University of Southampton

Faculty of Arts and Humanities

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An Investigation into the Effects of Processing Instruction on the Acquisition of Subject–Verb Agreement by Spanish-speaking Second Language Learners of English

by

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Thesis for the degree of Doctor of Philosophy (PhD) in Applied Linguistics

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Abstract

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Identifying what is difficult or easy to learn when learning a second language has received attention from researchers in the last decades. What seems to be of general agreement in this field of research is that certain language features are acquired faster and more accurately than other ones, due to a number of factors. A language feature that has been identified as problematic for L2 learners is English subject–verb agreement. Even the morpheme maker *-s* for subject–verb agreement is very frequent in the input, and it is subject of intensive instruction, its omission and overuse are very frequent in L2 learners.

The acquisition of morphology has been addressed by VanPatten's Input Processing model (IP), based on how linguistics and cognitive processing interact during language comprehension and asserts that L2 problems with morphology may be connected to the way learners distribute attentional resources when processing input. According to IP learners will be more readily to use content words to determine sentential meaning than grammatical morphemes. L2 learners thus tend to overlook the use of the *-s* to express singularity and rely on the noun phrase to derive meaning.

The current thesis presents a study investigating the effects of processing instruction, an input-based type of grammar instruction informed by IP, on the acquisition of English subject–verb agreement compared with traditional instruction. While to date, numerous studies on PI have been conducted on a variety language features and on different languages, little research has investigated its effects on agreement. A grammaticality judgement task, a sentence completion task, an oral and a written discourse production tasks were used to measure learners' gains after the interventions. The analysis of participants' results showed similar positive effects of both treatments. However, results of the PI group in the production tasks suggest that PI may be more beneficial than TI. Even learners were not asked to produce the target form at any moment during the PI treatment, the new knowledge acquired was also available for production which may suggest that PI was successful on altering the way learners processed subject–verb agreement which in turn produced a change in their L2 developing system.

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I 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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Definitions and Abbreviations

BH Bottleneck Hypothesis

FRH The Feature Reassemble Hypothesis

GJT Grammaticality Judgement Task

IP Input Processing

L1 First Language

L2 Second Language

MSH Missing Surface Inflection Hypothesis

PI Processing Instruction

SI Structured Input Activities

SLA Second Language Acquisition

SSH Shallow Structure Hypothesis

TI Traditional Instruction

UG Universal Grammar

Chapter 1 Introduction

There is sufficient evidence that second language acquisition (SLA) is a difficult process, at least compared with the acquisition of a first language (L1), and that there are some language features that seem to be more difficult to acquire than others (Dekeyser, 2005; Marsden, William and Liu, 2013). Identifying what is difficult or easy to learn when learning a second language (L2) has received attention from researchers in the last decades (e.g., Dekeyser, 2005; Housen and Simoens, 2016b; Slabakova, 2014). What seems to be of general agreement in this field of research is that certain language features are acquired faster and more accurately than other ones, due to a number of factors.

One of these factors is how cognitively complex a language feature is, that is to say, how demanding a given language feature is regarding mental resources and cognitive mechanisms required for processing and internalising the language form, which in turn is influenced by its intrinsic characteristics (Housen and Simoens, 2016a). The characteristics of a particular language form that make it more or less complex can be formal or functional (Dekeyser, 2005). L2 formal complexity refers to the structural elements in terms of number and nature of components (e.g., English *-ing* vs. *-s*), the number of positional variants of a feature (e.g., *-ing* has no allomorphs, whereas *-s* has three), or the number of operations needed to derive a target form from a base form (e.g., forming passive clauses from active structures). On the other hand, functional complexity (also conceptual or semantic complexity) refers to the number and nature of meaning or function of a particular language feature. Some meanings are conceptually more complex than others depending on how abstract, specific, or multi-layered they are (e.g., grammatical tense vs. grammatical aspect or grammatical vs. biological gender).

Another factor affecting difficulty of acquisition of a particular language feature, is how opaque or transparent a form is in the input. A form can be easy or difficult for L2 learners depending on the multiplicity and regularity of form–meaning mappings which in turns determine its transparency or opacity in the input (Dekeyser, 2005). Language forms with a one-to-one mapping (e.g., English comparative *-er* in adjectives meaning *more*) are more transparent and consequently easier than linguistic constructions with multiple mappings between form and meaning (e.g., the morpheme *-s* in English marks number agreement when it is added to a verb, if it is added to a noun, it marks plurality, if it is adjoined to a noun phrase it marks possession). Other elements that conspire to make form–meaning connections more or less transparent are optionality (e.g., null pronouns in Spanish) and communicative redundancy. For example, the morpheme *-s* for plural nouns in English is not redundant since the meaning it conveys (plurality)

is not expressed by any other feature in a sentence. On the contrary, the *-s* used in English third person singular is largely redundant because its meaning is also demonstrated by the presence of an overt subject in the sentence. In addition, the context in which input is given, instructional or naturalistic, is another factor that affects the form–meaning mapping process. It may be more challenging for learners to make opaque form–meaning connections in naturalistic contexts (e.g., immigrants immersed in a country where a L2 is spoken) than in instructional settings where input can be modified by pedagogical interventions and instructors can draw students' attention to the linguistic form and its function.

A language feature that has been identified as problematic for L2 learners is English subject–verb agreement (Haznedar, 2003; Ionin and Wexler, 2002; Jensen, Slabakova, Westergaard and Lundquist, 2020; Lardiere, 2007). Subject–verb agreement in English works in just the same way as in languages such as Spanish, where three persons and two numbers are distinguished, and agreement ensures that a verb has the same person and number as its subject. For this reason, L2 learners should not have problems applying a very simple syntactic rule of agreement: verbs agree with their subjects in person and number. English marks present tense verbs with the morpheme *-s* when the subject is 3rd person singular. At first glance, subject–verb agreement in English may seem a simple phenomenon. The agreement marker is not only frequent in English input, but also subject to intensive instruction from early stages in L2 classrooms; however, both under and overuse have been found in L2 acquisition (Hawkins and Casillas, 2008; Lardiere, 2009). Therefore, it seems that the learning task regarding subject–verb agreement is more complex than the application of its grammar rule. The processing and internalisation of subject–verb agreement involves a significant cognitive effort from the learners (i.e., identifying relationships between two or more elements in a sentence). With respect to formal complexity, the inflection *-s* as agreement marker, is rather opaque in the input since it can be linked to other functions (e.g., plurality). It is also redundant as the information that it carries is also expressed in the sentence subject. In addition, L2 learners' variability in the production of this inflection has been signalled as a frequent phenomenon (e.g., Ionin and Wexler, 2002; Slabakova, 2014).

A question that has been debated by many researchers with a generative perspective, is whether this variability in the use of tense and agreement morphology means that the functional categories of tense and agreement are somehow impaired in L2 grammar, or whether the functional categories are indeed present, with the lack of overt inflection attributable to some other cause (Ionin and Wexler, 2002). In this regard, it has been argued that omission of inflection is due to problems with the realization of surface morphology, rather than to feature impairment, in accordance with the Missing Surface Inflection Hypothesis of Prévost and White (2000).

Another theory that addresses L2 problems with morphology is the Bottleneck Hypothesis, which holds that functional morphology is the bottleneck and consequently, the most challenging part of L2 acquisition (Slabakova, 2008).

VanPatten's Input Processing model (IP) (VanPatten and Oikkenon, 1996; VanPatten, 2004; VanPatten and Williams, 2007) addresses the complexity of the learning task regarding morphology, based on how linguistics and cognitive processes interact during language comprehension. Even though it is not a theory that seeks to address inflectional problems but the internal mechanisms and strategies that learners use to process input in the L2, it identifies functional morphology as a language feature susceptible to being affected by the way learners distribute attentional resources when processing input.

IP describes a set of processing strategies (called principles) that learners use to process linguistic data in the input they are exposed to (VanPatten, 1996). The strategies that learners use to process functional morphemes may hinder or delay their acquisition. According to IP the acquisition of morphemes is affected by The Primacy of Meaning Principle. This principle states that learners process input for meaning before they process it for form (VanPatten, 2003) and that learners' focus of attention will be on content words that carry the most meaning of a sentence. Functional words such as inflections on verbs and nouns, may be ignored or partially processed and then dropped by working memory, since the processing resources are overloaded by the efforts needed to process content words (VanPatten, 2004b, p. 7). In addition, if a morpheme expresses the same meaning that can be encoded lexically L2 (redundancy) learners prefer to process lexical items instead of grammatical forms because their attentional resources are not enough to process both (Benati, Lee and Lee, 2007). Furthermore, the location that the morpheme *-s* has in an utterance, also influences its processing. According to the Sentence Location Principle, forms appearing in initial position are more salient than items located in final and medial position (such as the *-s* verbal morpheme) thus, learners would attend first to items in initial position. Therefore, morphemes placed in final and medial position are more difficult to process than those in initial position (Barcroft and VanPatten, 1997). The main consequence of these processing strategies is that form–meaning connections are not made, which causes delay in the acquisition of the formal properties of a target language such as functional morphology (Benati, 2013, p. 101).

Subject–verb agreement involves a dependency relationship at sentence level between the Noun Phrase (NP) and the main verb. The successful processing of this relationship implies that the subject noun has to be tracked and temporarily stored until the verb has been comprehended or produced (Pearlmutter, 2000; Kaan, 2002). Different studies related to this issue have

identified how the number of elements between the subject and the verb, as well as the properties of these, influence agreement processing. For example, Bock and Miller (1991) studied L2 learners' errors related to subject–verb agreement in sentences where the subject noun (or head noun) was separated from the verb by a phrase with another noun (called local noun, or attractor) that disagrees with the subject in number (e.g., *the key to the cabinets were lost*). They concluded that the closer plural noun misleads learners' comprehension of the actual subject to which the verb is referring. This explanation can be complemented, following the IP theory, by the Availability of Resources Principle which suggests that L2 learners cannot process and store the same amount of information as native speakers can, since their processing resources are limited (VanPatten, 2007). Simultaneously, comprehension of input is quite demanding in terms of cognitive effort of processing and working memory. Therefore, if learners struggle to comprehend the message of a sentence, they will not have any attentional resources left to keep track of the subject noun that the verb should agree with. Besides, comprehension and production of subject–verb agreement can also be affected by The First Noun Principle in sentences containing more than one noun phrase. This is the case of sentences with embedded clauses (i.e., relative clauses). The First Noun Principle states that learners tend to process the first noun or pronoun they encounter in a sentence as the subject or agent of it. In this regard, learners do not encounter any problem when listening or reading sentences with subject verb object (SVO) order to make correct syntax and meaning connections. However, in sentences with subordinated clauses such as *We have a software that teaches you how to speak Chinese*, following The First Noun Principle, the subject *we* is more prominent compared with the relative clause and the object *a software* therefore, learners may make the verb *teach* plural to agree with the subject *we* instead of its singular form to agree with the singular noun phrase *a software*. This strategy to process input may lead to misinterpretation of the meaning of a sentence and may delay learners' ability to map syntax structure accurately (Benati, 2013).

Understanding why subject–verb agreement is challenging for L2 learners leads us to examine its pedagogical implications and raises questions related to what can be done to facilitate its acquisition and correct use. Are difficult L2 features susceptible to instruction? What type of pedagogical intervention may be more suitable for dealing with problematic language forms as subject–verb agreement?

Contrary to the vast amount of research on the issue of why agreement is problematic, the role of explicit instruction in its acquisition has not been explored. The discussion on whether certain type of instruction may be more or less effective to help learners cope with difficult language features and facilitate its acquisition is still open and more research is needed.

Considering that most of the difficulties of subject–verb agreement are related to input processing and how learners make form–meaning connections, it seems that an input-based pedagogical intervention as Processing Instruction (PI), may have positive effects on learners' acquisition.

Processing Instruction (PI) is an instructional intervention based on VanPatten's model of input processing. Its primary objective is to facilitate the establishment of form–meaning connections that language learners may not typically make (Wong, 2004). PI is categorized as an input-driven form-focused instruction, focusing on intervening during the processing of language input by L2 learners, as opposed to output-based instruction. At the core of PI intervention are Structured Input (SI) activities. These activities prioritize learners' processing strategies, manipulating the input to steer them away from non-optimal strategies and push them to process the target form, for instance by removing non-target cues. For example, the design of a SI activity for improving the processing of the *-s* as agreement marker in English, as in the sentence *walking improves your mood* will require removing the sentence subject (i.e., walking). This encourages learners to avoid a lexical preference strategy and recognize the function of the verbal morpheme *-s* as the only cue to understand that the action expressed by the verb refers to a singular subject. SI activities are designed to cause failure in the interpretation of input, prompting learners to find alternative strategies for successful comprehension. As learners develop effective strategies, they can replace the ineffective ones (VanPatten, 2002).

In the present study, PI is compared to output-based instruction, specifically Traditional Instruction (TI). This comparison aims to provide support for the claims made by underlying theories regarding the role of instruction in second language acquisition (SLA) in general, and its impact on problematic L2 features such as subject–verb agreement in particular.

PI, as a form of input-based instruction, is aligned with views of SLA that propose a single knowledge store utilized for both comprehension and production and that develops as a result of processing input (Shintani, et.al. 3013). PI is based on VanPatten's (2007) perspective that input processing, defined as the establishment of form–meaning connections, leads to changes in the learner's internal grammar, which subsequently manifest in both receptive and productive tasks. This suggests that for acquisition to take place, learners need to overcome processing principles that define their attentional priorities and hinder their focus on specific grammatical features in

the input (Shintani, et.al. 2013). Therefore, the goal of instruction should be to direct learners' attention to overlooked features affected by processing constraints, thereby impacting their processing, and influencing their developing linguistic system. On the other hand, TI instruction can be associated with Skill-learning theory, which assumes that learners internalize grammar through a sequence of production-based activities. Examples of such activities include pattern drills, sentence transformation or translation exercises, where the focus is on manipulating learners' output to bring about changes in their developing system (Lee and Benati, 2009). Skill-learning theory also emphasizes that practice over time results in changes in the learner's knowledge system, particularly "in the basic cognitive mechanisms used to execute the same task" (DeKeyser, 2007, p. 99). In other words, input based-instruction contributes to knowledge available for comprehension tasks, while output-based instruction contributes to knowledge accessible during production tasks.

VanPatten and Cadierno (1993) conducted the first study on PI to compare its effectiveness with TI on the acquisition of Spanish object pronouns, a language feature influenced by The First Noun Principle. The study involved an interpretation task and a production task. The results indicated that the PI group showed improvement in both tasks, while the TI group only improved in the production task (VanPatten and Cadierno, 1993). These finding suggested that PI modified the way that the learners processed input, influencing their developing system and consequently the knowledge available during production (VanPatten and Cadierno, 1993; VanPatten, 2002; Wong, 2004). On the other hand, although TI improved the learners' production of the target feature, it did not change the way they processed the input and thus did not enhance their performance in the interpretation task (VanPatten and Cadierno, 1993); rather, the TI group simply "learned to do a task" (VanPatten, 2002, p. 771).

Since then, extensive research has been conducted on PI in comparison to output-based instruction, targeting various languages and grammatical aspects. PI has been examined in studies focusing on the English past tense *-ed* (Benati, 2005), English 3rd. person present tense *-s* (Bayrak and Soruç, 2017), French causative *faire* (VanPatten and Wong, 2004), Italian future tense (Benati, 2001), and Spanish *ser* vs. *estar* (Cheng, 2004), among others. The outcomes of such investigations have consistently supported the findings of VanPatten and Cadierno; PI has shown positive effects on both interpretation and production, while TI has primarily improved production. These findings suggest the generalizability of these conclusions to other languages and grammatical forms (Benati, 2005). However, the relative effects of PI on the acquisition of agreement have not been fully explored. In a meta-analysis of comparative studies on comprehension-based instruction and production-based grammar instruction (Shintani, Li and Ellis, 2013), twenty-one PI studies were included, but none of them focused on subject–verb

agreement as target language feature. Only one study examined gender agreement. Benati (2004) investigated the relative effects of PI, structured input activities and explicit information on the acquisition of gender agreement in Italian adjectives and observed beneficial effects of PI. Additionally, Henry (2022) studied the effects of PI on the acquisition of grammatical gender and gender-marked definite articles in German, with results indicating positive effects of PI.

