 2.50%	10 5.71%	5 2.86%	6 3.43%
3. Inquiring about the TW							
A. Making an inquiry about the TW							
A.1 inquiring on their own without a guess	Instances %	-	1 0.50%	-	-	-	-
A.2 inquiring about its part of speech	Instances %	-	-	1 0.50%	-	-	-
B. Making an inquiry about their inferences	Instances %	-	1 0.50%	-	1 0.57%	-	-
Total of inquiring about the TW by groups	Instances %	**-**	**2 1.00%**	**1 0.50%**	**1 0.57%**	-	-
Total Evaluating Strategies used by groups	Instances %	**16 8.00%**	**12 6.00%**	**8 4.00%**	**17 9.71%**	**8 4.57%**	**10 5.71%**
Total Evaluating Strategies by Text	Instances %	**36 18.00%**			**35 20.00%**		

Next, commenting and elaborating was used by learners either towards the inferenced TW or what they have comprehended throughout the text, which was used more with correct responses in Bonfire Night (21) than Eid Al-Fiter (12). This strategy was mostly used by the advanced group

with successful responses, followed by the B1 and then B2 groups. Finally, inquiring about the TW was the least used strategy since only 7 instances were found in this study. All groups in Eid Al-Fiter used this strategy while only C1 members applied them in Bonfire Night (see Table 5-15). From the 7 instances of inquiring strategies, 4 were associated with successful answers.

In summary, all ESs were used with correct responses by all groups, with C1 and B1 members using them more for Bonfire Night while B2 for Eid Al-Fiter. Furthermore, the C1 members resorted to them the most (33) and used them the most in both texts. While there was a slight difference between the intermediate group (20) and the least proficient group (18).

5.9.1.4 **Monitoring Strategies**

Finally, the least used set of strategies found with successful answers was Monitoring Strategies (MSs). The present study found that learners used a total of 131 MS with all their answers, with 73 instances (18.25%) found in Eid Al-Fiter while 58 instances (16.20%) for Bonfire Night (see Table 5-14, and Figure 5-21 for details of the number of instances in terms of groups and texts). However, the opposite was true with MSs used with successful responses with more MSs used in Bonfire Night (14.29%) than Eid Al-Fiter (11.29%) as displayed in Table 5-32.

Reattempting was the most dominant ES used among all the strategies by all groups, with more found with correct responses in Bonfire Night. In terms of groups, reattempting was resorted to the most by the advanced group compared to all the other groups. However, in terms of text, the advanced group used them the most in unfamiliar text, B2 members used them slightly more in the familiar while the least proficient group used them equally. Next, in terms of skipping and its sub-types, the table displays that all the types were used with one successful response. Skipping was used more with successful responses in Eid Al-Fiter (5) than Bonfire Night (3). The advanced group used skipping the most (4), followed by the B1 (3) then B2 (1) groups.

Stating the failure/difficulty of their inferencing, which was only used 15 times in the familiar text, decreased to 4 instances with successful responses. It was found by all groups with C1 using it twice. Finally, although noticing that their guess distorts the TW sentence was used in both texts, it was found 3 times only in Bonfire Night with successful responses. This strategy was slightly used more by the C1 group (2) compared to B2 (1).

Table 5-32 Monitoring Strategies used with correct responses

Monitoring Strategies		Eid Al-Fiter			Bonfire Night		
		C1	B2	B1	C1	B2	B1
1.Reattempting	Instances %	5 2.50%	6 3.00%	2 1.00%	12 6.86%	5 2.86%	2 1.14%
2.Suspending judgment (skipping)							
a. skipped on their own without a guess	Instances %	1 0.50%	1 0.50%	-	1 0.57%	-	-
b. skipped on their own with a guess	Instances %	1 050%	-	-	-	-	-
c. skipped after the researcher reminded them of skipping without a guess	Instances %	-	-	1 0.50%	-	-	1 0.57%
d. skipped after the researcher reminded them of skipping with a guess	Instances %	-	-	1 0.50%	1 0.57%	-	-
Total of Suspending judgment by groups	**Instances %**	**2 1.00%**	**1 0.50%-**	**2 1.00%**	**2 1.14%**	**-**	**1 0.57%**
3.Stating the failure/difficulty of inferencing	Instances %	1 0.50%	1 0.50%	2 1.00%	-	-	-
4.Noticing the guess distorts the TW sentence	Instances %	-	-	-	2 1.14%	1 0.57%	
Total by Group	Instances %	8 4.00%	8 4.00%	6 3.00%	16 9.14%	6 3.43%	3 1.71%
Total by text	**Instances %**	**22 11.00%**			**25 14.29%**		

Overall, all groups used MSs differently with their correct response, with C1 using them more in Bonfire Night while the remaining groups more in Eid Al-Fiter. At group level, C1 had the highest number of MS (24), followed by B2 (14) and the least by B1 (9).

5.10 Number of strategies activated

While inferencing, learners used both single as well as combinations of lexical inferencing strategies (LIFSs). In terms of the total of correct answers, most responses, regardless of topic, were associated with using all the four different types of LIFS categories (Figure 5-28). Using combinations of all the four different strategy categories was the most common type of approach with successful inferencing in this study that covered 61.87% of the total number strategies used, which is more than all the remaining strategies combined. On the other hand, applying combinations of three different strategy categories was used 33.60% followed by 4% for integrating two strategy groups and the least was using one type of strategy (0.53%).

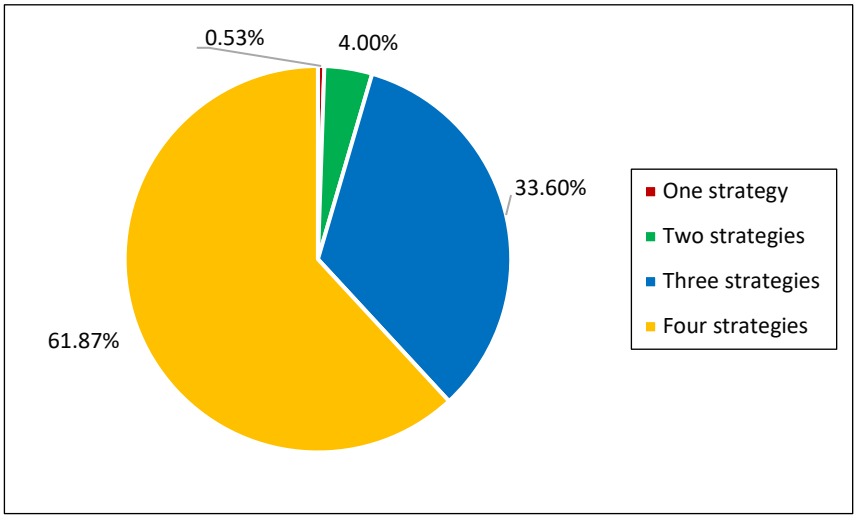


Figure 5-28 Number of strategy combinations used with successful inferencing responses

In terms of LIFS combinations and their patterns associated with successful responses, the data found differences existed between the two texts. As illustrated in Figure 5-29, only three types of strategy combinations were identified with successful responses in Eid Al-Fiter. Here, the majority of correct responses were through integrating four different LIFSs (61%) from the major strategy categories. This was followed by using three LIFS strategy combinations (38%) while applying two strategies with correct responses was the least frequent approach used by only 1% in the text.

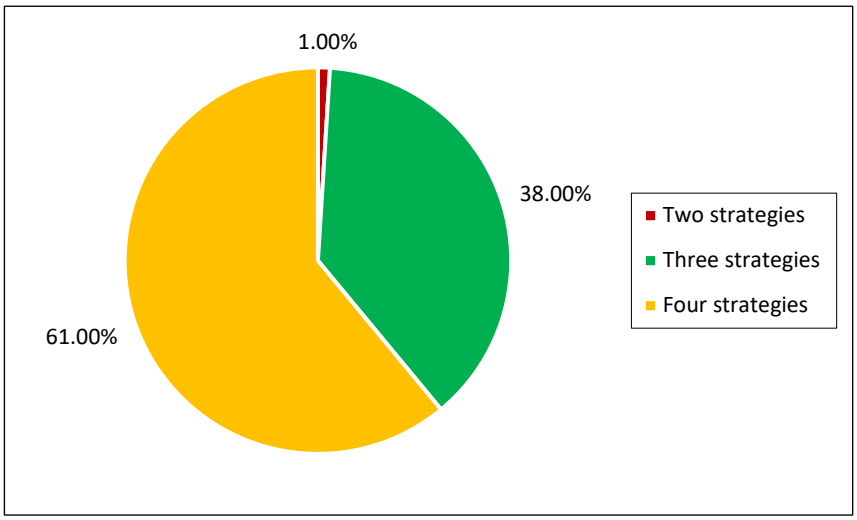


Figure 5-29 Number of strategy combinations used with successful inferencing in Eid Al-Fiter

As opposed to Eid Al-Fiter in Bonfire Night, participants began to use only one type of strategy by 1.14% from the total percentages of correct answers. Learners combined two different strategies from different strategy categories by 7.43% (Figure 5-30) which was more than Eid Al-Fiter (1.00%). Combinations of activating three and four major strategy types were found in both texts

by learners. Combinations of three strategies were used more in Eid Al-Fiter by 15.14% while four were slightly more used by 7.57% for Bonfire Night.

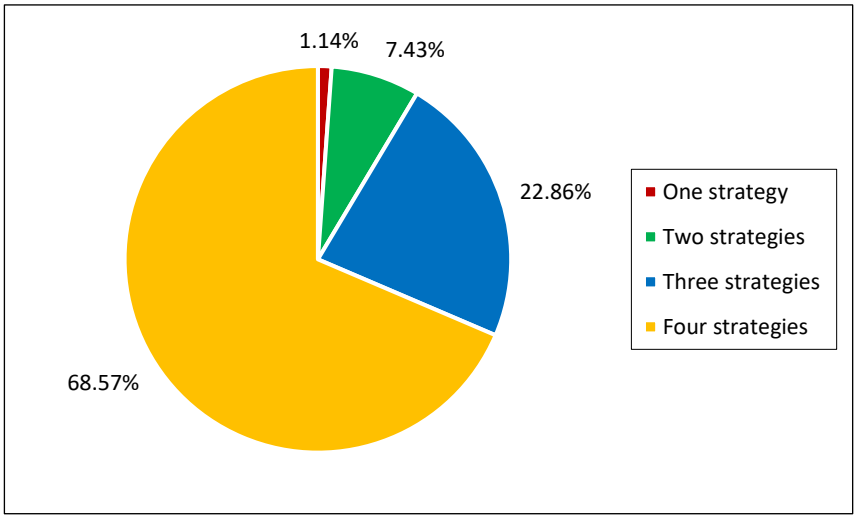


Figure 5-30 Number of strategy combinations used with successful inferencing in Bonfire Night

As with KS, learners also used both single and combinations of different strategies from the four categories with correct responses. The number of strategy combinations and their percentages used with successful inferencing in each text is displayed in Table 5-33 below. Here, combining refers to using more than one strategy from each of the four major strategy categories. Using a single LIFS was only used by B2 in the unfamiliar text twice. Next, combining two different inferencing strategies from two major strategy categories was only used by the intermediate group (2) in Eid Al-Fiter while all groups used it for Bonfire Night. Overall, the intermediate group used them the most with successful responses across both texts.

Table 5-33 Distribution of the number of strategy categories used incorrect inferencing responses

	Eid Al-Fiter			Bonfire Night		
Number of major strategy categories employed	**C1**	**B2**	**B1**	**C1**	**B2**	**B1**
One category	-	-	-	-	(2) 0.53%	-
Two categories	-	(2) 0.53%	-	(2) 0.53%	(8) 4.57%	(3) 1.71%
Three categories	**(39)** **10.40%**	(22) 5.87%	(25) 6.67%	(7) 14.00%	(3) 1.71%	**(30)** **17.14%**
Four categories	**(47)** **12.53%**	(39) 10.40%	(26) 6.93%	**(73)** **41.71%**	(29) 16.57%	(18) 10.29%
Total of strategies used with correct responses	**(86)** **22.93%**	(63) 16.80%	(51) 13.60%	**(82)** **21.87%**	(42) 11.20%	(51) 13.60%
Total by text	**200** **53.33%**			**175** **46.67%**		

*(n) = total of strategies used

Integrating combination of three different LIF types was used more in Eid Al-Fiter (86) compared to Bonfire Night (40). This combination was used the most by the most proficient group in Eid Al-Fiter while the least proficient group displayed it for Bonfire Night. Finally, combinations of all the four strategies were associated more with correct answers in Bonfire (120) than Eid Al-Fiter (112). This combination was used the most by the advanced C1 group in both texts while B2 and B1 members used it more for Eid Al-Fiter.

5.11 Patterns of lexical inferencing strategy combinations

As with KS combinations, groups displayed both similar and different combinations of LIFS patterns and types with correct responses in both texts. The data revealed that using one type of LIFS with a successful response was the least applied approach to inferencing (Table 5-34). Using a single LIFS with a successful inferenced TW was only found in Bonfire Night by the intermediate group with one successfully inferenced TW (see the number of TWs between brackets) in the form of **MFS**. When learners reported two different LIFSs, the C1 and B1 groups shared the same pattern of **MFSs+FFSs** used once by these groups only in Bonfire Night. On the other hand, the intermediate group had their own strategy combination of MFSs+ESs (in **bold**) which was used once in each text.

Table 5-34 Strategy combinations patterns with successfully inferenced responses by groups

	Eid Al-Fiter			Bonfire Night		
LIFS combinations	**C1**	**B2**	**B1**	**C1**	**B2**	**B1**
One category	-	-	-	-	**MFS (1)**	-
Two categories	-	**MFS+ES (1)**	-	MFS+FFS (1)	**MFS+ES (1)**	MFS+FFS (1)
Three categories	MFS+FFS+ES (3) MFS+FFS+MS (1)	MFS+FFS+ES (1) MFS+FFS+MS (1)	MFS+FFS+ES (3) MFS+FFS+MS (1)	MFS+FFS+MS (1)	MFS+FFS+MS (1)	**MFS+FFS+ES** (4)
All Four categories	(3)	(4)	(2)	(5)	(3)	(2)
Total of correct TW	**7**	**7**	**6**	**7**	**6**	**7**

MFS= Meaning-Focused Strategies, FFS = Form-Focused Strategies, ES= Evaluating Strategies, MS= Monitoring Strategies, (X) = number of TWs

When using three different strategy categories, all groups had two combinations in Eid Al-Fiter as opposed to one combination in Bonfire Night. When integrating LIFSs from three major strategy categories, the combination patterns of **MFSs+FFSs+ESs** and **MFSs+FFSs+MSs** were shared by all groups in Eid Al-Fiter. With correct inferencing responses in Eid Al-Fiter, the advanced and the least proficient groups used the **MFSs+FFSs+ESs** combination the most while all three groups used **MFSs+FFSs+MSs** once with a single TW. For Bonfire Night, the opposite was true, where only one strategy combination was found for each group. The advanced and intermediate groups shared the integration of **MFSs+FFSs+MSs**. On the other hand, the least proficient group used **MFSs+FFSs+ESs** with four correct TW responses, the highest number of correctly inferenced TWs for B1 in terms of LIFS combinations.

Finally, integrating four LIFSs from the four different strategy categories was used by all groups and was used slightly more in Bonfire (10 TWs). This combination was used the most by the advanced group, with a total of 8 correctly inferenced words. On the other hand, B2 members integrated four different strategy categories with 7 correct TW responses with the majority found in Eid Al-Fiter (4 TWs). B1 learners used such integration the least with only 4 correct TW responses, equally divided in both texts.

To summarize this section on successful inferencing and LIFSs used, this study found that in terms of correct responses and the frequency of LIFSs used, the same pattern was found for both texts, starting with the most frequently used strategy category as follows:

Meaning-Focused > Form-Focused >Evaluating > Monitoring Strategies

5.12 Summary

This chapter presented the quantitative findings to answer both the second and third research questions. In order to answer the second research question, which aimed at identifying how learners approached the inferencing task. More specifically, L1 Arabic EFL learners' inferencing attempts, their responses, how they approached the TWs, the knowledge source clues, the lexical inferencing strategies they applied in terms of text familiarity and proficiency level. The quantitative data from participants' verbal protocols provided detailed information regarding the knowledge source clues and lexical inferencing strategies learners resorted to. They can be summarized as follows. First, results showed that participants provided more inferencing attempts in favour of the unfamiliar text, Bonfire Night, with C1 participants providing the most number of attempts. Second, as for the three types of inferencing responses, the majority were correct, followed by incorrect then partially incorrect ones. In terms of topic familiarity, the number of correct responses were similar between the texts with only 3 responses more in favour of the familiar Eid Al-Fiter while there were more incorrect responses in Bonfire night (11). Third, clues were activated more in Eid Al-Fiter by all groups compared to Bonfire Night. Regarding the overall summary of the frequency of knowledge source clues used (regardless of the outcome of responses), the following pattern for both the two texts beginning with the most KS clues used was found:

Sentence Level> Word Level> Vocabulary knowledge> World Level> Discourse Level clues

In terms of strategies at text level, all groups used more strategies in Eid Al-Fiter than Bonfire Night. In terms of strategy categories, more Form-Focused and Monitoring Strategies were found in Eid Al-Fiter while more Meaning-Focused and more Evaluating Strategies for Bonfire Night. Fourth, results also found that not all clues can be further used to develop into strategies. This was the case with word level synonyms and antonyms. Finally, it was found that while both texts shared the same clues and strategies, some were only found in one text and not the other. Clues limited only to Eid Al-Fiter were; using punctuation and TW paragraph level clues. While for strategies, associating (MFS), restoring to the information in the local clues, replacing the TW with two proposed guesses (in English) in the sentence before choosing one (ES) and stating the

failure/difficulty of inferencing (MS) were used. On the other hand, clues in the form of antonyms and formal schema were activated by learners only in Bonfire Night, while for strategies, it was replacing a guess in Arabic to see if it fits (MFS). Regarding the overall summary of the frequency of lexical inferencing strategies used (regardless of the outcome of responses), two different types of strategy frequency patterns were found for each text beginning with the most frequent category used:

Eid Al-Fiter: **Meaning-Focused> Form-Focused> Monitoring> Evaluating Strategies**

Bonfire Night: **Meaning-Focused> Form-Focused> Evaluating> Monitoring Strategies**

The second section of this chapter presented the findings for the study's third research question. This question focused on the role of learners' proficiency level and topic familiarity on successful inferencing on the number of inferencing attempts, outcome of responses, knowledge source clues and lexical inferencing strategies applied by the three groups. First, inferencing results showed that learners scored more correct responses in the Eid Al-Fiter compared to Bonfire Night. Second, in terms of the overall clues used with successful responses, the data found that Word, Vocabulary Knowledge and World level clues were used more in Eid Al-Fiter while it was Sentence and Discourse level clues for Bonfire Night. Third, in terms of the number of knowledge source clue combinations from different knowledge sources at text level, the data revelled that differences between the knowledge source clue combinations existed. In Eid Al-Fiter, learners used a range of clues from a single knowledge source clue to combinations of 4 clues, all from different knowledge sources. On the other hand for Bonfire Night, successful responses were through using less KS clue combinations, which ranged from using a single knowledge source clue to integrating 3 different knowledge source clues

In terms of the overall lexical inferencing strategies used with successful responses, learners used more Meaning-Focused and Form-Focused Strategies in Eid Al-Fiter while Evaluating and Monitoring Strategies were used more in Bonfire Night. Learners integrated a number of lexical inferencing strategies with their successful responses in both texts. In Eid Al-Fiter, learners used a range from at least using 2 lexical inferencing strategies to combining up to 4 different lexical inferencing strategies from the four main strategy categories. As opposed to Eid Al-Fiter, in Bonfire Night learners displayed a larger range of strategy combinations from at least as a single lexical inferencing strategy until 4 different lexical inferencing strategies. Finally, participants used single as well as combinations of types of knowledge source clues and lexical inferencing strategies, which were either shared by all three groups, as well as being idiosyncratic to a group

in some cases. These combinations were either the same between the groups across the two texts or some were specific to each group and text.

Chapter 6 Discussion

6.1 Introduction

The study's main aim was to examine the role of background knowledge in the form of topic familiarity on participants' inferencing behaviours when encountering unknown words (UNWs) while reading. The participants were 15 female EFL learners who were majoring in English at the university and were L1 speakers of Arabic. At the time of data collection, these participants were enrolled in a reading (102) class and represented three different proficiency levels. Through using the primary research methods for collecting data, sequential verbal reports (VRs) in the form of concurrent verbal think-alouds (TAs) followed intermediate stimulated recalls (ISRs) and finally semi-structured interviews. The main objective of the current study was to add to the existing body of the lexical inferencing strategy (LIFS) literature through investigating how L1 speakers of a Semitic language, Arabic, approach UNWs while reading. L1 speakers of Semitic languages have been mostly neglected for the majority of research conducted on LIFSs (see 1.2). The main objective of this study was to explore and understand how L1 speakers of Arabic inferenced and uncovered the meanings of UNWs while reading texts. More specifically, while reading texts that required activating cultural background knowledge about Eid Al-Fiter and Bonfire Night. The objectives of the study can be summarized as follows (see 1.3 for details):

- Explore and describe how L1 speakers of a Semitic language approached the UNWs while reading in English.
- Identify the range and types of knowledge source (KS) clues, lexical inferencing strategies (LIFSs), their combination patterns that participants activated and their frequency of usage by each group as they inferenced the target words (TWs). More specifically, while reading two cultural topics, one familiar to their Saudi culture while the other culturally unfamiliar to them.
- Explore the role of the reader's background knowledge and topic familiarity in successful inferencing in terms of the KS clues activated and LIFSs applied.
- Explore the role of learner's proficiency level (PL) in determining the range of KS clues, LIFSs and their combination patterns with successful responses.
- The study also aimed at proposing a taxonomy of the lexical inferencing behaviours by Saudi L1 Arabic speakers when deducing meanings of UNWs. This taxonomy covers the KS clues that learners tapped into and the LIFSs resorted to while inferencing.
- Propose a lexical inferencing model of the L1 Arabic EFL reader based on the study's findings which takes into account components from both the reading and lexical inferencing literature.

Chapter 6 Discussion

In this chapter, results pertaining to each of the three main research questions discussed in chapters 4 (**RQ1**) and 5 (**RQ2 & RQ3**) are triangulated and discussed with reference to the literature. The discussion of the findings is presented in terms of the significant themes that have emerged from each of the 3 research questions. Due to data triangulation, some themes were repeated across different questions. Therefore, I have presented them to the reader under the most relevant research question and theme in an attempt to avoided repetition. However, in such instances cross-referencing has been used for ease of reading.

The present study's research questions are presented below and are cross-referenced to their discussion for each sub-question.

1. How do Saudi Arabic L1 speakers majoring in English infer meanings of unknown words while reading? (see 6.2)
    - 1.a. How do they approach the unknown words?
    - 1.b. What are the range of knowledge sources clues do they tap into to uncover the meanings of the unknown words?
    - 1.c. What are the range of lexical inferencing strategies do they resort to uncover the meanings of the unknown words?
2. How does topic familiarity of the text affect, if any, learners' lexical inferencing of unfamiliar words with respect to their proficiency levels?? (see 6.4)
    - 2.a. What are the numbers of lexical attempts and responses made between the groups in the two texts
    - 2.b. What are the similarities/differences between groups in terms of knowledge source clues used when reading culturally familiar and unfamiliar topics and with what frequency?
    - 2.c. What are the similarities/differences between groups in terms of lexical inferencing strategies employed when reading culturally familiar and unfamiliar topics and with what frequency?
3. In terms of successful inferencing, what is the role of learners' topic familiarity, if any, on their lexical inferencing? (see 6.5)
    - 3.a. How successful are the groups in their lexical inferencing attempts?
    - 3.b. What are the knowledge sources activated by the groups in both texts and with what frequency?
    - 3.c. What are the lexical inferencing strategies used by the groups in both texts and with what frequency?

The next section discusses the findings of **RQ1** according to the major themes found, metacognitive awareness, learners' approaches to the text, strategic awareness, motivation, text engagement and intentional vocabulary learning.

6.2 Metacognitive awareness and lexical inferencing

Metacognition strategies oversee, direct and regulate the learning process through which learners understand and take control of their own thinking and learning, like coordinating the planning, monitoring, organization of strategy use, and evaluating the learning process (Oxford, 1990; Koda, 1994; Rahimi and Katal, 2012). Through such strategies, learners take control of their own cognition (Cohen, 2014). According to Auerbach and Paxton (1997:40-41), metacognition in reading ''entails knowledge of strategies for processing texts, the ability to monitor comprehension, and the ability to adjust strategies as needed''. Metacognition in reading incorporates the ability to monitor, reflect, address comprehension difficulties and regulate text comprehension (Mokhtari and Reichard, 2002; Pinninti, 2016). Reading is a multi-skill process with the ultimate objective of text comprehension. Therefore, one crucial aspect of metacognition is controlling one's reading process through using strategies like; monitoring one's reading, awareness of cognitive and linguistic resources, organizing and retaining information for the ultimate goal of comprehension (Koda, 2005; Grabe, 2009). In this way, metacognitive reading strategy awareness plays a significant role in reading comprehension (Ahmadi et al., 2013). Furthermore, research shows that a positive relationship exists between students' metacognitive awareness of the reading process and their ability to read and excel academically (Carrell, 1991; Sheorey and Mokhtari, 2001).

The **RQ1** aimed at exploring how L1 Arabic EFL learners inferenced the meanings of UNWs while reading, where **RQ1.a**. aimed at investigating how Saudi EFL learners approached the UNWs while reading. The findings revealed that learners displayed a number of behaviours. Learners reported encountering unfamiliar words while reading as the most significant challenge they faced (6.2.1). Furthermore, learners differed in their inferencing approaches to how they read the texts and the inferenced TWs themselves (6.2.2). The data also found that when faced with an UNW in a reading text, learners would decide to inference the UNW depending on its importance. This importance was either to understand the text, its location in the TW sentence or to answer a reading comprehension question (on their reading exams) where the TW is part of the answer. Furthermore, the findings of this current study found that L1 Arabic EFL learners' approaches to inferencing the UNWs are linked to their strategic awareness (6.2.3), motivation and text engagement (6.2.4) and can facilitate intentional vocabulary learning (6.2.5). These displayed

behaviours show the importance of learners' metacognitive awareness, which are discussed in the following sections.

6.2.1 Encountering unfamiliar words and topics during reading

Nagy (1997:1) stresses that the "Effective use of context to disambiguate words, or to infer the meanings of unfamiliar words, depends on a variety of knowledge-world knowledge, linguistic knowledge, strategic knowledge". For what differentiates between what successful and unsuccessful readers do when confronted with a demanding content is the willingness to counter the challenge by finding strategic ways to circumvent their impediments. The current study's interview data revealed that L1 Arabic speakers, especially those with lower proficiency levels, reported encountering UNWs while reading as a common problem. This was applicable to the lexical inferencing task in the current study or while reading for pleasure in general and during reading exams specifically. Some participants labelled the UNWs they encountered while reading as "difficult words" due to being unknown to them which highlights their limited vocabulary knowledge. During reading, readers must identify the nature of the problem, generate possible solutions and resort to available resources to determine what works best for them (Koda, 2005), which is linked to their metacognition as discussed in 6.2. In light of this, one explanation as to why lower PL participants in this present study reported such difficulty could be explained in terms of their vocabulary size in English. Learners with low vocabulary knowledge encountered more UNWs and understood other words less well. This low vocabulary knowledge resulted in less contextual information available to help these learners inference other UNWs and also increased demands upon their attention (Shefelbine, 1990).

According to Grabe and Stoller (2013:15), vocabulary knowledge is "the most fundamental requirement for fluent reading comprehension is rapid and automatic word recognition (or lexical access-the calling up of the meaning of a word as it is recognized)". Therefore, limited vocabulary knowledge restricts learners from successfully using the context to infer the meanings of unfamiliar words. The previous reason could also explain why learners in the current study also reported not knowing the meanings of other words, either in the TW sentence itself or the sentences surrounding the TW sentence, as a challenge for these Arabic participants while inferencing. In the present study, reporting lexical difficulties in the form of UNWs by participants are in line with similar studies in the Saudi context that have reported this as a major problem for Arabic Saudi EFL learners when reading due to their limited vocabulary size (see 1.1) (Al-Bogami, 1995; Al-Akloby, 2001; Al-Qahtani, 2016; Aldukhayel, 2016; Alkhaleefah, 2017; Mohammed and Ab Rashid, 2019). Furthermore, the findings of this present study are consistent with and further add to the existing reading literature that encountering UNWs and reading about unfamiliar

topics are the most severe obstacles highlighted by EFL/ESL readers (Grabe, 1991; Aebersold and Field, 1997; Paribakht and Wesche, 1999; Nation, 2001; Bengeleil and Paribakht, 2004; Alderson, 2005; Cabaroglu and Yurdaisik, 2008; Grabe, 2009; Grabe and Stoller, 2013). This was echoed by L1 Arabic speakers in the current study who highlighted the challenges they faced in their reading exams. These were encountering new words related to an unfamiliar topic that they lacked the required background knowledge about, the presence of an UNW in the comprehension question itself and a specific question inquiring about an UNW. In terms of background knowledge, Alsamadani (2011) report that his 10 Arabic Saudi EFL university (male and female) participants reported that prior knowledge of the reading topic affected their degree of comprehension. Background knowledge helps learners to build schemata about the texts as they read and determines how learners approach the text, either continuing to read or quitting if the topic is not interesting to them or if they lacked the required background knowledge (for more see 6.5.3).

Finally, another explanation can be proposed in light of learners' proficiency level (PL) in which reading ability in FL depends on learners' proficiency. The more difficult a text is linguistically or conceptually challenging, the more critical FL proficiency becomes (Laufer and Sim, 1985b). Furthermore, a learner's PL is also a factor that affects the process of lexical inferencing as previously discussed in section 2.11.2.3. In the present study, the majority of low PL learners expressed the presence of UNWs as a difficulty while reading since linguistic proficiency influences how successfully a learner can use the context to inference (Haastrup, 1991; Nagy, 1997; Bengeleil and Paribakht, 2004; Riazi and Babaei, 2008; Tavakoli and Hayati, 2011) (see 6.6.4).

6.2.2 Reading approaches to the texts

Guessing from context is viewed as a sub-skill of reading where guessing appears to draw heavily on other reading skills, for good guessers are good readers (McKeown, 1983; Nation, 2001). In terms of approaches to the text, PLs also determined how learners in the study approached the text as a whole and how they worked out the TWs. Learners varied as to how they approached the texts, in each reading text only 8 students took the time and read the whole text before beginning to infer (see 4.2), thus being strategic. While others immediately only read the TW sentence or extended this to include a sentence before and after the TW (non-strategic). Anderson (1991) views skimming as crucial for general understanding and classifies it under 'supporting strategies' that are used to regulate processing behaviours. On the other hand, other researchers see reading a text as part of "comprehension-gathering/monitoring strategies" (Block, 1986). Furthermore, in order to inference the TWs readers must first successfully comprehend the text and so they "must utilize metacognitive knowledge and invoke conscious and deliberate

strategies" (Sheorey and Mokhtari, 2001:443). In terms of monitoring their comprehension, only one dominant learner, C1-2, applied Block's (1992) 3 phrase monitoring process (evaluation of the problem-action phase-checking phase) (p:74) through all her inferencing regardless of topic. On the other hand, the remaining learners varied in monitoring their comprehension, for they would evaluate the problem followed by an action phase but did not always check their answers. Some tended to skip the action phase by simply stating they think they know/have heard a word before, followed/unfollowed by a checking phrase.

Another interesting finding of the study was how participants approached the titles of the two texts during the inferencing tasks. Guessing or predicting the reading text through previewing and reading its title is regarded as a pre-reading activity that has been reported in the EFL/ESL reading literature (Sahan, 2012; Pinninti, 2016). Oxford *et al.* (2004:26) reported that using the title to predict the text did not only significantly differentiate between high and low proficiency learners but "predicting, like guessing from context is a hallmark of a good reader" where prediction is often used by metacognitively aware students who tend to plan ahead and latter check their predictions. Pre-reading activities like reading the title, making use of pictures, discussing or relating the text to students' background knowledge aim to activate readers' schemata before reading (Cabaroglu and Yurdaisik, 2008). This is further supported by contextual studies in the Arabic Saudi context (Alsamadani, 2012).

However, one striking result in the current study was the absence of any instances of resorting to the title of the text as a discourse clue by these L1 Arabic EFL learners during the inferencing task (see 6.4.1.4). When asked about reading the titles, interview data found that the majority of learners did not read the title. This finding is consistent with other studies researching reading strategies in the Saudi context (Al-Nujaidi, 2003; Al-Qahtani, 2016). For example, one finding of Al-Nujaidi's (2003) study was that Arabic EFL university students (226) representing both genders showed general awareness of reading strategies, yet some do not use or rarely use them. While Al-Qahtani (2016) reported that Saudi EFL learners lack the vital necessary reading habits in both L1 (Arabic) and L2 and rarely make use of vital reading strategies.

6.2.3 **Strategic awareness and lexical inferencing**

Strategic awareness plays a critical role in successful reading comprehension by guiding learners to choose from a repertoire of tactics that best suit the situation and apply them appropriately to overcome language limitations or challenges while reading (Koda, 2005; Winne and Perry, 2005). As earlier mentioned in this study, one of the factors that play a role in lexical inferencing is the degree of learner's strategic awareness (see 2.11.2.4). For strategic knowledge can compensate

and fill in learners' limitations of proficiency and second-language linguistic knowledge (Nagy, 1997). In terms of lexical inferencing, being strategic to both the process of lexical inferencing and reading comprehension is what distinguishes successful inferencers from less successful ones (Haastrup, 1991; Block, 1992; Hu and Nassaji, 2014).

In this study, one interesting finding was how learners varied in the amount of strategic control as they engaged in the inferencing task. Strategic control refers to how the learner takes control and thus the responsibility of his/her performance through taking account of the task's requirements and employing the strategies to accomplish the task more effectively and efficiently (O'Malley and Chamot, 1990; Oxford, 1990; Oxford et al., 2004; Cohen, 2014). Strategic learners engaged more in active strategic processing in both texts in several ways. For instance, these learners did not solely rely on their vocabulary knowledge of the word but also resorted to contextual and non-contextual clues or checking their answers compared to other learners who refrained from this. Similar findings were also reported by a number of studies that have found more proficient readers frequently made more use of context strategies (i.e., Meaning and Form Focused) then less-proficient readers (Hu and Nassaji, 2014; Lin and Yu, 2015)

Another example that displayed some learners' strategic awareness was how they judged the importance of the UNWs and their approaches to these words. Interviews revealed that when encountering an UNW not bolded or underlined during tests, learners would decide to either inference these words or ignore them depending on their importance in the text. Learners had different views on judging the importance of an UNW, some reported that an UNW is ignored until they encounter it as part of a comprehension question or its answer. They also tended to ignore the word if they already had comprehended the meaning of its sentence rather than waste time inferencing it. This is consistent with other studies that have reported similar reasons for skipping UNWs during reading (Hosenfeld, 1977; Walker, 1983; Huckin and Bloch, 1993; De Bot et al., 1997; Paribakht and Wesche, 1999; Laufer and Yano, 2001; Al-Homoud, 2014). From a reading perspective according to Smith (2015), this approach to hypothesize what the UNW might mean based on the surrounding meanings and use what a reader knows about similar-looking words is preferred when a learner does not have a teacher to turn to for assistance or support. However, if they understand all the words in the text except this UNW and still cannot construct meaning, learners realize its significance to meaning as one B2-4 learner explains how she judges the importance of an UNW "*If I didn't understand the passage and I knew all the words except this one*". One learner, C1-5, reported using the location of the UNW to indicate its importance "*From its place, if it's in the beginning, in the end or middle. Maybe it's a supporting idea or something, it's not a main idea in the paragraph*". Judging the importance of the TW was also related to its

part of speech, participants tended to inference verbs and adverbs since they change the meaning of the sentence while ignoring adjectives as 2 B2 learners (B2-3, B2-5) explained.

On the other hand, regarding Arabic learners' approaches to the TWs, verbal report data and my field notes during the sessions uncovered two patterns of behaviour. A linear approach to the words as they were presented in the text while the second was choosing any word to begin with. Interestingly, all groups tended to follow the first approach in both texts and when skipping, would aim to inference the following TW or choose another TW further down the list. A linear approach to the TWs without skipping was used by a handful of learners in both texts by 2 C1, 1 B2 and 1 B1 learners. In Eid Al-Fiter, both the advanced C1-2 and surprisingly the least proficient learner in the sample, B1-5, approached the words in this manner while for Bonfire Night it was used by the C1-1 and B2-1 learners.

The two C1 learners' behaviour can be explained in terms of their PL, vocabulary knowledge or being strategic. In terms of proficiency, these learners had the highest proficiency in the sample, C1-1 was half Saudi/American and C1-2 had lived in Canada for 9 years. Regarding vocabulary size, both these learners had the highest scores across all frequency level bands including the academic words among the sample (Appendix E). A large vocabulary can overcome problems of deceptive vocabulary and guessing ability through providing a higher coverage of known words, thus increasing the chances of locating more clues (local and global) for inferencing unknown words (Laufer, 1997a). Thus, allowing them to gradually move from one word to another without skipping. Therefore, the more vocabulary learners have, the more chances they employ proper guessing (Bengeleil and Paribakht, 2004). On the other hand, the opposite is true for the less proficient B2-1 and B1-5 learners, where their low PL and limited vocabulary size could have played a role in their linear approach to the TWs. Since "readers with less competence appear to be less sensitive to contextual information and consequently use a more bottom-up strategy of relying on graphic information" (Cziko, 1980:121). Furthermore, in the case of B2-1, her unfamiliarity with the Bonfire Night could have also played a role in adopting this linear approach in order to integrate the new information as she read and located enough clues guiding her in choosing the type of inferencing strategies she believes are appropriate.

The second approach to the TWs was used in the familiar text by only two participants, B1-4 and B1-5, who began their inferencing by choosing a word as opposed to the previous approach. It may be the case that these learners were strategic regarding their awareness to which TW they had a higher chance of inferencing correctly, in light of the clues they located and strategies applied. This was confirmed through their verbal reports, where they provided successful inferencing responses to the first words they began with, **((innovate))** and **((collaborative))** by

B1-4 and B1-5 respectively. The previous findings indicate that strategic learners, sometimes regardless of their PL, have deeper metacognitive knowledge about their own thinking in terms of how to approach the task and "the ability to orchestrate the strategies that best meet both the task demands and their own learning strength" (Rahimi and Katal, 2012:74).

6.2.4 Motivation and text engagement

One unique find that was found while answering **RQ1.a** was the role of learner's motivation and text engagement while they engaged with the inferencing task. Interestingly, such finding has not be addressed in the lexical inferencing literature. In this study, motivation and text engagement were displayed through the number of inferencing attempts made and intentional vocabulary learning. In terms of inferencing attempts, learners' risk-taking chances were reflected in the number of inferencing attempts or hypotheses they generated. Individual learners vary according to their "propensity for making inferences, his/her tolerance of risk and his/her ability to make valid, rational, and reasonable inferences"[5] . (Carton, 1966:18). Risk-taking, according to Beebe (1983:39) is a "situation where an individual has to make a decision involving choice between alternatives of different desirability; the outcome of the choice is uncertain; there is a possibility of failure". Studies have suggested that age differences among learners, gender, personality, driving motivation, self-esteem, class/teacher traits and classroom activities constitute major factors affecting learners' risk-taking behaviour (Bang, 1999; Zarfsaz and Takkac, 2014). From a language learning perspective, a trait of a successful learner is one who is prepared to take the risk of being wrong in order to succeed in L2 acquisition (Vuković, 2015). McDonough et al. (2013:46) view success as "based on such factors as checking one's performance in a language, being willing to guess and to 'take risks' with both comprehension and production, seeking out opportunities to use strategies, developing efficient memorizing strategies, and many others". Risk-taking has also been reported to increase language learners' self-confidence when using language (Cohen, 2014). Ellis (1994b) reports that risk-taking students tended to prefer unplanned speech, used complex language structures, were more tolerant of errors and thus took more substantial risks to develop their oral linguistic proficiency.

The present study found that there were more inferencing attempts for the unfamiliar Bonfire Night text compared to Eid Al-Fiter by all groups (Figure 5-1), where the C1 group were the highest risk-takers in both texts followed by the B2 and B1 groups. Significant differences

[5] italics added by myself

between high and intermediate proficiency EFL Iranian learners in terms of their risk-taking was also reported by Dehbozorgi (2012). In the present study, not only were group differences present within the same group but this extended to the texts where more inferencing attempts for all the groups were found for the culturally unfamiliar Bonfire Night (147) (Table 5-2) compared to the culturally familiar Eid Al-Fiter text (130) (Table 5-3). Although immediate stimulated recalls and semi-structured interviews, data revealed that learners did not possess any cultural background knowledge for Bonfire Night and reported it to be challenging, yet they generated more inferencing attempts for it. We can try and account for this risk-taking behaviour in my EFL learners in three ways; the Hypothesis-Generation/Testing Model, motivation and text engagement and the Affective Filter Hypotheses.

The first explanation for why there were more inferencing attempts in Bonfire Night can be explained through Huckin and Bloch's (1993) Hypothesis-Generation/Testing Model. Where due to due to lack of background knowledge, learners ended-up generating more hypotheses and testing them in the metalinguistic control steps section. This was to compensate for the lack of background knowledge component in the Generator/Evaluator section and update its remaining elements (2.9.1). Also, from the perceptive of Coady's (1979) Psychological Model of second language reading, the lack of background knowledge is compensated for by resorting to learners' conceptual abilities and processing strategies.

The second explanation is viewed in light of the Engagement Theory, which differentiates between 'engaged' and 'disengaged' readers (Guthrie and Wigfield, 2000; Guthrie, 2004). Engaged learners are characterized as strategic readers who are intrinsically motivated to read, use metacognitive strategies to build a conceptual understanding of the text and are socially interactive. In the present study, interviews revealed that learners reported the Bonfire Night reading text was more interesting than Eid Al-Fiter. Therefore, learners' were more curious, engaged, motivated, involved and devoted more effort to complete the task which was reflected in the number of attempts to inference the UNWs. They also characterized Text-1 (Eid Al-Fiter) as either already known to them or contained repetitive information they already knew and therefore viewed it as uninteresting. Due to motivation, learners were more engaged with Text-2 (Bonfire Night). Engaged reading is the "joint functioning of motivation, strategy use, and conceptual knowledge during reading" (Guthrie et al., 2001:146). This falls in line with Gardner and Lambert's (1959) two types of motivation, instrumental and integrative where the latter correlates more with successful language learning. Furthermore, not only is high motivation a trait of a good language learner (Rubin, 1975) but highly motivated learners are active engaged readers and high achievers (Guthrie et al., 2000; Cho et al., 2010). Furthermore, as motivation

increases, the amount of academic engagement grows which increases achievement scores or grades (Guthrie et al., 2001).

During interviews, learners expressed their engagement and interest in Bonfire Night for many reasons. One reason was the element of suspense as one C1 learner explains, "*the topic, it's something I had no idea what it is about, coz when I first read the title, I thought it was just going to be about camping or something*". It seems that this learner, who has lived 9 years of her life in Canada, activated her schema about camping in which bonfires are a part of but not as to its role in British history. A second reason of interest was linked to the real historical story behind Bonfire which intrigued learners, as B1-1 explains, "*stories, especially true stories are interesting to know for me*". While others reported being motivated by the new information that they had never read/heard about as the least proficient learner (B1-5) explains, "*(Arabic) Bonfire Night, I loved it so much, because it a new information, or a new article so I learnt about it so I liked the topic but there were a few hard words but there were easy words, too*". Other learners have mentioned that the story-like nature or style of the Bonfire Night text made it more interesting since Eid Al-Fiter was descriptive. Although Bonfire Night was linguistically more challenging than Eid Al-Fiter and learners did not have the required background knowledge about it, yet they were still more motivated about the story. A similar finding was also reported by Cho et al. (2010), who through focus groups, found that motivation was highly related to the content of the 4 stories given to participants even if they were linguistically complex rather than their linguistic simplicity. Furthermore, motivation could also explain why none of the groups reported their failure/difficulty of inferencing (Monitoring Strategy) in Bonfire Night compared to Eid Al-Fiter, where all groups reported it (p:245). Thus, this highly interesting yet challenging material had a positive impact on students' motivation to read and complete the task regardless of its difficulty.

A third explanation for risk-taking from my point of view can also be explained partly from the perspective of the Affective Filter Hypotheses, one of Krashen's five basic hypotheses (for an overview see Krashen, 1981; 1982; Mitchell et al., 2019). The affective filter is a psychological one that prevents language learners from fully absorbing the language input, where the hypothesis states that learners with positive attitudes will not only have more input but also a lower affective filter and vice versa. In terms of learners' Affective Filter and risk-taking, Yulan and Yuewu (2020) view the adventurous learner as one with a lower affective emotional filter, thus is more willing to take risks and will perform better in language learning compared to a learner with a higher filter. In the present study, the research sample were L1 Arabic university females majoring in English who have enrolled due to their passion and interest in the language after passing an entrance exam to the faculty. Therefore, they are passionate, motivated and committed to their major where upon graduating these learners will use English in their workplaces as teachers, translators

or other sectors that require using English like; newspapers, banks, hospitals, etc. Therefore, in this study learners had a lower Affective Filter which could have guided and motivated them to take more inferencing risks and challenge the unfamiliar Bonfire Night text through displaying more inferencing attempts there than the less challenging uninteresting Eid Al-Fiter text.

6.2.5 **Intentional vocabulary learning**

Some scholars stress the role that metacognitive awareness plays to enhance the effectiveness of vocabulary learning tactics through planning, monitoring and evaluating strategies (Ellis, 1997; Tseng and Schmitt, 2008; Teng, 2017a; Teng, 2017b; Teng and Reynolds, 2019). Furthermore, successful learners use their sophisticated metacognitive knowledge in order to select cognitive learning strategies that are appropriate to the task of vocabulary acquisition which includes inferencing word meanings from context (Ellis, 1997). As mentioned in 2.8.2, lexical inferencing is a cognitive process that plays a role in incidental vocabulary learning (Nassaji, 2003a; Jelić, 2007; Wesche and Paribakht, 2010; Nation and Webb, 2011). Incidental vocabulary learning via lexical inferencing from context "is the most important of all sources of vocabulary learning" (Nation, 2001:232). This stresses the critical role of the context which is not only limited to uncovering the meanings of unknown words but learning them, too. Although this present study did not address lexical inferencing and incidental vocabulary learning (retention) which has been researched in the LIFS literature (Hulstijn, 1992; Paribakht and Wesche, 1999; Laufer and Hulstijn, 2001) but unexpectedly the opposite was found, intentional vocabulary learning (see 4.5.2).

In the current study, semi-structured interview data found that some learners had reported selecting words after the inferencing task sessions ended to learn them intentionally. These learners could be viewed as possessing a high level of metacognitive awareness about their vocabulary learning. Through further questioning these learners, it appeared that this behaviour is one that they are generally accustomed to after their reading quizzes and exams in their reading course where they would look up one or two words immediately after leaving the classroom. These learners reported checking the meanings of these selected words in several ways through using Google or electronic dictionary applications. Some even went a step further and would add the words to their favourite list online or through an application and occasionally revise them. Learners saw these words as items to be learnt. Nation's (2001) three conditions for vocabulary learning which are listed from the least to the most effective are noticing, retrieving and generating. In terms of noticing strategies, he lists putting a word in a notebook or list, orally and visually repeating the word. Although these strategies tend to be largely recoding ones, yet they are "a very useful step towards deeper processing of words" (Nation, 2001:221).

Interviews also revealed that a handful of learners mentioned selecting words to learn intentionally. They would further use these new words through their writing (reflections, reflective poetry) and in their notebooks. Through using their phones, some learners, regardless of their proficiency, saved the new words on language applications or webpages after Googling their meanings which they mentioned revisiting from time to time (Examples-74-76). In this way, learners are generating or recycling these intentionally learnt new words, for it is crucial for new words to be regularly recycled to be learnt (Schmitt and Schmitt, 1995) without which, many partially-known words will be forgotten (Nation, 1990). Rubin (1975) attributes seeking opportunities to hear the language and use it when not required is a trait of the good language learner. In terms of vocabulary learning, the present study's findings provide more support to the role that lexical inferencing plays as an initial link towards vocabulary learning (Haastrup, 1991; Fraser, 1999; Paribakht and Wesche, 1999; Nation and Webb, 2011).

Furthermore, it could be argued that learners who have reported intentionally selecting a UNW either during this present study or on their reading exams in general for the aim of learning these UNWs, display a high level of metacognitive learning awareness. This was reflected on how these learners planned to select a word to learn, used websites, mobile applications to evaluate their meanings and recycled these words in their language. In vocabulary learning, the progress of metacognitive strategies, according to Schmitt (2000:136) "involve(s) a conscious overview of the learning process and making decisions about planning, monitoring, or evaluating the best way to study". This includes deciding between the words worth studying and thus learning compared to those which are not (Schmitt, 2000). In addition, learners' motivation, attitudes, engagement and their strategic behaviour also play a role in word learning (Schmitt, 2008, 2010). Learners in the present study who selected words to learn intentionally could also be labelled as strategic and self-regulated learners who are aiming at improving their vocabulary knowledge through seeking every opportunity they get to learn a word. In terms of metacognitive awareness, strategic behaviour displayed through self-regulation plays a vital part of vocabulary learning where in this view, vocabulary learning is "part of a cyclical processes, where one's self-regulation of learning leads to more involvement with and use of vocabulary learning strategies, which in turn leads to better mastery of their use" (Schmitt, 2008:338). Thus, facilitating and promoting self-regulation enhances language learning (including vocabulary) strategies (for an overview see Tseng et al., 2006; Oxford, 2011; Oxford, 2017).

6.3 A taxonomy of the Arabic EFL learner and lexical inferencing

In the lexical inferencing literature, studies tended to either investigate the KS clues or LIFS used by EFL/ESL learners. However, one significant aspect of this study was investigating both the KS

clues and LIFS used by EFL learners together in one study in order to understand how learners made use of these clues as part of their LIFSs. Therefore, one objective of the current study was to produce a taxonomy of the range of KS clues and LIFSs used by Saudi EFL learners. This is mirrored in questions **RQ1.b** and **RQ1.c**, which resulted in generating two taxonomies, one devoted to the types of clues and their major KSs (see 4.3) while the second covers the strategies and their major categories (see 4.4). In the present study, the majority of KS clues found supported the findings of other studies and their taxonomies (Sternberg and Powell, 1983; Haastrup, 1987; Haastrup, 1991; Morrison, 1996; De Bot *et al.*, 1997; Fraser, 1997; Paribakht and Wesche, 1999; Bengeleil and Paribakht, 2004; Paribakht and Wesche, 2006). However, at the same time, there were some new clues uses by the L1 Arabic participants that were not reported in other LIFS taxonomies. Although it has been reported that learners use morphological word level analysis in the form of prefixes, stems and affixes. This study has further found that when L1 Arabic EFL learners used the stems of the UNWs, they tended to remove their affixes either implicitly or explicitly through stating this during their think-alouds. Furthermore, there were no instances in the data that learners used suffixes but only prefixes and stems were used which can be attributed to the different inflectional and derivational morphological systems between Arabic and English (Shamsan and Attayib, 2015; Igaab and Kareem, 2018). The second unique finding of the present study is the role of learners' vocabulary knowledge clues during inferencing. Due to the fact that learners repeatedly tapped into their vocabulary knowledge and consulted it, led to it becoming one of the major KS categories as opposed to the previous KS taxonomies which did not include vocabulary knowledge as a KS.

In terms of LIFS taxonomy, this study supported previous LIFS taxonomies reported in the lexical inferencing literature (Nassaji, 2003a; Nassaji, 2006; Hu and Nassaji, 2012; Hu and Nassaji, 2014) and also listed some new LIFSs not reported in previous taxonomies. First, in terms of Cognitive Strategies, Arabic participants in this study replaced the TW with a guess either in Arabic/English to see if it fits the meaning as a Meaning-Focused Strategy. Furthermore, learners fell back on their vocabulary knowledge and used it as a strategy in this category, too. Second, regarding Metacognitive Strategies, the study found that when learners skipped a TW, they would decide to do so on their own or after being reminded by the researcher that they could skip. Furthermore, when they did skip, they would either skip without providing any hypotheses of the TW's meaning or with a proposed meaning but were not confident enough to write it as their final answer. Finally, both the KS clues and LIFS taxonomies in this current study closely listed a detailed account of the sub-clues and sub-strategies used by these L1 Arabic EFL learners as they inferenced UNWs which were missing in previous inferencing taxonomies. For example, the nature of the local clues that learners used, pointing to specific words, resorting to definitions or

description, using parts of speech, using the meaning of the whole sentence or using sentence conjunctions. Such a rich detailed account is provided by the embedded multiple case study nature of the present study, the mixed methods approach to both data collection and analysis that was conducted.

6.4 Topic familiarity and inferencing unknown words while reading

The second research question and its sub-questions looked at the number of lexical inferencing attempts and responses made in the two texts. It also investigated the types of KS clues and LIFSs used in both texts along with their frequency regardless of the outcome of inferencing responses.

2. How does topic familiarity of the text affect, if any, learners' lexical inferencing of unfamiliar words with respect to their proficiency levels?
    - 2.a. What are the numbers of lexical attempts and responses made between the groups in the two texts?.
    - 2.b. What are the similarities/differences between groups in terms of knowledge source clues used when reading culturally familiar and unfamiliar topics and with what frequency?
    - 2.c. What are the similarities/differences between groups in terms of lexical inferencing strategies employed when reading culturally familiar and unfamiliar topics and with what frequency?

As for the first sub-question, **RQ2.a**., the number of lexical attempts made by the three groups in both texts has been previously discussed under the theme of learner's motivation and text engagement in 6.2.4.

6.4.1 Clues and knowledge sources activated

The findings of **RQ2.b.** reported that Saudi EFL learners used clues from all the five knowledge sources (KSs) but with different frequencies in terms of groups and texts. In terms of text, regardless of the outcome of responses, there were more KS clues tapped into in Eid Al-Fiter (193) compared to the unfamiliar Bonfire Night (158) (Table 5-5). Data also revealed that some clues were only used by some groups and not all while other clues were tapped into in one text and not the other.

6.4.1.1 Vocabulary knowledge clues

The lexical inferencing strategy literature has reported that learners would assume that they know a TW and impose preconceived notions about it even if it distorts the sentence's meaning.

According to Huckin and Bloch (1993:153) “the most common cause for unsuccessful guessing when students thought they knew a word but didn’t-and therefore didn’t really make a guess”. In the present study, learner’s Vocabulary Knowledge was one of the inductive KSs which was not the case for previous lexical inferencing studies (4.3.1.1). Learners tapped into their mental lexicon as a clue to compare and identify the familiarity or unfamiliarity of the TWs. One reason for assuming knowing a word without guessing can be attributed to Saudi learners’ limited vocabulary size, language teaching methods and how they learn vocabulary through memorizing meanings and word lists (1.1). I propose a further explanation in terms of the Lexical Processing Model (De Bot et al., 1997) (Figure 2-7), where learners confuse the UNW’s orthographic form (lexeme) which is similar to a word form they already know and thus impose this familiar word’s meaning (lemma) onto the UNW’s form (lexeme). This is done, in most cases, without checking their guess against the text. As if these UNWs were part of their sight vocabulary and therefore, their meanings are immediately recalled. Smith (2015) classifies word identification into *‘immediate identification’* and *‘mediated identification’.* The former refers to sight words that can be recognized on sight without decoding to sound while the latter is mediated by other means to discover meanings of unknown words, one of which is using the given reading text. Surprisingly, the L1 Arabic participants in this study resorted to immediate identification of the given TWs through relying on their vocabulary knowledge which mostly resulted in unsuccessful inferencing.

Regarding the number vocabulary knowledge clues used, the advanced group displayed resorting to their vocabulary knowledge more than the remaining groups in both texts due to their advanced LP and large stock of words (Qian, 2005; Nassaji, 2006), followed by B2 and B1 (Table 5-6). Overall, learners reported encountering the TWs before more in Eid Al-Fiter than Bonfire Night (Figure 5-13). Familiarity with the topic motivated and aided learners to recall words from their vocabulary knowledge which did not violate their Eid Al-Fiter schema. On the other hand, due to lacking a Bonfire Night schema and its unfamiliarity, learners were unable here to use their vocabulary knowledge as a clue as much as they did for Eid Al-Fiter. Learners could not judge if they already knew the TW as part of their stock of known words as they previously did with Eid Al-Fiter since they could not determine if the recalled TW meanings were appropriate or violated the meaning of the text due to the lack of required background knowledge. This was also observed on the pretest when learners would report knowing a TW and provided an incorrect meaning. One reason for these ‘preconceived notions’ is learners’ uncertainty of the UNWs familiarity (Bensoussan and Laufer, 1984). In second language, deciding whether or not a word is familiar takes extra effort and time, as Haynes (1993) reflects that interviews and pretests have shown participants often hesitated if asked to point/underline UNWs themselves or if asked about specific underlined words. Some learners would assume they know a TW and provide an

incorrect meaning or indicate not knowing it and during the inferencing task suddenly remember its meaning, which Huckin and Bloch (1993) label as “late bloomer”.

However, using preconceived notions about the TWs are misleading. Words with multiple meanings resulted in the largest number of comprehension and inferencing errors (Bensoussan and Laufer, 1984; Laufer, 1997b). As they encounter UNWs, learners might assume that they know them but in reality they may know only one or two meanings of that word which is different from its meaning in the text or might not know them at all. As a result, they tend to impose or force their ‘preconceived notions’ about that UNW even if it distorts text comprehension due to their inability to discard the inappropriate preconceived notion about the UNW’s meaning. This was the case while inferencing the TW **((abandon))**, where B1-4 explained that she knows the word [[cellars]] as ‘prison cell’ that was supported by the entrance of the soldiers into the cellars. This learner resorted to her vocabulary knowledge in only one meaning of the word [[cellars]] and imposed this meaning through activating her prison schema from the text before finally disregarding the old inference and proposing a new one, <to hide>.