Thus, while PI has demonstrated positive effects in various language forms, no empirical research has been conducted so far to investigate the relative effects of PI on English subject–verb agreement compared to TI. The present work will study local agreement of simple sentences and different sources of agreement errors such as distance between agreeing parts, agreement attraction and semantic vs. grammatical number of subjects. As previously discussed, functional morphology has been identified as a language feature that can be affected by IP principles (VanPatten, 2004); however, other features of agreement that may trigger L2 errors had not been addressed within an IP framework. This thesis aims to show that IP principles can also explain other sources of problems related to subject–verb agreement such as distance (e.g., when the subject and verb are separated by intervening words) and attraction (e.g., when the verb is influenced by a nearby noun phrase). Even though agreement problems due to distance and attraction have been thoroughly documented, none of the explanations provided are linked to pedagogical interventions.

Considering the above arguments, I hypothesise that a treatment such as PI that aims to alter learners' default processing strategies should benefit learners' acquisition of subject–verb agreement.

1.1 Research Questions

The present study seeks to contribute to the field of instructed second language acquisition and particularly to its effects on language features that are challenging for L2 learners, by investigating the extent to which an intervention directed to modify leaners' processing strategies as PI, contributes to learners' acquisition of English subject–verb agreement. To this end the study addresses the following research questions (RQs):

> RQ1. Does Processing Instruction bring about significant gains on learners' linguistic competence as measured by a grammaticality judgement task (GJT), compared with Traditional Instruction?

RQ2. Does Processing Instruction bring about significantly improved performance on learners' production of subject–verb agreement at sentence level, compared with Traditional Instruction?

RQ3. Does Processing Instruction bring about significantly improved performance on learners' production of subject-verb agreement at discourse level, compared with Traditional Instruction?

1.2 Structure of the Thesis

Having established the motivation and research problem of the present study in Chapter 1, Chapter 2 will set the study's background and present a review of relevant research. Chapter 3 will present the methodology and methods utilised in the study. Chapter 4 details the results for each of the outcome measures, both over time (pre-, post-, delayed post-test) and between groups (PI and TI). Finally, Chapter 5 presents a discussion of the findings of the study in relation to the research questions that the study sought to address, reviews the limitations of the study and its pedagogical implications.

Chapter 2 Background

2.1 Second Language Acquisition

The term *second language acquisition* (SLA) refers to the learning of any language, to any level with the only sharing condition is that it takes place at some point of an individual's life later than the acquisition of the first language. It includes languages that are not part of an individual's daily life communication such as foreign languages (e.g., languages used by immigrants) or a language different to the native one used in the learner's local context in certain areas (e.g., a language used for business) because it is believed that the underlying learning processes are essentially the same regardless purposes and circumstances (Mitchell and Myles, 2004, p. 5). It is also of interest of SLA research, all kinds of learning whether, planned, intentional and formal (as in educational settings) or informal or unstructured (as inherited languages). Different theories of SLA seek to account for the complexity of humans' ability to acquire a language within a variety of environments and conditions.

In trying to understand the process of SLA, researchers attempt to answer some basic questions: What exactly does the L2 learner come to know? How does the learner acquire this knowledge? Why are some learners more successful than others? (Saville-Troike, 2012, p. 2). How is that knowledge put to use? How is that knowledge implemented in the brain? How did that knowledge emerge in the species? (Slabakova, 2016). There is no simple answer to these questions and even there may be no one answer at all. Linguists have not reached an agreement yet, mainly because they come from different perspectives or disciplines and have addressed the problem from distinct angles, linguistic, psychological, and social. Linguists emphasize the characteristics of the differences and similarities in the target language. Psychologists and psycholinguists are concerned with the mental or cognitive processes involved in language learning, and the representation of language in the brain. Sociolinguists are interested in variability in learners' linguistic performance, language use or pragmatic competence.

Despite their diversity, all SLA theories claim that input plays a crucial role in second language learning. Input refers to meaningful samples of a target language that a language learner is exposed to in a meaningful context. Meaningful input is often referred to as primary linguistic data. Written or spoken, primary linguistic data contain examples or exemplars of various grammatical forms and other linguistic information that the learner attends to for meaning.

2.2 Input in SLA

Input is the primary factor in language acquisition. Although production may also play a significant role, language acquisition cannot occur without input, since it provides the linguistic information or data necessary for a learner's second language system to grow over time (Barcroft and Wong, 2013). To further illustrate, consider how the function of input has been characterized in various SLA perspectives. In a behaviourist perspective, input is crucial for acquisition since language learning is based on mimicking that input. SLA research moved away from the input-output based behaviourist framework in the 1960s and 1970s, recognizing that in the relation between input and output there was a significant amount of cognitive activity beyond the mere response to stimuli (Gass, 2010). Generative approaches to language acquisition (i.e., Universal Grammar) are concerned with attempting to explain how learners acquire all of the complexities of a language despite the absence of part of these complexities in the input (i.e., the poverty of the stimulus). This perspective on language learning is founded on the idea that "all human beings inherit a universal set of principles and parameters that control the shape human languages can take, and which are what makes human languages similar to one another" (Mitchell and Myles, 2004, p. 5). This theory has led SLA researchers to ask whether the L2 system might be based on a similar set of innate rules and if so, what implications this may have for acquiring a L2. Universal Grammar (UG) constrains what possible grammars can be learnt for L1 learners based on input. According to UG, language knowledge is symbolic and appears as an unconscious, abstract mental representation of language. This mental representation is a distinct faculty or mental organ, showing that language is unique from other types of cognition (White, 2004). According to UG, the interlanguage of a learner is determined by principles and parameters. Principles are general, universal rules for all languages, whereas parameters are language-specific characteristics that account for language and interlanguage variation. Input is a crucial UG component, as it enables the setting of parameters.

The provision of input becomes even more important from cognitive perspectives, since it is from this input (rather than innate language facilities) that learners can start to establish the necessary connections between the different items in input. For example, connectionism does not impute the learner with any innate knowledge; instead, the learner is like a human computer that processes and tallies linguistic information in the input (Gass and Selinker, 2008). From this processing and tallying, grammar emerges over time. Under this scenario, everything the learner needs is contained in the input data. Ellis (2007) explains that “as with other statistical estimations, a large and representative sample of language is required for the learner to abstract a rational model that is a good fit with the language data” (p. 88).

In the 1990s, VanPatten (1996) and Gass (1997) offered a more detailed examination of the interaction between input and other processes in SLA from an information processing perspective. The information processing model sees second language acquisition as the building up of automatized knowledge that can be retrieved at any moment for understanding of speaking. The evolution of language learning is closely dependent from the attentional resources that learners have available.

Segalowitz (2003) and others claim that learners at first have to pay attention to every aspect of language they try to understand or produce. According to information processing, there is a limit to the amount of focused mental activity that humans can be engaged in at one time. Learners at beginning stages will use more of their attention to understand the main words in a message. In that situation, they may not notice some grammatical features (e.g., morphemes) from input, especially if they do not affect meaning. Gradually, through experience and practice, more and more language that was unknown becomes easier to process and learners are able to access to it automatically.

Unquestionably, these SLA approaches are fundamentally distinct in terms of how they define language knowledge and how it is generated. Nonetheless, the purpose of this section is to demonstrate that diverse theoretical viewpoints on second language acquisition postulate a crucial function for input in language acquisition.

Although input is considered necessary for acquisition, it does not necessarily imply that input is sufficient for acquisition. Learners are exposed to vast amounts of input over time. The L2 learner might hear, see, or read hundreds of sentences in a given period of time, yet acquisition is slow. Input can only become part of the learners' developing system once there is some processing of language (Gass, 2010). Learners' internal processors filter input and only part of it goes into the developing system (VanPatten, 1996). The portion of input that learners process is usually referred to as intake, a term coined by Corder (1967)

Based on this understanding, much research has been conducted to examine the initial process of SLA where input is processed and how it is incorporated in learners' interlanguage system (Sharwood Smith, 1993; Carroll, 2001; VanPatten, 2002). Whereas input and input processing involve different components of language (phonology, morphology, syntax, discourse), the focus of the present work is input, and input processing related to the acquisition of L2 grammatical features.

2.3 The Input Processing Model

VanPatten's (1996, 2004, 2007) model of input processing is one of the important theoretical models that attempts to describe what learners are doing during comprehension (i.e., how they process input). According to VanPatten, “Input Processing (IP) is a model of moment-by-moment sentence processing during comprehension and how learners connect or don’t connect particular forms with particular meanings. It is a model of how learners derive the initial data from input for creating a linguistic system” (VanPatten, 2007, p. 116). Figure 2.1 illustrates where IP fits into an acquisition scheme (VanPatten, 2007, p. 117) .

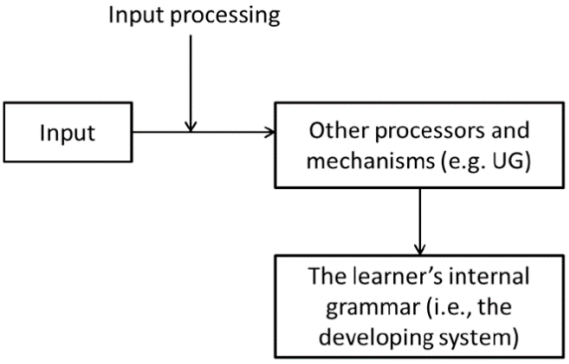

Figure 2.1 IP into an acquisition scheme

VanPatten (2015) defines the processing of input for language acquisition based on two crucial phenomena. One involves parsing, that is the computation of syntactic relationships in real time. The other one involves the correspondence between the formal properties of language and the meaning they encode, that is called making form–meaning connections.

In the parsing task, any word learners encounter must be assigned a category (e.g., noun, verb, adjective) which will determine the projection of its partial structure in the sentence. For example, if a noun phrase is encountered, the parser will project its relationship to other sentential phrases and will give the subject position to the phrase that it believes to be a sentential subject (VanPatten, 2015, p. 92). Parsing involves the moment-by-moment construction of sentence structure in real time. When a learner encounters something that is classified as a word, it must be assigned a category (noun, verb, determiner, etc.), and partial sentence structure is projected based on that categorization. When seeing a determiner, for instance, the parser will predict a determiner phrase, and a noun phrase will follow. If a noun phrase is found, the parser will project its relationship to other sentential phrases (e.g., it will be projected into the subject position if the parser determines that it is a subject) (VanPatten 2015).

Form–meaning connections are the link between the formal qualities of a language and the meaning they encode. Form refers to grammatical form (e.g., bound morphemes, prepositions, articles, and pronouns), whereas meaning refers to the semantic meaning that forms in a text communicate (VanPatten, 1996). The word *dog* is an example of a lexical form. It corresponds to the definition of dog (with the various connotations associated with it such as animate, four-legged, fur, carnivore, among others). In English, the verbal suffix *-ed* is a grammatical word that carries the sense of pastness. In English and other languages, the distinction between past and present is contained in the verb endings. Thus, form may be grammatical or lexical, but meaning relates to a real-world concept that is part of the learner's semantic component (VanPatten and Benati, 2010).

Establishing form–meaning connections is an essential component of second language acquisition. The majority of second language learners prioritise meaning when attempting to communicate. This often, but not always, means that lexical acquisition takes precedence over grammatical components of language acquisition. It has been proposed that the mechanisms involved in the acquisition of the semantic and formal components of words are distinct. According to N. Ellis (1994) , new lexical words' phonetic and phonological features are implicitly learned through repeated exposure. In contrast, word meanings are actively learned, requiring conscious processing at semantic and conceptual levels as well as careful attention to form–meaning relationships. However, establishing form–meaning relationships extends beyond lexical learning. Acquisition of significant subsystems in interlanguage grammars focuses almost completely on the link between forms, their meanings, and how the two are connected (VanPatten, Williams and Rott, 2004).

The nature of form–meaning connections, when it comes to syntax, may be less direct and can be redundant with some lexical items, context, or both in terms of the meaning it conveys (Barcroft and Wong, 2013). Syntactic and morphosyntactic forms have meanings, such as presentness, futureness, and direct object marking, to indicate who did what to whom, that may be challenging to acquire due to the redundancy of their meanings. Third person *-s* in English is an example; as English requires explicit subjects, this morpheme is redundant given the information provided by the subject.

The attentional constraints affecting the connection that the learner makes between form and meaning are the focus of IP. As explained by Harrington (2004, p.86) “the likelihood of this form–meaning connection being made is a function of the meaningfulness of the mapping”. Meaningfulness depends on the communicative value of the form in terms of its contribution to the comprehension of input (VanPatten, 2004a). Every content word has a meaning however,

certain forms contain meaning and some do not. In English, the third person singular *-s* conveys the semantic meaning another person who is neither the speaker nor the person talked to, but it also indicates subject–verb agreement between the noun and the verb. This last element of the form that corresponds to grammatical information does not carry semantic information; hence, it lacks communicative value, even if agreement helps to understand who is performing the action and what is being performed (VanPatten, 2004).

To undergo the processes of parsing and establishing form–meaning connections while having limited attentional resources, learners make use of a series of strategies which allow them to attend to input selectively (VanPatten, 1996). For example, L1 English speakers apply a word order strategy to identify the subject of a sentence (most utterances in English follow subject-verb-object order). However, if the same learners (L1 English) learning Spanish apply the same strategy to the L2, they may misunderstand sentences like *La invita el professor* (Her teacher is inviting her) because they may assign the subject role to *La* (she) since it is encountered initially in the sentence (VanPatten and Cadierno, 1993).

2.3.1 Principles of The Input Processing Model

VanPatten's IP model (VanPatten, 1996) is underpinned by the claims: (1) when exposed to input, learners are primary focused on the extraction of meaning; (2) learners must notice language features in the input for learning to happen; (3) noticing is constrained by limited resources of working memory regarding the amount of information that the learners are able to hold during real time computation and processing of sentences (VanPatten, 2004). Having these claims into account, VanPatten based his theory on a set of principles and sub-principles by which learners' attention is guided to linguistic forms in the input. In other words, a series of processing strategies used by L2 learners when they process linguistics data at input level.

2.3.1.1 Principle 1: The Primacy of Meaning Principle

The Primacy of Meaning Principle states that learners process input for meaning before they process it for form (VanPatten, 2004). Learners are driven to look for messages or communicative contents in the input. Although this also can be observed in any human interaction, for L2 learners this need to get meaning, combined with limited resources for processing input (i.e., attention, working memory) implies that some forms may not be processed for further acquisition (VanPatten, 2004, p.7).

Looking for meaning in the input entails that learners' focus of attention will be mainly on content words, those words that can help them understand what they heard or read. On the

other hand, functional words, such as inflections on verbs and nouns, may be neglected or only partially processed and then dropped by working memory, since the processing resources are overloaded by the effort needed to process content words (VanPatten, 2004, p. 7). The Primacy of Meaning Principle is subdivided into six sub-principles that explain the interaction between linguistics and cognitive processes during language comprehension (see table 2.1).

Table 2.1 Summary of The Primary of Meaning Principle (P1) and Sub-principles.

Principle 1	Sub-principles
The Primacy of Meaning Principle Learners process input for meaning before they process it for form.	P 1a. The Primacy of Content Words Principle: Learners process content words in the input before anything else (VanPatten, 2004, p. 117).
	P 1b. The Lexical Preference Principle: If grammatical forms express a meaning that can also be encoded lexically (redundancy), then learners will not initially process those grammatical forms until they have lexical forms to which they can match them (VanPatten, 2004, p. 118).
	P 1c. The Preference for Non-redundancy Principle: Learners are more likely to process non-redundant meaningful grammatical markers before they process redundant meaningful markers (VanPatten, 2004, p. 119).
	P 1d. The Meaning-Before-Non-meaning Principle: learners are more likely to process meaningful grammatical markers before non-meaningful grammatical markers (VanPatten 2004, p. 119).
	P 1e. The Availability of Resources Principle: For learners to process either redundant meaningful grammatical forms or non-meaningful forms, the processing of overall sentential meaning must not drain available processing resources (VanPatten 2004, p. 114).
	P 1f. The Sentence Location Principle: Learners tend to process items in sentence initial

	position before those in final position and those in medial position (VanPatten, 2004, p. 125).