Deducing the meanings of the UNW through resorting to its resemblance in sound or script to other languages (L1 or TL) is one commonly reported inferencing strategy (Bensoussan and Laufer, 1984). This was the case for TW word **((bulky))** by B2-5, who utters the word <block> in Arabic, which in English means ‘red bricks’ for building and puts it as her final answer. It was found that some learners when resorting to their vocabulary knowledge, did not pay attention to the context due to the blindness of applying preconceived notions about the TW (Bensoussan and Laufer, 1984; Haynes, 1993; Huckin and Bloch, 1993). Not only are the dangers of preconceived notions limited to distortion of text comprehension but learners will rarely seek a meaning different from the one they previously have for these words. As Bensoussan and Laufer (1984:26) point out “that these ‘somewhat familiar words’ have a smaller chance of being correctly guessed than words completely unknown in the sentence because in the latter case, they know they do not know the word and therefore might try to guess its meaning”. Learners fail to make use of context clues to check their accuracy of guessing the preconceived notion of the UNW, which as Huckin and Bloch (1993) suggest, is due to the word-shape familiarity which overrides contextual factors during inferencing and learners do not attend to syntactic relations. Haynes (1993:58) explains that L2 learners search for familiar units as they read but are often unsure whether a word is really new or not, therefore “it is not surprising that any flash of familiarity in a word arrests their attention, making the context fade into the background”.

6.4.1.2 **Word level clues**

The present study's finding showed that groups used more word level clues in Eid Al-Fiter compared to Bonfire Night (Figure 5-14). It was found that B2 learners used the most word level clues in both texts (Table 5-7) which seems they favoured a word to word process when they encountered an unknown word (Walker, 1983). Regarding morphological clues, removing affixes was the most frequently used clue of all the morphological clues, where learners used these clues as an analyzing strategy (P: 300). It was found that these Arabic participants favoured removing affixes as a clue by extracting the root of the TWs. Extracting a root of an UNW but encountering difficulty in determining the functions of its affixes has been reported in lexical inferencing (Soria, 2001). In this study, removing affixes was used by all the three groups with more activated in Eid Al-Fiter by the intermediate B2 group while resorting to analyzing prefixes was only displayed by the advanced group (C1) in both texts. Only the two remaining low proficiency groups used their L2 perceived near homonymy (word form) knowledge. This clue was used the most with the intermediate group, once in the familiar text and four times in the unfamiliar one, while the B1 group used it only twice in the unfamiliar text. According to FL learning vocabulary studies, homonymy is a mnemonic strategy used by FL learners who are quite early in their learning and involves cognates or phonemic correspondences (Lawson and Hogben, 1996).

In terms of semantic world level clues, using semantic relationship clues were only found in Eid Al-Fiter since participants were familiar with the topic and were able to evoke more association/collocation clues as opposed to Bonfire. It was found that all groups tended to use more collocation clues in the familiar text, which was used the most by the intermediate group (5) while the remaining groups used it equally twice. In addition to being familiar with the topic, larger vocabulary sizes would make more words available for semantic relationships (Schmitt and Meara, 1997). Of the 9 semantic relationship clues that were reported only in Eid Al-Fiter by all groups, 3 lead to successful inferencing, with one for each group (Table 5-21). This supports studies that have found that inferences based on word form associations/collocations rather than using clues from the text lead to inappropriate word-meanings (Bensoussan and Laufer, 1984; Haynes, 1993; Huckin and Bloch, 1993). Although antonyms and synonyms have been reported as compensation strategies for limited vocabulary knowledge when the precise meaning is known (Oxford, 1996) and as a vocabulary learning strategy for EFL (Lawson and Hogben, 1996; Schmitt, 1997), they were only used by the two most advanced C1 learners. These clues all lead to successful inferencing in both texts. This is one of the innovative findings of the present study, since using antonyms and synonyms has not been reported previously in studies on lexical inferencing KS clues (Haastrup, 1991; Bengeleil, 2001; Paribakht and Wesche, 2006; Wesche and Paribakht, 2010; Yin, 2011). In my view, this can be explained in terms of both the C1 learners'

high PL and large vocabulary knowledge size that allowed them to use synonyms and antonyms. This finding further supports similar findings in the literature that proficient learners make more use of word associations than less proficient ones (Tavakoli and Hayati, 2011) due to their large vocabulary size, more specifically depth of vocabulary knowledge (Qian, 2005; Nassaji, 2006). Although learners activated a number of contextual clues at TW level, all of which further became the basis of their Form-Focused Strategies (p:301) except their knowledge of antonyms and synonyms.

6.4.1.3 **Sentence level clues**

At sentence level knowledge, all groups favoured sentence level meaning clues over grammatical ones while inferencing in both texts(Figure 5-15). Furthermore, in terms of sentence level clues, learners activated more local clues in both texts compared to global ones (Table 5-8). It was found that learners used slightly more local clues in Eid Al-Fiter (109) compared to Bonfire Night (94) while the opposite was found in Bonfire Night with more global clues (8) found as opposed to Eid Al-Fiter (5). Thus, this study supports findings that have reported learners' preference for using local clues while reading and inferencing more than global ones (Alseweed, 2000; Dehghan and Sadighi, 2011; Al-Homoud, 2014; Baniabdelrahman and Al-shumaimeri, 2014). The present study found that sentence level local clues were used the most by the B2 group in the familiar text while the B1 group used them the most in the unfamiliar one. Descriptive data showed that the lower the learners' PL, the more local clues were found in both texts due to their bottom-up approach to the text, for they found it challenging to go beyond the current TW sentence meaning to the surrounding sentences. However, in Bonfire Night in an attempt to locate more contextual clues that are comprehendible and suitable to their PL, learners crossed beyond the TW sentence boundaries and used global clues. Although global clues are more challenging than local ones (Haynes, 1993; Huckin and Bloch, 1993) but due to the absence of a Bonfire Night schema, learners went beyond the local clues (TW sentence) in attempts to understand the UNWs. This is in line with the schema theory where in the absence of a content schema (background knowledge) readers turn to their linguistic schema (language knowledge) and deduce as much information from the text (formal schemata) as they can, which becomes the main source of information about the topic.

In terms of global clues, the study found that 11 backward global clues (C1=4, B2=2, B1=5) were used more than forward clues (2) since they are easier to locate and use (Chern, 1993). Backward clues were used more in the unfamiliar text due to the lack of background knowledge to link the TW with what learners had previously read to comprehend its meaning. While in the familiar text, it was to search for more clues since learners were unable to either use the TW sentence clues or

simply overlooked them and looked at the previous sentence for clues/connections. Due to their advanced proficiency, not only were global clues used the most (6) by the C1 group but forward clues (2) were only used by them once in both texts. Proficient learners were more prone to read sentences surrounding the TW sentences to search for yet more clues to draw upon while inferencing the UNWs or to check their answers. This further supports studies that reported that global processes are more favoured and well used with advanced proficiency while less proficient readers favoured more localized processes (Carrell, 1989; Chern, 1993; Sheorey and Mokhtari, 2001; Mokhtari and Reichard, 2002; Hamada, 2009; Lin and Yu, 2015).

Finally, in terms of sentence level grammar clues, word order was only used once in each text by the advanced group. On the other hand, a single instance of resorting to knowledge of sentence punctuation was used by one learner. This learner, B2-3, used her knowledge of punctuation and placed a comma on the text to facilitate her comprehension of the sentence (Example 38). She further uses this clue as part of her MFS (see p:300). This finding is in line with other lexical inferencing studies that have reported using punctuation; capitalization (marking proper nouns) and commas (to separate noun series) (De Bot et al., 1997; Paribakht and Wesche, 1999) while others have not (Tavakoli and Hayati, 2011).

6.4.1.4 **Discourse level clues**

Activating discourse clues was the least KS activated of all sources with a total of only 5 instances found (Figure 5-16). The most striking result was that discourse clues were only used by the advanced group in Eid Al-Fiter in the form of TW paragraph level clues while only the B1 group used formal schema as a clue in Bonfire Night (Table 5-9). It was found that activating and searching for clues beyond the TW's current sentence level was not preferred by all learners except the highly proficient C1-2 learner (4.3.1.4). Block (1986) reported that knowledge of some aspects of text structure differentiated successful proficient readers from their less successful non-proficient counterparts. Across groups, this C1-2 learner was the only one who used her knowledge of paragraph discourse level clues twice only in the familiar topic. She had used her knowledge of a topic sentence in the TW **((substantially))** (Example 39) which was the initial topic sentence for the paragraph that lead to successful inferencing. She also turned to the whole TW paragraph while inferencing **((fondness))** (Example 40) in an attempt to comprehend its meaning between sentences. Through discourse, this learner was aiming to make connections between sentences to comprehend the TW, these connections are both essential to the reading process in general and more specifically inferencing individual words (Clarke and Nation, 1980). On the other hand, in terms of discourse knowledge, only two B1 learners reported using formal schema in the

form of a story in Bonfire Night. Furthermore, all the discourse clues activated were used as textual clues and part of learners' Meaning-Focused Strategies (P:300).

6.4.1.5 **World knowledge clues**

Possessing the required prior knowledge (content schemata) and its activation plays a significant role when reading. The importance of activating background knowledge in reading is highlighted by Grabe and Stoller (2013:21) where:

> Background knowledge (whether understood as linked networks of reconstructed knowledge, instances of memory, schema theory or mental models) plays a supporting role and helps the reader anticipate the discourse organization of the text as well and disambiguate word-level and casual meanings as new information is incorporated into the text.

Since learners of the present study were familiar with the religious cultural festival of Eid Al-Fiter, they tapped into this KS more when reading about it compared to Bonfire Night. In fact, world knowledge clues were used twice as much in the familiar text compared to the unfamiliar one (Figure 5-17) and were used more than discourse clues. This supports Carrell's (1983b) view that readers fail to use background knowledge because they are linguistically bound. This was seen more in Bonfire Night, where due to not possessing the required schema, B2 and B1 learners turned to word and sentence level clues followed by their Vocabulary Knowledge more. A number of studies reported that according to the Schema Theory, in the absence of content schema individuals rely on the two remaining elements, language and formal schema (see 2.5.1). Nassaji (2003a) reported that among all KSs, world knowledge was the most activated knowledge by 21 ESL university learners living in Canada representing various L1's. This finding is in contrast to the one in this present study which can be explained in terms of the status of English for Nassaji's participants who are at an advantage of more exposure to the target language (English) than the EFL learners in this current study. In terms of groups, all groups used world knowledge clues more in Eid Al-Fiter than Bonfire Night with C1 using them the most on both texts (Table 5-10). This was due to their advanced PL which allowed them to active top-down decoding strategies while the remaining lower PL groups depended more on bottom-up decoding strategies than activating their background knowledge (Carrell, 1989; Anderson, 1991) (see 6.4.4). Although Bonfire Night was unknown to all learners, they still fell back on their personal experiences and world knowledge where learners used this world knowledge (7 clues) later on as either part of their Meaning-Focused (p:300) or Evaluating Strategies (p:307).

Since learners lacked background knowledge about Bonfire Night, instances of miscomprehension were only found here. For the word **((inevitably))**, B1-1 put her final answer as <by mistake> and explains "*because you know there is a fire, in his body, he will run to just get this fire off so <<by mistake>> or [wrongly] people would have lost their lives*". Another breakdown in comprehension was by B1-2, where she had understood that the plotters burnt a doll to fool the guards, "they did a smart thing by using old clothes filled with paper as they are burring a doll". One learner actually thought that the plotters were successful with their scheme. This was also reported by Alkhaleefah (2017) where some participants expressed a lack of schema about trains in general or British trains in the 1950s, the main setting for the text and as a result, miscomprehended the meanings of some TWs. Participants did not have any background knowledge about trains because the network of trains and train lines were at that time currently under construction in Saudi Arabia. This supports findings by Horiba (1990) and Pritchard (1990), which demonstrated how the lack of previous knowledge or schema about a text's content is a key factor in causing problems or difficulties in the comprehension process.

To summarize, the previous sections have discussed the KS clues with all inferencing responses (correct-partially correct-incorrect). It was found that the learners used the same frequency pattern for both texts beginning with the most KS clues used:

Sentence Level>Word Level>Vocabulary Knowledge>World Level>Discourse Level clues

6.4.2 Lexical Inferencing strategies

The final question, **RQ2.c**. as with the previous KS clues, aimed at reporting the range of LIFSs used by the learners and their frequency in terms of groups and texts regardless of inferencing outcomes. In terms of text, regardless of the outcome of responses, there were more strategies used in Eid Al-Fiter (400) than the unfamiliar Bonfire Night (351) (Table 5-11). The results indicate that all groups used the four major strategy categories, which were grouped into 2 main groups; Cognitive (Meaning-Focused and Form-Focused) Strategies and Metacognitive (Evaluating and Monitoring) Strategies. The following sections will discuss each strategy category beginning with the largest reported in this study and then descending onwards.

6.4.2.1 Meaning-Focused Strategies

The present study found that although Meaning-Focused Strategies (MFSs) (p:199) were the most used strategy category among the remaining strategy categories. Futhermore, although MFSs were used more in the Eid Al-Fiter, in terms of text, they had more weight in the unfamiliar text. Learners used more sentence level clues in the familiar text compared to the unfamiliar one

(Figure 5-19). However, since learners did not possess the essential Bonfire Night schema to comprehend the text, they turned to and depended heavily on the text to fill this missing knowledge gap as opposed to Eid Al-Fiter (see 6.4.1.3 above). Regarding groups, all three groups used textual clues with the C1 group using them the most in Eid Al-Fiter while B1 members used them the most in the unfamiliar text (Table 5-12). This can be explained in terms of learner's proficiency level, where the dominant C1 groups, due to their advanced PL had access to a more extensive repertoire of strategies beyond textual clues and may use them better than the lower PL group (O'Malley *et al.*, 1985; Riazi and Babaei, 2008; Cohen, 2014; Rahbarian and Oroji, 2014). The next most used strategy by learners after using textual clues was tapping into their vocabulary knowledge (6.3.1.1). It was found that the advanced group depended heavily on their vocabulary knowledge as a strategy in both texts due to the richness of their vocabulary knowledge (breadth and depth) while inferencing (De Bot *et al.*, 1997; Nassaji, 2006).

The third strategy in frequency was replacing the TW with a guess, either in Arabic or English. Replacing the TW with a guess in English was frequently used by all groups in both texts with C1 using this strategy the most. On the other hand, replacing the TW with a guess in Arabic was used only by the lower groups B2 (2) and B1 (2) in Bonfire Night with none-reported by the advanced group. Surprisingly, this replacing strategy has not been reported in any of the LIFS studies except by Hosenfeld (1977) by her successful reader, who replaced the TW with the filler-word "something" and completed the sentence before applying inferencing strategies. Thus, keeping the background of the reading passage in mind as he/she interacts with the foreground, the immediate sentence he/she is decoding. On the other hand, Hosenfeld's unsuccessful reader immediately stopped at the word without continuing to read the sentence and looked up the word in the glossary. Therefore, using fewer clues to its meaning that are available to inference the word in the remaining parts of the sentence. Finally, resorting to background knowledge as a clue (6.4.1.5) was the least used strategy in the present study used in both texts. Although all the L1 Arabic participants in this study knew nothing about Bonfire Night, yet it was used at least once by all groups in the unfamiliar text. Although there was a total of 21 background knowledge clues, only 8 were used as part of MFSs while the majority were used as EVSs (6.4.2.4). Since learners did not possess any knowledge about Bonfire Night, they fell back on their world knowledge and personal experience (Examples 43 & 44).

6.4.2.2 **Form-Focused Strategies**

Form-Focused Strategies (FFSs) (p:202) were used more in Eid Al-Fiter than Bonfire. Regarding repeating strategies, they were used more in Eid Al-Fiter with the advanced group using them the most, followed by the least proficient (B1) group and finally the intermediate group (Table 5-13).

It was found that TW repeating alone was more heavily used than repeating a TW within a phrase or sentence (Figure 5-20). Nassaji (2003a) reported that section repeating was more associated with successful inferencing than TW repeating. He explains that the advantage of section repeating assists the learner to relate the word to its sentence and use the available clues. This further supports that repeating tends to be one of the first strategies that is always at the disposal of learners (Pressley and Afflerbach, 1995; De Bot et al., 1997; Paribakht and Wesche, 1999; Hu and Nassaji, 2014; Rahbarian and Oroji, 2014). In this current study, since participants here tended mostly to use TW repetition, this provided evidence that it is more of a retrieval strategy than an inferencing one, perhaps to buy time in an attempt to retrieve meaning from phonetic or graphic clues (Paribakht and Wesche, 1999; Rahbarian and Oroji, 2014). Hu and Nassaji (2012) also found that both TW and section repeating led to more successful inferencing, for repetition assisted learners to relate the TW to the phrase/sentence it occurred in and extract the potential clues available in those contexts. Through repetition, L2 learners also use homonyms where the similarity of an unfamiliar word sounds or looks like a word they know (Paribakht and Wesche, 2006). From which, learners can then identify if the TW exists as part of their receptive (passive) lexicon or not (Walker, 1983).

In this study, a handful of participants (5) turned to the researcher to utter the word, which might be another strategy to make use of another form of input other than the text where a learner can make use of both inputs to help process the word (De Bot *et al.*, 1997; Paribakht and Wesche, 1999). Another explanation is that the learner may not be sure of her pronunciation, thus seeks it from the researcher. For example, when a learner recognizes a word in spoken form but not written, especially with a language like English with a complex phoneme-grapheme correspondence (De Bot *et al.*, 1997; Paribakht and Wesche, 1999). This is in line with Nation's (2001) idea that knowing a word is more than knowing its meaning but includes more aspects, i.e., recognising its form, sound, etc. Thus, vocabulary learning is an incremental process that depends on repeated exposures with each exposure adding more information about the word. Another explanation preventing learners from uttering a word was due to the phonological difficulty of those TWs which is determined by their L1 system and thus one strategy to cope with this is the avoidance of these phonologically problematic words by adult learners (Laufer, 1997b).

Regarding analysis strategies, learners resorted to them more in the familiar text with the intermediate group (B2) using it the most followed by the C1 and B1 groups . Furthermore, Arabic participants tend to favour word level analysis more than sentence level ones (Figure 5-20). Analysing is useful only if a root can be correctly isolated by the readers and a known meaning already exists for the isolated words by the learner (Haynes, 1993). From the 43 instances of TW analysis, only 18 were associated with correct inferring mostly by resorting to the stems of the

words (15) while tending to ignore their suffixes (Table 5-30). For example, for the TW **((insightful))** some respondents said they know the word "*insight***"** as deep thinking or smart. However, word-analysis strategy was not always successful. One learner, B2-2, initially guessed the word to mean "*when you know something from its picture, something like that*", here she is referring to the literal meaning as something *'in your sight of vision'*. A learner's ability to decompose a word into its morphemes can facilitate the recognition of a new word (Laufer, 1997b). However, the morphological complexity of a word also plays a role in unsuccessful inferencing, one case of which is 'deceptive transparency' where "the meaning of a word might look transparent from its parts which look like familiar morphemes" (Laufer, 1991:10). Here B2-2 assumed that the TW meaning equalled the sum of its components which has also been reported to lead to unsuccessful inferencing in lexical inferencing studies (Bensoussan and Laufer, 1984; Haynes, 1993). However, the B2-2 learner, who took in the literal meaning of **((insightful))**, reread the sentence and noticed a different meaning and said, "*But I felt that is has a completely different meaning than they intended here in this sentence*" and finally put down her answer as <smart people>. Unfortunately, not all participants reread their sentences like B2-2. For example, B2-4 explains, "*I think it comes from the word ratio*" when she encountered the TW **((rationale))**. She provided the guess ***'percentage'*** then put her final answer as <fake> assuming that it was a fake letter that was sent to King James. Again, this learner assumed the TW was made of a familiar morpheme *ratio* and activated the meaning she already had for the word.

Saudi EFL learners tended to initially rely on TW analysis without looking at the surrounding sentences even if they did use contextual clues, their preferences is devoted to TW analysis. This did not only lead to unsuccessful guessing but also a misinterpretation of the unfamiliar Bonfire Night. Using prefixes and focusing only on the meanings of familiar stems too early in the inferencing stages blinds readers from looking at the immediate text, grammar surrounding the TW and later on the broader context beyond the sentence level (Clarke and Nation, 1980). Similar findings with EFL Saudi university learners have been reported, Alseweed (2000) reports that even after strategy instruction learners' still were unsuccessful with morphological guesses. Some Saudi researchers explain that morphological TW analysis requires a vast pre-existing knowledge of a large number of prefixes and suffixes which is also influenced by learners' PL (Al-Homoud, 2014; Baniabdelrahman and Al-shumaimeri, 2014). However, Saudi learners face difficulty in memorizing the prefixes and suffixes for words since they process this information as rules (Baniabdelrahman and Al-shumaimeri, 2014). This could explain why the majority of my L1 Arabic learners who used TW analysis tended to ignore the affixes of the TWs and only focus on their stems. In addition to the small success rate in both texts by using analysing strategies compared to the overall total of reported strategies. In short, the more the UNW looked familiar in terms of

its graphophonemic form, the more difficult it became for readers to shift their attention from its form to test the guessed meaning in the syntactic context.

Finally, associating was the least used strategy (9) in this group and only used in Eid Al-Fiter. Since learners already had the background knowledge about the topic and were able to evoke more semantic relationships (i.e., word collocations/associations) for the TWs and associate them with other frequent words that go with them (see p:191). Interestingly, they were used the most by the intermediate group while the remaining groups used them equally the same. However, 3 of the 7 instances were associated with successful answers with one for each group.

6.4.2.2.1 The case of the TW ((Successively))

One of the most interesting pieces of data found was related to the TW **((successively))**. All learners, regardless of their proficiency levels, incorrectly inferred the meaning as <successfully>. On the pretest, all learners reported knowing the word as *'successful'* and while inferencing said that this word comes from a word they already know **"success"** without depending on anything else in the sentence. While others after inferencing <success>, used the sentence to support their guess, for example, B1-5 replaced the TW with her guess and said "*here [[they <successfully> managed to smuggle]]".* This resulted in miscomprehended the story where some learners believed that the plot was successful and an explosion did actually happen.

There are a number of reasons for this, first it can be explained in terms of the Word Frequency Lists, where **success** is within the 2000 frequent words in English. Lextutor lists ***success*** (the stem) as a word in the 1000 frequency word list. This high frequency is also supported by the New General Service List (Browne et al., 2013) where ***success***, lies in the 2000 high frequency word list. On the other hand, **((successively))** lies in sublist-7 of the Academic Word list (Coxhead, 2000b) where words listed towards the end become less frequent (Coxhead, 2000a). Second, it can be due to the word's orthography, i.e word shape familiarity between the TW **((successively))** and 'successfully' which lead to confusion between the two. L2 learners tend to confuse words that sound and/or look alike, this might not be difficult at the early stages of learning since few words are known or at an advanced near native-like stage when a lot of words are known. It is this intermediate stage between the two extremes that learners may be less certain about the words they know and how well they know them (Laufer and Yano, 2001). Studies have shown that while guessing UNWs, EFL readers experience inferences from already known words resembling similarities in graphemes or phonemes resulting in unsuccessful inferencing (Haynes, 1993), making it difficult to retain a new word in its correct form (Laufer, 1997b).

Furthermore, native speakers of Semitic languages, a subfamily of the Afro-Asiatic language family which includes Arabic, Aramaic Ethiopic and Hebrew, place great importance on consonants and hardly represent vowels tended to confuse words with similar consonants and different vowels (Ryan and Meara, 1991; Laufer, 1992a). In referring to confusion between similar lexical forms, Laufer (1991; 1997b; 1997a) used the umbrella term "Synforms" to refer to the similarity of words in any aspect of form; sound (synphones), script (syngraphs) or morphology (synmorphs). These synforms were classified into 10 categories each representing a different type of similarity between the TW and the error produced categories (for a detailed view see (Laufer, 1991)). According to this classification, the similarities between the TW **((successively))** and incorrect inferencing '***successful'*** belong to Category 1 where synforms have the same root, productive in present day English but different suffixes (e.g. *considerable/considerate, imaginary imaginative/ imaginable*). Finally, it might be due to the context itself, in which there were not enough clues for learners to infer the word (Haastrup, 1991; Dubin and Olshtain, 1993; Haynes, 1993).

Resorting to the spelling of the word has been reported as one of the most used strategies after using local clues by Saudi University EFL learners (Baniabdelrahman and Al-shumaimeri, 2014). However, it was also reported that the more this strategy was used, the less likely the correct meaning was inferred. This result is in line with Huckin and Bloch (1993), who labelled this strategy as **"*mistaken ID*"** .This could be explained through Coady's (1979) psycholinguistic model where beginning EFL/ESL learners resort to more grapheme-phoneme, grapheme-morpheme or syllable-morpheme correspondence clues instead of contextual meanings while reading. This mismatch between words might be a result of both bottom-up and top-down top processes (Haynes, 1993). Bottom-up in the sense that the word's graphic shape imposes a strong influence on the generated guess. Simultaneously, a top-down process might activate readers' background knowledge–their native phonological, writing system, and graphophonemic knowledge of the writing system, causing them to misrecognize the orthographic stimulus in the process of trying to match it to words in memory. It has been reported that the difficulty of learning new words in another language is due to 'internal factors', the intrinsic properties of the word which might affect its learnability properties that are related to the word's form and meaning (Laufer, 1990). These internal factors also seem to extend to inferencing unknown words while reading (Haynes, 1993).

6.4.2.3 **Monitoring Strategies Strategies**

Strategic awareness and monitoring the comprehension process are regarded as critically important aspects of skilled reading (Nagy, 1997; Sheorey and Mokhtari, 2001; Koda, 2005). These two elements also played a role in inferencing the meanings of the UNWs in this study. In terms of

Monitoring Strategies (MSs) (p:205), learners used more MSs in the familiar Eid Al-Fiter text than Bonfire Night (Table 5-14). Reattempting strategies, where an old inference is discarded and a new attempt is made, were the most dominant strategies in this category used slightly more in Bonfire Night (Figure 5-21). As previously mentioned (6.2.4), learner's reported more interest in the culturally unfamiliar topic, thus were motivated and engaged which lead to more reattempts to infer the TWs in Bonfire Night than Eid Al-Fiter. Reattempting was used the most by C1 learners in both texts with more applied in Bonfire Night while the remaining groups used them the same in both texts. Next, the strategy of suspending judgement (skipping) was mostly used more in Eid Al-Fiter (16) compared to Bonfire Night (12) with C1 using it slightly more than the remaining group. Skipping without a guess and later returning to it was the dominant type of skipping approach used. Skipping an UNW has been reported in a number of vocabulary learning and lexical inferencing studies (De Bot et al., 1997; Schmitt, 1997; Al-Fuhaid, 2004; Alyami, 2011; Alhaysony, 2012). Although skipping has been associated with successful readers, who skip words they view as unimportant to the total phrase meaning (Hosenfeld, 1977), in this study learners skipped because they could not find/activate clues or LIFSs to generate a hypothesis. Skipping could also have been used in order not to lose the reader's train of thought by getting distracted by details in the text (Cohen, 2014). In the Saudi context, skipping was the second largest word discovery strategy after social strategies while guessing and dictionary use were the least frequently reported strategies by Saudi university learners (Alhaysony, 2012).

As part of their monitoring processes, learners stated their failure/difficulty as a strategy to either generate a guess or if a guess violated the meaning of its sentence, during which learners also identified the source of this difficulty and took action (Block, 1992). They took action by either searching for more clues or skipped and moved to another TW. Interestingly, this strategy was only reported in Eid Al-Fiter with none reported for Bonfire Night, used the most by the C1 group, followed by B1 and finally B2. One explanation for this can be that due to having the background knowledge about Eid Al-Fiter, learners could judge whether they were successful or not in their inferencing attempts when they could not provide a guess that fitted their Eid Al-Fiter schemata. The activation of background knowledge (content schemata) has an immediate impact on a reader's comprehension, especially if the text is closely related to what the reader already knows (Cook and O'Brien, 2014; O'Reilly *et al.*, 2019). In addition to the previous, another explanation can be attributed to learners' motivation and engagement with the Bonfire Night text (6.2.4) and thus learners saw no difficulty or failure as they inferenced the TWs in that text. Finally, is can be attributed to the fact that participants knew nothing about Bonfire Night since they lacked that background knowledge and thus had nothing to compare their success or failure/difficulty of inferencing against. Finally, noticing that the generated guess distorted the meaning of the

sentence was the least used MSs which was used more in Bonfire Night (5) compared to Eid Al-Fiter (3). Interestingly, it was only used by the intermediate group in the familiar text whilst all groups used it in the unfamiliar one.

6.4.2.4 **Evaluating Strategies Strategies**

Finally, Evaluating Strategies (ESs) (p:205) were used slightly more in Bonfire Night than Eid Al-Fiter (Table 5-15). Checking their guesses was the dominant strategy where replacing the TW with a guess in English was the highest sub-strategy used (Figure 5-22). The advanced group checked their guess the most across the two texts, followed by the intermediate group then the least proficient group. Checking was used more in Eid Al-Fiter since learners were able to fall back on their schema/background knowledge about this cultural religious festival. The majority of learners who used replacing the TW with a guess tended to do this in English with slightly more in Bonfire Night while only 2 instances were reported for replacing the TW in Arabic. Next, checking through resorting to background knowledge was used in both texts and was the second highest form of checking strategies. Interestingly, regardless of their lack of knowledge about Bonfire Night, learners used their background knowledge in this text in the form of their general world knowledge or experience. In the word **((hefty))**, C1-1 activated her personal world experience and explained, "*I know it means like <heavy**>** or [fat] because the women in my family use it to describe each other, so I know that word*" (laughing). C1-2 also elaborates that for the word **((controversies))**, "*I feel like with history things like that, not everybody is going to go with the story they've been told*" and puts forward <differences>. Two learners also used their schema of jails to inference the word **((abandon))** but as part of their Meaning-Focused Strategies which were incorrect. One learner (B2-5) hypothesised [catch] upon seeing the word [[soldiers]] while another (B1-4) misunderstood [[cellars]] in the text for a prison cell and elaborates that "*it might be that this [[cellars]] means a (*zenzana) (Arabic) <prison cell>. Maybe this guy is in the cellars [[when the soldiers entered the cellars]]".* Learners also activated their knowledge of Western culture while inferencing Bonefire Night, B1-5 called upon the schema of a scarecrow upon reading the word [[straw]]. Another, C1-4, assumed that wine was in the barrels, thus making them <heavy> and interestingly, she also used her electronic gaming experience for the TW **((valid))** (Example 64). Although all participants lacked the background knowledge about Bonfire Night, only proficient learners used their world knowledge experience (top-down strategies) as an ES in the examples above. This was also true for the familiar text where using world knowledge decreases as proficiency levels decrease.