2.3.1.1.1 Processing Principle 1a (P1a). The Primacy of Content Words Principle

The Primacy of Content Words sub-principle suggests that learners at first focus on content words to get meaning in a sentence (VanPatten, 2004). This preference is due to the fact that content words carry the most meaning and work as cues for extracting meaning from input. For example, in the sentence *the contract is saved in the file*, learners will first process the words *contract* and *file*. Findings from empirical studies have demonstrated L2 learners' preference for content words to build up comprehension of sentences. For example, VanPatten (1990) studied L2 learners of Spanish to explore whether they were able to attend consciously to form and meaning when processing input. His results showed that learners' conscious attention to form competed with conscious attention to meaning. Bernhardt (1998) found similar results when studying the processing strategies used by native inexperienced and non-native readers of German. Lee (1999) also found a preference for attending to content words when exploring strategies employed by L2 learners of Spanish in reading comprehension.

2.3.1.1.2 Processing Principle 1b (P1b). The lexical Preference Principle

The Lexical Preference Principle suggests that L2 learners prefer to process lexical items instead of grammatical forms, when both convey the same information. For example, in early stages of L2 acquisition, when learners encounter a sentence containing a grammar form that indicates past tense (i.e. *-ed* in English) and an adverb (i.e., *yesterday*), It is more likely that they pay attention and process the adverb over the morphological marker (VanPatten, 1996). According to VanPatten (2007), this happens because the lexical item is a free-standing unit which carries more meaning. Different studies have supported this principle providing evidence that the main factor influencing how learners assigned tense, was the presence or absence of lexical items (i.e., time adverbs) and not verbal morphology. Lee, Cadierno, Glass and VanPatten (1997) investigated how L2 learners of Spanish assigned tenses. One group of learners was exposed to a passage containing adverbs to signal tense while another group to a passage where tense was marked only with verb morphology. The group who listened to the passage with adverbs correctly, identified more temporal references than the group exposed to the passage with morphology. Similar findings were reported in Rossomondo's (2007), where she used a think-aloud procedure to investigate the role of lexical cues in the acquisition of the Spanish future tense, in a group of beginning-level university students of Spanish. She exposed learners to input containing lexical temporal indicators of future and to input without lexical indicators. She found that learners

seemed to rely on lexical items as cues to understand future meaning of the target morphological form.

In another study using online and offline procedures, VanPatten and Keating (2007) investigated whether L2 temporal reference processing is altered by L1 processing procedures, and if L2 learners may attain nativelike processing abilities. Native and non-native Spanish speakers were required to read Spanish sentences with an adverb that either matched or did not match the verb's inflection. Eye-tracking and comprehension questions revealed that beginning and intermediate Spanish learners used adverbs to resolve temporal conflicts, but advanced learners and native speakers relied on verb inflections. In the second section of the experiment, the researchers discovered that L1 English speakers relied on adverbs far more to resolve temporal conflicts in their L1. This conclusion implies that the beginner and intermediate learners in the first part of the experiment interpreted the Spanish sentences using a strategy from their L1 language. In the final phase of the experiment, data from Spanish L1 speakers studying English L2 revealed that beginning English learners also relied on adverbs and not verb inflections, indicating that no transfer occurred from Spanish. VanPatten and Keating came to the conclusions that the use of adverbs is a universal strategy (at least as a starting point) for processing temporal reference (supporting the Lexical Preference Principle), and that nativelike processing is attainable in adult SLA (at least for the type of processing they investigated).

2.3.1.1.3 Processing Principles 1c (P1c) and 1d (P1d). The Preference for Non-redundancy Principle and The Meaning-Before-Non-meaning Principle

These sub-principles are interconnected; therefore, they are discussed simultaneously. These principles suggest that L2 learners tend to process meaningful and non-redundant grammatical forms before anything else (VanPatten, 1996). How meaningful a form is, depends on its communicative value or contribution that it makes to the comprehension of an utterance compared with other linguistic elements co-occurring in the input. In VanPatten words “[..] it is the relative communicative value of a grammatical form that plays a major role in determining the learner’s attention to it during input processing and the likelihood of it becoming detected and thus part of intake’’ (2004, p. 14).

To determine the communicative value of a form, two criteria are considered: inherent referential meaning and semantic redundancy (Benati, 2013, p. 99). For example, adjective inflections *-o* and *-a* in Spanish are low in communicative value because they are redundant and lack inherent semantic value. In the phrase *la cartera negra* ‘the black purse’, the ending *-a* in the adjective *negra* is the gender marker. Besides signalling that the adjective is feminine, this form does not carry any other semantic meaning. Moreover, the same information is provided by the

other words in the sentence also ending in *-a* (i.e., *la* and *cartera*) which makes the inflection *-a* in the adjective, non-meaningful and redundant. Different studies support these sub-principles with findings that indicate that redundant and non-meaningful grammatical forms are processed later. Lee's (Lee, 1987) study on Spanish subjunctive form, demonstrated how L2 learners skip items with low communicative value during processing. Bransdorfer's (1989, 1992) research also investigated L2 learner's ability to process meaning and form simultaneously in the preposition *de* or the definite article *la* in Spanish.

2.3.1.1.4 Processing Principle 1e (P1c). The Availability of Resources Principle

The Availability of Resources Principle suggests that when processing resources are low, L2 learners will focus their attention on the part of the sentence that they consider most relevant. L2 learners cannot process and store in working memory the same amount of information as native speakers can, since their processing resources are limited (VanPatten, 2007, p. 116). At the same time, comprehension of input is quite demanding in terms of cognitive effort of processing and working memory. Therefore, if learners struggle to comprehend the message, they will not have any attentional resources left to pay attention to forms that have low communicative value. These forms will only be processed if learners do not struggle with understanding the meaning they receive. Therefore, understanding short sentences would be easier to process than long sentences or connected discourse (Benati, 2013). Wong's (2003) results in a study about input enhancement showed that L2 learners of French performed better when understanding sentence level input than discourse level input in tasks related to the target structure.

2.3.1.1.5 Processing Principle 1f (P1f). The Sentence Location Principle

The Sentence Location Principle relates to the impact that the specific location of a form in a sentence may have in how likely it is to be processed by the learner. In VanPatten's words (2004a, p. 13) "[..] elements that appear in certain positions of an utterance are more salient to learners than others, namely, sentence initial position is more salient than sentence final position that in turn is more salient than sentence internal or medial position". Therefore, The Sentence Location Principle suggests that it will be more challenging for L2 learners to process forms that are in middle or final position (Benati, 2013).

In sum, The Primacy of Meaning Principle, and its sub-principles in IP theory, claim that L2 learners process input for meaning first, and that they rely on words rather than forms to obtain meaning. When words and forms have the same meaning, learners will prefer words over forms, since their attentional resources are not enough to process both. In addition, L2 learners would attend to linguistic elements appearing at the beginning of sentences before the ones that are in

the middle and in the end. According to Benati (2013), the consequence for SLA is that these inefficient strategies interfere in the processing of grammatical forms and "form–meaning connections are not made which causes delay in the acquisition of the formal properties of a target language" (p. 101).

2.3.1.2 Principle 2. The First Noun Principle

The second processing principle posited by VanPatten (1996), states that learners tend to process the first noun or pronoun they encounter in a sentence as the subject or agent of it. According to this principle, learners do not encounter any problem when listening to or reading sentences with subject-verb-object (SVO) order to make correct syntax and meaning connections. However, in languages where object-verb (OV) and object-verb-subject (OVS) orders are frequent, this processing strategy may lead to misinterpretation of the meaning of the sentence and may delay learners' ability to accurately map syntax structure in the utterance (Benati, 2013). For example, the English passive construction does not have SVO order but OVS such in the sentence *Susan was kissed by Robin*. Learners might process *Susan* as the subject of the sentence and misunderstand it as it was *Susan* who kissed *Robin*. VanPatten points out the relevance of this principle for SLA stating that "this particular principle may have a variety of consequences in a variety of languages. It is not just that learners may get word order wrong, it is also that they may not process case markings for some time, will have difficulties with the pronoun system in some languages, and so on" (VanPatten, 2004, p. 16).

Research on this processing principle has provided evidence to support VanPatten's claim. González (1997) studied the acquisition of different word order in learners of Spanish and found that the pattern OSV was acquired first, and OVS was the last acquired. VanPatten and Wong (2004) explored The First Noun Principle in learners of French, a language that does not follow strict SVO, and concluded that utterances where the object precedes the subject were problematic for L2 learners. In VanPatten's IP theory, The First Noun Principle is the main processing strategy used by L2 when making grammatical relationships among sentence elements.

To summarize, IP is concerned with how learners process input during comprehension. VanPatten (2004) has taken the position that all learners, regardless their L1, possess a set of universal processing strategies they take to the task, and that it is not an L1 processor that attempts to compute sentence structure during comprehension. For example, one such processing strategy is that learners come to the task knowing that words exist and that there are ways to connect meaning with language. A consequence of this, according to IP, is that at the earliest stages, learners search for content lexical items to try to comprehend what they hear, and

they may skip function words and other small elements in the input. At the same time, they rely on what is called The First Noun Principle, which states that as long as there is no contextual or semantic evidence to the contrary, learners assume that the first noun or pronoun they encounter is the subject or agent of the sentence. What the model of IP predicts is that the input processors filter out data from the input and deliver structural information to the internal mechanisms that build representation (e.g., UG).

2.4 Processing Instruction

2.4.1 The Nature of Processing Instruction

Processing Instruction is an instructional intervention based on the model of input processing developed by VanPatten, whose main objective is to drive language learners to establish form–meaning connections that they would not normally make (Wong, 2004, p. 33). Making form–meaning connections means attending to the grammatical forms in the input so as to link the forms with their meanings or functions (Lee and Benati, 2009).

At the heart of PI treatments is the identification of the processing problem, which is a particular comprehension strategy (or set of strategies) that causes learners to under-process the targeted linguistic form (Wong, 2004). For example, consider the acquisition of English subject–verb agreement. In local agreement, the processing of the 3rd. person singular *-s* is affected by The Lexical Preference Principle, which states that "learners will tend to rely on lexical items rather than grammatical form to get meaning when both encode the same semantic information" (VanPatten, 2004b, p. 14). An example is the sentence *walking improves your mood*, where the *-s* in *improves* means singular, which is also expressed by the singular subject walking. Therefore, learners tend to overlook the verb ending because of its redundancy. Additionally, the placement of the agreement marker *-s* is another aspect that interferes according to the IP model. The *-s* comes in the middle of the phrase, which reduces its prominence according to The Sentence Location Principle, which states that "learners tend to process things in sentence beginning position before those in sentence final position and medial position" (VanPatten, 2004b, p. 125). Processing instruction is only useful insofar as it deliberately structures input to steer learners away from these less-than-optimal processing strategies.

In addition to the processing principles from VanPatten's IP model, the nature of language and what gets acquired are crucial to understanding processing instruction. Frequently, instructed L2 research focuses on rule acquisition. VanPatten argues against the traditional construction of rules (e.g., VanPatten, 2014; VanPatten and Rothman, 2014). From a generative viewpoint, it is

argued that rules such as *add -s to the verb for third person singular subjects in English* are not linguistically accurate representations of what exists in either the mind or brain of an L1 or L2 speaker. Rather, agreement in English is the product of a complex interaction between the lexicon (such as the underlying features encoded in English's primary verbs), feature checking connections, and syntactic computations. According to VanPatten and Rothman (2014, p. 25), learners do not acquire rules from the input. Learners instead internalise surface morpho-phonological components (e.g., lexical form, morphological form) combined with underlying characteristics or specifications. These units interact with information supplied by UG and the language-making mechanisms of the human language faculty in such a way that, over time, anything resembling rules (from an external perspective) emerges. Therefore, the goal of PI is not to internalise rules. Instead, PI is concerned with the processing of morpho-phonological components and phrases. The basic claim of PI is that it uses input to "change processing methods and improve acquisition intake" (VanPatten et al.,2013, pp. 507). In other words, PI claims to impact processing, which has an effect on the learner's developing linguistic system.

In a similar way, PI does not aim to raising learners' consciousness about linguistic forms but instead "enriching their subconscious intake" (VanPatten 1996, p. 85). Processing Instruction is not based on the notion of noticing; rather, its main concern is the mechanisms and conditions by which learners make connections between form and meaning. This takes place in the first stages of input processing, namely input perception and intake (VanPatten, 2004b). Perception and noticing are key elements in the first stage of the process; however, VanPatten points out that perceiving input and noticing are not equivalent in terms of form–meaning connections. Perception of input occurs before assigning meaning, and in many cases, something that is perceived gets deleted before assigning meaning. Noticing refers to any registration of the form but not necessarily to its connection with meaning. Therefore, PI is fundamentally different from other input-based interventions based on "noticing without consideration of whether or not learners actually link meaning with form or how they build sentence structure as part of parsing" (VanPatten 2015 p. 93) such as input enhancement.

In addition, to better understand the goal of PI, it is essential to distinguish between two concepts: underlying knowledge and skill development. The aim of PI is not to lead to communicative skill but rather to assists learners in the development of a mental representation of language (or underlying competence) that can later be used during the development of skill (VanPatten 2015, p. 100). According to VanPatten (2007), skill development is separate from the creation of an implicit linguistic system or mental representation of language. The mental representation of language refers to an unconscious system consisting of abstract properties of language, including all of the formal domains of language such as syntactic, lexical, phonological,

and morphological properties (VanPatten, 2010). It is implicit since speakers may be aware that they possess a mental representation of language, but they are not conscious of its content (VanPatten, 2016). For example, any speaker of English knows that *I went to the supermarket* is a perfectly fine affirmative sentence in English but *went to the supermarket I* is not. However, they may be unable to explain why one sentence is acceptable while the other is not, based on the abstract grammar principles underlying their judgement. This system requires input and certain internal mechanisms (i.e., UG) to develop (Benati and Schwieter, 2019), as well "as processors that mediate between input data and UG. Input processing is situated in the dimension of what processors do" (VanPatten 2016, p. 99).

On the other hand, skill refers to the accuracy and fluency with which a person can perform certain actions or behaviours (Anderson, 1982). Accuracy refers to how error-free a task is performed, while fluency refers to the speed and ease with which someone can perform the task. A highly skilled English language learner speaks quickly and effortlessly, with few non-native-like features, while a low skilled learner may struggle to find the right words or phrases, resulting in non-native-like speech (VanPatten 2016).

Anderson (2000) proposes that learners progress from explicit knowledge of something to procedural knowledge, and finally to automaticity through practice. DeKeyser (1998) suggests that to move from declarative to procedural knowledge, learners need to engage in activities that required them to use the language (output-based activities), which helps them in moving from "initial representation of knowledge to highly skilled behaviour" (DeKeyser and Criado, 2012, p. 1). However, when applying skill theory to language acquisition, there are two problems, as noted by Wong and VanPatten (2003). Firstly, in a classic skill theory scenario such as riding a bicycle, individuals do not practice specific movements in isolation. Instead, they learn to ride a bicycle by consistently using and adapting their movements in the context of actually riding the bike. Similarly, in language learning, learners do not acquire forms and structures to express meaning by first practicing them. Instead, they acquire them by consistently using them in communicative situations in which they are required. Secondly, skill theory suggests that learning a language is like learning tennis, typing, or chess, which only develops through transfer of appropriate behaviours and ignores that language learners bring to the task of acquisition certain mechanisms that are specific to language processing. Thus, speaking develops only through communicative acts of speaking (VanPatten, 2015). However, when it comes to the development of fluency and accuracy in language use, skill theory can provide insights. It is likely that learners must use language in communicative contexts to become fluent and accurate communicators, similar to how chess players need to play chess to improve their skills. Nevertheless, using language repeatedly in communicative contexts should not be equated to drilling or the construction of the

linguistic system itself. Instead, learners' production of language in communicative contexts depends on the already established linguistic system (Wong and VanPatten, 2003). In this regard, PI plays no role and should not be used as a pedagogical intervention intended to improve skill (VanPatten, 2015).