To compensate for their lack of knowledge about Bonfire Night, learners used nearly twice as much more commenting and elaborating strategies in the unfamiliar text compared to the

familiar one. Furthermore, it was found that as learners' proficiency decreases, dependence on commenting and elaborating strategies increases (Table 5-15). Regardless of topic familiarity, it seems that as proficiency advanced, learners used more focused checking strategies than resorting to commenting and elaborating on what they have comprehended, which might not always be correct. Learning to evaluate an initial guess is as important as learning to first hypothesize it (Haynes, 1993). Finally, although inquiring about the TW was the least used strategy here, with only the advanced group using them in both texts, while the remaining groups only used them in the familiar text. Inquiring is a self-monitoring processing that reflects good readers' higher-level processing since it incorporates evaluating the ideas behind the sentence and relating it to their background knowledge about the topic (Alkhaleefah, 2017). Although 7 instances of inquiring were identified in the data, only 4 were associated with successful inferencing (Table 5-31).

To summarize, the previous sections have discussed the LIFSs applied with all inferencing responses (correct-partially correct-incorrect). It was found that learners displayed two different patterns of the frequency of inferencing strategies used for each text as seen below:

Eid Al-Fiter: **Meaning-Focused > Form-Focused > Monitoring > Evaluating Strategies**

Bonfire Night: **Meaning-Focused > Form-Focused > Evaluating > Monitoring Strategies**

One explanation is that due to their background knowledge about Eid Al-Fiter learners used fewer Evaluating Strategies to verify the appropriateness of their inferenced responses. Learners instead depended more on monitoring their reading comprehension through Monitoring Strategies to indicate awareness of their inferencing processes and text features. On the other hand, due to lacking the background knowledge about Bonfire Night, learners depended more on Evaluating Strategies to verify the appropriateness of their guesses since the only source of information about the topic was from the text itself. Interestingly, the Bonfire Night LIFS frequency pattern was the same as that reported by Hu and Nassaji's (2012) 11 ESL participants enrolled in a Canadian university majoring in economics/business. However, as opposed to the present study, these 11 ESL were given an academic text from an introductory economics textbook. In other words, these participants already have background knowledge about the text, are ESL learners living abroad and have more exposure to English while in this study L1 Arabic EFL learners lacked background knowledge about Bonfire Night and were EFL learners which could explain the difference in findings.

6.5 Successful inferencing and background knowledge

The final research question, **RQ3**, looks at the learners' ***successful*** inferencing attempts, the KS clues and LIFS used with correct responses in terms of their degree of topic familiarity or background knowledge. More specifically, it investigates the role of L1 Arabic participants' degree of topic familiarity and their inferencing success. More specifically, the type and frequency of KS clues and LIFSs associated with successful responses.

3. In terms of successful inferencing, what is the role of learners' topic familiarity, if any, on their lexical inferencing?
    - 3.a. How successful are the groups in their lexical inferencing attempts?
    - 3.b. What are the knowledge source clues activated by the groups in both texts and with what frequency?
    - 3.c. What are the lexical inferencing strategies used by the groups in both texts and with what frequency?

Nagy (1997) considers the role of learners' pre-existing knowledge bases and how these influence strategy usage and success of using context effectively. He groups learners' knowledge bases into three main categories of knowledge; linguistic, world and strategic. Linguistics knowledge covers all aspects of knowledge about the linguistic context in which the word has occurred. This includes syntactic, lexical knowledge and word schema i.e. knowledge about the possible meanings of a word (Nagy and Scott, 1990). World knowledge embeds learners' understanding of the relevant domains of knowledge and their world experiences. Finally, strategic knowledge, which involves "conscious control over cognitive resources" (Nagy, 1997:81), including knowledge of strategies employed during inferencing and attempting to deduce meanings from context (Nassaji, 2006). The present study found that appropriate use of both linguistic and background knowledge is essential for successful inferencing as it "provides a conceptual framework that helps inferencers to fill the gaps in textual meaning" (Hu and Nassaji, 2014:36).

In reading, prior knowledge about the reading and its activation while reading is a crucial element to achieve and improve reading comprehension regardless of reading and language abilities (Carrell, 1984, 1987; Alderson, 2005; Yousef *et al.*, 2014; Ibrahim, 2015; Al-Qahtani, 2016). In terms of successful inferencing (**RQ3.a)**, the present study found that since all L1 Arabic participants possessed the cultural knowledge about Eid Al-Fiter, there were slightly more correct lexical inferences responses in Eid Al-Fiter (culturally familiar) compared Bonfire Night (cultural unfamiliar) (Table 5-17). This supports other studies that reported L2 learners were more successful at inferencing when they are aware of the reading topic (Pulido, 2007b; Klykova, 2008; Atef-Vahid *et al.*, 2013). This is compatible with the Schema Theory, where participants were able

to fall back on their knowledge of Eid Al-Fiter, activate and use it to infer the meanings of the UNWs where some were associated with successful responses.

Regarding groups and their successful inferencing, the advanced C1 group scored the highest in both texts with slight differences between scores. This was followed by the B2 and B1 groups, where the last group interestingly scored the same on both texts (Table 5-17). However, the current study further found that all groups tapped into their background knowledge as a clue in both texts (Table 5-10) but only the advanced group had these clues associated with successful answers in both texts (Table 5-24). Although groups displayed more inferencing attempts in the unfamiliar text (Table 5-2 &Table 5-3) due to being motivated and engaged with the text (6.2.4), yet more successful responses were in favour of the familiar text. Although all 3 proficiency groups resorted more or less to the same clues and strategies, not all resulted in successful inferencing. In this study, there was a total of 351 instances of tapping into KS clues while inferencing but only 183 clues were associated with successful responses (Table 5-18). On the other hand, there were 758 instances of resorting to strategies, however slightly less than half, 375, lead to successful answers (Table 5-27). Thus, suggesting that successful inferencing may not be related in terms of quantity of the strategies but quality used (Nassaji, 2003a). For less successful learners many use various strategies but "often use strategies in a random, unconnected and uncontrolled manner" (Ehrman *et al.*, 2003:316), thus leading to a lack of 'strategy orchestration' which refers to the ability of making choices to solve problems (Vandergrift, 2003). For it is not only sufficient for a learner to know about a range of strategies but a reader must also "know how to use a strategy successfully and orchestrate its use with other strategies" (Anderson, 1991:468-469). Haastrup (1991:110) also reported the differences between the high and low proficiency groups in her study were less than expected. She explains that the low proficiency group would active a number of KS clues because they were uncertain which ones are relevant due to their "trial and error approach".

This could explain why in some situations, the B2 group used more strategies and KS clues than the advanced group. However, when compared to successful KS clues and strategies they were less successful than the advanced group. In the current study, learners activated more clues and strategies with the familiar topic, which might be due to possessing a strong related cultural schema required by the text which gave them the confidence to tackle the task at hand (Paribakht and Wesche, 1999). Carton (1971) views FL learners of a language that is divergent from their L1 as largely dependent on extra-lingual clues and upon acquiring some proficiency would also depend on intra-lingual clues. However, the findings of this study contradict this claim since regardless of proficiency, the majority of clues were intra-lingual (word and sentence level) while world knowledge (extra-lingual) was used far less. One explanation for this is that Carton's (1971)

claim is not built on empirical data but merely an exploration of the functions of clues in FL learning.

The current study found that, successful inferencers, regardless of PL, made use of the wider context through going beyond the TW sentence and activating their background knowledge, too. While less successful inferencers bounded themselves to either the TW level itself or its sentence or both. This finding is in accordance with previous studies that have reported advanced learners' tendency to use their background knowledge more which led to more successful responses (Haastrup, 1991; Hu and Nassaji, 2014). Furthermore, being equipped with the appropriate reading schema (background knowledge) can help learners overcome limitations in their insufficiently developed linguistic knowledge (Al-Shumaimeri, 2006).

6.5.1 Successful inferencing and knowledge sources used

The results of **RQ3.b**. (What are the knowledge sources activated by the groups in both texts and with what frequency?) indicated that for Eid Al-Fiter's successful inferencing responses, learners depended more on activating clues from all the KSs except their sentence and discourse KSs which were used more in Bonfire Night (Table 5-19). It was found that the types of KS clues that learners resorted to with successful responses were the same in both texts. Regardless of the topic familiarity and inferencing responses, it was found that learners used pattern (a) for all inferencing responses (current-partially correct-incorrect) while those associated with ***successful*** responses are in pattern (b) for both texts:

a) **Sentence > Word > Vocabulary knowledge> World > Discourse level clues**
b) **Sentence > Vocabulary knowledge> Word > World > Discourse level clues**

There is a revised change of order of vocabulary knowledge and world level clues with successful responses. This would indicate that although word level clues were used as the second largest KS, it was associated more with unsuccessful responses than successful ones (see below). By looking closely at the groups, it was found that each group had its own KS pattern associated with correct inferencing which differed in both texts. Below are the types of KSs used with correct responses with the total of clues used between brackets.

Eid Al-Fiter text:

C1 group: Sentence (23) > Vocabulary Knowledge (9) > Word (7) > World (6) > Discourse clues (1).

B2 group: Sentence (20) > Vocabulary Knowledge (10) > Word (7) > World clues (2).

B1 group: Sentence (17) > Word (3) > Vocabulary Knowledge (2) > World clues (1).

As shown above, sentence level clues were the most associated with correct responses by all groups in the familiar text, with the dominant group displaying the highest number of correct clues in this KS. These clues were used most by the advanced group, followed by the intermediate and finally the lowest PL group. Next, although all groups used their vocabulary knowledge as a clue, it was the second frequently used KS for the advanced and the intermediate groups with B2 learners using one clue more while the lower group used their word KS clues. Due to their proficiency, C1 and B2 learners have larger vocabulary sizes compared to the B1 learners and thus were able to use it correctly in their inferencing. Studies have shown that learners with a larger vocabulary (depth/breath) had more chances to employ correct successful inferencing (Bengeleil and Paribakht, 2004; Qian, 2005; Nassaji, 2006; Nation and Webb, 2011). Furthermore, in this study B1 only used 6 instances of resorting to word level clues, with only 2 found with a correct response. Limited vocabulary knowledge and a lack of a rich stock of words hindered participants from activating their vocabulary knowledge and using it successfully (Haynes, 1993).

Next, word level clues were their third most frequently used KS clues equally used between the first two groups while for B1 their third used KS was vocabulary knowledge. Although all groups used word level clues, the intermediate group were the highest group who resorted to these clues (17) (Table 5-7) and were also the only group who had more incorrect responses by resorting to word level clues (Table 5-21). Studies have shown that overreliance on word level clues, for example, depending on word analysis or word form without considering the surrounding text was not always successful and has the potential for misleading learners (Haynes, 1993; Huckin and Bloch, 1993; Nation, 2001). Interestingly, all three groups had world knowledge as the fourth frequently tapped into KS clue with their successful response due to their familiarity with this religious and cultural event, with C1 using it the most (Table 5-24). Finally, the advanced group was the only group to use discourse clues with a successful response in this study. This group was the only group to use 2 discourse level clues in Eid Al-Fiter (Table 5-9) with one discourse clue associated with a successful response. Using discourse clues has been reported as the least used strategy with successful responses (Nassaji, 2003a). A study by Tavakoli and Hayati (2011) reported that not only did advanced learners use more discourse knowledge clues than lower PL learners but they also had a higher percentage of correct responses using discourse clues more than the lower proficiency group. Another study by Bengeleil and Paribakht (2004) found that discourse level clues were the last and least KS clues by the advanced learners while they were the second frequently used KS clues used by their intermediate group. The findings of the present study support the previous behaviour of the advanced group in the first study but at the same time, contradict those of the intermediate group's inferring behaviour in the second study.

Bonfire Night text:

C1 group: Sentence (22) > Vocabulary knowledge (4) > Word (3) = World clues (3)

B2 group: Sentence (16) > Word (3) > Vocabulary knowledge clues (2)

B1 group: Sentence (18) > Vocabulary knowledge (2) > Word (1) = Discourse clues (1)

One interesting finding of the study was that although all three proficiency groups used the same KS categories, they sometimes tended to display the same behaviour with some KS clues and differ in others with their successful responses. Interestingly, while the advanced and lowest PL groups displayed the same KS category patterns, the intermediate group's behaviour was different. This intermediate B2 group differed in a number of ways. First, although they used sentence KS clues the most as with C1 and B1, these clues were used the least (16) with correct responses compared to the remaining two groups. One explanation could be that since all groups did not have any background knowledge about Bonfire Night, they resorted to the text since it was the only source of information for them (Carrell, 1983b; Al-Shumaimeri, 2006). However, in terms of the behaviour of the intermediate group, although they used the same number of sentence level clues (33) as the advanced group(Table 5-8), these mostly resulted in incorrect inferencing.

The intermediate group also behaved differently compared to the remaining groups, where it was found that this group depended on word level clues as the second most used KS clue while it was vocabulary knowledge for the remaining groups. In this study, since the advanced group had a larger vocabulary (size) and therefore tapped into this knowledge the most while inferencing (Laufer and Sim, 1985b; Qian, 2005). On the other hand, the opposite is true for the least proficient group, for due to their limited proficiency, they fell back on their limited vocabulary knowledge as the second most frequently tapped into KS. It may be due to the fact that they had some sense of control when using their vocabulary knowledge in terms of recalling meaning from their stock of words rather than using word level clues, which were found to result in incorrect inferencing for this group. On the other hand, as opposed to both the C1 and B1 groups, vocabulary knowledge was used as the third KS category for B2. Two suggestions can be put forth to explain this. First, it could be that at this stage of intermediate proficiency between advanced and beginning stages of language learning, intermediate learners are less unsure about the words they know well and those they do not know at all (Laufer and Yano, 2001). Thus, when these intermediate learners used their vocabulary knowledge it resulted in more incorrect inferencing responses. The second explanation was in terms of the nature of the word level clues themselves. Although B2 use more word level clues (9) than vocabulary knowledge (6), these word level clues

led more to incorrect responses. Thus, highlighting that Arabic L1 participants tend to rely more on word level clues that than vocabulary knowledge clues although these word level clues were mostly misleading.

Although world knowledge was used by all groups (Table 5-10), it was only successfully used by the advanced group (Table 5-24) while only B1 used discourse clues since they were only used by them in Bonfire Night. Investigating three different PL groups at this detailed level was useful in this study since it provided us with insights not only into the similarities between the groups but also the differences. This was evident in the displayed KS clues that were associated with successful responses for the intermediate group in the present study. Furthermore, how this intermediate PL group behaved compared to the other groups was missing from other LIFSs which normally investigated only two PLs, for example, high and low (Haastrup, 1991; Morrison, 1996), high and intermediate (Bengeleil and Paribakht, 2004; Rahbarian and Oroji, 2014), high-intermediate and low intermediate (Tavakoli and Hayati, 2011), intermediate and low (Riazi and Babaei, 2008) or only one proficiency (Fraser, 1999; Harmon, 1999; Paribakht, 2005). Therefore, displaying the KS clues by the three PL groups provided us with a deeper understanding about their similarities and differences which might be similar/different if other PLs (i.e. C2, A1, A2) were involved.

6.5.2 Successful inferencing and lexical inferencing strategies used

On the other hand, regarding **RQ3.c.** (What are the lexical inferencing strategies used by the groups in both texts and with what frequency?), the current study found that with overall successful responses in both texts, learners used more Cognitive (Meaning and Form-Focused) Strategies than Metacognitive (Monitoring and Evaluating) Strategies (Appendix Y). In Chapter 5, it was reported that there were two different frequency strategy category patterns for each text associated in terms of the overall inferencing response (current-partially correct-incorrect). Regardless of group level, these patterns were as follows;

Eid Al-Fiter: Meaning-Focused >Form-Focused> Monitoring> Evaluating Strategies

Bonfire Night: Meaning-Focused> Form-Focused> Evaluating> Monitoring Strategies

However, with ***successful*** inferencing responses, it was found that L1 Arabic Saudi EFL students tended to follow ***one*** strategy pattern in both texts:

Meaning-Focused > **Form-Focused** > **Evaluating** > **Monitoring Strategies**

Even though all groups followed the above strategy category pattern with their correct inferencing responses, they differed in the number of strategies they resorted to in each category with successful inferencing. Below are the types of LIFSs used with correct responses with the total of strategies used between brackets;

Eid Al-Fiter Text:

C1 group: Meaning-Focused (34)> Form-Focused (28)> Evaluating (16)> Monitoring Strategies (8)

B1 group: Meaning-Focused (28)> Form-Focused (15)> Evaluating (12)> Monitoring Strategies (8)

B1 group: Meaning-Focused (21)> Form-Focused (16)> Evaluating (8)> Monitoring Strategies (6)

Overall, the advanced group used more correct strategies across the 4 strategy categories, followed by the intermediate B2 group across all but one strategy category, Form-Focused Strategies (FFSs). In this category, the lowest PL group had slightly more strategies with their correct responses. Although the B2 group had slightly more FFSs (33) than the B1 group (32) (Table 5-13), slightly more FFSs were found with correct responses by the last group (Table 5-30).

Bonfire Night Text:

C1 group: Meaning-Focused (27)> Form-Focused (22)> Evaluating (17)> Monitoring Strategies (16)

B1 group: Meaning-Focused (20)> Form-Focused (8)> Evaluating (8)> Monitoring Strategies (6)

B1 group: Meaning-Focused (24)> Form-Focused (14)> Evaluating (10)> Monitoring Strategies (3)

The same frequency strategy pattern was also found in the unfamiliar Bonfire Night text, with the C1 group displaying the highest number of strategies across all categories as with the Eid Al-Fiter text. Interestingly as opposed to Eid Al-Fiter, in the unfamiliar text the lowest PL group was the second group with the highest number of strategies applied across all strategy categories except Monitoring Strategies. This is because the B1 group applied more Meaning-Focused (Table 5-12), Form-Focused (Table 5-13) and Evaluating Strategies (Table 5-15) regardless of their inferring outcome than the intermediate group. Thus, B1 members had a higher chance of getting more strategies associated with their successful response than B2 (Table 5-29, Table 5-30 &Table 5-31).

Although all groups used more Cognitive Strategies in both texts, more were found in the familiar text (Table 5-28). One explanation is because they were familiar with the topic and thus could fall back on their background knowledge about it. Therefore, allowing them to locate more word and sentence level clues. Furthermore, they would tend to select the clues and thus strategies that would fit their knowledge about the topic. In terms of proficiency groups, C1 displayed the highest

number of Cognitive Strategies used in both texts, followed by B2 then B1 (Appendix Y). While in terms of Metacognitive Strategies, both Evaluating and Monitoring Strategies had more weight with successful responses in the unfamiliar Bonfire Night text. Since learners lacked the required schemata for Bonfire Night, they depended more on Metacognitive Strategies to allow them to plan, choose, control and evaluate the strategies they applied while inferencing the UNWs (Graham, 1997; Anderson, 2002). This finding supports the evidence of the importance of Metacognitive Strategies in lexical inferencing since these strategies help learners to assess, examine the accuracy of their guesses and evaluate them against the information in the broader context (Nassaji, 2003a; Hu and Nassaji, 2014). Furthermore, these Metacognitive Strategies were used more by the C1 group compared to the remaining groups. This finding is consistent with previous studies in the strategy literature that reported that high PL learners use Metacognitive Strategies more frequently and that successful learners use them more often than less successful learners (Chamot, 2005; Anderson, 2008; Cohen, 2014). Studies have also reported that advanced and intermediate level students use Metacognitive Strategies more frequently than beginning students (O'Malley *et al.*, 1985; Chamot, 1987). On the other hand, beginning students due to their limited PL, may know what strategies to use but due to the lack of vocabulary or other schema related information they may not have a strong enough language foundation to build upon (Anderson, 1991).

6.5.3 Combinations of knowledge sources and strategies used in successful lexical inferencing

A key finding in this study was how the groups combined different KS clues and LIFSs with successful responses in terms of the number of combinations of the main KS/strategy categories and their combination patterns (5.8 & 5.11). This study not only found that groups both shared similar/different combinations of clues and strategies between them but also differed between texts, too. Learners used more clue and strategy combinations with successful answers in Eid Al-Fiter compared to Bonfire. In Eid Al-Fiter, the majority of KS clues were found through using 3 and 4 main types of KS categories by all groups with the exception of the B1 group, who did not use 4 KS (Table 5-25). On the other hand, in Bonfire Night all groups refrained from using 4 KS clues but instead used 3 different KS clues with the exception of B1, who preferred using 2 KS clue combinations.

Regarding KS pattern combinations, some of these combinations were either the same across all the 3 groups while some were idiosyncratic to the groups' proficiency level. Interestingly in Eid Al-Fiter, B1 members used world (background) knowledge only when combining 2 KS clues. The B2 group used background knowledge only when integrating 4 KS clues while C1 had used it the most

with both 3 and 4 KS clue combinations (Table 5-26). However, not only were 4 KS combinations in Bonfire Night absent but interestingly the advanced learners would also have their unique combination not shared by the remaining groups in Eid Al-Fiter. This combination involved using their background knowledge with a successful response in the form of ***Word + Sentence + World Knowledge + Discourse Level clues***. A similar finding was reported by Haastrup (1991) on her Dutch participants, where the high PL participants made more use of all the six KS clues in addition to combining them successfully while the lower PL group focused on using four KS combinations.

Furthermore, the current study reported the majority of successful responses by the groups were made through various combinations of KS clues. The advanced group reported the highest number of successful responses by using more KS combinations with more found in Eid Al-Fiter (Table 5-26). These successful learners activated both top (their background knowledge) and bottom (contextual) clues, applied deeper analysis through tapping into more KS clue combinations than the remaining groups. On the other hand, the remaining groups tended to be more word-bounded, restricted themselves more to the local context than venture beyond it (Hu and Nassaji, 2014). This finding supports other studies by Haastrup (1991) and Morrison (1996), that using multiple KSs resulted in more successful responses and that advanced PL learners displayed these combinations the most. On the other hand, the low PL of the remaining groups, which is often a result of limited lexical knowledge (Morrison, 1996), prevented them from using more KS combinations. It comes as no surprise since limited vocabulary has been defined as a significant problem in reading comprehension (Laufer and Ravenhorst-Kalovski, 2010; Grabe and Stoller, 2013).

In terms of Lexical inferencing strategies (LIFSs), a number of studies have reported that learners combined strategies when inferencing (Nassaji, 2003a; Hu and Nassaji, 2012; Hu and Nassaji, 2014) but they did not state the pattern types of these combinations. Regarding LIFSs, the groups used both similar and different combinations of the four main strategy classifications (MFS, FFS, ES, MS). The current study found that although learners combined 3 strategy categories in both texts, more correct strategies were found in Eid Al-Fiter (Table 5-33). While 4 strategy combination categories were found more in Bonfire Night. In terms of combination patterns, all groups regardless of texts, shared using the Cognitive Strategies (MMF+ FFS) when combining 2 strategy categories in Bonfire Night expect B2 (Table 5-34). Interestingly, B2 was the only group who used ***MFSs+ESs*** when combining 2 different strategy combinations in Bonfire Night and was also the only group to use in Eid Al-Fiter. Furthermore, B2 was the only group to use a single strategy (MFS) with one correct answer which was only found in the unfamiliar text.

When using 3 groups of strategies, all groups used both ES and MS plus the 2 Cognitive Strategies in Eid Al-Fiter. This was different in the unfamiliar test, for only one pattern was found when using 3 strategies by the C1 and B2 groups, ***MFSs+FFSs+MSs*** while the least proficient group used ***MFs+FFs+ESs***. While combinations of all the 4 strategy categories were found in both texts with more slightly associated with successful inferencing responses in Bonfire Night. It was found that the most successful learners are those who actively drew on a wide range of strategies from four main categories while the least successful learners used a more limited range (Gu and Johnson, 1996). A distinction between strong and weak language learners is the ability to orchestrate various strategies, coordinating, organizing, making decisions and evaluating, such strategies meet the task demands and their own learning needs (Anderson, 2002, 2008). The study found several important characteristics of successful inferencers, frequent use of evaluation and monitoring strategies, a combination of both textual and background knowledge, self-awareness, and repeated efforts to infer the target word meanings. Furthermore, that proficient learners take conscious steps in planning, monitoring and evaluating their inferencing though using a wider range of strategies than less proficient learners (O'Malley *et al.*, 1985; Oxford, 1989; O'Malley and Chamot, 1990; Cohen, 2014).

The following sections discuss successful inferencing in terms of learners' proficiency levels (6.5.4) and topic familiarity (background knowledge) (6.5.5).

6.5.4 Successful inferencing and proficiency level

Learners' proficiency level (PL) plays a significant role in lexical inferencing and using the reading context effectively. A number of studies in the LIFS literature which have looked at learners' PLs have reported that L2 PL plays a role in the success of uncovering meanings of UNWs (Bengeleil and Paribakht, 2004; Riazi and Babaei, 2008; Tavakoli and Hayati, 2011). The present study's findings are consistent with those of Haastrup (1991) and Morrison (1996), where from the total of 123 correct TW inferences, 49 correct responses (39.84%) were made by the proficient C1 group (Table 5-17). Haastrup (1990:130) found that a trait of proficient learners is the interaction between top-level (World) and bottom-level (word) clues, which revealed that PL is a "decisive factor in lexical inferencing procedures and that there definitely seems to be a threshold level of L2 proficiency that learners have to reach first before they are able to use effective inferencing procedures". Using the wider context was also supported in this current study, where through various combinations, the proficient group made use of the broader context through using global (backward and forward) clues as well as their background knowledge in both texts. This supports other findings where high PL participants usually tend to use more global strategies (Chern, 1993; Sheorey and Mokhtari, 2001). Furthermore, lexical inferencing is influenced by a learner's L2

richness (i.e., vocabulary, grammar, discourse, etc.) of the L2 language, this richness gradually develops as the learner's proficiency grows. It is this richness that guided the advanced groups in the present study by tapping into a range of KS clues and apply LIFSs in a successful manner than the remaining groups (Nassaji, 2006; Riazi and Babaei, 2008).

Although participants lacked the background topic knowledge on Bonfire Night, they still used their world experiences. More specifically, when C1 members integrated world knowledge in their 3 and 4 KS combinations, they were able to correctly inference more TWs in both texts (Table 5-26). On the other hand, there was not a lot of variation in the combination patterns of clues and strategies by the remaining groups which can be explained due to their limited PL which "appears to exert a powerful effect on the behaviours utilized by readers" (Clarke, 1980:206). Also, the level of PL could have contributed to the difficulty of integrating various sources of information (KS clues) followed by applying a number of strategies (Parreren, 1995). The highest PL group made more use of Sentence level, Vocabulary Knowledge and World Knowledge in both texts than the remaining groups. The current study's findings contrast those reported by Riazi and Babaei (2008), where the elementary PL group used more contextual, intra-lingual and inter-lingual clues than the intermediate group who only used contextual clues while the advanced group used contextual and intra-lingual clues. These findings could be a result of two significant weaknesses of the study. First, the inaccuracy of measuring PLs since teachers were used to rank participants' PLs instead of a standardized English proficiency test. Second, the 15 participants were asked to guess the meanings of words that were unknown to them as opposed to the researchers selecting the UNW. Thus, due to their PL, the elementary group might have encountered more unknown words than the remaining groups and alternatively had to use more clues to inference.

Learners' vocabulary breadth and/or depth also could have contributed to their successful inferencing, with the C1 group using this knowledge the most. Learners who had large vocabulary (size) scores at the higher frequency bands inferenced the TWs better because they knew more words in the text and thus had more clues to guide them (Laufer and Sim, 1985b; Qian, 2005). In terms of depth, Nassaji (2006) differentiated between skilled and less skilled readers in terms of their vocabulary depth and found that skilled readers did not only differ in the type of strategies they used but also how effectively they applied them. Furthermore, having a rich lexical knowledge "may make them better able to make use of potential clues available in the text and context" (Nassaji, 2006:395). In the current study, it was found that Saudi EFL learners relied heavily on single word clues (form & meaning), including their vocabulary knowledge in the initial stages of searching for clues. If they were unsuccessful, they would then look at the immediate TW sentence for (local) clues. This was followed by word form and finally subject matter. This is

partly in line with Laufer and Sim's (1985b) investigation of the linguistic threshold for adequate reading comprehension, where for an EFL reader, vocabulary knowledge is the most crucial required knowledge followed by subject knowledge, discourse markers and syntactic knowledge.

In terms of overall strategies used regardless of responses, all groups applied more Cognitive than Metacognitive Strategies, with more displayed by the proficient group to accomplish the task due to operationalizing them effectively more than the lower proficiency groups (O'Bryan and Hegelheimer, 2009). The current study's findings are also in line with Alseweed's (2000), who reported that PL influenced the type of word-solving strategies used by Saudi university senior students. The present study also found that the two lower proficiency groups tended to use many clues and strategies but they did not lead to successful inferencing (see 6.5). This can be explained in terms of readers' metacognition, PLs and reading performance, for "Poor readers do not possess knowledge of strategies, and are often not aware of how or when to apply the knowledge they do have. They often cannot infer meaning from surface-level information" (Alderson, 2005:41). Another finding of this present study was that more proficient learners were more sensitive to inconsistencies in the text and used more Monitoring and Evaluating (Metacognitive) Strategies to monitor their comprehension in both texts compared to the remaining groups (Appendix Y). Interestingly, the C1 group used more Metacognitive Strategies in the unfamiliar texts due to the lack of background knowledge about Bonfire Night while the remaining groups used them less compared to Eid Al-Fiter. For the more proficient students are, the more Metacognitive Strategies they apply (Magogwe, 2013).

In this study, the more proficient learners were the more variety of strategies they displayed depending on the nature of the task and the degree of familiarity of the context. On the other hand, less proficient learners deployed fewer strategic processes or applied strategies that are were not thought through (O'Malley and Chamot, 1990). Furthermore, the C1 group had fewer differences between both the total of KS clues and LIFSs they employed and those associated with their successful responses compared to the remaining groups. Due to proficiency, C1 learners had a higher level of self-efficacy and carefully orchestrated their KS clues and LIFSs while the lower PL groups often used these in a random, unconnected and uncontrolled manner (Ehrman *et al.*, 2003; Cohen, 2014). In addition to the previous point, due to their PL the advanced C1 group had more successfully inferenced TWs with their KS clues and LIFS combinations, in addition to their own unique idiosyncratic combinations. Oxford *et al.* (2004) view that successful learners not only apply task-appropriate strategies but they often employ a number of these strategies in a flowing sequence which makes the task easier to complete. Oxford (2017) refers to such strategies as a 'strategy chain' which consists of a set or sequence of interlocking strategies used by the learner to facilitate fulfilling the task. To this Cohen (2014:27) views that "for a strategy to effectively

enhance learning or performance, it needs to be combined with other strategies simultaneously in strategy clusters or sequentially in strategy chains". In the present study, more successful responses were found when learners used more combined strategy categories, with the greatest number of correct responses associated with using 4 different types of strategies depending on the level of proficiency (Table 5-34).

6.5.5 Proficiency level and background knowledge

Knowledge of the world is viewed by Haastrup (1991:47) as "part of the language user's and language learner's general social-cultural knowledge", it is this knowledge that the language learner brings to the inferencing task. Background knowledge is widely recognized as a significant factor in reading comprehension processes (Graesser *et al.*, 1994; Nassaji, 2007; Grabe, 2009; Grabe and Stoller, 2013). Background knowledge interacts with many factors like motivation, goals, activities and language proficiency while reading (Perfetti *et al.*, 1996). In terms of reading and background knowledge, the participants in the present study found Eid Al-Fiter uninteresting with some labeling it as boring. Although all participants lacked background knowledge about Bonfire Night, they found it more interesting since it provoked their interest. Furthermore, it could be that due to text engagement through motivation, the unfamiliar text had more inferencing attempts than the culturally unfamiliar text (6.2.4).

Learners' background knowledge (topic familiarity) of the text played a role in their inferencing behaviour. More specifically, in terms of learner's proficiency level (PL) and topic familiarity, the C1 group scored the most successful TW responses in both texts regardless of topic familiarity than the remaining groups (Table 5-17). In other words, the lack of background knowledge about Bonfire Night did not affect the highest proficiency group since they compensated for this lack through their linguistic schemata and world knowledge/personal experiences (content schemata). Furthermore, B2 learners scored a higher number of TWs in the familiar text while there was no change for the last group, B1. This current study's findings support Al-Shumameri's (2006) who investigated the effect of topic familiarity on the reading comprehension of Arabic Saudi high and low PL readers while reading a familiar and unfamiliar text. Regarding the effect of topic familiarity, there were no significant differences between the groups comprehending the familiar text but a significant difference in the unfamiliar one. In terms of PL and topic familiarity, Al-Shumameri reported significant differences were only found in the performance of the low PL group between the two texts, where they did better in the familiar topic while none were found for the higher groups between the texts. However, these findings should be interpreted with caution since participants' PL was accessed based upon their instructional university level (year) and not to a standardized language test. Furthermore, multiple choice questions were used to

measure reading comprehension which have a high level of guessing then written comprehension questions.

In terms of successful responses in both texts, the current study found small differences in the correct responses between the texts with C1 showing the least difference followed by B2 and B1 (Table 5-17). It seems that the effect of learners' lack of prior background knowledge about Bonfire Night decreased as proficiency increases. One explanation is that prior background knowledge helps readers at a certain level of PL in this case at the C1 and B2 level but not the lower group. This is line with the study by Carrell (1983b) which explains the high scores of the first two groups in Eid Al-Fiter. Furthermore, it may suggest that at very low PL, possessing or lacking the required background knowledge does not make a difference since due to low PL, learners are more linguistically bound to the words and sentences than activating their background knowledge/experiences (Carrell, 1983b). This was supported in the data since B1 was the group that used World Knowledge the least as a KS in both texts, in which only 1 was associated with a correct response. A second explanation is related to PL, that the lack of background knowledge does not hinder inferencing in unfamiliar texts at higher PLs since learners compensate for this lack through resorting to their linguistic knowledge by locating clues and applying strategies appropriately, which is in line with the Schema Theory. Thus, their language knowledge freed their cognitive resources allowing them access to clues, lexical inferencing and processing strategies effectively (Al-Shumaimeri, 2006). However, language proficiency is multifaceted and it is possible that some dimensions of that knowledge may play a greater role than others in assisting the learners to inference the meaning of unfamiliar words from context (Nassaji, 2006). Thus, further research is needed to decompose the different elements of learners' proficiency knowledge (e.g. vocabulary breadth VS depth, linguistic knowledge, world knowledge, etc.) and investigate their relationship with inferencing meanings of unfamiliar words from context.

6.6 Summary

The main aim of this current embedded mixed methods multiple case study was to investigate how L1 Arabic learners, representing three different proficiency levels, inferenced the meanings of unknown words while reading a familiar and unfamiliar topic. Through answering the **RQ1**, it was found that strategic awareness was crucial in activating and making use of knowledge source clues and lexical inferencing strategies. Furthermore, it is also linked to the behaviours displayed by learners while engaged with the inferencing task. Some of these behaviours, like expressing difficulty when encountering unknown words and the role of strategic awareness have been previously mentioned in the lexical inferencing literature. Thus, the present study further

supports such findings of previous studies in this way. Furthermore, since the current study is an intensive detailed case study, it also found significant findings regarding how learners approached the unfamiliar words, the text itself, the role of learner's motivation including text engagement and intentional vocabulary learning. This has not been reported previously in the lexical inferencing literature. All of these findings are of great interest, especially the last, for incidental vocabulary learning is expected of lexical inferencing but as the study has shown, it was in fact intentional vocabulary learning that occurred with these L1 Arabic EFL learners. All the findings mentioned in this section stress the role of metacognitive awareness during inferencing. Therefore, contributing to the lexical inferencing literature and potential areas to be further investigated in order to deepen our understand of the lexical inferencing process. One of the main objectives of the present study is to propose and develop a taxonomy of the L1 Arabic EFL learner while inferencing. This present study proposed two taxonomies, one for the KS clues used while the other for lexical inferencing strategies. These taxonomies supported previously mentioned knowledge source clues and lexical inferencing strategy taxonomies and also reported new ones specifically displayed and tailored by L1 Arabic participants.

The next section of the chapter moves to discuss the role of learners' topic familiarity, the knowledge source clues and lexical inferencing strategies they used in both texts regardless of inferencing response (**RQ2**). The study found that the three groups displayed similarities and differences regarding each knowledge source and lexical inferencing strategy category, which were highlighted in the discussion. In terms of the frequency of all knowledge source clues used regardless of the outcome of responses, the study found that learners relied on the same patterns for both texts, beginning with the most used knowledge source: *Sentence Level>Word Level>Vocabulary knowledge>World Level>Discourse Level clues***.** On the other hand, two different strategy patterns were found for the two texts. For Eid Al-Fiter, it was *Meaning-Focused > Form-Focused > Monitoring > Evaluating Strategies* while for Bonfire Night, *Meaning-Focused > Form-Focused > Evaluating > Monitoring Strategies.* One of the most surprising findings was how none of the groups, including the advanced, were successful in inferencing the TW ((**successively**)) as they all put their answers as "successful". The study attempted to provide a number of explanations to explain why this had occurred in terms of the word's frequency, word shape familiarity, differences between Arabic and English orthography. This could be further followed-up with studies with different L1 Arabic EFL learners with the same word or similar words to see if this extends beyond participants in the current study.

In terms of successful inferencing (**RQ3**), the study reported that there were similarities and differences in the displayed behaviour of the three groups in terms of the knowledge source clues and lexical inferencing strategies, especially the intermediate group. This also extended to the

knowledge sources and lexical inferencing strategy combination patterns. A number of shared combinations between groups were found while some were idiosyncratic to some groups and found in one text not the other. Such combinations between three groups have not been reported in great detail in previous studies as the ones presented in this study which takes into account the reader's topic familiarity with the text. Therefore, it was not always possible to compare such combinations with other studies from the lexical inferencing literature. Although a number of explanations have been proposed to explain certain displayed behaviours by the 3 groups in terms of proficiency level, vocabulary knowledge and background knowledge, a larger sample and more quantitative results are needed to investigate these similarities and differences further.

Chapter 7 Conclusion

7.1 Introduction

This study investigated the role of L1 Arabic EFL learners' content schemata, i.e. their background knowledge (topic familiarity) on inferencing the meaning of unknown words while reading. More specifically, it reported on the knowledge source clues and lexical inferencing strategies used by 3 groups of L1 Arabic EFL university students representing different proficiency levels while reading culturally familiar/ unfamiliar (distant) reading topics. This final chapter begins by providing a brief overview of the study which highlights its aims, objectives, methods and a summary of its key findings. This paves the way to discuss the study's contribution to knowledge on the phenomenon of lexical inferencing strategies of L1 Arabic EFL students when reading in English in general and Saudi EFL learners specifically. There will also be a discussion of the pedagogical implications. From which the discussion then moves on to highlight the current study's challenges and limitations. Finally, the chapter ends by discussing potential avenues for further research before the researcher's final remarks.

7.2 Overview of the Study

The main purpose of this study was to describe and explore Arabic (Saudi) EFL university students' lexical inferencing processes in relation to the level of topic familiarity. It aimed to report on these students in terms of their proficiency levels (PLs) and how they approached the target words (TWs) in both texts. More specifically, it aimed at identifying the overall range of knowledge sources (KS) clues and lexical inferencing strategies (LIFSs), including their frequencies while attempting to deduce the meanings of unknown words (UNWs) and readers' degree of topic familiarity. Furthermore, what types of KS clues and LIFSs , including their frequencies, did groups use with successful responses and their combination patterns displayed by these groups by highlighting their similarities and differences. In addition, the study also aimed at exploring how the presence/absence of background knowledge affected the type and frequency of KS clues and LIFSs used by learners according to their PLs.

In order to answer the study's research questions and fulfill the objectives of the study, the present study is an instrumental, explanatory and descriptive embedded mixed methods multiple case study which involved 5 stages of data collection. The preliminary stage of this current study was through conducting an online questionnaire with open-ended items in order to select the distant, culturally unfamiliar text. This questionnaire also was used to explore and understand

what Saudi EFL students did when they encountered UNWs while reading. This would further guide the researcher to formulate the paper-based questionnaire for my chosen population in the main stage of the study and to shape my semi-structured interview questions for the study's participants.

The first stage involved purposively choosing and observing two reading classes taught by two instructors, in which the paper-based questionnaires were distributed. In the second stage, two reading classes were chosen for practical reasons (high level of class attendance and questionnaire response rate). In addition, Oxford's online proficiency test was conducted for all students in these two classes and semi-structured classroom observations were conducted (stage two). This was followed by choosing the sample through stratified random sampling and choosing 5 learners to represent each of the 3 PL groups (stage three). Stage four was initiated through conducting the verbal report sessions through think-alouds (TAs) (including warm-ups) and followed by immediate stimulated recalls (ISRs). Finally, in stage five semi-structured interviews were conducted to investigate the learners' displayed inferencing behaviour through explaining and expanding on what learners reported in their verbal report sessions.

7.3 Research questions and summary of findings

Based on the research objectives outlined in 1.3, this current study aimed to address the following three main research questions;

1. How do Saudi Arabic L1 speakers majoring in English infer meanings of unknown words while reading?
    - 1.a. How do they approach the unknown words?
    - 1.b. What are the range of knowledge sources clues do they tap into to uncover the meanings of the unknown words?
    - 1.c. What are the range of lexical inferencing strategies do they resort to uncover the meanings of the unknown words?

One of the unique findings of the present study was reporting on how L1 Arabic participants approached the UNWs and text itself while reading, from which several findings emerged linked to learner's metacognitive awareness (**RQ1.a**). The findings of **RQ1.a** here can be grouped into two groups; those findings that have been previously reported in the lexical inferencing literature and those which are new and thus have not been reported.

In terms of the findings that have been reported in lexical inferencing literature and were found in this present study were challenges of encountering UNWs and strategy awareness during inferencing. It was found that L1 Arabic EFL learners in this study reported encountering UNWs

while reading was a source of difficulty for them (see 6.2.1). Furthermore, the study found that this lexical difficulty was reported more by learners with limited vocabulary knowledge which could explain why they struggled with other words in the texts. Thus, these learners could not make use of other surrounding words in the reading context. This was echoed in reading research conducted in the Saudi context (Al-Qahtani, 2016; Aldukhayel, 2016; Alkhaleefah, 2017; Mohammed and Ab Rashid, 2019) and EFL/ESL learners in general (Nation, 2001; Bengeleil and Paribakht, 2004; Grabe and Stoller, 2013). A second proposed explanation was in terms of learners PLs where reading ability in a foreign language depends on the learners' PLs since linguistic proficiency influences how successfully learners can make use of the reading context (Laufer and Sim, 1985b; Haastrup, 1991; Nagy, 1997; Harmon, 1999; Bengeleil and Paribakht, 2004; Tavakoli and Hayati, 2011). By looking at the PLs of learners in this study who have reported lexical difficulties during their verbal reports (think-alouds, immediate stimulated recalls) and semi-structured interviews, it was found that they represented either the B2 or B1 PL groups.

In terms of strategic awareness and lexical inferencing, being strategic to both the process of reading comprehension and lexical inferencing were vital elements contributing to successful inferencing (Haastrup, 1991; Block, 1992; Hu and Nassaji, 2014). In this study, learners expressed their strategic awareness through not only depending on their vocabulary knowledge to infer the meanings of the UNWs but also searching, activating more clues and applying different LIFSs. Another interesting behaviour, which has only been referred to in a handful of lexical inferencing studies was how learners judged the importance of the UNW and depending on its importance, learners would decide to inference it or ignore it completely (see 6.2.3). Interview findings revealed how learners usually judge the importance of UNWs while reading and would then decide to inference them or alternatively skip them (see 6.2.2). A UNW was viewed as important if found in a comprehension question about the text or was part of its answer. While it was viewed as unimportant to inference if learners could understand the sentence in which the word was situated in. Furthermore, the UNW's part of speech also played a role in its importance, where it was reported that verbs and adverbs had a higher chance of being inferenced since they change the meaning of the sentence.

The majority of learners tended to start with the first UNW and would skip to other words if they did not know this word and so on. However, two other approaches were found in this study which were only used by a handful of students, a linear approach or choosing a TW to inference (see 6.2.3). The first approach was adopted by two advanced C1 learners, C1-1 and C1-2, which can be explained in terms of their advanced PLs and vocabulary knowledge, allowing them to go through the TWs in a linear sequence as they appear in the text, from the first TW until the last without the need to skip. Interestingly, B2-1 and B1-5 also displayed a linear approach to the TWs as the

advanced group did but it was due to their low PL and limited vocabulary size forcing them to use a more bottom-up approach to the text. Thus, relying on graphic information and adopting a gradual linear approach towards the TWs. On the other hand, selecting TWs to begin inferencing, as opposed to the previous approach, was only used by B1-4 and B1-5. These learners selected a TW they knew they had a higher chance of inferencing correctly, which they did. Such approaches to the task by learners highlight and stress how metacognitive awareness is a critical component for strategic awareness during the lexical inferencing processes.

The present study also reported interesting findings that have not been previously highlighted in the lexical inferencing literature: the approaches to the reading text, motivation and text engagement and intentional vocabulary learning. In terms of approaches to the reading text (6.2.2), the findings displayed that Saudi L1 Arabic EFL learners varied in their approach to the reading text itself, they either read the whole text or only the TW sentence with/without one preceding sentence. Participants explained various reasons for not reading the whole text, due to time limitation or because only these TWs were required from the task. Those who read a sentence after the TW sentence reported it as a way to check if the following sentence is related to the previous TW sentence or not. In order to inference the TW correctly, one needs first to comprehend the text. In this study, one of the reasons for unsuccessful inferencing is the learner's failure to read the whole text and comprehend it first than just only reading the TW sentence. These learners lacked strategic reading awareness compared to those strategic learners who read the text before beginning to inference.

One of the study's unique findings was the role of motivation and text engagement on the lexical inferencing process. In this study, it was found that although Bonfire Night was unfamiliar to learners, learners took more risk-taking attempts in the form of more lexical inferencing attempts compared to the familiar Eid Al-Fiter text. A number of explanations were proposed to explain this (see 6.2.4); Huckin and Bloch's (1993) Hypothesis-Generation/Testing Model, Engagement Theory (Guthrie and Wigfield, 2000; Guthrie, 2004) and the Affective Filter Hypotheses (Krashen, 1981, 1982) (see **RQ2.a** below)

Finally, through data triangulation, which was further elaborated upon through interviews, the issue of intentional vocabulary learning was found (6.2.5). Learners reported through a number of methods how they would look up an UNW which they had picked up in a TA session or their reading exams, either through Google or through using language applications on their phones. Some would take it a step further and recycle these words through their writings, saving them as notes on their phones and later revising them through the saved webpages, notes or applications. This was reported by some learners representing the 3 groups which stresses that both strategic

and metacognitive awareness can overcome a learner's PL. However, since this is a case study with only 15 participants, a larger sample and further investigation are needed to confirm this.

Questions **RQ1.b** and **RQ1.c** represent one objective of the study's significance, which was to capture the lexical inferencing behaviours of L1 Arabic Saudi EFL university students through reporting the range of KS clues and LIFSs used while inferencing (see 6.3). This was for the aim of constructing a taxonomy of L1 Arabic EFL learners while reading, since until now very little has been done with first language speakers of Semitic languages, more specifically Arabic, compared to other languages. Two taxonomies about the L1 Arabic EFL learner have been generated, one devoted to the types of clues and their major KSs (Table 3-11) while the second covered the LIFSs and their major strategy categories (Table 3-13). In terms of KS clues, the present taxonomy supports the lexical inferencing taxonomies reported in previous studies in addition to some new clues that were used by L1 Arabic EFL learners not previously reported. This was attributed to the in-depth embedded mixed methods multiple case study approach to the inquiry. The new clues were removing affixes either implicitly or explicitly while refraining from using suffixes. Furthermore, a new KS category was found, learner's Vocabulary Knowledge, since these Arabic participants fell back on this KS for clues while inferencing. The same was found for the LIFS taxonomy, some strategies were reported in previous LIFS taxonomies at the same time, new LIFSs were found by the L1 Arabic participants. These included replacing the TW with a guess either in Arabic/English to see if it fits the meaning (Meaning-Focused Strategy), different approaches to skip either with/without a guess in which skipping is initiated either by the learner herself or the researcher. Furthermore, both taxonomies provided a detailed account of the sub-clues and sub-strategies used by L1 Arabic EFL participants in this study that the majority of previous taxonomies missed.

The study's second research question aimed at comparing learners' inferencing attempts, KS clues and LIFSs in terms of their topic familiarity to the text.

2. How does topic familiarity of the text affect, if any, learners' lexical inferencing of unfamiliar words with respect to their proficiency levels?
    - 2.a. What are the numbers of lexical attempts and responses made between the groups in the two texts?
    - 2.b. What are the similarities/differences between groups in terms of knowledge source clues used when reading culturally familiar and unfamiliar topics and with what frequency?
    - 2.c. What are the similarities/differences between groups in lexical inferencing strategies employed when reading culturally familiar and unfamiliar topics and with what frequency?

Regarding **RQ2.a.**, it was found that more inferencing attempts were found with Bonfire Night while more correct responses were for Eid Al-Fiter. Semi-structured interviews revealed that all learners reported the unfamiliar text to be more interesting and more engaging than the familiar text. Thus, motivating and engaging the learners with the text (Engagement theory). Furthermore, it also explains why learners did not state the difficulty/failure of inferencing (Monitoring Strategy) here compared to Eid Al-Fiter. Thus, even with the lack of background knowledge, learners were not put off by this lack but produced more inferencing attempts due to their motivation and engagement with the text. The second explanation is that in light of the Hypothesis-Generation/Testing Model (Huckin and Bloch, 1993), that due to lack of background knowledge, more hypotheses and testing was needed in the metalinguistic control steps section to compensate for this lack and update the remaining elements in Generator/Evaluator (2.9.1). However, the disadvantage of not having the required background knowledge for Bonfire Night led to breakdowns in comprehension, which were only found here, resulting in more incorrect answers compared to Eid Al-Fiter. The final explanation is from the perspective of the Affective Filter Hypotheses since these L1 Arabic EFL university students were majoring in English at the university, thus are passionate, motivated and committed to their major. Therefore, they had a lower affective filter and were motivated to challenge the unfamiliarity of the Bonfire Night text, which as a result, generated more inferencing attempts there. Although the previous rationales support why learners took more risks in Bonfire Night, from my point of view, the data tends more to support the Engagement Theory since learners reported that they were motivated by the story behind Bonfire Night, which positively impacted their inferencing attempts although they lacked background knowledge about it.

Question **RQ2.b.** aimed at comparing the types and frequency of KS clues used between the two texts, regardless of the inferencing outcome. Overall, results reported that learners used more KS clues and LIFSs in Eid Al-Fiter compared to Bonfire Night. Overall, groups resorted to the same KS clues and strategies but differed in their frequency of usage. Regarding KS clues, only 2 C1 (C1-1 & C1-2) learners used clues that were not used by the other groups, using synonyms, antonyms and TW paragraph clues. This can be attributed to these learners' advanced vocabulary knowledge reflected in their Vocabulary Levels Test scores (Appendix E) and their high PLs since they were the most advanced in the sample. Furthermore, some clues were only present in one text and absent in the other. For Eid Al-Fiter, using semantic relations, punctuation, TW paragraph clues, while for Bonfire Night, antonyms and formal schema. Regarding the types and frequency of KS clues used regardless of the outcome of responses and text, the following pattern was used for both texts, beginning with the most KS clues used:

Sentence Level> Word Level> Vocabulary knowledge> World Level> Discourse Level clues

The results displayed that although Word Level clues were the second most resorted to clues after Sentence Level clues, the majority tended to be misleading and misguided participants. More specifically, learners used TW analysis in the form of removing affixes and focusing on the stem which led mostly to incorrect responses. This was clearly seen in the case of the TW **((successively)),** where none of the learners were able to inference its meaning correctly, which the study proposes a number of explanations to account for this (6.4.2.2.1). All groups tapped into their World Knowledge in Eid Al-Fite with only some C1 learners also using it in Bonfire Night through reflecting on their world experiences.

On the other hand, in terms of LIFSs, **RQ2.c.**, groups used more Cognitive (Meaning-Focused & Form-Focused) Strategies in both texts as opposed to Metacognitive (Monitoring and Evaluating) Strategies. There were two different overall patterns that learners depended on for each text:

Eid Al-Fiter: Meaning-Focused > Form-Focused > Monitoring > Evaluating Strategies

Bonfire: Meaning-Focused > Form-Focused > Evaluating > Monitoring Strategies

One proposed explanation for this is related to the familiarity with the reading topic. Since learners were familiar with Eid Al-Fiter they resorted more to monitoring their reading comprehension to indicate their awareness of the TW inferencing task rather than verifying or examining their guesses through Evaluating Strategies. Since their background knowledge served as a framework upon which their inferences were generated within. On the other hand, due to the absence of a Bonfire Night schemata since it is culturally specific to the British culture, learners resort more to Evaluating Strategies by checking and verify their answers more than simply monitoring their reading comprehension since their only source of information was only the text itself. As with KS clues, there were also strategies confined to one text than the other. For example, suggesting punctuation, associating, replacing the TW with a generated guess or two guesses in English and choosing between them, resorting to the information in the TW sentence and stating the failure/difficulty were only reported in Eid Al-Fiter. On the other hand, only replacing a TW with an Arabic guess to see if it fits the meaning of the TW sentence was only found in Bonfire Night.

The third and final research question focused on ***successful*** inferencing responses, more specifically, how successful were learners in their inferencing attempts, what were the KS clues and LIFSs used with these responses.

3. In terms of successful inferencing, what is the role of learners' topic familiarity, if any, on their lexical inferencing?
    3.a. How successful are the groups in their lexical inferencing attempts?

3.b. What are the knowledge source clues activated by the groups in both texts and with what frequency?

3.c. What are the lexical inferencing strategies used by the groups in both texts and with what frequency?

Overall, in terms of text, there were slightly more correct answers in Eid Al-Fiter compared to Bonfire Night (Table 5-16). In terms of partially correct answers, there were nearly half as many in Bonfire Night compared to Eid Al-Fiter and more incorrect responses were found in the unfamiliar text. In terms of successful TW responses at group level (**RQ3.a**), all groups except the B1 group scored more correct TWs in the familiar Eid Al-Fiter text (Table 5-17) while C1 members scored the highest in both texts with surprisingly a slight difference of one correct inferencing response. This was followed by the B2 group who had slightly more differences between the texts (two correct responses) than C1. Surprisingly, B1 scored the same number of correct responses on both texts.

In terms of correct responses regarding the type and frequency of KS clues used (**RQ3.b**), the same pattern was found for both texts, beginning with the most KS clues used:

Sentence Level> Vocabulary knowledge> Word Level> World Level> Discourse Level clues

As previously mentioned, this pattern was different from the pattern used with the overall response (correct-partially correct-incorrect) inferencing responses (see **RQ2.b** above). Furthermore, by looking at KS clues at group level, it was found that the C1 and B2 groups followed the above pattern while the least proficient group, B1, reversed the order between vocabulary knowledge and word level clues in Eid Al-Fiter (6.5.1). One proposed explanation in this study was linked to the least proficient learners' vocabulary knowledge (size) of words due to their limited PL and even if they this used this knowledge, they mostly resulted in incorrect responses. Furthermore, the advanced group was the only one to use discourse clues in the familiar text while surprisingly, the least proficient group was the only one to activate this clue in the unfamiliar text.

On the other hand, it was the intermediate B2 group that displayed a different pattern in Bonfire Night by reversing the order between vocabulary knowledge and word level clues, as B1 had done in Eid Al-Fiter. One possible explanation for this behaviour of the intermediate group was at that this stage of proficiency, learners tend to be at a developing stage between the two proficiency continuum, high and low. Thus, intermediate learners are more unsure about the words they know well and those they do not know at all which could have led to more incorrect inferencing responses. The second suggested explanation was linked to the nature of word level clues

themselves. Although B2 used word level clues the most (26) between the three groups, only 10 were associated with successful responses. While compared to their Vocabulary Knowledge clues (18), 12 clues were associated with successful responses. It appears that the more word level clues are used, the more incorrect responses are found. Thus, one of the study's highlights was reporting that Arabic L1 participants tend to rely more on word level clues than vocabulary knowledge clues although these word level clues were misleading as with the case of the TW "**successively**" (6.4.2.2.1).

The final question, **RQ3.c**, which looked at ***successful*** inferencing, found that Meaning-Focused Strategies were used more than Form-Focused Strategies (Cognitive Strategies) while Evaluating Strategies compared to Monitoring Strategies (Metacognitive Strategies), were used more. Thus, only one pattern was found for both texts;

Meaning-Focused > **Form-Focused** > **Evaluating** > **Monitoring Strategies**

Furthermore, in terms of groups, all groups used the previous pattern with differences in frequency of usage (6.5.2) as opposed to the behaviour of some groups (B1 and B2) in terms of KS clues as mentioned previously in **RQ2.b.**

One of this study's key findings was reporting on the types of KS clues and LIFS combinations and patterns with successful responses displayed by the 3 groups while reading Eid Al-Fiter (culturally familiar) and Bonfire night (culturally unfamiliar). In terms of KS clues and LIFS with successful responses, groups shared the same patterns across the texts but also had idiosyncratic patterns of their own. In terms of KS clues, all groups used one KS in both texts, when this occurred, the KS clue was always a sentence level clue (Table 5-26). On the other hand, when displaying combinations of two KS clues, they were mostly Word + Sentence Level clues which were found in both texts by all groups except the advanced group in Eid Al-Fiter. The least proficient group, B1, also displayed another combination of World knowledge + Sentence Level clues only in Eid Al-Fiter. In Bonfire Night, in addition to the previous combination shared by groups (Word + Sentence Level clues), another combination of Sentence + Vocabulary Knowledge Level clues was displayed by all groups, too. Combinations of Word+ Sentence + Vocabulary Knowledge Level clues were shared by all groups when integrating three KS clues except for B1 in Bonfire Night. Interestingly, the advanced group had another combination of World Knowledge + Sentence + Vocabulary knowledge Level clues which they used in both texts. Finally, regarding combination patterns with all four KS clues were only found with successful responses in Eid Al-Fiter by only the C1 and B2 groups. These groups shared the combination patterns of Word + Sentence + World Knowledge + Vocabulary knowledge Level clues with another combination only used by the advanced group; Word + Sentence + World Knowledge + Discourse Level clues. Surprising, there

were no instances where all five KS clues were found. The study found that all groups displayed more KS clue combinations with successful responses in Eid Al-Fiter since learners were able to active more KS clues due to their familiarity with the topic.