Skill acquisition theory sees input-based instruction and output-based instruction as having different roles, where the first one will only improve learners' comprehension skills, whereas output-based instruction will develop production skills (Ellis, 1999, p. 67). On the contrary, PI is not in direct opposition to skill theory, indeed they could be understood as complementary. One of the conclusions of VanPatten and Cadierno (1993) was that "Learners who receive instruction that attempts to alter input processing receive a double bonus; better processing of input and knowledge that is apparently also available for production" (p. 240). This does not mean that learners under PI, develop communicative output skills, instead instruction in processing input transfers to production (VanPatten, 2015).

2.4.2 Processing Instruction: A focus on Form Approach

Processing Instruction is considered an input-driven form-focused instruction since this approach focuses primarily on intervening when L2 learners process the language at input level. Although it is concerned with input comprehension, it differs from other techniques in that PI gives repeated opportunities for connecting the target grammatical form with its function in the input. It is a focus on form treatment as opposed to focus on forms. Focus on forms can be defined as any type of instruction that teaches one form at a time in isolation from context (Doughty and Williams, 1998). According to Lowen (2018) Presentation, Practice, Production (PPP) is a type of focus on forms instruction. Learners are initially presented with pedagogical principles or other explicit linguistic information in PPP. Then, students are guided through a series of practice exercises in which they use the target structures with increasing autonomy (Loewen, 2018).

Another focus on forms instruction is what VanPatten (2003) referred to as Traditional Instruction (TI). TI involves learning activities where, for instance, students repeat what the instructor says, translate a statement from the L1 to the L2, write sentences in a particular tense to demonstrate their ability to use it, compose phrases in response to specific prompts (e.g., *Where do you live? I live in London*). A common characteristic of these tasks is that learners are producing language for the sake of producing language. TI follows Paulston and Bratt´s (1976) sequence of grammar practice. They proposed that grammar-based practice should move from mechanical to meaningful to communicative exercises. They also emphasized the need of mechanical practice (pattern drills) in the internalisation of L2 rules and forms. Paulston's claim

agreed with the mainstream language learning theories of the 1950s and 1960s that had and emphasis on observable behaviour, habit formation, and instant feedback based on behaviourism (VanPatten, Smith and Benati, 2019). This approach for grammar instruction and practice can currently be found in many foreign language textbooks as well as coursebooks for teaching education (e.g., Harmer, 2007; Ur, 2012a). This model of focus on forms has been criticised by scholars (Long and Robinson 1998; Wong and VanPatten 2003), particularly on the grounds that L2 learners follow predictable sequences in certain L2 features, rather than acquiring discrete lexical or grammatical objects one at a time. Furthermore, SLA researchers (e.g., VanPatten, 1996; Krashen and Terrel, 1983) have questioned the over-reliance on this type of practice for assisting L2 learners in acquiring the target language. VanPatten (1996, p. 58) asserts that in this type of grammar instruction "the accommodation and restructuring of the developing system is seen to happen because of practice, not because of the exposure to language samples in the input". VanPatten argued that the emphasis on output practice of TI is inconsistent with the notion that input is the most important factor in the mental representation of L2 learners' grammar. Learners practice a form or structure, but they are not getting the input that is needed for their developing system. In contrast to TI, PI does not require learners to produce specific grammatical items; rather, learners are encouraged to focus on language features during tasks in which they hear or see language that expresses meaning. Thus, attention to input features becomes an intrinsic component of the process of acquiring grammar. Therefore, unlike TI, PI is consistent with the input-based nature of learning.

2.4.3 What Makes Processing Instruction Effective

PI is more efficient than other approaches to grammar teaching as its purpose is to modify the processing strategies that students apply to the task of comprehension and to encourage them to make better form–meaning connections than they would on their own (VanPatten, 1996). In order to achieve this goal, PI is built up around two key components: (1) explicit instruction (EI) and Structured Input (SI) activities, and its design is based on some particular features.

2.4.3.1 Components of Processing Instruction

The EI provided during PI consists of both information about the target grammatical feature as well as information about the related processing problem. Learners are given information regarding the characteristics of the grammatical feature in question, as well as appropriate pedagogical grammar rules (VanPatten, 1996; Wong, 2004). Grammatical information is typically presented in textbook-style descriptions of the targeted forms. It is essential to emphasize the meaning or function of grammatical features in target language sentences in order to draw

students' attention to form–meaning connections (VanPatten, 1996). The second aspect of the EI in PI is the additional information offered concerning possibly problematic processing strategies (VanPatten, 1996), which is unique to the PI treatment. Learners are given information on the processing strategy that can lead to inappropriate processing of the target grammatical feature (Wong, 2004). Usually, this is indicated in the form of a warning at the end of the EI.

The core of any PI intervention is the Structured Input (SI) activities and suggested to be the most significant component of the PI package (VanPatten and Oikkenon, 1996; Sanz and Morgan-Short, 2004). These activities are specifically designed to allow learners to actively engage with structured input. This input's nature and purpose can be summarized as follows:

> "Input that is manipulated in particular ways so that learners become dependent on form and structure to get meaning and/or to privilege the form or structure in the input so that learners have a better chance of attending to it (i.e., learners are pushed away from their natural processing tendencies toward more optimal tendencies)" (VanPatten, 2002, p. 765).

PI includes two types of structured input activities: referential activities and affective activities. Referential activities require that the learner pays close attention to the target grammatical form and its related function in order to correctly understand the phrase and reach the correct answer (in closed response format). They have a correct or incorrect answer, and learners are often given quick feedback (correct or incorrect) either during or soon following each referential task (VanPatten, 2004).

Affective activities, require learners to "express an opinion, belief, or some other affective response while engaged in processing knowledge about the real world" (Wong, 2004, p.42). Including affective activities in the PI package was part of an effort to connect PI with communicative language teaching, which frequently incorporates such activities in order to develop learner-centred instruction and a focus on meaning (VanPatten and Cadierno, 1993; VanPatten, 1996). In affective activities, learners must respond in some way to sentences containing the target form; but, unlike referential activities, attention to the target form–meaning connection is not necessary. Instead, the goal is to reinforce the target form by providing additional exposure within significant input (Wong, 2004). As a result, there are no right or wrong answers in affective tasks (VanPatten, 1996, 2002; Wong, 2004). Therefore, such activities do not ensure that the learner will attend to the target form–meaning connection when working on the task (Marsden, 2006).

Research on the components of PI has suggested that SI appears to be the most relevant and potentially sufficient component of PI. The effects of PI with and without the EI component

have been measured (e.g., VanPatten and Oikkenon, 1996; Benati, 2004; Farley, 2004; Wong, 2004; Fernández, 2008), and no significant difference was found in the effects of the PI treatment. For example, Marsden and Chen (2011) examined the relevance of affective activities in a study on the *-ed* past tense verb inflection. A total of one hundred and twenty Taiwanese learners of English were assigned to one of four different groups: referential activities plus affective activities, referential activities only, affective activities only, and control group. Results showed that the learning gains observed were due to referential activities, and that exposure to *-ed* inflection in the input during affective activities (i.e., without being forced to attend to its form or meaning) did not carry additional benefits for learning this form.

2.4.3.2 Design Features of Processing Instruction

In the design of SI activities learners' processing strategies should be considered first and foremost, as this is the characteristic that distinguishes them from other types of input-based activities. The key to this is identifying the processing problem and structuring input so that learners are driven away from non-optimal processing strategies and forced to process the target form. This is done by manipulating the input in such a way that non-target cues are removed from it. In the example of English subject-verb agreement given earlier (*walking improves your mood*), this would mean that the subject (e.g., walking) should be removed to avoid a lexical preference strategy and direct learners to recognize the function of the verbal morpheme *-s*. It is the only cue helpful to understand that the action expressed by the verb refers to a singular subject and not to a plural subject. In this way SI activities are designed to cause failure in the interpretation of input so that learners note that they must find alternative strategies for successful comprehension. As learners develop successful strategies, they can replace the ineffective ones with new, more effective ones (VanPatten, 2002 p. 768).

Since SI activities aim to enhance opportunities for learners to improve their ability to make form–meaning connections, and not just noticing the form for itself, effective SI activities must encourage L2 learners to pay attention to the referential meaning of the input they receive in order to complete the task. In other words, the successful completion of the task requires learners to rely on form to derive meaning. If this condition is achieved, learners will be pushed to link individual forms with their meaning effectively since the activities show their function clearly. In addition, keeping meaning in focus, implies that SI activities should require learners to do something with the input they are processing and must show this by responding to the input in some way (e.g., learners may be asked to state agreement or disagreement, choose alternatives or match sentences with pictures) (VanPatten, 1996). This response should be followed by feedback to let learners know whether they correctly processed the sentence. Without this

feedback, learners might not realise that their preferred processing strategy led to an incorrect interpretation, and they would be less likely process the target form for meaning (Henry, 2015).

Another important design feature of SI activities related to meaning is their focus on one linguistic feature at a time. Unlike traditional instruction that overwhelms learners with information and rules, SI activities break down paradigms and rules into smaller parts and learners are asked to attend to one of them when processing the input. Therefore, PI acknowledges that L2 learners have limited processing capacity. Presenting one thing at a time will enhance the opportunities for learners to map one form to one meaning (Lee and Benati, 2009, p. 43), as Wong (2004) points out “when there is less to pay attention to, it is easier to pay attention" (p.38). This is a relevant difference with traditional grammar instruction. Whereas traditional materials may present an entire grammatical paradigm at once (e.g., verb agreement with singular and plural subjects in English), PI focuses on only one specific aspect of the paradigm (e.g., the *-s* as agreement marker for 3rd. person singular only).

Another defining characteristic of SI activities is that they should progress from isolated sentences to connected discourse. The rationale for this goes back to the fact that L2 learners have limited capacity to process input. Learners are more likely to attend to the meaning of target forms when they are presented in short sentences (Wong, 2004). Later as learners become familiar with the relevant form–meaning connections and effective processing strategies they should be gradually introduced to connected discourse (Lee and Benati, 2009).

In addition to these design components, SI activities should also take into account learners’ individual differences. SI activities should combine both aural and written input, as some learners may respond differently to one mode of input than the other. Some researchers posit that when presented through the oral mode, cognitive burden is placed on the learners' working memory, resulting in competition for attentional resources between meaning and form (Ito and Wong, 2018; Wong, 2001). Additionally, Haghani (2020) examined how two groups of learners with different learning styles allocate their attention to form and content when exposed to distinct input modalities (aural and written). Her findings revealed that due to constraints imposed on the learners' working memory, aural input would drain more of learners’ attentional resources, and simultaneous attention to form and meaning was more cumbersome for both groups. On the other hand, written input may reduce the demands on processing resources and help learners process the input at their own pace and review sections as many times as needed.

To summarize, PI is an input-driven form-focused instructional approach based on VanPatten's input processing model that aims to help language learners establish connections between form and meaning. It focuses on inefficient strategies that hinder learners from fully processing targeted linguistic forms. Unlike traditional rule-based approaches, PI does not aim to internalize rules but instead it focuses on the processing of morpho-phonological components and phrases. PI provides repeated opportunities for learners to connect target grammatical forms with their functions in the input. PI distinguishes between underlying knowledge and skill development emphasizing the importance of building a linguistic system through input and internal mechanisms. It is based on two main components: explicit instruction (EI) and structured input (SI) activities. The EI provides learners with information about the target grammatical feature and the related processing problem. SI activities are considered the most relevant element of PI. Effective SI activities require learners to rely on form to derive meaning. They incorporate six design features that include manipulating the input to guide learners away from default inefficient processing strategies, focus on one targeted linguistic feature at a time, progress from isolated sentences to connected discourse, and combining aural and written input.

2.5 Research on the effectiveness of PI

2.5.1 Processing Instruction Compared to Output-based Instruction.

Extensive research has been conducted on PI in comparison to output-based instruction, specially to traditional instruction. Initially, this comparison was mainly driven by the fact that TI was the dominant approach to grammar instruction during VanPatten and Cadierno's (1993) original study. However, comparing the effectiveness of these two instructional approaches is interesting and valuable endeavour for a number of reasons. A relevant one is that PI and TI differ in their emphasis on form–meaning connections and explicit rule presentation. Notably, TI does not address any specific processing problem or non-optimal input processing strategies that may hinder language acquisition (VanPatten, Farmer and Clardy, 2008). In TI, the underlying assumption is that learners internalise grammar through a sequence of production-based activities, therefore the focus of instruction is on the manipulation of the learners' output to produce changes in their developing system (Lee and Benati, 2009). Therefore, the results from empirical research showing the effects of one or the other shed light on the potential benefits and limitations of each approach and provides insights into their impact on learners' language development.

Initially, the work of VanPatten and Cadierno (1993) aimed to answer the following research questions: "Does altering the way in which learners process input have an effect on their

developmental systems? If there is an effect, is it limited solely to processing more input or does instruction in IP also have an effect on output? If there is an effect, is it the same effect that TI has (assuming an effect for the latter)?" (VanPatten and Cadierno, 1993, p. 20). The target grammatical feature of the study was object pronouns in Spanish, the processing problem related was The First Noun Principle. The PI group in the study was given explicit information about the target feature and related processing problem and was required to complete SI activities such as the following:

"Listen as your instructor reads a sentence. Select the best interpretation from the English renderings.

a. My parents call me b. I call my parents

(Instructor reads aloud: Me llaman los padres)" (VanPatten and Cadierno, 1993, p. 231)

In comparison, the TI group was given only explicit information about the target feature and then had to complete production drills ranging from mechanical to meaningful. There was also a control group that did not receive any guidance regarding the target feature. All three completed sentence level interpretation and production tasks during the pretest and posttest. The learners were asked to match the statement to one of two images in the interpretation task:

[picture: boy greeting girl] [picture: girl greeting boy]

Al chico lo saluda la chica.

"The girl greets the boy." (VanPatten and Cadierno, 1993, p. 232)

The production task was a sentence completion task as the following:

[picture: boy thinking about a girl] [picture: boy phoning girl]

El chico piensa en la chica y entonces_____ .

"The boy is thinking about the girl and then he calls her".

(VanPatten and Cadierno, 1993, p. 233)

According to VanPatten and Cadierno (1993), the PI group improved on both tasks, whereas the TI group only showed gains on the production task. Based on these findings, it was hypothesized that PI altered the way learners processed input, which in turn influenced their developing system and hence the knowledge available during production (VanPatten and Cadierno, 1993; VanPatten, 2002; Wong, 2004). However, while TI improved the learners'

production of the target feature, it did not change the way they processed the input and thus did not improve their performance on the interpretation task (VanPatten and Cadierno, 1993); rather, the TI group simply "learned to do a task" (VanPatten, 2002, p. 771).

Further work on PI has showed a similar pattern of results for other structures with different processing problems. Cadierno (1995) conducted a partial replication of the previous study on the effects of PI in terms of the design and general aims but now addressing a different processing problem, the Lexical Preference Principle on the Spanish preterit tense. The pretests and posttests consisted of an interpretation and a sentence production task. The participants were sixty English native speakers enrolled in an intermediate Spanish course at undergraduate level. The findings showed that the group who received PI outperformed the TI group and the control group in the interpretation task and that both groups showed equivalent gains in the production task. These findings were in line with VanPatten and Cadierno (1993) and provided evidence that PI was effective on a different language feature and processing problem.

Since then, numerous empirical studies have been conducted using various languages, targeting a variety of different grammatical aspects. PI has been tested for the English past tense -*ed* (Benati, 2005), French causative *faire* (VanPatten and Wong, 2004), Italian future tense (Benati, 2001), and Spanish *ser* vs. *estar* (Cheng, 2004), among others. The outcomes of such investigations were consistent with those of VanPatten and Cadierno; PI enhanced both interpretation and production, but TI only improved production. These findings have been interpreted as evidence of the generalizability of such conclusions to other languages and grammatical forms (Benati, 2005).