Regarding LIFSs, the same was found in terms of LIFS combinations where some were shared across groups and texts while some were tailored by a specific group. Using only one LIFS in the form of MFSs was displayed only by the intermediate group in Bonfire Night (Table 5-34). Combinations of two strategy categories were found only by the intermediate group in Eid Al-Fiter while all groups used them in Bonfire Night. Interestingly the B2 group had their own strategy combination of MFSs+ESs while the C1 and B2 groups used MFSs+FFSs. All groups displayed the same two different types of combinations; MFSs+FFSs+ESs and MFSs+FFSs+MSs in Eid Al-Fiter. However, in Bonfire Night only one combination was displayed by the three groups, in which C1 and B2 shared the same combination of MFSs+FFSs+MSs. While the least proficient group, B1 had their own LIFS combination pattern of MFSs+FFSs+ESs. Finally, all groups combined the four LIFS categories in both texts with the advanced group using the most. The results revealed that the C1 group tended to display the most combination patterns for both KS clues and LIFs in both texts. Furthermore, they tended to integrate their World Knowledge or experience more (top-down), and contextual clues (bottom-up) approaches, thus applying a more interactive (upper-lower) processing approach to reading and inferencing.

7.4 Implications

In light of the present study's objectives and findings, a number of implications are presented in the following sections. This section begins with theoretical contributions to the field of applied linguistics, followed by a proposed theoretical model for the Arabic EFL reader. Next, several pedagogical implications for teachers to prepare, guide and improve L1 Arabic EFL learners to the process of lexical inferencing are discussed.

7.4.1 Theoretical implications to the field of Applied Linguistics

The findings of the present study contribute to the current body of reading, LIFSs and Second/Foreign language learning literature in a number of ways. First, in terms of reading comprehension the study found that possessing the required content schemata (background knowledge) of the reading topic and activating it while reading not only leads to successful comprehension without breakdowns in meanings (Carrell and Eisterhold, 1983) but also lexical inferencing responses. The present study also highlighted the importance of the cultural schemata of the target language (TL) for Arabic EFL readers and that the lack of Bonfire Night

background knowledge led to breakdowns in comprehension and alternatively the outcome of inferencing responses. This supports previous studies that have rationalized why a specific schema is not activated by a reader. It can be, as this study has found, that the content schemata (reading topic) is culturally specific and not part of the EFL reader's cultural background (Carrell and Eisterhold, 1983), the type and degree of contextual support (Beck *et al.*, 2013) reader's PL in the target language (Koda, 2005) and misconceptions between the reader's background knowledge and the intended one by the author (Yousef *et al.*, 2014).

This study also highlighted that the role of context is more critical for L1 speakers of Semitic languages while learning English as a FL compared to other Indo-European language speakers. Context plays a critical role for foreign/second language readers for several reasons (Nagy, 1997). First, these readers encounter a higher rate of unfamiliar words compared to their first language (L1) and through the context, can inference their meanings. Second, SL readers face cross-linguistic differences in multiple meanings of unfamiliar words more in the target language, English, compared to their first language. Through context, learners can disambiguate such words and select the one relevant to the sentence's meaning. Furthermore, the relative importance of context as an avenue for intentional vocabulary acquisition through reading (Laufer and Hulstijn, 2001; Grabe, 2009; Nation and Webb, 2011). The current study expands on this and adds that intentional vocabulary learning while reading, which is related to the reader's metacognitive awareness, can also lead to vocabulary learning. This study reported that some learners selected either the TW or other words to check their answers and meanings, which lead to learners recycling these words through different channels.

Second, in terms of the LIFS literature, the findings of this study not only add to the sparse but growing body of EFL literature on lexical inferencing behaviours of EFL learners, more specify L1 Arabic EFL learners, but also takes into account the role of content schemata (background knowledge) while reading. In other words, it adds to the LIFS literature the importance of content schemata, especially culturally specific ones, on the inferencing behaviours displayed by Arabic EFL readers when encountering UNWs. Surprisingly, the role of content schemata has been widely researched in the reading literature (Carrell, 1983b; Alderson, 2005; Al-Shumaimeri, 2006; Dehghan and Sadighi, 2011). On the other hand, only a handful of studies have investigated the role of content schemata in the LIFS literature which did not use TAs or ISRs but only questionnaires (Atef-Vahid et al., 2013), translation tasks (Pulido, 2007a), cloze passages (Biria and Baghbaderani, 2015). Using the latter set of methods does not provide an in-depth approach to the study of LIFSs compared to verbal reports, TAs and ISRs, as we have seen in the present study. In terms of LIFSs and readers' background knowledge, through using verbal reports and semi-structured interviews in the present study, it found that learners compensated for their

absence of Bonfire Night familiarity by falling back onto their linguistic knowledge of the TL, as predicted by the Schema Theory. Overall, regardless of inferencing responses, L1 Arabic participants used more sentence level and discourse KS clues while more Meaning-Focused and Evaluating Strategies in Bonfire Night compared to Eid Al-Fiter. In terms of culturally specific schemata, EFL learners are more of a disadvantage since they are not exposed to English as much as ESL learners. Therefore, in this study L1 Arabic EFL learners in Bonfire Night text turned to sentence level, discourse clues and Meaning-Focused Strategies as the only source of background knowledge for the text. In addition, learners relied more on Evaluating Strategies to verify or examine their generated hypothesis to compensate for their lack of cultural knowledge. Furthermore, in addition to EFL readers' linguistic knowledge, their ability to monitor what they understand and take strategic action, strategy schemata (Casanave, 1988) plays a vital role, too. In the current study, although all the learners lacked cultural knowledge on Bonfire Night, what differentiated good learners was not only using more different KS clues and LIFSs but also their strategic approach to locating and applying these clues and strategies effectively through monitoring and evaluating their inferencing.

In addition to the previous in terms of implications to LIFS literature, the current study also supports studies that have investigated the factors that affect the outcome of inferencing responses. In terms of PL, it was found that higher PLs not only led to successful inferencing but also using KS clues and LIFS in a more controlled manner than lower PLs (Morrison, 1996). Furthermore, even in the absence of the required background knowledge of the text, the advanced PL group fell back on either their background knowledge of the world and/or their personal experiences. From a Schema Theory perspective, when there is a lack of background of one of the three types of schemata (linguistic, formal, content), the two remaining schemata compensate for this. Thus an interactive process between top and bottom processes. This explains why all groups used more global clues in Bonfire Night than Eid Al-Fiter, since the text (linguistic, formal) was the only source of information for them in addition to their linguistics schemata. Furthermore, it was found that proficient learners use the wider context, either through contextual global clues and/or background knowledge which confirms other lexical inferencing studies (Haastrup, 1991). In the present study, one significant finding which was not reported in the LIFS research was the strategy of replacing TW with a guess, either in Arabic or English as either a Meaning-Focused Strategy or an Evaluating Strategy. More interestingly, when L1 Arabic EFL readers read the sentence in English, they would read their Arabic guess and switch back to English so smoothly as if it was part of a sentence. This illustrates that L2 readers, in addition to the reading text, will use all their available language resources like; vocabulary knowledge, background ground (world) knowledge, strategic awareness and in the current study,

their L1, to help fulfill the gaps in knowledge when they encounter reading difficulties. Therefore, insights of this study can contribute to a better understanding of the lexical inferencing processes by L1 Arabic EFL learners and other non-European language backgrounds (Chinese, Koran, Japanese) through identifying similarities and differences in KS clues and LIFSs they use. Knowledge of the KS clues, LIFSs and their mechanisms will help us develop a comprehensive understanding of the lexical inferencing process and develop a theory of EFL reading and inferencing unfamiliar words.

Finally, in terms of foreign/second language learning literature, the current study found that even if learners lacked the required cultural background knowledge of the reading text, they still had more inferencing attempts and hypotheses than the familiar topic. Through verbal reports and semi-structured interviews, it was revealed that motivation and engagement with the text, including their lower affective learning filter were the driving force behind this. Thus, supporting the importance of motivation to engage learners in their language learning journey, in this case particularly in their inferencing attempts (Dörnyei, 2001; Dörnyei and Ushioda, 2013)

7.4.2 A theoretical lexical inferencing model of the Arabic EFL reader

In light of the findings of this current study, I present an initial lexical inferencing model of the Arabic EFL learner during reading as displayed below (Figure 7-1). This interactive model expands on the basic three components of the Schema Theory, in which I have integrated a fourth element of Casanave's (1988) Strategy Schemata, which reflects participants' strategic behaviour towards their inferencing. Furthermore, the innovative aspect of this model is reflected through the role of the psychological component and the lexical inferencing process. This psychological component accounts for some factors that have been found in the current study that affect the readers' inferencing like motivation, text engagement, their affective filter level and risk-taking readiness. As the diagram displays, this model is in a constant ongoing cynical process between its elements but located at its core is a multidirectional interaction between these five elements. Thus an interactive process towards lexical inferencing.

In this study, it was found that the components of the Schema Theory were the sources of KS clues that L1 Arabic EFL learners tapped into and made use of as they inferenced the TWs while reading. In terms of content schemata, learners fell back on their cultural knowledge of Eid Al-Fiter and its traditions while for Bonfire Night, only the advanced group used their world experience since they did not possess any cultural knowledge about Bonfire Night. Since learners were familiar with Eid Al-Fiter, this allowed them to rely more on their vocabulary knowledge as clues by indicating previously having encountered the TWs. Although pretest results contradicted

this and learners were unable to recall the meanings of the TWs. However, this was not the case in the unfamiliar text due to lacking the cultural background knowledge required for Bonfire Night. Language proficiency (linguistic schemata) also determined what KS clues learners tapped into, activated, combined and the LIFSs they resorted to. In addition, how learners approached the clues either bottom-up, top-down or an interactive approach.

The last element of the Schema Theory was formal schemata which was the least used schemata compared to the previous ones. In the current study, formal schemata represented discourse knowledge clues. It was found that one dominant learner used her paragraph organization knowledge of the text as clues, the location of the TW sentence as a topic sentence and using the whole paragraph of the TW in Eid Al-Fiter. On the other hand, for Bonfire Night using the feature of story genre as a clue was only used by two B1 learners.

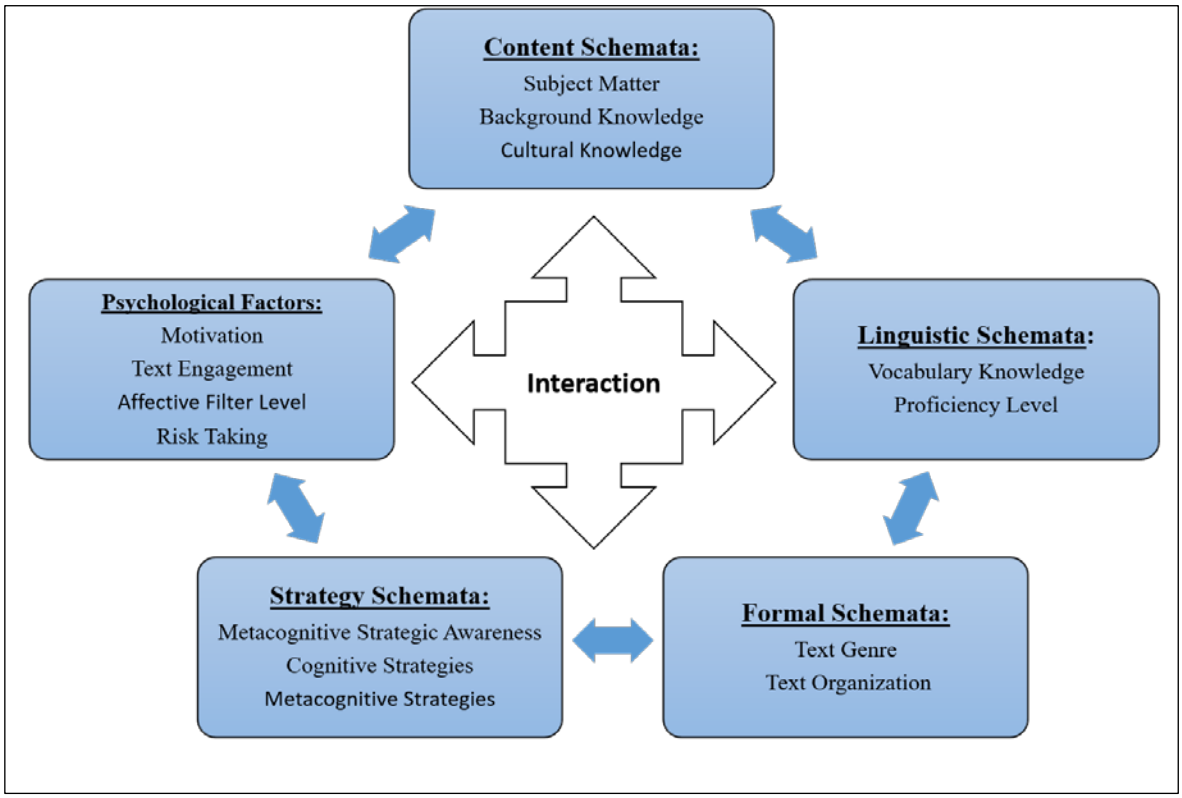


Figure 7-1 A proposed lexical inferencing model of the Arabic EFL readers inferencing strategies

The fourth component of the proposed model is strategy schemata, where metacognitive strategic awareness played a part in how L1 Arabic EFL learners approached the TWs themselves, the reading texts and intentionally learnt words from text. This awareness also guided learners to use cognitive and metacognitive strategies and display various combinations that were either shared among groups or idiosyncratic to a group. Finally, one of the significant findings of the current study was acknowledging the role of the reader's psychological factors, which played a significant part during the lexical inferencing process. L1 Arabic EFL university students displayed

more risk-taking chances reflected in their inferencing attempts in Bonfire Night. A number of explanations were proposed in terms of; the Hypothesis-Generation/Testing Model (Huckin and Bloch, 1993), motivation and text engagement with the unfamiliar text and Krashen's Affective Filter Hypotheses (Krashen, 1981, 1982) (see 6.2.3).

7.4.3 Pedagogical implications in the EFL classrooms

Language teachers play a critical part in teaching and developing language learners' cognitive and metacognitive skills. According to Anderson (2002:3), "Understanding and controlling cognitive processes may be one of the most essential skills that classroom teachers can help second language learners develop". Language classrooms are not only places to teach the language, but according to Nunan (2002:143), "should have a dual focus-not only on teaching language content, but also developing learning processes". Based on the study's findings, pedagogical implications and recommendations are highlighted for L1 Arabic EFL learners in language classrooms. These include the importance of explicit strategy instruction in teaching LIFSs, enhancing strategic reading strategies and increasing readers' vocabulary size.

One way of developing learners' learning processes is through strategy instruction and training. The role of strategy instruction and training is to promote language learners to take control of their own learning, thus enabling them to become more independent, autonomous, lifelong learners (Nunan, 2002; Cohen, 2014; Little et al., 2017). Helping L1 Arabic EFL learners become metacognitively and cognitively aware allows them to become more self-reflective in terms of monitoring, evaluating, planning, making decisions about how to approach the task, problem-solving skills, etc. In light of strategy training, three main pedagogical implications are proposed based on the current study's findings and the proposed inferencing model of the Arabic EFL reader (Figure 7-1) (discussed in 7.4.2). The three main pedagogical implications of the current study are; teaching and training lexical inferencing strategies (7.4.3.1), enhancing metacognitive strategic reading awareness (7.4.3.2) and increasing learners' EFL vocabulary through reading (7.4.3.3).

7.4.3.1 Teaching lexical inferencing strategies

Inferencing meanings of unfamiliar words from context is a vital coping strategy that allows learners to compensate for lack of specific language knowledge to meet the language demands when reading and listening (Thornbury, 2006; Cohen, 2014). Lexical inferencing helps learners deal with ambiguity in context, can lead to vocabulary learning and is one of the most useful skills that can be applied inside and outside the classroom (Nation, 2001, 2005; Thornbury, 2006). The

present study found that that Arabic EFL learners tended to rely more on their limited vocabulary knowledge more than combining it with the reading context to assist them during inferencing.

A number of practical pedagogical implications emerge from the present study's findings which can be applied and implicated in EFL classrooms. First, the KS clue and LIFS taxonomies that were developed in this study can be used as a guide or framework to help teachers in a number of ways. First, teachers can increase their awareness of how their learners approach unknown words while reading and serve as a basis for teaching inferencing skills through context. For example, the current study found that learners tended more to remove prefixes and resort to the meaning of the TW's stem or assume the TW was made of prefixes, which was not the case, leading to incorrect inferencing. Thus, teaching word analysis to L1 Arabic EFL learners should be postponed until learners have acquired a substantial number of complex words as unanalyzed wholes (Nation, 2000). It should be viewed that lexical inferencing strategy training combined with teachers' guidance and opportunities for learners to practice will facilitate reading comprehension and initially contribute to incidental vocabulary learning (Bengeleil, 2001). Furthermore, the PL of the students should also be taken into consideration in strategy instruction, too.

Sternberg (1987:89) claims that ''teaching people to learn better from context can be a highly effective way of enhancing vocabulary development''. Training emphasis could focus on teaching the kinds of clues and strategies that are relevant to infer the meanings of UNWs and how such clues can be identified/located in the text (Sternberg and Powell, 1983). Such focused instruction can enhance learners' lexical inferencing processing, their strategic competence and knowledge of the situations of where/when to apply KS clues and strategies effectively and efficiently. Studies that focused on the role of strategy instruction have reported positive effects on students' strategy use (Fraser, 1997). For example, Fraser (1999) after five months of strategy instruction on French L2 learners of English, found a sharp increase in success after the onset of strategy training. Furthermore, learners began to generate inferences based on linguistics clues in the text rather than associating the UNWs with phonologically or orthographically similar words in their L1 or L2 lexicons. In the Saudi EFL context, Alseweed (2000) reported that learners who had received instruction on word-solving strategies while reading performed better than the control group. Such evidence further supports that once learners are aware of the alternative means available to them when inferencing the unfamiliar words, they tend to do better.

Second, teachers should encourage learners to reflect on thinking-aloud as they formulate a hypothesis or generate a guess (Chamot, 1987). Anderson and Vandergrift (1996:3) view verbal reports (i.e. TAs and ISRs) as a beneficial metacognitive activity which "helps students become

more aware of the options available to them in understanding language and being a better language learner". Thus, by helping learners reflect on their own learning process will gradually help them to develop stronger learning skills (Anderson, 2002). This can be through TAs, oral stimulated recalls or asking students to "write aloud" their responses to what they are doing while inferencing, after which the teacher could elaborate more on these responses. This will provide teachers with insights to what clues and strategies their learners are using, either successfully or unsuccessfully, upon which they can intervene and provide the necessary feedback. This allows learners, especially lower PLs to be exposed to other clues or strategies that proficient or successful learners are using. Furthermore, Haastrup (1991) found that providing some kind of feedback to learners during inferencing may help with word retention. In addition, successful and unsuccessful learners can compare their inferencing behaviours (Hosenfeld, 1977) while guidance and more elaboration can be provided by the teacher.

Third, in terms of assessing UNWs during reading comprehension, from my point of view, teachers should integrate lexical inferencing in task-based activities, for example, in listening and reading. Thus, allowing learners more chances to practice their inferencing abilities and receive teachers' feedback. Furthermore, teachers should refrain from using multiple choice questions (MCQs) inquiring about the underlined UNWs which may be one of the main reasons that some learners reported not using lexical inferencing strategies as revealed through semi-structured interviews (4.5.3). Teachers could substitute the MCQs with those that require learners to write down, in their own words, the meanings of the UNWs. In a classroom activity, the previous task could be further followed by one asking learners to write down the clues and strategies they used to reach the meanings of the UNWs even if this is expressed in their L1. A language pedagogy that utilizes inferencing removes language learning from being mere skills to "a domain that is more closely akin to the regions of complex intellectual processes" (Carton, 1971:57). Thus, allowing language learning to become a continuing problem-solving process that allows for learners' knowledge and experiences to interact while learning. Furthermore, guiding EFL readers to use effective lexical inferencing processes to identify meanings of unfamiliar words would result in readers making more effective use of context. Regarding the importance of lexical inferencing and reading comprehension, Perfetti (1995:112) states that:

> Helping students develop text problem solving skills, e.g. using context to figure out interpretations, intentions, conclusions, etc. is a good idea. But getting good at word identification is an important goal in setting the stage for the successful use of such comprehension strategies.

7.4.3.2 **Enhancing metacognitive reading strategies**

Metacognitive awareness is a key element in proficient reading, where effective good readers are more aware of the strategies they use to monitor and adjust these strategies more flexibly according to their purpose for reading and the type of text they are reading than poor readers (Block, 1986). Metacognitive reading strategy awareness should be viewed as an opportunity to provide students with the knowledge and confidence that enables them to manage their learning and overcome reading comprehension difficulties (Paris and Winograd, 1990). For when learners understand how to monitor, plan, control and regulate their learning, this "can lead to more profound learning and improved performance, especially among learners who are struggling" (Anderson, 2003:20).

The current study also suggests implications for teaching strategic reading and test-taking strategies where more attention can be devoted to training learners to reflect on how they solved reading comprehension problems during reading. Therefore, one implication of the present study is the need for metacognitive training in reading to teach L1 Arabic EFL learners how to adjust their cognitive ability to reflect on how to solve reading comprehension problems during reading and promote more effective comprehension. Therefore, in order to enhance Arabic EFL learners' metacognitive reading strategy awareness, we need to find out what reading strategies they are aware of first (Carrell, 1989). One of the study's findings reported the disadvantages of learners resorting solely to TW analysis strategies. Thus, teaches should caution and train learners not only to rely on word morphology but also read beyond the TW and look at the broader context of the TW's sentence or the text and check their meaning against it (Laufer, 1997b). Furthermore, teachers should stress more emphasis on using abstract higher-level reading processing strategies (2.3.1) as well as lower reading ones (i.e. grapheme-phoneme, grapheme-morphophoneme, see Figure 2-3) since the latter can indirectly result in learners with a poor sense of prioritizing strategies (Coady, 1979).

In terms of text engagement, language learners' attitudes and reading materials influence learners' motivation to read and engage in another language (Day and Bamford, 1998). Teachers can present interesting yet challenging reading materials to invoke motivation and engagement inside and outside the classroom (Cho *et al.*, 2010). This could be done through a needs analysis by teachers at the beginning of the course to see what topics and genres interest their students. The opportunity to read is a significant contributor to reading achievement since it increases the amount of engaged reading by learners (Guthrie *et al.*, 2001; Guthrie, 2004). Thus, developing engaged readers is a prominent goal of teachers.

Futhermore, teachers can contribute by using a variety of books for reading, provide lists of good readings or access to e-books for students. This can support student autonomy which is vital for engagement. Teachers who helped students find authors and topics to their interest were able to increase cognitive engagement in reading (Sweet *et al.*, 1998). In the present study, semi-structured interviews revealed that although learners found Bonfire Nigh to be difficult since they lacked any background knowledge about it, they were still motivated by it because it was new to them. To the extent that one (C1-3) learner expressed that she never usually reads a whole text but she did in this case of Bonfire Night because she had found it to an interesting historical story about another culture. Thus, introducing reading texts from other cultures can be one way of text engagement, the significance of culture in a FL classroom is elaborated by Nostrand (1968 cited in Al-Hassan, 1992:38) where:

> Language, moreover, is not self-dependent; it cannot be wholly understood without reference to the culture of which it is a part and the social relations which it mediates. Literature, likewise, cannot be wholly understood without reference to the culture that produced it.

Thus, to understand a text when it is culturally unfamiliar, L1 Arabic EFL learners need to know about its culture which can be achieved through pre-reading activates with the teacher. Furthermore, teachers can facilitate reading performance/comprehension through providing specific cultural background information when noticing covert information is assumed by the author that is required by the reader to comprehend (Carrell and Eisterhold, 1983). In addition to the choice of reading topic, teachers can also support learners through presenting a variety of text genres or types and collaborate with learners in the classroom. This will motivate and engage learners to use various comprehension strategies since reading comprehension increases when learners are provided with opportunities to share their questions, opinions, self-reflect and gain new information (Guthrie, 2004). Finally, by carefully listening to what our students say about the reading texts they are asked to read, we, teachers, can become further sensitized to their hidden comprehension problems.

7.4.3.3 **Increasing Arabic EFL learners' vocabulary size**

Vocabulary plays a fundamental role in the language learning process, communication and linguistic comprehension abilities (Nation, 2001, 2005; Kaya and Charkova, 2014; Al-Khresheh and Al-Ruwaili, 2020). In the current study, it was found that encountering unknown words while reading was one of the challenges reported by learners, especially by the lower PL groups (see 6.2.1) due to learners' limited vocabulary size. This was the same reason that prevented learners from using clues beyond the TW sentence, i.e. paragraph level clues. In this way, the current study

further supports previous studies that have highlighted the weakness of Saudi EFL learners' limited vocabulary size which led to difficulties in reading English materials (Al-Bogami, 1995; Al-Akloby, 2001; Al-Nujaidi, 2003; Masrai and Milton, 2012; Aldukhayel, 2016). Therefore, one implication of the present study is increasing L1 Arabic EFL readers' stock of vocabulary since it is vital for improving both their language and reading comprehension. This could be fulfilled through vocabulary teaching through reading, training learners in vocabulary learning strategies and extensive reading.

First, in terms of vocabulary teaching approaches through reading, rather than providing word lists for the words to be learnt, teachers can integrate and present these words in short reading texts. Presenting words in context enables learners to not only infer the meaning but are also exposed to the words' environment'; their associated word collocations, associations or grammatical structures (Thornbury, 2006). For example, linking the new words with the topic of the text, for words that are connected by the topic are easier to learn (Thornbury, 2006). Also, pre-reading activities like brain storming and webbing activities can help expose learners to new vocabulary and help develop their vocabulary knowledge (Tracey and Morrow, 2012). Teachers can use games that draw attention to either previously or recently learnt words which encourage recall, guessing or categorizing to allow learners to engage with a word and allow deeper cognitive processing (see Involvement Load Hypothesis 2.8.2) (Hulstijn and Laufer, 2001; Thornbury, 2006; Schmitt, 2008, 2010). This can be through using follow-up reading activities with vocabulary exercises that focus on the new lexical items to be learnt (Paribakht and Wesche, 1993a). This should also include previously taught words in the language programme as an approach to recycle words, so they are not forgotten by learners. Explicit teaching approaches to vocabulary in English language classrooms can complement incidental approaches, too (Schmitt, 2008; Sonbul and Schmitt, 2010). Instructing and training EFL learners in vocabulary learning strategies can develop their vocabulary knowledge and their lexical competence which is critical for critical inferencing (Trujillo et al., 2015).

Second, the importance of teaching the schemata of the text is as significant as vocabulary instruction which should be taught side by side (Carrell, 1992a). Teaching and training learners in vocabulary learning strategies can improve/increase their stock of words. This is especially important for beginning language learners since they need to learn a large number of words in a short period of time and vocabulary learning strategies often help (Oxford and Scarcella, 1994). This will allow learners with opportunities to learn vocabulary through context, help them to learn strategies to acquire words and to continue learning words outside the classroom.

The third proposed implication of the study to improve L1 Arabic EFL learner's vocabulary size is implementing intensive reading, which involves reading large quantities of material for pleasure to learn new vocabulary that can also reinforce and recycle taught vocabulary in the class (Nation, 1990; Schmitt and Schmitt, 1995; Nation, 2005; Sonbul and Schmitt, 2010). From this, one objective of EFL programmes for L1 Arabic speakers is to incorporate extensive reading skills with the aim of expanding EFL readers' vocabulary knowledge and to provide opportunities for extensive reading.

7.5 Challenges and limitations of the study

The present study has a number of limitations regarding its methodology, sample, research instrument and materials but the main limitation was not always being able to explain the causality of the data produced in some situations. While I have been able to identify some explanations in light of the existing literature, my own observations and reflections which were supported through learners' verbal reports and semi-structured interview data, there might still be insights that learners' have not verbalized. Furthermore, through a qualitative approach to the inquiry by adopting an instrumental, explanatory and descriptive embedded mixed methods case study was to explore, describe and report an account of the range of KS clues and LIFSs used by 3 groups of learners and those associated with successful responses. This excluded the fact that, some KS clues and LIFSs might be statistically significant with successful inferencing responses since it is not one of the objectives of the study in addition to the small sample size. Another limitation was regarding the study's constructed KS clues and LIFSs taxonomies. One of the objectives of this study was to provide taxonomies of KS clues and LIFS used by Saudi L1 Arabic EFL students when encountering unknown words. However, these observed taxonomies do not represent a comprehensive list but only those that could be identified and observed through the data. Thus, replication studies are needed on samples of university Saudi L1 Arabic EFL learners from different disciplines to support or modify the current taxonomies.