Despite a large database indicating the superiority of PI, there have been concerns as to whether similar outcomes can be observed when PI is compared to a more meaning-output-based approach to grammar instruction. It was argued that the reported positive effects for PI may be related to the fact that it is entirely meaning-based, whereas the TI used was not (Farley, 2004). Consequently, Processing Instruction was compared to a different output-based instruction named Meaning-based Output Instruction (MOI). This approach employs activities with a meaningful context, and the target forms are produced not for the solitary purpose of practicing the target item, but rather to convey opinions, beliefs, or other information related to a particular topic.

Farley (2001a, 2001b) compared PI to MOI on the acquisition of the Spanish subjunctive in two consecutive studies. This feature is affected by the Sentence Location Principle. In his first study, twenty-nine subjects enrolled in a fourth semester Spanish course divided into two groups received PI and MOI each one. Participants' performance was measured by an interpretation and

a production task with a pretest and two posttests. Results indicated that PI learners' gains were superior to MOI for interpretation and equivalent to MOI for production. In his second study Farley used a larger sample, one hundred and twenty-nine undergraduates were assigned to either a PI group or a MOI group. Both groups were assessed with an interpretation and a production task. Results differed from the first study, no significant differences were found between PI and MOI on either the interpretation or production task.

Benati (2005) compared the effects of PI, MOI and TI on the acquisition of English past simple (affected by the Lexical Preference Principle) measured by an interpretation task and a written production task. He conducted two studies one with Chinese (47 subjects) and another one with Greek school-age learners (30 subjects) of English living in their respective countries. The participants in both schools were divided into three groups and received PI, MOI or TI treatment. One interpretation and one production measure were used in a pre- and posttest design. The results were very consistent in both studies, it was observed equivalent improvement of the three groups on the production task while in the interpretation task, only the PI showed significant gains. Even if PI did not outperform the TI and MOI, these results support the findings of previous research on Processing Instruction, which demonstrated that the PI group made comparable gains from the pre-test to the post-test in production tasks compared to the two output groups. This indicates that PI has an effect not only on how learners interpret sentences, but also on how they produce sentences. The research findings highlight that PI has impacted the way in which students process input. This, in turn, has had an effect on their developing system and subsequently impacted what the subjects could access for production.

Different results were found in Morgan-Short and Bowden (2006). They studied 45 Spanish students in their first semester that were divided into three groups: PI, MOI, and a control group. The PI and MOI groups improved equally on the interpretation task, and the MOI group outperformed the PI group on the production test. The authors suggested that the communicative nature of MOI may have resulted in the learners producing extra incidental input for one another, similar to that of the structured input activities in PI, thereby accounting for the observed equivalent benefits (Morgan-Short and Bowden, 2006).

Lee and Benati (2007) provided additional support for the efficacy of PI in comparison to MOI. In a parallel study, they compared the effects of these two instructional treatments on the acquisition of the Italian subjunctive of doubt and opinion and the French subjunctive of doubt (Sentence Location Principle, as in Farley's studies). The findings support the results of the vast majority of studies examining the effects of PI, which indicate that PI brings about more gains than MOI. On the other hand, they differ from Farley's (2001b), and of Morgan-Short and

Bowden's (2006) where MOI equivalent gains were observed in both treatments. According to Lee and Benati (2007a) the difference may have been due to the way the treatments were delivered and how this may have favoured the appearance of incidental input. In this study, the treatments were delivered via computer terminals, thus the participants did not receive any incidental structured input, in contrast to the studies conducted by Farley (Farley 2001a, 2001b) and Morgan-Short and Bowden (2006).

Nonetheless, it is important to highlight that a number of studies have obtained results that differ from those reported above. DeKeyser and Sokalski (1996) discovered that their PI group outperformed their TI group on the comprehension task at posttest in their replication of VanPatten and Cadierno's study, while the opposite pattern was found for the production tasks. Similarly, Allen (2000) discovered equal gains for the PI and TI groups on the comprehension task, but the TI group outscored the PI group on the production task in their study with the French causative. VanPatten suggested that the observed discrepancies in results are attributable to the way PI has been operationalised in studies such as those conducted by DeKeyser and Sokalski (1996) and Allen (2000). It has been suggested that the instructional treatment used in those experiments did not match the criteria for structured input activities, since a processing problem was not established or attention to the relevant form–meaning connection was not made task essential (VanPatten, 2002; Wong, 2004).

In another context, studies on the relative effects of PI and some complex grammar forms have produced inconsistent findings. Collentine (1998) studied PI in adjectival clauses using the subjunctive. He discovered that both experimental groups (PI and TI) performed significantly better than a control group on both types of tasks, but that neither experimental group did significantly better than the other. Collentine's tasks and activities, on the other hand, have been criticised for failing to maintain treatment fidelity to PI (Farley, 2002). Russell (2012), who examined PI with the Spanish subjunctive, concluded that her findings only partially support the findings of previous studies comparing PI and TI and lend support to Collentine's (1998) results, that both PI and TI are equally effective for the acquisition of the Spanish subjunctive for both interpretation and production tasks.

2.5.2 Durability of Processing Instruction Effects

The durability of PI effects has been demonstrated in several studies. For example, Benati (2001;2004) and Cheng (2002, 2004) observed lasting effects three weeks after training. Toth (2006) found positive effects of PI twenty-four days after the intervention while VanPatten and Cadierno (1993) and Cadierno (1995) found sustained effects of PI one month after training.

Additional studies, such as and VanPatten and Fernandez (2004), have also shown positive effects of PI over extended periods. In a replication of VanPatten and Cadierno (1993), participants completed a delayed posttest eight months after training. Although not all gains were maintained, participants still exhibited significant improvements in both comprehension and production compared to the pretest. Marsden (2006) compared PI to Enhanced Input on French present and perfect tense verb inflections. She found that the effects of PI were maintained over a period of three and a half months, in the five measures she used (reading, listening, writing, speaking at sentence level, and speaking at discourse level) with a group of twenty-seven 13-14-year-old secondary students. In addition, Benati and Batziou (2019) employed discourse-level interpretation and production tasks to evaluate effects of PI on the acquisition of the English causative form. The study contrasted: structured input (SI), structured output (SO), and a combination of SI and SO (SI+SO). Findings showed that both SI and SI+SO interventions were more effective than SO alone. In addition, the gains observed in the SI and SI+SO groups were maintained even six months later. While only few studies have documented the long-term effects of PI (more than four weeks), a substantial body of research has consistently demonstrated its durable effects. These findings strongly support that PI is an effective instructional approach, not only in the immediate term but also in both the short and long term.

2.5.3 Processing Instruction and Online Measures

As mentioned in the previous sections, PI is a pedagogical intervention designed to modify the processing strategies employed by L2 learners during real-time. However, despite the emphasis on real-time comprehension, the majority of research evidence supporting the positive effects of PI and structured input have mainly come from offline tasks which do not provide an accurately measure of moment-by-moment processing. The use of online methods enables access to more detailed information and analysis regarding moment-by-moment sentence comprehension, providing a means to better measure implicit knowledge (Benati, 2020). Studies in PI have employed various types of online measures, including self-pace reading, eye-tracking, and reaction time measures.

Chiucchiu and Benati (2020) conducted a study to investigate the effects of SI and textual enhancement on the acquisition of the Italian subjunctive of doubt using a self-paced reading task. This language feature is affected by a combination of processing principles: non-meaningfulness, redundancy, and location. The focus of the study was to measure sensibility to violations and accuracy in sentence interpretation containing the target language feature. The participants of the study, eighteen Chinese (L1) learning Italian in a private school, were randomly assigned to a SI group and to a textual enhancement group. The results indicated that higher

sensitivity to violations was only observed in the SI group. This group also showed better results when comparing pretest to posttest in the ability to process and comprehend sentences containing subjunctive forms during real-time.

In another study also using a self-pace reading test, Benati 2022 compared the effects of SI and structured output (SO) on the acquisition of English passive construction forms by measuring accuracy of response. Fifty-three Chinese university level students (19 -21 years old) enrolled in an English language course at UK were the subjects of this investigation. Participants divided in two groups, received either SI input instruction or SO instruction. Following PI material design guidelines, the SI activities were developed to push participants to get meaning only based on the target linguistic form instead of relying on the default processing strategy (The First Noun Principle). The SO treatment contained activities that encourage learners to produce the target form. Their main characteristics were that participants had to interact exchanging unknown information and use the target form in the production of meaningful sentences. The treatments lasted for two hours over two days. The analysis of results of participants' reaction time in picture selection and reading time of target forms, showed that the SI group outperformed the SO group.

In the field of online measures for PI, a line of research has utilized eye-tracking. Eye tracking allows measuring the location and duration of eye gazes while speech unfold, this can reveal how learners allocate visual attention during language processing. Studies within this research line have mainly focused on language features whose processing is affected by the First Noun Principle, such as causative structure and passive constructions.

In the first study using eye-tracking in PI, Wong and Ito (2017) compared changes in processing patters between SI and TI on the acquisition of the French causative. The study adopted a pre- post design and employed a dichotomous scene selection eye-tracking task to assess both eye-movement patterns and accuracy in picture selection during the processing of auditory sentences. They also examined the role that explicit information (EI) could play in the accuracy of picture selection and processing of the target form. The participants were sixty-four L2 French learners enrolled in a college-level course. The study involved two experiments, with the main distinction being the presence or absence of explicit information provided prior to sentence processing. The results demonstrated that participants in the SI group outperformed the TI group, exhibiting higher accuracy scores in both experiments. Additionally, a change in eye movement patterns was observed among learners who received SI training, while no changes were observed in those who received TI training.

In a similar study, Benati (2020) used eye tracking to compare SI and TI on the acquisition of English passive forms. The participants of this study were fifty-two adult Chinese adults (aged 19-

21 years) who were enrolled in an intermediate English course in the UK. Findings indicated that SI training positively affected the eye movement patterns of learners. The PI group achieved significantly higher accuracy scores compared to the TI group. Moreover, Benati (2021) replicated his previous study but now comparing the effects of SI with meaning-based output instruction on the acquisition of Italian passive constructions. The eye-tracking task results once again revealed that the SI group had substantially higher accuracy scores than the meaning-output based instruction group. Recently Benati (2022) conducted a study aimed to investigate whether SI or TI resulted on difference in accuracy in language processing, focusing on the English causative form. Additionally, the study examined whether these effects were accompanied by changes in eye-movement patters. The results were in line with previous reported positive effects of SI. The results were in line with previous reported positive effects of SI.

Having reviewed some research on eye-tracking in the field of online measures for PI, I now turn my attention to a study that investigated the effects of PI on the acquisition of agreement using reaction time which is relevant for the present work. Henry (2022) used reaction time to investigate the effects of PI on the acquisition of agreement, specifically gender-marked definite articles and gender-marked pronouns for clothing-related vocabulary in German. The study addressed the challenges German learners face with gender assignment, which involves identifying the correct gender (masculine, feminine, or neuter) for nouns. Learners tend to prioritise animacy over gender when using pronouns, leading to the frequent attribution of the neuter pronoun *es* to inanimate objects regardless of their actual gender. The study analysed reaction times during sentence comprehension to determine if PI promotes online processing of generic information and thereby helps learners avoid inefficient processing strategies (Primacy of Content Words, Preference for Non-redundancy, and Preference for Meaning-before-Non-meaning Principles). Offline measures were also utilised, including a gender selection and translation task, a sentence production task, a comprehension task, and a pronoun matching task. The study compared the effectiveness of PI, TI and Categorization/Memorization (CM). The participants were sixty-eight L1 English adults enrolled in a beginning German course at a university in USA. The results of the comprehension task, which required accurate processing of gender-marked pronouns, showed that the PI group scored higher and responded faster than the TI and CM groups, indicating their more effective processing of gender-marked pronouns. Moreover, the gender selection and gender production measures revealed that PI outperformed the TI and the CM groups in the posttest. However, it should be noted that gains made by the PI group were not sustained, as no significant differences were found among the treatments in the delayed posttest. Regarding pronoun use, the results of the sentence production task did not show better results in the PI group as all three groups exhibited similar rates of improvement.

The findings of the pronoun matching task were considered inconclusive since the PI and the TI were at ceiling at pretest. This study's findings demonstrate the efficacy of PI in promoting accurate gender assignment and pronoun use as measured through online and offline tests. However, it is important to note the temporary nature of the gains achieved by the PI group, suggesting the need for further investigation into long-term effects.

In conclusion, the positive effects of PI or SI on a variety of online measures, such as eye-tracking, self-paced reading, and reaction times, provide compelling evidence of PI's capacity to influence how learners process specific language features and modify their processing strategies for the target form. Notably, eye-tracking studies have revealed that SI training consistently produces significant and meaningful changes in the participants' eye-movement patterns.

2.5.4 Research Measuring Discourse Effects of Processing Instruction

The majority of PI research (Benati, 2001, 2004, 2005; Farley, 2004; VanPatten and Wong, 2004) has relied on sentence-level interpretation and production tasks. Similarly, Norris and Ortega (2000) discovered in their meta-analysis that the majority of the grammar instruction studies examined (90%) used controlled production tasks (e.g., gap-fill, sentence transformation), which required learners to produce short segments of the target language. Because they involve the production of the target feature within a highly regulated linguistic environment, such measures are likely to promote the application of explicit rather than implicit knowledge.

The use of discourse-level tasks is regarded as a more valid and reliable way to assess learner's implicit language knowledge (R. Ellis, 2009; Marsden and Chen, 2011). Discourse-level tasks are more challenging than sentence-level tasks since they require learners to construct language across sentence boundaries addressing issues of cohesion and coherence. They must focus on what they want to express, rather than focusing on producing one single form (Benati, Lee and McNulty, 2010). Positive effects of PI are notable since learners in PI treatment only perform SI activities that do not require them to produce the target form. However, after the intervention, learners can produce the target language feature, indicating that processing the form creates grammaticality richer intake for the developing system. Once the form is in the developing system, learners can access it for production (Benati, Lee and McNulty, 2010, p. 125). This is referred to as The Discourse Hypothesis, which suggests that PI leads to significant improvement on discourse-level tasks (Benati and Lee, 2008:173). While PI has demonstrated its effectiveness in improving learners' performance on sentence-level interpretation and production tasks, only few studies have shown that PI can have a positive effect on discourse-level interpretation and production tasks.

Different studies have demonstrated the effectiveness of PI on discourse-level interpretation tasks. For example, Benati and Lee (2010) measured the effects of PI using discourse-level interpretation tasks with a group of 29 primary school-aged students. Following a pretest/posttest design, PI and traditional Instruction (TI) were compared. They found evidence that PI on the English past tense improved learners' performance on interpretation tasks at both the sentence and discourse levels. Additionally, Benati, Lee, and Hikima (2010) found that PI on Japanese passive constructions enhanced performance on two different discourse-level interpretation tasks (listening to a story and listening to a dialogue followed by a guided recall task). In a more recent study, Benati (2015) investigated the effects of re-exposure and discourse-level PI on the acquisition of Japanese passive construction. He addressed the question of whether learners could maintain their ability to interpret and produce the target linguistic feature at sentence-level and at discourse level if they are re-exposed to the PI treatment. He examined the performance of 55 native speakers of English learning Japanese as part of their second-year undergraduate degree in a University in the United Kingdom. The subjects were divided into three groups: PI group, PI re-exposure, and control group. A pretest, post-test and delayed post-tests procedure was followed. Three different tests were developed: two sentence-level tasks, interpretation, and production; and one discourse-level task (a dialogue). The results of the sentence-level tests showed that there was a significant difference between PI groups' performance and the control group. The data collected through the discourse assessment task indicated that the PI groups improved their ability to interpret Japanese passive form, while the control group showed no gains.

Regarding production, various studies such as, VanPatten and Sanz (1995); Sanz (2004), Cheng (2002, 2004); Benati, Lee and McNulty (2010) and Benati and Batziou (2019); have reported significant improvements for learners after receiving PI.

VanPatten and Sanz (1995) found significant effects of PI on direct object pronouns in Spanish at both the sentence and discourse levels. The participants of the study were forty-four university students studying Spanish in their third semester. A design with a pre- and post-test was adopted. The effects of instruction were assessed using three different production tasks presented in two modes: sentence-level production, a structured question-and-answer interview, and a video-based narration task. In the third task, learners were required to view a two-minute video and then either report orally or produce a written account of what they saw. The results of the statistical analysis showed that the PI group improved significantly on the written mode but not on the oral mode on the sentence-level task and the video-narration task. In a subsequent study on Spanish object pronouns, Sanz (2004) investigated the role of feedback in PI as measured by sentence level and discourse level tasks. At the discourse task, she asked learners to view a

video and retell its content. After completing the SI activities, learners demonstrated significant gains on the video retelling task.

Cheng (2002) reported significant effects of PI on Spanish copular verb choice at both the sentence and discourse levels. At the discourse level, she used a guided composition. The participants of the study were eighty-three subjects studying fourth semester Spanish at the undergraduate level. They were assigned to a PI group; a TI group; and a control group. Cheng used three types of tests: sentence-level interpretation; sentence-level production; and a guided written composition to measure discourse production. Learners were asked to write a composition describing a series of images using twelve key adjectives provided with the pictures. The results showed that PI had better effects on learners' interpretation at sentence level than the control group. No significant difference was found between PI and TI scores. In the sentence production tasks and in the guided composition task, both PI and TI groups performed equally well. Cheng (2004) further analysed the results of the guided composition task in order to identify the rate at which learners employed the copular verb *estar.* She found that both PI and TI produced the target form more frequently than the control group. Again, she found significant PI effects on both sentence- and discourse-level tasks. She observed in both studies that the effects of PI on discourse-level tasks were both immediate and long-lasting (three weeks after the intervention). Findings of this study are in line with VanPatten and Sanz (1995) indicating that the effects of PI are measurable at the discourse-level.

Benati, Lee and McNulty (2010) investigated the effects of PI on learners' performance of a discourse-level guided composition with the Spanish subjunctive after the adverb *cuando*. Participants (n= 36) were enrolled in the 7th. Semester of an intermediate level Spanish class at a university. To elicit the production of the target form in the composition tasks, learners were given a perspective (their future and their best friend's future) and options (circumstances and outcomes). Results of the composition tasks showed positive effects of PI on learners' production of the subjunctive forms after the adverb *cuando*.

Another study which supported the positive effects of PI on discourse-level interpretation and production tasks is Benati and Batziou (2019). Benati and Batziou (2019) assessed the short-term and long-term effects of PI on the acquisition of the English causative form using discourse-level interpretation (listen to a story) and production task (text re-construction). Through a pretest and posttest design, they compared structured input (SI) only, structured output (SO) only, and a combination of SI and structured output (SI+SO). Sixty-eight participants, native speakers of Greek, aged 10-12, who were enrolled in an intermediate English course were randomly assigned to three groups. The study found that SI and SI+SO treatments were more

effective than SO only in interpreting and producing the target form embedded in discourse in both short-term and long-term measures. Gains found for SI and SI+SO groups were maintained even after six months of no further instruction or practice.

The main findings of these studies offer evidence that PI is effective in less controlled, discourse-oriented tasks, going beyond sentence-level production. It is crucial to emphasise that discourse-level production tasks in the field of PI should not be used as a skill measure; rather, their primary purpose is to assess whether L2 learners can access newly developed knowledge. In this regard, the reviewed studies strongly support the notion that modifying learners' processing strategies brings about a change in their underlying knowledge, which becomes accessible for use in production.

To summarise. To date, dozens of studies have been conducted on a variety of elements and issues, all of which leads to compelling evidence of the beneficial impacts of PI. Most of those studies have shown that PI outperformed output-based instruction at interpretation tasks and have had equivalent results in production tasks, which has been confirmed by online measures. PI durable effects have also been supported by a number of studies, however it is still a field that could be further explored, since few studies report long-term effects (four weeks after intervention). In this regard, the present study can add relevant evidence since the effects of the treatments were measured after six weeks. One of the most interesting results of research on PI are learners' gains at production tasks. The fact that an intervention that does not aim to develop skill (speaking or writing) enable learners to improve the production of the target forms, indicates that the modification of learners' processing strategies do produce changes in their underlying linguistic systems, and that this knowledge is available for production (VanPatten, 2007). Even though research have moved from production at sentence level to discourse level, it is still something that should be further studied, the effects of PI in more spontaneous tasks as the speaking and writing tasks included in the present study.

2.6 SLA and Difficult Language Features

In SLA, the issue of learning difficulty has been framed in (at least) two ways: in terms of linguistic or structural complexity and in terms of cognitive complexity (Housen and Simoens, 2016a). Linguistic or structural complexity is determined by the properties of a linguistic feature or subsystem and can be operationalized by considering the level of markedness, number of transformations, and/or typological distance from the first language (Spada and Tomita, 2010). The concept of cognitive complexity, on the other hand, is consistent with the assumption that domain-general processing mechanisms apply to all aspects of cognition, including language.

Cognitive complexity, often known as learning difficulty, can refer to both explicit and implicit knowledge and learning (Dekeyser, 2005; Ellis, 2006). Learning difficulty in the context of explicit knowledge is determined by the attributes of the metalinguistic proposition (i.e., pedagogical grammar rules) used to define and explain the form, function, and application of linguistic aspects. In the context of implicit knowledge, learning difficulty refers to the characteristics of the language features that are available in the input. For example, pedagogical grammar rules can differ in terms of scope and validity, or they can apply to more or less archetypical uses of a language form (Graaff and Housen, 2009). Similarly, the grammar form described may differ in terms of perceptual salience or communicative redundancy (Graaff and Housen, 2009).

Housen and Simoens (2016b) define SLA difficulty as cognitive complexity. Cognitive complexity refers to how demanding a given language feature is in terms of mental resources and cognitive mechanisms required for processing and internalizing the feature (Bulté and Housen, 2012), which involves the synergistic influence of L2 target feature characteristics, learning conditions, and the individual learner. For most language learners, the intrinsic properties of particular language features are more cognitively taxing. These features can be both formal and functional (DeKeyser, 2016). L2 formal complexity relates to the quantity and nature of structural elements (e.g., English *-ing* vs. *-s*) or the number of positional versions of a characteristic (e.g., *-ing* has no allomorphs, whereas *-s* has three). Functional complexity (also known as conceptual or semantic complexity) refers to the number and nature of meanings or functions associated with a specific linguistic component. Some meanings are more conceptually complex than others based on how abstract, particular, or multi-layered they are (e.g., grammatical tense vs. grammatical aspect or grammatical gender vs. biological gender). According to this definition, agreement is a complex language feature for L2 learners. Agreement is the result of the relationship of a number of sentence-level elements (e.g., noun, verb, morphology), which implies a series of operations required to track and temporarily store in working memory the subject noun until the verb has been understood or produced (Pearlmutter, 2000; Kaan, 2002). Its processing and internalisation require a significant cognitive effort from learners. Furthermore, in terms of functional complexity, the morpheme *-s*, which is employed as a marker for subject–verb agreement in English, has two additional functions: if it is attached to a noun, it denotes plurality, and if it is adjoined to a noun phrase, it marks possession (e.g., genitive), which increase its difficulty.

Another aspect that determines how difficult or easy a L2 feature is relates to input qualities and form–meaning relationships. The input that students are exposed to has forms and functions that are mapped onto one another (DeKeyser, 2005). The variety and regularity of form–meaning mappings, which determine a form's transparency or opacity in the input,

influence whether a form is easy or challenging for L2 learners. As a result, language forms with a one-to-one mapping (for example, English comparative *-er* in adjectives meaning *more*) are more transparent and thus easier to understand than linguistic formulations with many mappings between form and meaning (e.g., the morpheme *-s* as explained before). Optionality (e.g., null pronouns in Spanish and Italian) and communicative redundancy are two more factors that contribute to the transparency of form–meaning links. The plural *-s*, for example, is not redundant since the meaning it provides (plurality) is not represented by any other component in a phrase, whereas the English 3sg *-s* is mostly redundant because its meaning is also indicated by the sentence's subject.

The environment in which input is provided, whether instructional or naturalistic, influences how difficult it is for SL learners to make form–meaning mappings (or form–meaning connections). In naturalistic environments (e.g., immigrants immersed in a country where L2 is spoken), learners may find it more difficult to make opaque form–meaning mappings than in instructional settings where input can be adjusted by pedagogical interventions to aid form–meaning mapping.

One of the approaches to teaching grammar whose aim is to help learners to make form–meaning connections is PI. In PI, input is manipulated, and activities are designed to push learners to attend to form to get meaning and, in this way, help them to make form–meaning connections. PI has repeatedly been shown to work well with certain language features that can be considered complex for L2 learners (e.g., morphemes, gender agreement, word order) but there is not much empirical data regarding its effects on subject–verb agreement.

2.7 Why English Subject–Verb Agreement is Problematic for L2 Learners

English marks present tense verbs with the morpheme *-s* when the subject is 3rd person singular. At first glance, subject–verb agreement in English may seem a simple phenomenon. The agreement marker is not only frequent in English, but it is also subject to intensive instruction from early stage in L2 classrooms, however, both under and overuse have been found in L2 acquisition. For example, in Stauble's (1984) cross-sectional case study on the acquisition of English by adult native speakers of Spanish and Japanese, even the advanced learners had very significant difficulties (the Japanese speakers producing the *-s* suffix correctly less than 20% of the time). Along similar lines, Lardiere (1998) reported that even after 18 years in the United States, her Chinese-speaking subject Patty tended to omit the inflectional morpheme *-s*, despite having mastered many other language features, including pronominal case, negation, and the order of

adverbs and verbs. Therefore, it seems that the learning task regarding subject–verb agreement is more complex than the application of its grammar rule. Its comprehension and production involve different processes that can explain why this language feature is challenging for L2 learners. It is of interest of the present work to focus on two aspects of subject–verb agreement in English that may delay or interfere with its acquisition, the nature of the functional morpheme *-s* that marks agreement in English and the complexity in agreement processing.

2.7.1 Functional Morphology and SLA

SL researchers have been particularly interested in explaining why functional morphology arises naturally in the development of children's native language whereas morpheme production is varied in L2 learners. They exhibit long periods of variation in which they omit or substitute inflectional morphology (Gogolin, 2011). According to Pienemann (2005), because this morpheme is the last structure in learners' natural developmental stages, learners will not acquire it until they master the elements that are at an earlier level. Factors that may explain why grammatical morphemes are acquired in the observed order are of different nature, for example, the frequency with which they occur in input, the cognitive complexity of the meaning they convey, and the relative difficulty of perceiving or pronouncing them. However, there is no sufficient explanation that accounts for the order of acquisition observed, and most researchers agree that the order is governed by an interaction of several diverse factors.

Within the generative SLA paradigm, researchers have differing perspectives on the eventual attainment of morphosyntax. Representational deficit approaches (.e.g., Hawkins and Hattori, 2006) assert that adult learners' difficulty processing L2 morphosyntax is due to L1–L2 disparities arguing that L2 grammars lack of abstract syntactic components necessary for processing agreement relations. Therefore, adult L2 learners cannot acquire grammatical features of functional categories (e.g., tense, gender, number) unless these features are present in the L1 (Hawkins and Casillas, 2008).

Problems with morphological agreement, according to the representational deficit viewpoint, are caused by missing or deficient syntactic characteristics that activate it. As a result, L2 learners' morphological errors reveal underlying syntactic issues (Hawkins and Casillas, 2008). Hawkins and Liszka's (2003) study lends support to this claim, they analysed advanced L2 English speakers from various L1 backgrounds, Chinese, Japanese, and German speakers, to see if they employ the correct inflection for past tense and if their understanding allowed them to appropriately inflect verbs they had never encountered before. The authors assessed this by observing learners' spontaneous oral production in an anecdote and a film retell task. The results

revealed that Chinese learners performed significantly differently than Japanese and German speakers, producing less inflected verbs for the past tense (*-ed* morpheme). They concluded that performance pressure was unlikely to be the source of variation in verb marking for simple past tense, because the same performance would be expected in all three groups. They suggested that Chinese speakers struggle with English past tense form since it is not present in their L1 (Hawkins and Liszka, 2003, p. 41). One criticism levelled at this study was that the researchers provided no explanation for Chinese learners' understanding of other features such as nominal subject or overt topic when compared to German and Japanese learners' knowledge (Slabakova, 2016, p. 187).

Hawkins and Franceschina's study is another noteworthy work that supports this approach (2004). They compared L1 and L2 gender agreement acquisition in French and Spanish. They distinguished between interpretable and uninterpretable elements. A sentence's subject pronoun conveys information such as gender and number; these properties are interpretable because they are required to understand the phrase. Alternatively, the features on the verb that indicate agreement with the subject do not add to the content of the phrase, they are referred to as uninterpretable (Slabakova, 2016, p. 183). According to Hawkins and Franceschina (2004), uninterpretable qualities emerge later in L1 learning and are not represented in the language system of L2 learners. L2 learners go through a stage in which uninterpretable characteristics are not part of their representation, and they will not be able to establish them in the L2 beyond childhood. In another study, Liszka (2004, 2005) investigated the acquisition of English present perfect by advanced L2 English learners from China, Germany, and Japan. She discovered variations in the prevalence of non-present perfect forms in present perfect contexts. Japanese students varied between using the past simple (55%) and using the present simple (38%); Chinese students alternated between using the past simple and using the present; and Germans favoured using the past simple and overusing the present simple. She attributed the learners' deficiency to their linguistic background. Liszka and Roberts (2013, p. 418) support the deficit view in their study with advanced French and German learners of English (L2) about their sensitivity to tense–aspect mismatches in temporal adverbial and the succeeding inflected verb. Based on a comparison of learners' performance and the presence or absence of the target feature in their L1, their findings revealed that learners' L1 affected the processing of tense–aspect violations in L2 English.

Computational (or accessibility) approaches take a different position. L2 learners have no trouble learning syntactic aspects; the problem is transferring abstract features to the matching surface morphology (Lardiere, 1998, 2000). Prévost and White (2000) named this the Missing Surface Inflection Hypothesis (MSIH). In essence, L2 learners gain syntactic structure early, but

morphological learning is simply lacking or delayed. The syntax and morphology are broken in such a way that the morphology may be absent, but only on the surface (Prevost and White, 2000, p. 129). According to Lardiere (2000), when learners are able to detect correspondences between syntactic features and overt inflectional morphology, the mapping problem that they experience will be gradually solved.

Lardiere (2000) and Ionin and Wexler (2002) provide evidence in support of the MSIH. Lardiere conducted a longitudinal case study with an adult immigrant English learner. Patty, a Chinese American, had learned English as an adult under reasonably favourable circumstances. She had lived in the United States for over eighteen years, was well educated, having earned a bachelor's and Master's degree from U.S. universities, and held a managing position in a U.S. corporation. Despite her achievement in L2 language learning, she still used non-nativelike grammatical constructions in her speech. Patty tended to omit inflectional morphemes such as past -ed and 3sg -s in contexts where such morphemes are obligatory among English native speakers, while she used sentential subjects, pronominal cases, auxiliary verbs and copula be forms in native-like ways. According to Lardiere (2000), this implies that if there is no syntactic impairment in L2 grammar, the absence of agreement morphology is attributable to a mapping difficulty between abstract properties and surface morphological forms. Haznedar (2001) discovered similar evidence for missing inflections while reviewing longitudinal data from a Turkish child L2 English learner. The subject of this study exhibited deficient inflectional morphology (third person singular -s and regular and irregular past tense forms) in early stages of L2 acquisition; however, there was evidence of the acquisition of elements such as copula be and auxiliary be, as well as overt and non-nominative subjects, indicating that the lack of some functional elements does not imply the absence of others (Haznedar, 2001:21). Ionin and Wexler (2002) investigated the absence of verbal inflections in spontaneous speech production of L1 Russian children learning English as a second language. They concluded that functional categories existed in learners' grammar, based on the finding that deleting inflection nearly never resulted in improper tense–agreement morphology. Tense is present in L2 grammar, and it is highlighted by forms of the auxiliary verb be. They excluded children's L1 as the primary reason for the low usage of inflections because the Russian language lacks an overt copula in the present tense and has no be auxiliary in any tense except the compound future tense (Lonin and Wexler, 2002, p. 108). Their findings corroborate the Missing Surface Inflection Hypothesis.