Generalizability of this study's findings is another limitation due to the study's limited sample size and the methodology used. Thus, the findings should be interpreted with reference to the Saudi Arabic context of the study, more specifically, L1 Arabic EFL university students enrolled in a reading course at the university. Therefore, the findings of this study cannot accurately represent the wider population when compared to other findings in the LIFS literature. Thus, making it hard to generalize these findings beyond this population. Furthermore, due to the small size of the research sample in this study (15), the present study, as with studies that have looked at a phenomenon at group level, the information about participants' individual behaviour is often lost in group analyses (Schmitt and Meara, 1997). Therefore, it is also crucial to understand learners'

individual behaviour to provide us with a comprehensive and detailed qualitative view of their lexical inferencing processes. This will result in a deeper understanding of the cognitive and metacognitive processes underlying what L1 Arabic EFL readers do when inferencing UNW while reading.

A further notable limitation related to the current study's research was gender since all participants were females due to practical reasons. For it was impossible for myself as a female, to have access to male participants due to gender segregation in the Saudi culture. Although, in the early stages of this study gender was a factor that I wanted to investigate since there are only a handful of studies that have investigated gender and lexical inferencing. Tavakoli and Hayati's (2011) study focused on the role of gender on LIFS use and success by Iranian EFL learners. However, TAs were not used in this study but learners were asked to write down the LIFSs they used. The researchers found no differences between gender, the type of LIFS used and success response rates. However, the presence of L1 Arabic EFL male participants might have displayed whether or not both genders shared similar KS clues, LIFSs and their combination patterns or even if new clues and strategies were only used by male participants.

Limitations also extended to the instruments and materials used for collecting data. In terms of text type, although the TWs were chosen from the same sublists of the New Academic Word List (Coxhead, 2000a) and readability formulas were similar, yet the genre (text structure) of the text differed. Since there were differences in the genre, descriptive/narrative (Eid Al-Fiter) and story (Bonfire Night) genres, which might have affected the KS clues and LIFSs used. In his study of reading and comprehension strategies, Alkhaleefah (2017) found that Saudi university EFL learners reported more explicit lexical and comprehension problems in the narrative text than the expository one. Text structure refers to the way ideas are organized in a text, the relationship among ideas and the vocabulary used to convey meaning to the readers (Pyle et al., 2017). Knowledge of text structure "should enhance text-meaning construction" (Koda, 2005:154). This guides readers into building a coherent mental representation of what the text means (text model of reading comprehension, see 2.3.1) to use the text structure in organizing information in their memory (Anderson and Pearson, 1984; Grabe and Stoller, 2013). Therefore, text genre could have played a role in the type, range and frequency of KS clues and LIFSs that L1 Arabic EFL learners activated and applied. Another limitation in terms of reading materials was regarding the choice of TWs. When a learner correctly provided the meaning of a TW on the pretest, it was replaced by a preselected set of synonyms that were selected from two online thesaurus websites (3.7.4.1). However, in situations where a learner, especially an advanced individual, knows a word after a pretest, it would have been more suitable to use nonsense or pseudowords generated phonologically and orthographically with the target language (English) as an extra measure to

ensure the replaced TW is entirely unknown. This could be done through specialized lexical vocabulary websites like ARC Nonword Database (http://www.cogsci.mq.edu.au/research/resources/nwdb/).

Although I took detailed notes during the TAs and ISRs sessions, some might have been missed due to the vast amount of small details I was writing down. Thus, video recordings would have provided a rich source of data (Dörnyei, 2007) which can help researchers keep track of events which could quickly go unnoticed while taking notes since micro-details are often lost when one is emerged in a setting for the first time (Otrel-Cass *et al.*, 2010). Furthermore, video recording looks beyond language and captures non-verbal events (Carey, 2006). Video recordings could display how participants interacted/engaged with the text, either by underlining words or parts of the text, moving the pen over words or their parts. This will provide different non-verbal approaches and strategies to how learners approach the UNWs and the text which were not verbalised in the verbal reports. However, due to the critical sensitivity of the issue of video recording females in public or in educational settings which is frowned upon by the Saudi community. It was impossible to use used video recording even after several attempts were made by the researcher.

7.6 Recommendations for further research

In light of the study's limitations and challenges, a number of recommendations in terms of methodology, research instruments and material for future research are presented to the reader. First, the objective of this qualitative embedded multiple case study was to account for the range of KS clues and LIFSs, including those associated with successful responses, and their frequency of usage by L1 Arabic EFL learners representing 3 different PL groups. However, in order to further investigate if some KS clues and LIFSs were more significantly associated with correct responses and PLs, quantitative statistical approaches and analysis need to be undertaken, in addition to a large research sample. Second, replication studies using TAs and ISRs are needed on samples of university Saudi L1 Arabic EFL learners from different universities and disciplines to support and modify the current taxonomies. This will provide important and more accurate details about L1 Arabic EFL learners regarding the type of KS clues, LIFS and their lexical inferencing processes. These processes could later be compared to other taxonomies on L1 Arabic EFL learners from different countries to see the similarities/differences or if another language other than Arabic and English (i.e. a third language, a colonization language) influences these processes. This will lead to a comprehensive and developed list of KS clues and LIFS taxonomies of the L1 Arabic EFL reader while inferencing UNWs during reading.

Third, a large research sample representing both genders is crucial for lexical inferencing research since the aspect of gender has not been thoroughly investigated in the lexical inferencing strategy literature. The role of gender has been widely researched in language learning (Green and Oxford, 1995; Tercanlioglu, 2004; Liyanage and Bartlett, 2012) and vocabulary learning strategies. (Gu, 2002; Catalan, 2003) However, given the importance of lexical inferencing in relation to both reading comprehension and subsequent vocabulary acquisition, there is a significant gap regarding the lexical inferencing process and gender. Only two studies have looked at the role of gender and guessing though only using questionnaires (Alhaysony, 2012; Baniabdelrahman and Al-shumaimeri, 2014). Therefore, there is still a need for lexical inferencing research that takes into account the role of the learners' gender; whether or not the choice of KS clues and LIFSs differs by gender as with other learner variables with have been researched like language proficiency and vocabulary knowledge.

Fourth, in order to explore patterns or changes in behaviours or development, qualitative longitudinal methodological research is a good starting point (Dörnyei, 2007). By investigating how KS clues and LIFSs develop or change over time can provide us with the stages that learners develop and use certain KS clues and LIFSs. For example, this could even include monitoring different learners representing different PLs and how their inferencing in terms of KS clues and LIFSs develop/change as they process through the course(s). Since there is also a need for further research to investigate the role of lexical inferencing strategy instruction through reading, qualitative longitudinal research can be applicable to study learners through a semester/module. This will help teachers and researchers gain a deeper clearer understanding of what L1 Arabic EFL learners, in this case readers, are doing as they engage in inferencing meanings of unfamiliar words while reading. Continued research and its application in the classrooms will assist language learners not only to improve their strategy use but also increase their ability to use the language in its varied context outside the classroom walls.

Fifth, another methodological recommendation is implementing video recording and eye-tracking analysis in future research in order to capture all the approaches to the UNW in the text. Video recording can provide richer data than audio ones since it captures nonverbal clues like facial expressions and gestures (Dörnyei, 2007). Even in sensitive contexts, like mine, a video recorder can be placed above the text to record participants' actions while they think-aloud as they inference. While video recordings capture the observed behaviours of learners, eye-tracking data analysis can provide insights into their cognitive ones. Eye-tracking is a useful tool in language research because it allows us to study moment-my-moment processing decisions during natural, uninterrupted comprehension without relying on participants' responses (Roberts and Siyanova-Chanturia, 2013). Due to its advantages, eye-tracking has become the "gold standard" in studying

reading (Rayner, 2009) with an increasing number of studies in applied linguistics implementing it in reading, listening, writing, translation and test-taking contents (see Conklin et al., 2018). Through eye movement data, Dolgunsöz (2016) investigated how 72 EFL participants inferenced 12 UNW through reading and their recognition later on. Regarding reading, results found that a significant effect between PL and the sum of affixations monitored through eye moments while learners went back/forth using contextual clues available. Due to their high PL and advanced vocabulary knowledge, the highest C1 group spent fewer affixations on the UNWs while the weakest, B1, spend the most. Therefore, if eye-tracking was used in this study, it would have further helped results by uncovering the frequency of how a learner either used local/global clues, identifying clues and strategies resorted to while the duration of affixations could indicate the complexity of the TW. This information could then be compared across the 3 different PLs to find similarities and differences. Furthermore, eye movements while reading could be used to validate learners' responses to reading the text and how they approach the TWs which further strengthens the study's trustworthiness.

Sixth, in terms of reading materials, only two types of genres were represented in this study. Thus, a wider range of short texts needs to be investigated to see if certain KS clues and LIFSs are influenced by the text's genre or text preference as reported in this study. Finally, further research is needed to explore and test the study's proposed lexical inferencing model of the Arabic EFL reader in light of the findings of the present study. This will further contribute to our understanding of second language reading especially by L1 Arabic EFL learners, who are prone to limitations of cultural background knowledge of the TL. It is now time to expand and look beyond the classical components of the Schema Theory and see how other elements like learner's metacognitive awareness, strategic knowledge and psychological aspects (motivation, text engagement) contribute and affect reading comprehension and lexical inferencing. All these elements contribute to the process of lexical inferencing of unknown words while reading by L1 Arabic EFL students and the outcome of their responses.

Appendix A **Washing Clothes**

The procedure is actually quite simple. First you arrange things into different groups. Of course, one pile may be sufficient depending on how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step, otherwise you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run this may not seem important but complications can easily arise. A mistake can be expensive as well. At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one never can tell, After the procedure is completed one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually they will be used once more and the whole cycle will then have to be repeated. However, that is part of life.

Appendix B **Preliminary online questionnaire (Arabic)**

REVIEW MODE] استبيان بخصوص القراءة باللغة الانجليزية للطالبات جامعة الملك عبد العزيز Survey - Google

MH0v48FbTIUB_2Frm_2Bypj3Zk3gbJIdgFPvEIwBfkZjYq3unWF9D3S

PREVIEW & TEST

استبيان بخصوص القراءة باللغة الانجليزية للطالبات جامعة الملك عبد العزيز

استبيان بخصوص القراءة باللغة الإنجليزية (للطالبات) - جامعة الملك عبد العزيز

السلام عليكم ورحمة الله وبركاته

عزيزتي الطالبة أشكر لك تعاونك و مساهمتك و إعطاء جزء من وقتك في الإجابة على هذا الاستبيان

هدف الاستبيان هو معرفة الصعوبات التي تواجها الطالبة عند قراءة قطعة نصية باللغة الانجليزية و كذلك معرفة المشاكل التي قد تواجهها الطالبة في هذا الموضوع

* 1. الكلية التابعة لها:

- كلية العلوم
- كلية الآداب و العلوم الإنسانية
- كلية الهندسة
- كلية الإدارة و الإقتصاد
- سنة تحضيرية
- أخرى

الرجاء ذكر اسم الكلية إذا لم تكن ضمن الخيارات السابقة

* 2. ماهو تخصصك ؟

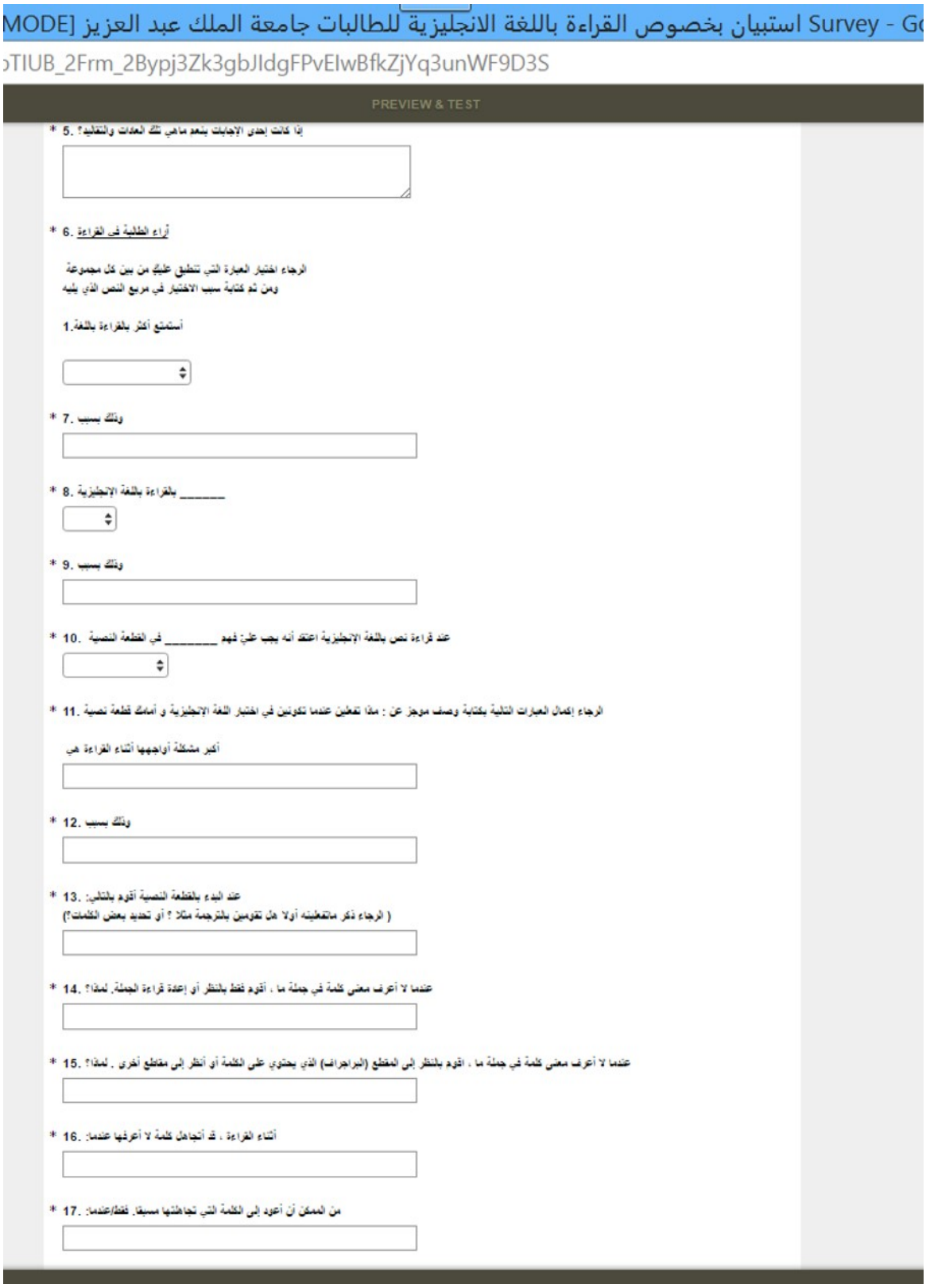
* 3. هل سبق و أن قمتي بأحد الأعمال التالية ؟

	الاجابة
نشر ورقة علمية في مجلة علمية	
تقديم ورقة علمية في مؤتمر دولي	
عرض تقديمي في مؤتمر دولي	
شراء منتجات عن طريق الإنترنت	

* 4. هل سبق وأن قرأتي عن عادات و تقاليد الشعوب التالية (الرجاء اختيار كل ما ينطبق عليك)

	الاجابة
الخليجية	
الإفريقية	
الشرق آسيوية	
البريطانية	
الأمريكية	

* 5. إذا كانت إحدى الإجابات بنعم ماهي تلك العادات والتقاليد؟


MODE] استبيان بخصوص القراءة باللغة الانجليزية للطالبات جامعة الملك عبد العزيز Survey - Go
oTIUB_2Frm_2Bypj3Zk3gbJIdgFPvEIwBfkZjYq3unWF9D3S
PREVIEW & TEST
* 5. إذا كانت إحدى الإجابات بنعم ماهي تلك العادات والتقاليد؟
* 6. آراء الطالبة في القراءة
الرجاء اختيار العبارة التي تنطبق عليك من بين كل مجموعة
ومن ثم كتابة سبب الاختيار في مربع النص الذي يليه
1. أستمتع أكثر بالقراءة باللغة
* 7. وذلك بسبب
* 8. بالقراءة باللغة الإنجليزية _____
* 9. وذلك بسبب
* 10. عند قراءة نص باللغة الإنجليزية اعتقد أنه يجب علي: فهم _____ في القطعة النصية
* 11. الرجاء إكمال العبارات التالية بكتابة وصف موجز عن : ماذا تفعلين عندما تكونين في اختبار اللغة الإنجليزية و أمامك قطعة نصية
أكبر مشكلة أواجهها أثناء القراءة هي
* 12. وذلك بسبب
* 13. عند البدء بالقطعة النصية أقوم بالتالي:
(الرجاء ذكر ماتفعلينه أولا هل تقومين بالترجمة مثلا ؟ أو تحديد بعض الكلمات؟)
* 14. عندما لا أعرف معنى كلمة في جملة ما ، أقوم فقط بالنظر أو إعادة قراءة الجملة. لماذا؟
* 15. عندما لا أعرف معنى كلمة في جملة ما ، اقوم بالنظر إلى المقطع (البراجراف) الذي يحتوي على الكلمة أو أنظر إلى مقاطع أخرى . لماذا؟
* 16. أثناء القراءة ، قد أتجاهل كلمة لا أعرفها عندما:
* 17. من الممكن أن أعود إلى الكلمة التي تجاهلتها مسبقا. فقط/عندما:

Appendix C **Preliminary online questionnaire (English)**

Dear student thank you for your collaboration and for spending some time to complete this questionnaire. This questionnaire aims at investigating the difficulty/problems a student faces while reading in English.

1. What academic faulty are you enrolled in

Faculty of science – Humanities – Engineering – Business and Management – foundation- year.

If not listed above, please write your factuality below

2. What is your major?

3. Have you ever attempted to do the following (yes/No)

-Published a research paper in an academic journal - presented a paper in an international conference – Presented a PPT at an international conference – Purchased items online

4. Have you read about the customs and traditions of the following culture (Yes/ No)

The Gulf Region – African – East Asia – British – American

5. If the answer was **yes**, what were these customs and traditions?

6. Students opinions on reading

Please choose the answer that applies to you from the flowing drop list

1. I enjoy reading in [Arabic-English]

7. Because _____

5. Please answer the following questions and providing a reason in the following box

-The biggest problem I have while reading in English is _____ because

-When I begin reading a text, I begin by _____

-When I do not know the meaning of a word, I just look at the word itself or the whole sentence ____ because

-When I don't know the meaning of a word, I look at the paragraph when _____

- I tend to ignore an unknown word when _____

Appendix D **A sample of the paper-based questionnaire (English)**

Date: 25th Feb.

Questionnaire on Lexical inferencing Strategies

This is a simple open-ended questionnaire that is interested in what you do when you come across an unknown word as you read. Furthermore what you decisions and strategies are when trying to guess the meanings of unknown words as you read.

Please read the instruction carefully for each question and answer providing as much information as you can relevant to the question.

A. Demographic and personal information

1. Name (optional): [redacted]
2. Number of years learning English: 8 years.
3. Choose the type of schools you have attained and write the number of years you have studies there:
   Public governmental schools: ✓
   Private schools :

****

B. Reading perceptions

Choose one of the following statements and complete it providing as much information as you can

1. Choose **one** of the following, then complete the sentence below:

A.1. I enjoy reading more in Arabic than English

A.1. I enjoy reading more in English than Arabic

Because * I want to improve my reading skills.

****

A.2. I enjoy reading in English.

A.2 I do not enjoy reading in English.

Because it's fun when I discover a new word.

****

A.3. I believe that I have to understand every single word in the reading text.

A.3. I believe that I have to understand most of the words that are important in the reading text.

A.3. I believe that I have to understand most of the words, in general, in the reading text.

Because It's easier to understand the text in general then to understand * the meaning of each word.

1

2. **Please complete the following sentences by describing what you normally do when reading in English:**

a. One of the biggest problems I have when I read is understanding the meaning of the new words

b. When I first see the text, I start to count the paragraphs.

c. If I do not know a word I only look at the other words in the same sentence and not the whole paragraph when ~~because if I look it in the paragraph it'll confuse me, so I start reading the other words in the sentence to get the meaning of this words~~
If the word was in the begining of the sentence, I read the same sentence and the previous one.

d. If I do not know a word I only look at the whole paragraph or all the paragraphs in the text when ~~then I can get the meaning from the ideas of the paragraph~~
If the paragraph has one main idea and connected ideas then I can get the meaning from the text.

e. As I read, I will skip or ignore a word when it is very long and has many parts.

f. I would return to that word I skipped or ignored if/when I don't understand the sentence.

g. I would not return to a word I skipped or ignored if/when I understand the sentence.

h. In certain situations, I look at the form of the unknown word to (describe how you will use the word form) to understand the sentence, if it was adjective I'll know that this a describing sentence.

I. Sometimes I use the grammar of the sentence to help me guess the meaning by (describe how you will use the grammar) I don't look for the sentence grammar a lot, but I think it will help to get the meaning.

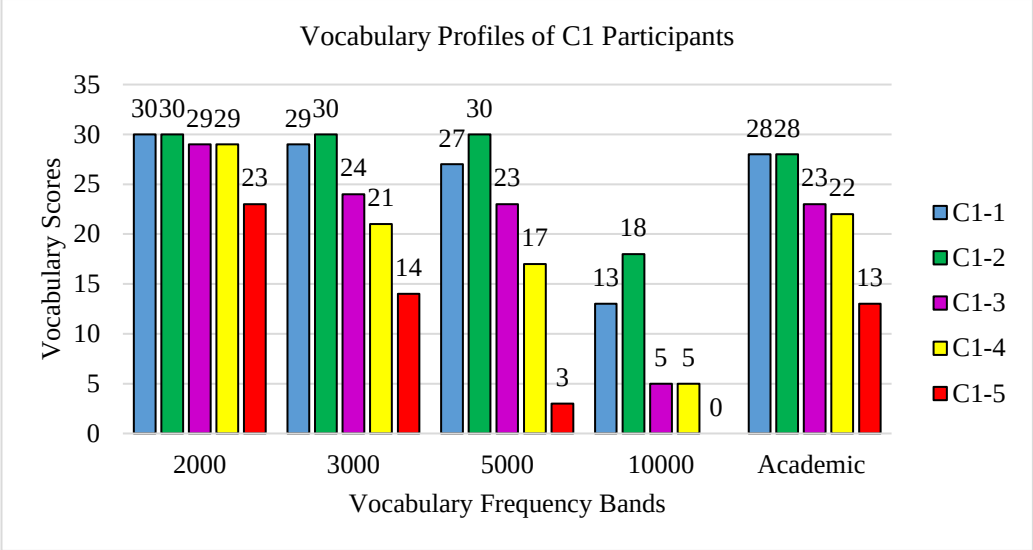
Would you be interested in taking part in the study? (Place tick (✓) the your response)

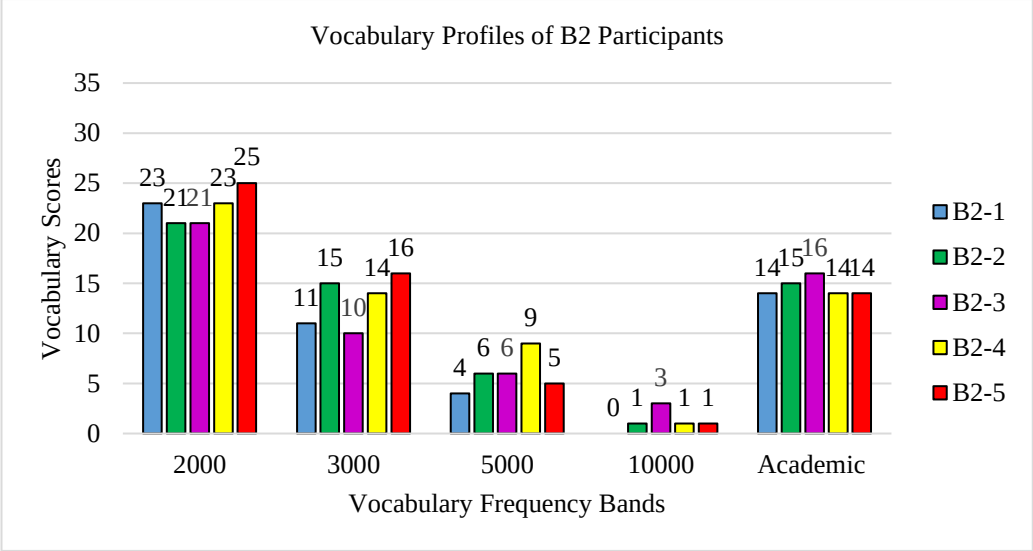
✓ YES ____ NO

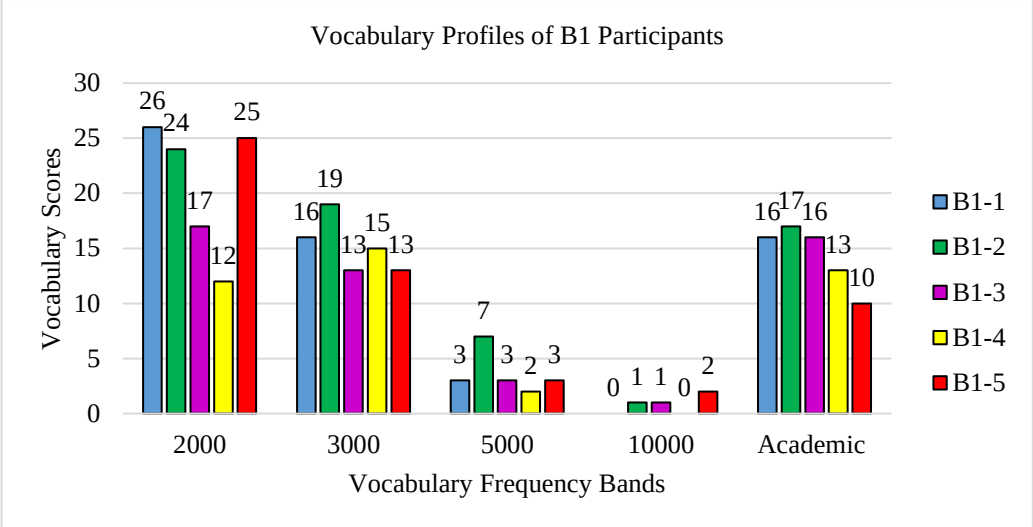
Thank you for your taking the time, effort and participating in this questionnaire.

3

Appendix E **Vocabulary Levels Test results**







Appendix F **Target word synonym substitutes**

Eid Al Fiter		**Bonfire Night**	
Original TW	**Synonyms**	**Original TW**	**Synonyms**
bonds	ties	infer	deduce
co-operative	collaborative	motive	impulse
induces	yields	successively	sequentially
insightful	shrewd	bulky	hefty
innovate	initiate	rationale	valid
predominantly	substantially	abandon	desert
devotion	fondness	inevitably	inescapably
definitely	undeniably	controversies	debates

Appendix G**Text1: Eid Al-Fiter text**

One of the most celebrated festivals or Eids as they are called in Saudi Arabia, is Eid Al Fiter. Regardless of age or nationality, Eid Al Fiter is celebrated by everyone and social **bonds** are strengthened. It has a large place in the hearts of all Muslims, for it is preceded by the Holy month of Ramadan, a sacred month to Muslims around the world. Everyone shares their love and affection for their loved ones and feelings of hate or anger disappear. Displays of **co-operative** actions between family members in getting ready for Eid are at their highest. The start of Eid Al Fiter is signaled by the early prayer calls for Eid Prayer.

Since a lot has to be done before this day, this **induces** or prompts the need for early preparations, which start in the last week of Ramadan, to ensure that everyone has a lovely, stress-free time. Before Eid Al Fiter, shops are busy, crowds and traffic jams are a common sight on the streets, **insightful** people are those who have prepared early. Sweet shops stop taking in Eid preparation orders since they tend to be overbooked with not enough time to spare. People buy new clothes, **innovate** ideas for their homes through makeovers by cleaning, rearranging or buying some house accessories for this occasion.

Eid is **predominantly** a day for renewing family ties and expressing one's feelings for others. The most important part of the day, after praying, is going out on short visits to family and friends to congratulate them on fasting Ramadan and wishing them a happy new year. Family ties are very sacred in Saudi society. That is why sons and daughters bring their children to their grandparents' house for breakfast. Eid Al Fiter breakfast differs from any other breakfast during the year. A sense of **devotion** in terms of shared feelings, traditional costume and customs is expressed throughout the day. On this day, houses smell of Arabic coffee which is presented with sweets or dates. Such old and new traditions, like giving young small children packs filled with some money and sweets, will **indefinitely** continue to grow.

Part 2:

#	Word	Inferenced/Guessed Meaning
1	Bonds	
2	co-operative	
3	Induces	
4	Insightful	
5	Innovate	
6	predominantly	
7	Devotion	
8	Indefinitely	

Appendix H**Text 2: Bonfire Night text**

Ever wondered why English people have bonfires and fireworks to celebrate Bonfire Night? On the fifth of November, people across the UK, celebrate Bonfire Night regardless of the weather. Preparations start early throughout towns and villages. Huge fires are lit accompanied by fireworks and food. In addition, a homemade model of a man is burnt in the fire. Who is this burning man? To find out, we need to go back in time and **infer** what happened then.

The historical story behind this festival is the Gunpowder Plot, where a group of men plotted to kill King James I. Their **motive** for this was because they disagreed with his religious beliefs and laws. These powerful men planned to blow up the Houses of Parliament when King James was there with his government. They also recruited a soldier called Guy Fawkes, who was an expert in explosives. In March 1605, one of the men rented a cellar underneath the House of Lords in the Parliament buildings. Believing this was the ideal spot to set off the explosion, they **successively** managed to smuggle 36 large **bulky** barrels of gunpowder into the cellar without being seen over the summer months. The barrels were covered with firewood and straw.

However, one of these plotters was worried about a relative, Lord Monteagle, who would be in Parliament on the day of the explosion, and sent him a letter not to come on that day. Lord Monteagle showed the letter to King James, who ordered a search, based on the **rational** explanation of the letter, of the building including its cellars. Since the plotters had to **abandon** Guy in the cellars, when the soldiers entered the cellars, they only found Guy near the barrels of gunpowder and immediately arrested him. Today, the burning doll is Guy, made by using old clothes filled with paper or straw. Many would have **inevitably** lost their lives that day if Monteagle had kept the letter hidden. A Guy and the fireworks are reminders of the gunpowder Fawkes hid in the cellar of parliament. However, there are **controversies** between peoples' opinions on burning a doll as burning a Guy is seen differently by members of the same group.

Part 2:

#	Word	Inferenced/Guessed Meaning
1	infer	
2	motive	
3	successively	
4	insightful	
5	bulky	
6	rational	
7	inevitably	
8	controversies	

Appendix I Think-Aloud Warm-up instructions

Instructions:

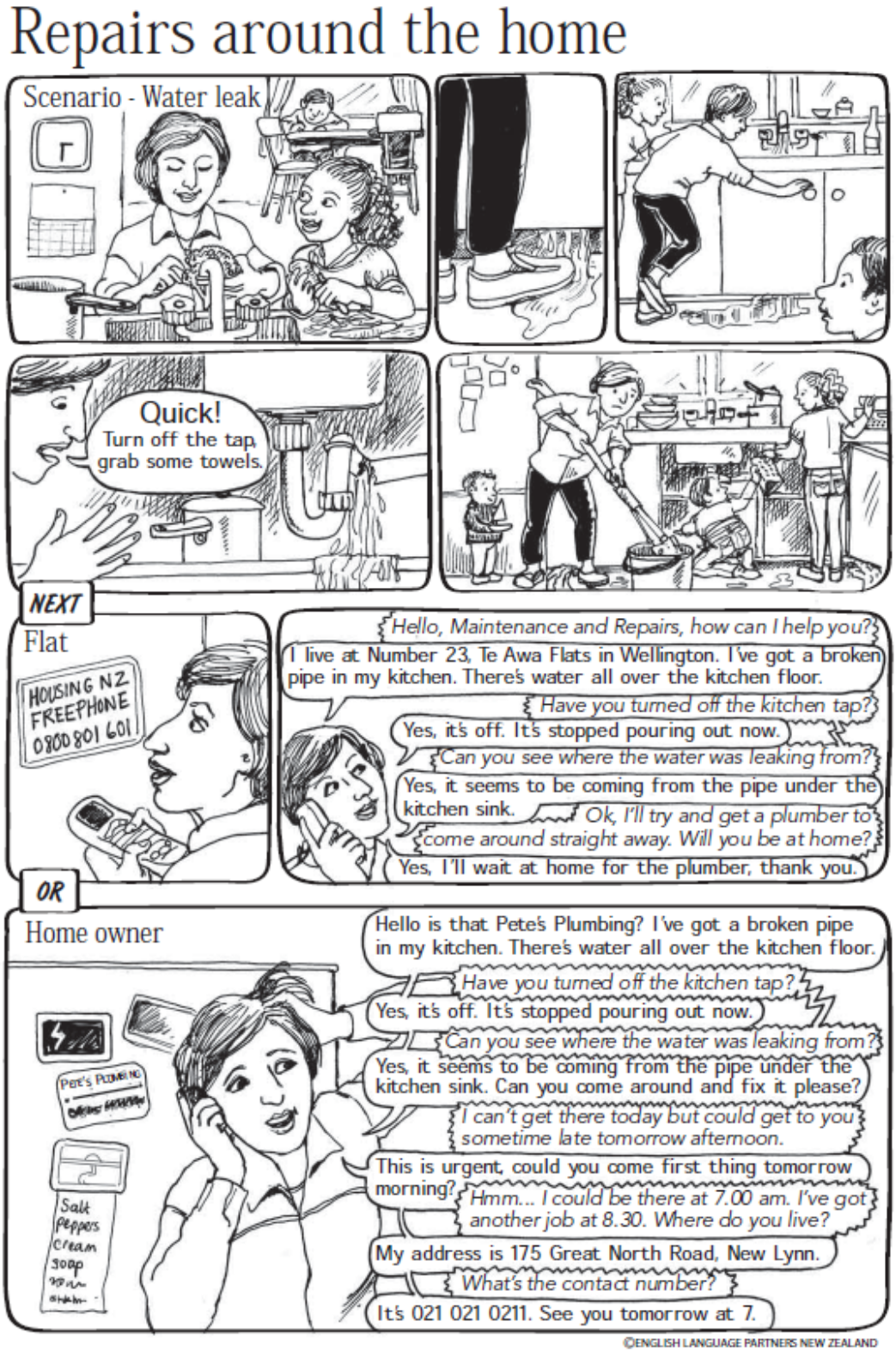
1. The following page contains a group of pictures that tell a story.
2. Look at each picture and THINK-ALOUD what you think is happening in each picture.
3. After completing this step, rearrange the pictures so they tell the story of what you think is happening.
4. Tell the version of your story aloud.
5. Remember to keep talking in all these stages.

I.1 Warm-up for Text-1

Source:

http://www.englishlanguage.org.nz/sites/englishlanguage/files/kcfinder/files/ELPNZEmergency%20Fire%202014%20WebsiteSmall.pdf

I.2 Warm-up for Text-2



Source:

http://www.englishlanguage.org.nz/sites/englishlanguage/files/kcfinder/files/Repairs%20around%20the%20home.pdf

Appendix J **Think-Aloud Instructions (Sessions)**

In this experiment, I am interested in what you do when you read a text in English and guess the meanings of some words. For this reason, I would like to know what you are thinking of as you read the following text and find out these meanings.

Instructions:

1. Please read the following reading passage and find the meanings of the bolded underlined words.
2. As you do so, please THINK-ALOUD, as if you were alone in the room talking to yourself.
3. Remember to KEEP Talking as much as you can while you try to find the meanings of these words.
4. You can use either Arabic or English or a mixture of both, whatever makes you more comfortable.
5. Write what you think these words mean in Arabic or English in Part 2 below.

Appendix K Semi-Structured Interview Guide

Welcome participant

- **Reading in general**

1. What are the most difficult challenges to you when you read texts in English?
2. When you read a text, do you read and try to understand every single word or just generally understand the paragraph without understanding every word?
    - Can you explain more, please? What makes you decide which way to use?
3. What about reading the title?

- **Lexical inferencing reading strategies**

4. Can you mention the strategies that you use when you find an unknown word as you are reading?
5. What about if you are in a test, What strategies do you use since you cannot use a dictionary or ask the teacher?
    - Form: what do you do?
    - Grammar:
    - Pronounce:
6. When do you decide to skip/ignore a word?
    - What makes you decide to skip/ignore it?
    - When do you go back to the skipped/ignored word?
    - Is in the unimportance of the word? Or you generally understand the text? Or you think you already know a word.
7. How do you check your guess?
8. Were there times you looked up a word after you finished a test or one of the tests with me? Why? What makes you choose a certain word to look up? What way do you do so?

- **Topic familiarity**

9. Is it harder to understand a text in your reading book when the topic is different from your culture?
    - Why do you think so? Is it you don't know the topic? Or because you have not been taught in class the vocabulary about that topic?

- **The reading Texts:**

10. Please rank the 4 texts from the easiest to the hardest? What was the most interesting/uninteresting (boring) text? Why?
    - Would you like to add anything more?

Thank you for participating and taking part in the interview

Appendix L **A Sample of think-aloud field notes**

Wed., 16-03-2016 Learner: **B1-5**

Eid Al-Fiter

Points:

- Asks if she can read aloud → students explains she normally does this.
- Reads the text aloud_X2.

TW order:

- bonds, co-operative, induces, insightful, innovative, predominantly, devotion, indefinitely

Goes in a linear order for the TW. *Why does she do so?*

- Maybe proficiency? vocabulary knowledge? Background knowledge about the reading?
- Learner explains that knowing about the reading topic helped her.
- She explains that she reads the text fast and then does not understand ((*what she normally does when reading*)).
- She reads the text again after reading the comprehension question on her reading exams ((*reading habits*)).
- She enjoyed reading the text.
- If she gets the meaning of a word from its sentence, she does not complete reading that sentence? ((*Why?! Do all the learners behave the same?- Need to investigate*)).

Appendix M **A Sample of a B1 learner's pretest**

B1-1

Text Two:

Pre-test of the Target Words

Look at each of the words in the table below and indicate one the Vocabulary Knowledge Scale, how much you know these words.

Vocabulary Knowledge Scale

I	I don't remember having seen this word before
II	I think/know I have seen this word before, but I do not know what it means.
III	I think/know I have seen this word before, and I think/know it means _____. (synonym or translation)
IV	I can use this word in a sentence: _____. (Write a sentence) (*If you do this section, please also do Section III*)

#	Word	Ranking
1	bonds	2
2	co-operative	3. ~~we sth done~~ working together. if This was a cooperative Project between two schools.
3	induces	2
4	insightful	3. clear / 4. This is an insightful steps.
5	innovate	2
6	predominantly	1
7	devotion	1
8	indefinitely	2

1

Appendix NA Sample of a B1 learner's inferencing sheet

Text 2 B1-1

Eid AL Fiter

One of the most celebrated festivals or Eids as they are called in Saudi Arabia, is Eid Al Fiter. Regardless of age or nationality, Eid Al Fiter is celebrated by everyone and social **bonds** are strengthened. It has a large place in the hearts of all Muslims, for it is preceded by the Holy month of Ramadan, a sacred month to Muslims around the world. Everyone shares their love and affection for their loved ones and feelings of hate or anger disappear. Displays of **collaborative** of actions between family members in getting ready for Eid are at their highest. The start of Eid Al Fiter is signaled by the early prayer calls for Eid Prayer.

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Part 2:

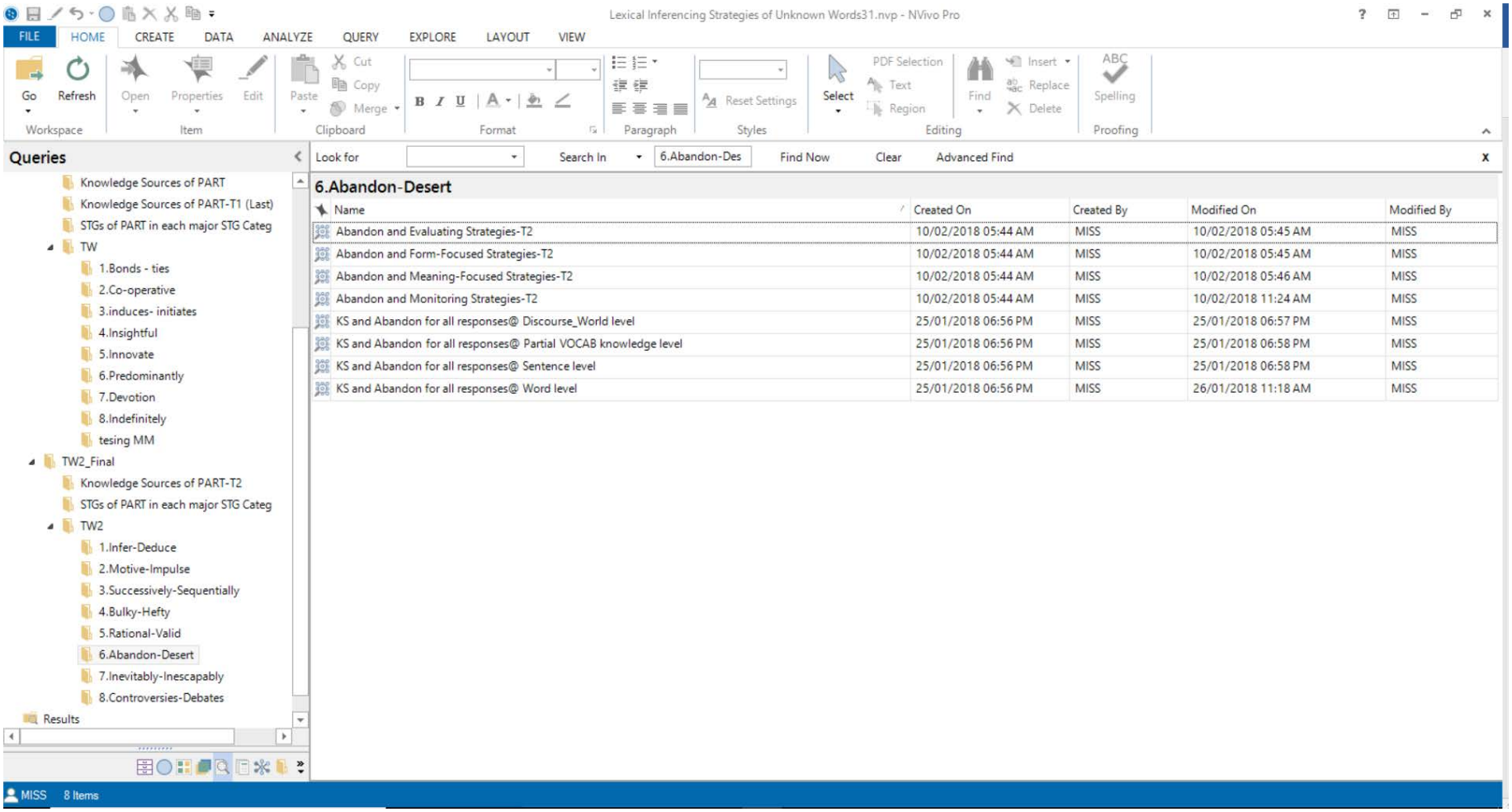
	#	Word	Inferenced/Guessed Meaning
	1	bonds	relationship
e1	2	collaborative	do an activity together.
	3	induces	show or tell
	4	insightful	used to , have an idea of
	5	innovate	establish , [illegible]
H2	6	predominantly	basically
H1	7	devotion	remembering
e2	8	indefinitely	Ofcourse .

2

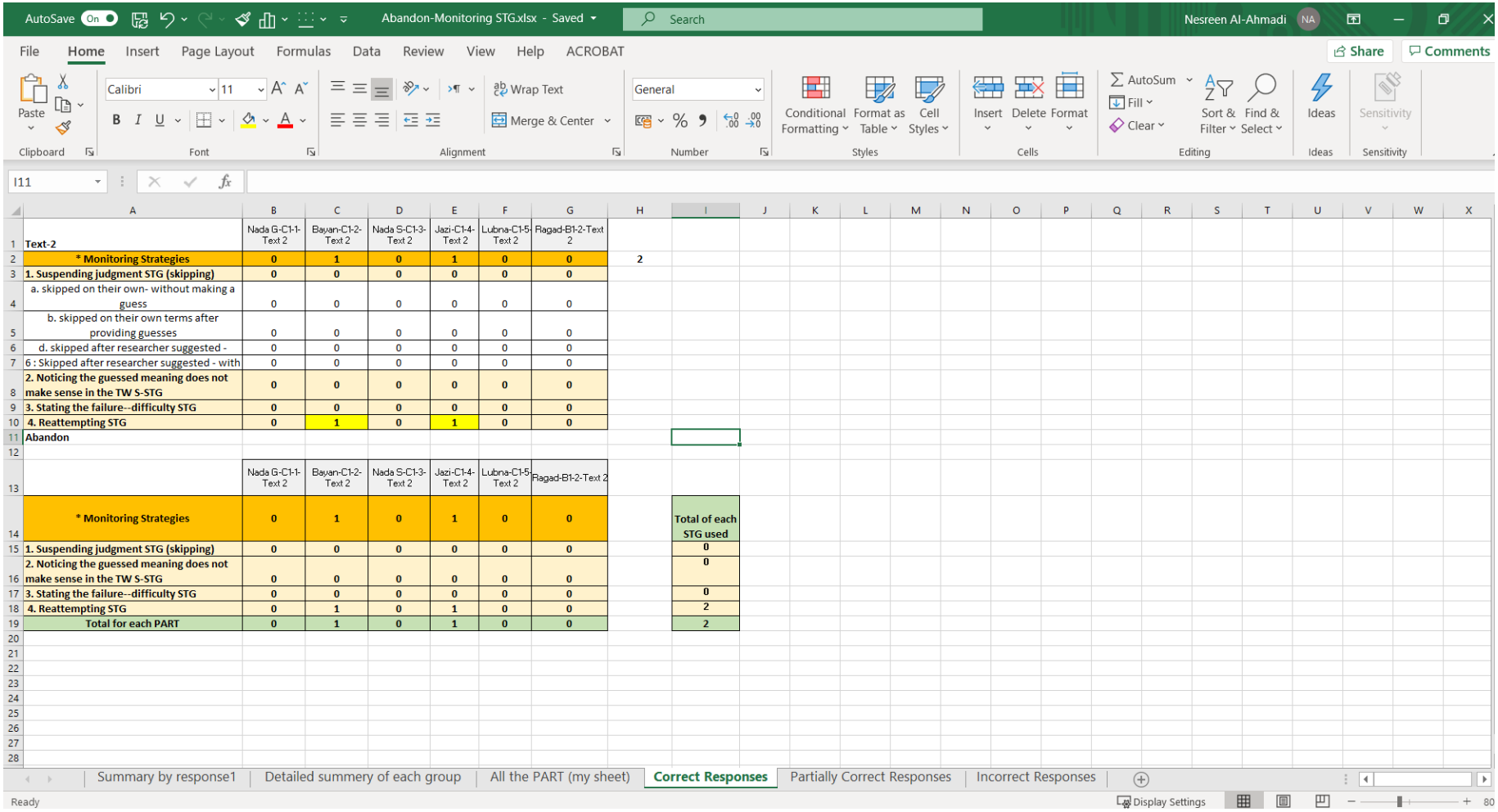
Appendix O Track of participants transcription, coding and analysis

			Texts						Interviews		
	PL	Student's Name	1. Eid Al-Fiter			2. Bonfire Night					
			Tran.	Coding	Ana.	Tran.	Coding	Ana.	Tran.	Coding	Ana.
1	C1-1										
2	C1-2										
3	C1-3										
4	C1-4										
5	C1-5										
6	B2-1										
7	B2-2										
8	B2-3										
9	B2-4										
10	B2-5										
11	B1-1										
12	B1-2										
13	B1-3										
14	B1-4										
15	B1-5										

Appendix P **A Sample of a Matrix Query in Nvivo**



Appendix Q **A Sample of Excel data**



	A	B	C	D	E	F	G	H	I
1	**Text-2**	Nada G-C1-1-Text 2	Bayan-C1-2-Text 2	Nada S-C1-3-Text 2	Jazi-C1-4-Text 2	Lubna-C1-5-Text 2	Ragad-B1-2-Text 2		
2	*** Monitoring Strategies**	**0**	**1**	**0**	**1**	**0**	**0**	**2**	
3	**1. Suspending judgment STG (skipping)**	**0**	**0**	**0**	**0**	**0**	**0**		
4	a. skipped on their own- without making a guess	0	0	0	0	0	0		
5	b. skipped on their own terms after providing guesses	0	0	0	0	0	0		
6	d. skipped after researcher suggested -	0	0	0	0	0	0		
7	6 : Skipped after researcher suggested - with	0	0	0	0	0	0		
8	**2. Noticing the guessed meaning does not make sense in the TW S-STG**	**0**	**0**	**0**	**0**	**0**	**0**		
9	**3. Stating the failure--difficulty STG**	**0**	**0**	**0**	**0**	**0**	**0**		
10	**4. Reattempting STG**	**0**	**1**	**0**	**1**	**0**	**0**		
11	**Abandon**								
12									
13		Nada G-C1-1-Text 2	Bayan-C1-2-Text 2	Nada S-C1-3-Text 2	Jazi-C1-4-Text 2	Lubna-C1-5-Text 2	Ragad-B1-2-Text 2		
14	*** Monitoring Strategies**	**0**	**1**	**0**	**1**	**0**	**0**		**Total of each STG used**
15	**1. Suspending judgment STG (skipping)**	**0**	**0**	**0**	**0**	**0**	**0**		**0**
16	**2. Noticing the guessed meaning does not make sense in the TW S-STG**	**0**	**0**	**0**	**0**	**0**	**0**		**0**
17	**3. Stating the failure--difficulty STG**	**0**	**0**	**0**	**0**	**0**	**0**		**0**
18	**4. Reattempting STG**	**0**	**1**	**0**	**1**	**0**	**0**		**2**
19	**Total for each PART**	**0**	**1**	**0**	**1**	**0**	**0**		**2**
20									
21									
22									
23									
24									
25									
26									
27									
28									

Appendix R **Participant Information Sheet**

Participant Information Sheet

Study Title: Content Schema: A Case Study of Lexical Inferencing Strategies by EFL Saudi Female University Learners during Reading

Researcher: Nesreen Al-Ahmadi **Ethics number**:18672

Please read this information carefully before deciding to take part in this research. If you are happy to participate, you will be asked to sign a consent form.

What is the research about?

My name is Nesreen Al-Ahmadi. I am a lecturer at King Abdul Aziz University in Jeddah and a PhD student. My research project is aimed at fulfilling an academic PhD qualification at the University of Southampton. The aim of the study is to investigate the reading strategies used by Saudi female EFL learners enrolled at the Department of English and European Languages and are currently registered in a reading class. This study aims at reporting at investigating the reading and lexical inferencing strategies by participants in terms of proficiency level, vocabulary size and type of text. The research is sponsored and funded by King Abdul Aziz University.

Why have I been chosen?

You have been chosen at random after having expressed your initial approval to participate in the study on my class visits to meet you. In that visit, I briefly introduced the research study and its procedures in one of your classes. After which, you showed an interest in participating in the study among others by writing your name and preferred contact method on an initial approval contact sheet. The final step was choosing random students from the previous stage then being contact by the researcher, asking once again if you would still like to be part in the study. Thus you have been chosen.

What will happen to me if I take part?

By participating in this study, you will take an online prolificacy placement test to assign you to one of the proficiency groups in the study. In addition to a vocabulary size level test. This is followed by a few training sessions on think-aloud procedures (on a picture sequence and a training text) given by the researcher. These will be followed by the actual think-alouds in which reading texts are provided to you to be conducted between 30-40 minutes.

These will be followed by stimulated recall interviews which last between 30 -45 minutes. All these sessions will be audio recorded. Finally, I will individually interview you and ask you more about the strategies you use when reading English texts. In order to understand more about your reading, I will also attend some of your reading class and also take some notes, too.

Are there any benefits in my taking part?

The benefits of participating in the study lay in the contribution you have made in investigating this phenomenon. The findings will contribute and add to current knowledge by understanding both reading and lexical inferencing strategies that EFL female Saudi university learners, like yourself, use during reading and the problems they encounter. Furthermore, it will help to see how these strategies are used at different levels of proficiency. This will help to find some solutions related to pedagogical and testing issues that will help future young learners and improve teaching English in Saudi universities.

Are there any risks involved?

There are minimal risks in this study, for example, if on a scheduled session, you do not feel well or tired. There is no need to worry, we can reschedule another session at your connivance. Another related issue related in the conducted sessions, if you feel that you need to take a break if you feel tried, please inform me and we will do so.

Will my participation be confidential?

Regarding the collected data, the researcher is in compliance with the Data Protection Act and University policy. All the data is stored on a password protected folder on a personal password protected laptop. In coding the data, participants are given pseudonyms and the true identity of the individual is only known to the researcher herself during the training, think-aloud and stimulated recall interview sessions.

I would like to draw your attention that in order to make the results of the study more reliable, some parts of the written transcribed data would be re-coded by another researcher. However, this data would have no clues or even pseudonyms that would identify you in any way.

What happens if I change my mind?

If for any reasons you would like to withdraw at any time, you have the right to do so without your legal rights being affected. I only ask that you would inform me if you decision to withdraw from the study.

What happens if something goes wrong?

In the unlikely case of concern or complaint, you should contact the Research Governance Manager by phone 02380 595058 or by e-mail at rgoinfo@soton.ac.uk

Where can I get more information?

If after reading this consent form, you have questions and would like more information. Please feel free to contact my supervisor at the university Sarah Rule at S.J.Rule@soton.ac.uk

Appendix S **Consent Form**

CONSENT FORM *(FACE TO FACE: V1)*

Study title: Content Schema: A Case Study of Lexical Inferencing Strategies by EFL Saudi Female University Learners during Reading

Researcher name: Nesreen Al-Ahmadi
Staff/Student number: 26436892
ERGO reference number: 18672

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet (insert date /version no. of participant information sheet) and have had the	☐
I agree to take part in this research project and agree for my data	☐
I understand my participation is voluntary and I may withdraw at	☐

Data Protection
I understand that information collected about me during my participation in this study will be stored on a password protected computer and that this information will only be used for the purpose of this study. All files containing any personal data will be made anonymous.

Name of participant (print name)……

Signature of participant……

Date……

Appendix T **Participants' availability timesheet**

		Weekly Available Hours					
	Student's Name	**Mobile Number**	**Sunday**	**Monday**	**Tuesday**	**Wednesday**	**Thursday**
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

Appendix U**Participants' session timing sheet**

	Availability						
Days	**8-9**	**9-10**	**10-11**	**11-12**	**12-1**	**1-2**	**2-3**
Sunday							
Monday							
		9.30 -10.50	**9.30 -11**				
Tuesday							
Wednesday							
		9.30 -10.50	**9.30 -11**				
Thursday							

Appendix V**Transcription Conventions**

Transcript conventions	**Meaning**
C1-1	Participants here are identified through their proficiency codes
R	Researcher
((**Bonds**))	The TWs in question is bolded between double brackets
<>	Participants' final answers are between angle brackets
<*X*>	Participants' final answers uttered in Arabic are translated into English and italicized between angle brackets
(A))	Utterances originally uttered in Arabic are indicated with a capital A between circular brackets both bolded, at the beginning of the utterance
maybe **(A)** (mofa9al) (detailed)	English utterances in which an Arabic word is used will be preceded by **(A)** followed by the Arabic word and its translation between singular circular brackets.
[ ]	learners hypotheses
[[ ]]	indicate parts of the text where participants directly read from the passages
(*writes down the meaning)	Descriptions of learners non-verbal behaviour indicated between barracks with an asterisk

Appendix W **Number of TWs and types of final answers used by participants**

	Eid Al-Fiter		Bonfire Night	
	Final Answer 1: without hypotheses	**Final Answer 2: with hypotheses**	**Final Answer 1: without hypotheses**	**Final Answer 2: with hypotheses**
Participants	**Number of TWs**		**Number of TWs**	
C1-1	6	2	6	2
C1-2	4	4	2	6
C1-3	6	2	6	2
C1-4	5	3	2	6
C1-5	4	4	7	1
B2-1	5	3	5	3
B2-2	6	2	6	2
B2-3	4	4	4	4
B2-4	6	2	5	3
B2-5	5	3	6	2
B1-1	7	1	7	1
B1-2	5	3	5	3
B1-3	5	3	6	2
B1-4	7	1	7	1
B1-5	6	2	6	2
Total	**81**	**39**	**80**	**40**

Appendix X **Percentages of successful inferencing by words**

Eid Al Fiter (Familiar Topic)				**Bonfire Night (Unfamiliar Topic)**			
Target Words	**word list**	**Number of correct guesses**	**%**	**Target Words**	**word list**	**Number of correct guesses**	**%**
bonds – ties (n.)	6	11	73.33%	Infer – deduce (v.)	7	8	53.33%
co-operative – collaborative (adj.)	6	9	60.00%	motive- impulse (n)	6	12	80.00%
induces - initiates (v.)	8	4	26.67%	successively – sequentially (adv.)	7	0	0.00%
insightful-shrewd (adj.)	9	1	6.67%	bulky – hefty (adj.)	9	6	40.00%
Innovate - initiate (v.)	7	13	86.67%	rational - valid (adj.)	6	3	20.00%
predominantly-substantially (adv.)	8	10	66.67%	abandon – desert (v.)	8	6	40.00%
devotion-fondness (n.)	9	3	20.00%	inevitably - inescapably (adv.)	8	10	66.67%
indefinitely - undeniably (adv.)	7	12	80.00%	controversies - debates (n.)	9	15	100.00%
Total: 120		**63**	**52.50%**	**Total: 120**		**60**	**50.00%**

Appendix Y **Summary of the major strategies used by groups with successful responses**

Text-1: Eid Al-Fiter

	Strategy Type	**Proficiency Level**			
		C1	B2	B1	**Total**
Cognitive Strategies	Meaning-Focused Strategies	34	28	21	83
	Form-Focused Strategies	28	15	16	59
	Total of Cognitive Strategies	**62**	**43**	**37**	**142**
Metacognitive Strategies	Monitoring Strategies	8	8	6	**22**
	Evaluating Strategies	16	12	8	**36**
	Total of Metacognitive Strategies	**24**	**20**	**14**	**58**

Text-2: Bonfire Night

	Strategy Type	**Proficiency Level**			
		C1	B2	B1	**Total**
Cognitive Strategies	Meaning-Focused Strategies	27	20	24	71
	Form-Focused Strategies	22	8	14	44
	Total of Cognitive Strategies	**49**	**28**	**38**	**115**
Metacognitive Strategies	Monitoring Strategies	16	6	3	**25**
	Evaluating Strategies	17	8	10	**35**
	Total of Metacognitive Strategies	**33**	**14**	**13**	**60**

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