The Feature Reassemble Hypothesis (FRH), proposed by Lardiere (2008), defines the L2 learning task as the construction or reassembly of the target L2 formal features. According to the FRH, this reassembly occurs via two processes: (1) the mapping process, which involves linking forms to correct grammatical meanings, mapping forms to possible different grammatical

features, and recognizing grammatical contexts for the morpheme occurrence; all based on perceived similarities between the meanings that the L1 and L2 items express; and (2) the restructuring process. More specifically, the learner must acquire not only knowledge of syntactic and semantic morphological features, but also knowledge of conditional factors that may be phonological, pragmatic, or discourse-related, as well as the conditions that determine which forms are obligatory, optional, or prohibited.

Even very proficient L2 learners with native-like command of the language must retrieve the correct morphological form in the appropriate grammatical context. This mechanism is inefficient, resulting in arduous and slow processing. Slabakova (2016, p. 395) exemplifies this by stating that if learners had efficient lexical access to the *-s* verbal morpheme, they would have no difficulty producing it because it is only used for third person singular in present tense, yet its omission is a highly common error in learner's interlanguage. Slabakova's Bottleneck Hypothesis (BH) is a contemporary explanation of morphological variability that is consistent with the ideas of the mapping problem viewpoint. The BH contends that functional morphemes and their properties are the bottleneck of L2 acquisition (Slabakova, 2013b, 2014). According to the BH, functional morphology is one of the most difficult features for L2 learners, because it "bundles a range of semantic, syntactic, and phonological characteristics that affect the meaning and acceptability of the entire sentence" (Slabakova, 2019). According to the BH, the acquisition of core syntax, semantics, and pragmatics develops without problems because they use universal operations, whereas functional morphemes and their features are the bottleneck of L2 acquisition. Formal characteristics of functional morphology cannot be transferred from learners' L1, they must be learned lexically. On the contrary, the transfer of syntax-related elements from L1 can aid in its acquisition (Slabakova, 2013a).

The BH is consistent with the syntax-before-morphology viewpoint (Haznedar, 2003; Lardiere, 2007; White, 2011). This viewpoint asserts that syntactic knowledge is available in learners' production before accurate suppliance of functional morphology, and that learners whose performance on inflectional morphology is not accurate, can still engage in functional categories related to that morphology (e.g., tense and agreement) and have the abstract representation of syntactic features in their interlanguage grammar (White, 2003, p. 182) . White (2003, p. 189) summarizes empirical data from three relevant research studies on morphological variability in adult and child L2 English production. Data demonstrate a considerable disparity between the frequency of correct verbal inflection production (varying between 46.5 and 4.5 percent) and the syntactic phenomena associated with it, such as overt subjects, nominative case on the subject, and verb of verbal phrases (above 98 percent accuracy). White found that divergence between surface inflection and most abstract syntactic features characterizes L2

acquisition. L2 learners from various languages employ morphology inconsistently while being quite accurate on related syntactic aspects (2003, p. 192).

Among the studies that support the BH (e.g., Lecouvet, Degand and Suner, 2021; Mikhaylova, 2018; Slabakova and Gajdos, 2008) the work of Jensen and et al. (2020) is relevant to the present study. The authors aimed to test the BH in a group of native Norwegian speakers learning English as a second language. They employed subject–verb agreement to assess learners' functional morphology knowledge, and word order (verb-second) in declaratives to assess syntax. Both constructions were not equal in English and Norwegian, and earlier research indicated that they were difficult for L2 learners. According to the results of an acceptability judgement task, learners had more difficulty distinguishing ungrammatical subject–verb agreement than ungrammatical word order. These findings not only verify the BH's predictions, but they also corroborate that subject–verb agreement is a challenging L2 feature.

VanPatten, Keating and Leeser (VanPatten, Keating and Leeser, 2012, p. 110) address the issue of morphological deficiencies in SLA by pointing out that, as demonstrated in Lardiere's Patty productions, mapping explanation accounts for long-term L2 learners, but it is unclear whether it is the same for beginning or intermediate L2 learners who still do not have a robust representation for morphological inflections in their grammar. McCarthy (2008) investigated this issue in a study on the acquisition of gender and number agreement with nouns and adjectives in Spanish as L2. For learners to demonstrate their understanding of number and gender, she used interpretation (comprehension) and production tasks. She discovered variability in learners' performance on the interpretation test and concluded that the syntax–morphology difficulty seen in prior morphology research may not just be connected to production-based limitations, but that learners' morphological representation may also be weak (McCarthy,2008, p. 483). According to this viewpoint, VanPatten (VanPatten, Keating and Leeser, 2012) investigated intermediate Spanish learners who had little exposure to naturalistic settings but a lot of experience learning L2 in instructional contexts. This implies that classroom learners may have not received enough input to have a robust representation of inflections in their grammars. Their findings support McCarthy's conclusion that morphological challenges for L2 learners may begin as representational problems, but subsequently become performance problems once there is a more robust representation for morphological inflections in their grammar. In other words, L2 learners' morphological deficit in earlier stages of acquisition may be due to the fact that they are not being represented strongly enough in learners' grammar, and later — assuming they are fully represented— morphological weakness is still present, but now due to a mapping problem during production.

VanPatten's IP model addresses the complexity of the learning task regarding morphology based on how linguistics and cognitive processes interact during language comprehension. Despite the fact that IP (VanPatten and Oikkenon, 1996; VanPatten, 2003; VanPatten and Williams, 2007) is not a theory that seeks to address inflectional problems, but rather the internal mechanisms and strategies that learners use to process input in a L2; it identifies functional morphology as a language feature that can be affected by how learners distribute attentional resources when processing input. Learners' strategies for processing functional morphemes may impede or postpone their acquisition. According to IP, the acquisition of morphemes is affected by The Primacy of Meaning Principle. This principle suggests learners analyse input for meaning before processing it for form (VanPatten, 2003), and that learners' attention will be focused on content words that contain the most significance in a phrase. Because the processing resources are overloaded by the effort required to process content words, functional words such as inflections on verbs and nouns may be disregarded or partially processed and subsequently deleted by working memory (VanPatten,2004, p. 7). Furthermore, if a morpheme expresses the same meaning that can be encoded lexically, L2 learners prefer to attend to lexical elements rather than grammatical forms, since their attentional resources are insufficient to process both (Benati, Lee and Lee, 2007). The English verbal morpheme *-s*, for example, is redundant, since the information it conveys (the subject of the sentence is a third person singular) is also represented by the sentence subject. Furthermore, the position of the morpheme *-s* in an utterance determines how it is processed. According to The Sentence Location Principle, forms in the initial position are more salient than items in the final and medial positions (such as the *-s* verbal morpheme), so learners would pay attention to items in the initial position first. Therefore, morphemes in last and medial positions are more difficult to process than those in initial position (Barcroft and VanPatten, 1997). The main effect of these processing strategies is that form–meaning connections are not made, resulting in a delay in the acquisition of formal aspects of a target language, such as functional morphology (Benati, 2013, p. 101).

In summary, there are different approaches addressing the acquisition of morphology, most of them are not opposite but complementary. However, it seems that there is agreement on the idea that difficulties with morphology are linked to imperfect processing. The MSIH suggests that learners face a mapping problem that will be solved once they are able to identify the correspondence between syntactic properties and inflectional morphology. How learners can achieve this, is not explained in the MSIH, but one may assume that it has to do with the way learners interact with input and the mechanisms they employ when processing it that allow them to actually link their knowledge of syntax and morphemes. The FRH argues that L2 learners have to retrieve the appropriate morphological form according to the grammatical context, which may

result in laboured and slow processing of functional morphology. The BH also supports the inefficient lexical access and slow processing as a source of L2 morphology problems (Slabakova, 2016, p. 395). Finally, VanPatten's IP model explains how learners process input and how the processing strategies they use affect the acquisition of morphology.

2.7.2 Agreement Processing

In English, agreement is straightforward: verbs must agree in number with their subjects for example, if the subject is plural, the verb must be plural as well. Despite this seeming simplicity, different studies show that L2 learners tend to have problems with agreement in some linguistic environments that affect its processing.

Researchers have investigated distance as a variable that could lead to agreement mistakes, such as the linear distance between agreeing parts. Keating (2009, 2010) and Foote (2011) conducted studies on this topic. Keating (2009) tested whether gender agreement violations between nouns and adjectives were detected differently depending on whether they were adjacent and within the same phrase (e.g., in *una casa pequeña* 'a small house') or across phrases separated by intervening material (e.g., *la casa es bastante pequeña* 'the house is pretty small'). Participants included Spanish native speakers and English learners of Spanish at various levels of proficiency. The findings revealed that native speakers noticed gender violations in all scenarios, beginning and intermediate Spanish learners did not, and advanced learners only detected them in adjacent conditions. Foote (2011) observed comparable findings when studying number and gender violations in sentences where the subject and verb were either nearby (e.g., *I see that your father is/are from Texas*) or separated by intervening material (e.g., *The man's watch is/are from Switzerland*). Spanish native speakers and English learners of Spanish were able to detect number violations in two self-paced reading tasks, but the interruptions in reading times were significantly larger in adjacent configurations, implying that learners' sensitivity to violations was reduced when the disagreeing elements were linearly more distant.

According to these studies, the linear distance between agreeing parts influences L2 speakers' capacity to detect agreement violations. Keating (2009) interpreted the stronger influence of linear distance in nonnative speakers as support for the Shallow Structure Hypothesis (SSH), which suggests that parsing in a L2 is shallower than in a native language, with a greater reliance on semantic, associative, and surface information rather than syntactic cues (Clahsen and Felser, 2006). Although the SSH does not directly correlate surface information with linear distance, Keating viewed his findings as supporting the SSH and suggested that the identified difficulties with L2 agreement in nonadjacent configurations mirrored a processing deficit caused

by a decreased capacity to retain gender information in working memory across intervening material.

In addition, Bock and Miller (1991) refer to a related phenomenon, agreement attraction. Attraction happens when a verb fails to agree with its grammatical controller and instead agrees with a nearby modifier with mismatched number information known as an *attractor*, as in (1):

1. *The key to the cupboards...*

In (1) the head of the complex noun phrase should match number of a forthcoming verb (i.e., it should be singular). Research on sentence production have revealed that individuals frequently produce verbs that agree in quantity with the local, or attractor noun phrase (e.g., cupboards) (Bock and Miller, 1991; Brehm and Bock, 2013). When the head is single and the attractor is plural, agreement attraction is considerably more common than when the head is plural, and the attractor is singular.

Attraction represents errors that occur during cue-based memory retrieval (Badecker and Kuminiak, 2007; Wagers, Lau and Phillips, 2009; Lorimor, Jackson and Foote, 2015). When speakers read or produce a verb, they employ its morphosyntactic properties as cues to retrieve a suitable controller from working memory. Because memory access techniques are noisy and prone to retrieval interference, the plural attractor *cupboards* is occasionally selected instead of *key*, tricking speakers into using a plural verb. According to Cunnings (2016), certain L2 issues are caused by an increased vulnerability to retrieval interference. Although this approach does not specifically address linear distance, it suggests that providing intervening material between subjects and verbs should increase retrieval interference both by accelerating the decay of the subject phrase in memory, and by creating extra competing elements. As a result, if L2 speakers struggle with memory retrieval more than native speakers, they may exhibit higher attraction effects.

Another source of problems for L2 regarding subject–verb agreement is that it contains both syntactic and semantic dimensions (Celce-Murcia and Larsen-Freeman,1983, p. 44). Learners tend to produce errors in contexts where a collective noun like *community* or indefinite pronouns like *everyone* or *every* are used. Because collective nouns and indefinite pronouns are theoretically numerous but linguistically singular, they create problems for subject–verb agreement. In English, indefinite pronouns are viewed as singular, although the anaphoric term *everyone* suggests that the indefinite is perceived as plural. According to Bock and Eberhard (1993), the information governing verb-number agreement may differ from that governing anaphor-number agreement. Although distinguishing number agreement between verbs and

anaphoric expressions is outside the scope of this thesis, these examples appear to demonstrate that establishing (grammatical) number agreement with verbs can be difficult when there is a conflict between grammatical and notional (or semantic) number in the same noun.

In summary, research has revealed that agreement processing in a L2 may be error prone due to working memory constraints even if linguistic representations are in place. The nature of these constraints predicts that linear distance will play a more important role in L2 agreement processing than in L1 agreement processing: as the distance between the subject head and the verb increases, agreement computations should become more prone to mistakes, either because the subject head decays more in memory (Keating, 2009, 2010) or because linearly closer, intervening elements are more prominent and thus more likely to be wrongly retrieved (Cunnings, 2016). Even though these attraction and distance configurations are thoroughly documented, the possible effects of instruction on learners' comprehension or production of agreement in the linguistic contexts described, have not been fully explored.

2.8 Processing Instruction and Agreement

The relative effects of PI on the acquisition of agreement have not been fully explored. In a meta-analysis of comparative studies on comprehension-based instruction and production-based grammar instruction (Shintani, Li and Ellis, 2013), twenty-one PI studies were included, none of them had subject–verb agreement as target language feature. There was one study about gender agreement, though. Benati (2004) studied the relative effects of PI, structured input activities and explicit information on the acquisition of gender agreement in Italian adjectives. Three groups of subjects were formed: the first received PI, the second received only structured input, and the third received only explicit information. In a pretest and posttest design, one interpretation and two production measurements were used. The findings showed that on a sentence-level interpretation and production tasks, the PI and structured input groups achieved considerable gains, whereas the explicit information group made no gains. In comparison to the explicit information group, the structured input group made identical improvements to the PI group in the oral production task.

As mentioned in the research review section of this thesis, another study that explored PI and agreement, specifically gender-marked definite articles and gender-marked pronouns in German, was conducted by Henry (2022). The study compared the effectiveness of PI, TI and Categorization /Memorization (CM). The methodology employed online and offline measures, analysing participants' reaction times during sentence comprehension to determine if PI promotes online processing of generic information, thereby helps learners avoid inefficient

processing strategies such as The Primacy of Content Words, Preference for Non-redundancy, and Preference for Meaning-before-Non-meaning Principles. Offline measures included a gender selection and a translation task, a sentence production task, a comprehension task, and a pronoun matching task. The findings revealed that the PI group scored higher and responded faster than the TI and CM groups, indicating their more effective processing of gender-marked pronouns. Additionally, the PI group outperformed the TI and the CM groups in the gender selection and gender production tasks.

Although both studies, Benati (2004) and Henry (2022), on PI and agreement corroborate prior research on the positive effects of PI, it is important to note that subject–verb agreement, a challenging L2 feature, requires additional research on the efficacy of PI in this area.

As previously discussed, there are some factors that give rise to problems and agreement, such as distance, intervening elements, attraction, and relative clauses, however, there are no studies that focus on how IP strategies as described by VanPatten's model, may interact with these factors, and somehow interact to make agreement challenging for L2 learners. As reported by Benati (2004) The Lexical Preference Principle, influences learners' performance in gender agreement, which supports that it may also work with number agreement (as in 3rd. person singular).

The present work is based on the hypothesis that PI has positive effects on the acquisition of English subject–verb agreement since it seems that the processing principles described in VanPatten's IP theory affect the correct interpretation and production of agreement.

First, for local agreement, the processing of the 3rd. person singular *-s* is affected by The Lexical Preference Principle, "learners will tend to rely on lexical items as opposed to grammatical form to get meaning when both encode the same semantic information" (VanPatten, 2004b, p. 14) as example (2) where the *-s* in *requires* means singular which is also expressed by the singular subject *reading*. In addition, the location of the agreement marker *-s* is another factor that interfere with its processing according to the IP model. The *-s* appears in the middle of the sentence, a position that makes it less salient as it is stated in The Sentence Location Principle; "learners tend to process items in sentence initial position before those in final position and those in medial position" (VanPatten, 2004b, p. 125).

The same processing principle may affect the correct realisation of agreement with subjects that differ in notional and grammatical number such as indefinite pronouns as *everyone, nobody, or anyone*. Learners tend to produce incorrect agreement with this type of subjects (Gunawan, Indah and Mulyani, 2018) mainly because these pronouns are conceptually plural (as they refer to

more than one person) but grammatically singular (3). The frequency of errors of this type may be reduced if learners' deficient strategies used to process the verbal morpheme *-s* could be replaced by more optimal ones.

2. ** Reading require concentration.*
   Reading requires concentration
3. ** Everybody think they can dance like professionals*
   Everybody thinks they can dance like professionals

In long distance agreement learners tend to rely on the noun that is closer to the agreeing verb. When the number of this noun (attractor) is plural, it may trigger incorrect agreement (see 4). The Availability of Resources Principle is the processing problem that could make long-distance agreement more problematic for L2 learners. The Availability of Resources Principle, states that for learners to process a redundant grammatical form such as the morpheme *-s*, "the processing of overall sentential meaning must not drain available processing resources" (VanPatten, 2004b, p. 14). Therefore, it would be more challenging for learners to process the agreement marker *-s* in constructions with long-distance agreement, since resources used to understand the sentence overall meaning, are also employed trying to maintain the number of the subject in working memory across the elements between the subject and the agreeing verb (Keating, 2005). The processing resources may be even more limited, and agreement may result more problematic if the distance between subject and the agreeing verb is increased by intervening elements such as prepositional phrases (5) or other modifying elements.

4. * *Reading palm lines require concentration.*
   Reading palm lines requires concentration.
5. ** The woman with big eyes speak two languages.*
   The woman with big eyes speaks two languages.

Comprehension and production of subject–verb agreement can also be affected by The First Noun Principle in sentences with relative clauses (6). In a sentence, relative pronouns link a subordinating or dependent clause to an antecedent word or pronoun. Therefore, it is critical that relative pronouns employed as subjects in relative clauses utilize verbs that agree with their antecedents. Within the clause, subject–verb agreement is made by determining if the antecedent of a subject relative pronoun is singular or plural. Greenbaum and Nelson (2002, p. 176) explain that a relative pronoun describes the noun that immediately comes before it and that such a pronoun is singular or plural depending on the noun it refers to. However, learners tend to refer to an incorrect noun phrase. The First Noun Principle states that learners tend to

process the first noun or pronoun they encounter in a sentence as the subject or agent of it. According to The First Noun Principle, in the sample sentence 6, the subject *we* is more prominent compared with *a robot* therefore, learners may make the verb *teach* plural to agree with the subject *we* instead of its singular form to agree with the singular noun phrase *a robot*. This process principle may lead to a misinterpretation of the meaning of a sentence and may delay learners' ability to map syntax structure accurately (Benati, 2013).

6. **We have a robot that teach you how to speak Chinese.*
   We have a robot that teaches you how to speak Chinese.

In summary, the *-s* agreement marker in English is affected by The Lexical Preference Principle and The Sentence Location Principle. In distance agreement, The Availability of Resources Principle may make the processing of number agreement more challenging for L2 learners. The First Noun Principle is another processing principle that may trigger incorrect production or comprehension of agreement in complex constructions. It is of interest of the present work to find evidence to support these observations.

Chapter 3 Methodology and Methods

3.1 Rationale of the Study

As discussed in previous chapters, different studies have shown that subject–verb agreement poses challenges to L2 learners (e.g., Stauble, 1984; Lardiere, 1998; Jensen et al., 2019). In addition, it has been observed that long-distance agreement (when there are intervening elements between the subject NP and the agreeing verb) is more challenging for L2 learners (Keating, 2009; Foucart and Frenck-Mestre, 2011). Furthermore, incorrect agreement with the NP closest to the verb (attraction error) is argued to be triggered by the misleading number on that NP (Bock and Miller, 1991; Cunnings, 2017). It has been suggested that linear distance plays a relevant role in L2 agreement processing, as the distance between the subject head and the verb increases, agreement computations should become more prone to errors, either because the subject head decays more rapidly in memory (Keating, 2009, 2010) or because linearly closer intervening elements are more prominent and thus, more likely to be incorrectly retrieved (Cunnings, 2016). What different explanations of long-distance agreement problems have in common is that they suggest that the nature of learners' errors seems connected to processing problems. This does not necessarily mean that agreement has not been acquired. In fact, the original motivation of this study was the observation of variability in the production of subject–verb agreement by a group of Chilean learners of English as L2. The observed learners produced correct agreement in simple sentences, where the subject was next to the agreeing verb (local agreement), which may indicate that they had acquired agreement, however, they showed problems in the production of long-distance agreement, and attraction. Even though English subject–verb agreement is taught and intensively drilled in Chilean language classrooms, this is limited to the initial levels, once learners achieve intermediate proficiency level, they do not receive explicit instruction on problematic agreement constructions such as long-distance agreement and local errors. Based on these arguments and others discussed in previous chapters, four different conditions representing problematic agreement and IP principles were studied:

In order to study The First Noun Principle and agreement, sentences with relative clauses, where the subject of the main clause differed in number from the subject of the relative clause were used (example 7). The Lexical Preference Principle was studied through sentences with local agreement with indefinite pronoun subjects (see 8). The Availability of Resources Principle was studied in combination with two conditions both declarative sentences with 3rd. person singular subjects and plural attractors. Distance between subject and the agreeing verb varied. In the third condition, the singular NP was composed by a deverbal noun followed by one word and a plural

attractor next to the agreeing verb (example 9). The intervening elements between the subject and the verb were only two. Distance was increased by adding a modifier (e.g., prepositional phrase) between the subject and the verb in the fourth condition (see 10).

7. Agreement with relative clauses.

   a. *These books are about a young man who become a wizard.

   b. These books are about a young man who becomes a wizard.

8. Local agreement with singular subjects.

   *a. *Nobody know what happened to all the cake.*

   b. Nobody knows what happened to all the cake.

9. Long-distance agreement with singular subjects plus attractor.

   a.* *Teaching young learners keep her motivated.*

   b. Teaching young learners keeps her motivated.

10. Long-distance agreement with singular subjects plus modifier and plural attractor.

    a. * *The mass production of humanoid robots bring new challenges and opportunities.*

    b. The mass production of humanoid robots brings new challenges and opportunities.

3.1.1 Experimental Research

In experimental studies, researchers deliberately manipulate one or more variables (independent variables) to determine the effect on another variable (dependent variable). This manipulation is usually described as a treatment and the researcher's goal is to determine a relationship between or within variables (Mackey and Gass, 2005, p. 137). Usually, experimental research involves a comparison of pre-treatment and post-treatment performance. A range of experimental designs can be employed depending on the nature and number of the chosen independent and dependent variable(s). The present study uses a treatment/condition based experimental design. It utilizes a between groups, pretest, posttest, and delayed posttest design, in order to determine whether the same gains (or lack of) were made following two different treatments. The dependent variable was students' performance on subject–verb agreement and the independent variable was the type of treatment they received in the instructional intervention (PI or TI).

Statistical analysis was employed to determine the size and nature of the relationships between the independent and dependent variables in question.

3.1.2 Validity

Control constitutes a key issue in research that seeks for causality. This is particularly relevant when experimental research is carried out in educational contexts, since experiments “lack complete control” (Campbell and Stanley, 1966, p. 1). In this context, the researcher attempts to control any potentially intervening variable as much as possible in order to accomplish internal and external validity of the study. Internal validity is the extent to which the changes in the dependent variable are actually due to the independent variable, in this case the experimental treatment (Mackey and Gass, 2005:358). On the other hand, external validity refers to the generalizability of the findings (Mackey and Gass, 2005; Cohen, Manion and Morrison, 2018)

To control factors that may affect validity, participants were assigned to the PI group and the TI at random. This ensures the equivalent distribution of any characteristic of the subjects that may influence results. In addition, the treatment was carried out in a web-based format. This mode was chosen for two reasons. First, to prevent any influence that an instructor may have on participants’ performance and second, to facilitate the implementation of PI activities. On the one hand, the presence of the researcher in the classroom as a "foreign body" can influence how participants respond to instructional and testing materials (Torgerson and Torgerson, 2001; Mackey and Gass, 2005; Cohen, Manion and Morrison, 2018). In contrast, variety in how the materials are given and/or confounding variables, such as group dynamics with certain teachers, might potentially contribute to differences in how individual classes respond to an intervention (Spada, 2005). As opposed to face-to-face settings, where learners receive input from their peers as well as their teachers, instructors have more control over their students' linguistic input in a web-based environment. Furthermore, when instructional interventions are offered individually and online, there is no interaction (or reliance) between participants, and learners do not receive incidental input from their instructor or peers, which was considered problematic in previous studies on PI (VanPatten and Wong, 2004; Benati, 2005; Morgan-Short and Bowden, 2006).

Another aspect regarding validity in L2 research is how to control for outside exposure to the language. Since the present study is set in a foreign language environment, this is much easier to control than in a second language environment. As suggested by Mackey and Gass (2005, p. 148), control for exposure in this type of setting can be accomplished by ensuring that the particular language focus (subject–verb agreement in this case) is not covered in the syllabus during the treatment. A revision of the syllabi and course-books of the language courses that

participants were enrolled on was done to corroborate that subject–verb agreement was not planned to be explicitly taught during the intervention.

3.1.3 Participants

The participants of this study were adult Chilean Spanish-speaking L2 Learners of English. They were learning English as part of the undergraduate English Language Teaching Program at University of La Serena, Chile. They were in their second or third year of study. Everyone took a proficiency language test to ensure they were at the same language proficiency level (intermediate). Sixty students answered the proficiency language test. Five were excluded because their scores corresponded to advanced level. Fifteen did not complete all the pretest battery (interpretation or production tasks) and were also excluded from the study. Thus, the final data analyses included a total of forty participants (27 women and 13 men). To assign participants to either the PI or TI group, they were randomised using a computer-based random number generator. In this way, one group was asked to enrol on the course called *Boost your Grammar Skills* (Pl group) and the other one to *Polish up your Grammar Skills* (TI group). Due to the mode of delivering the treatment, it was not needed to give them further explanation about the differences between each course.

3.1.4 Experimental Procedure

The present study included four main stages: Pretests, intervention, posttests, and delayed posttests. The pretests were administered three weeks before the intervention. The intervention itself was carried out over 4 weeks since participants enrolled in the assigned e-course with one session of an hour a week. Even though this may be considered a rather short intervention period, given the time constraints on participants' regular courses and other duties, it was thought to be realistic. This is because the average treatment length in previous research was four hours (Norris and Ortega, 2000; Spada and Tomita, 2010). The immediate posttest was administered one week after the participants finished the course. Finally, to determine whether any of the gains that appeared were sustained after a considerable amount of time had passed (Mackey and Gass, 2005), the delayed posttests took place 6 weeks after the intervention.

3.2 Tasks

A battery consisting of four tasks was used to measure participants gains after the treatment. It included a grammaticality judgement task (GJT), a sentence production task, a writing task, and a speaking task.

3.2.1 Grammaticality Judgement Task (GJT).

A Grammaticality Judgment Task (GJT) can be defined as a task in which participants are involved in "deciding whether a sentence is well-formed or deviant" (Ellis, 1991, p. 162). Gass and Selinker (2008, p. 272) explain that the GJT is primarily a decoding task that involves two steps: understanding the sentence and determining if it fits the English patterns reflected in learners' interlanguage. In other words, the learner should try to recognize the sentence based on their internalized linguistic system. Some researchers have questioned the validity of GJ tasks due to evidence of learner judgement variability (e.g., Johnson et al., 1996; Davies and Kaplan, 1998), while others find them useful in assessing underlying linguistic knowledge by correlating GJTs results with results on other tasks (e.g., Gass, 1994; Tremblay, 2005; Toth, 2006)

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In contrast to most studies on PI that use interpretation tasks as assessment measure, a GJT was chosen for the present work for several reasons. Firstly, the specific property studied cannot be tested with interpretation tasks since the presence or absence of the agreement marker does not interfere with the overall comprehension of the sentence. Interpretation tasks are more suitable for investigating phenomena at the syntax/semantic interface (e.g., tense and aspect, overt and null subject pronouns) (Ionin, 2012, p. 31). VanPatten criticizes GJTs, arguing that they assess the internalization of rules, which is not the primary focus of PI. Instead, PI emphasizes the processing of morphophonological units for meaning. However, GJTs are valuable for assessing learners' underlying competence or mental representation of language, as they reveal learners' judgments of ungrammaticality unlike production tasks (VanPatten and Benati, 2010). According to VanPatten (2016), the mental representation of language encompasses knowing what is impossible in addition to what is possible (p. 23). The aim of the present study is to investigate the effects of PI on learners' underlying knowledge or mental representation, which aligns with one of the assumptions supported by PI. VanPatten and Cadierno suggest that altering learners' input processing can influence their developing system.

Secondly, GJTs allow researchers to study language features that do not occur frequently in learners' spontaneous production (Mackey and Gass, 2005), such as the conditions of agreement included in the present work. This required the use of isolated sentences out of context to elicit learners' intuitions which is one of the critics levelled at GJTs. As Schütze (1996) pointed out, context is needed to reduce the likelihood that participants come up with their own imaginary context in which the sentence might occur. However, the context itself can also be a source of bias since informants may rate a sentence as ungrammatical, if they perceive it does not fit in the given context (Tremblay, 2005, p. 137). In addition, another concern regarding the use of decontextualized items is that they are unnatural, that is, they do not reflect real-world use of language. In this regards, extra care was taken to use very natural sentences in the design of the GJT used in the present study. Furthermore, GJT was chosen in response to criticisms claiming that interpretation tasks used in most PI studies were similar to the activities used in the PI intervention package (Shintani, 2015), suggesting that these may have influenced superior results of PI compared to other types of instruction. Hence, it was decided that a GJT would be an appropriate measure to elicit L2 learners' performance that draws on underlying grammatical knowledge and does not replicate either treatment group's instructional procedures.

The GJT designed consisted of 48 sentences, half of which were grammatical and half of which were ungrammatical, plus 36 fillers items. The items represented in equal proportion the four conditions studied (12 items each).

Table 3.1 Examples of GJT items

Acceptable items	Nonacceptable items
1. Everybody thinks they can sing really well.	1. Everybody think they can dance like professionals.
2. Playing video games makes you smarter.	2. Playing computer games make you more creative.
3. The generosity of the farmers fills the barns of America.	3. The richness of the fields fill the barns of America.
4. These books are about a young man who becomes a wizard.	4. These poems are about an old man who become a zombie.

3.2.2 Sentence Completion Task

The sentence completion task was used to measure participants' production of subject–verb agreement in the target conditions at sentence-level. The task consisted of 16 items, the target conditions (four items each) and 7 fillers. There were two key elements in each exercise: a full

sentence and a sentence with a section in blank. Participants had to fill in the blank of the second sentence using a verb given and no more than four words. They must also keep the meaning of the original sentence. A set of six exercises focusing on a different grammar feature was also included as fillers.

Table 3.2 Example of the Sentence Completion Task

Instruction: Complete the second sentence so that it has a similar meaning to the first sentence using the word given. Do not change the word given. You must use between two and five words, including the word given. *Prompt:* A different consciousness in humans is needed to save endangered animals. *Sentence to be completed:* Saving endangered animals _____ consciousness in human beings. (require) *Possible answer:* Saving endangered animals *requires a different* consciousness in human beings.

3.2.3 Writing and Speaking tasks

It is of interest of this study to investigate whether PI, that is based on sentence level tasks, influences learners' performance at spontaneous discourse production. One of the assumptions supported by PI research is that altering the way learners process input can alter their developing system. Evidence that the developing system has been affected is to find training effects on learners' spontaneous production (Lee, 2015). Previous studies showed that benefits of PI instruction extended beyond the sentential level and remained true for more communicative tasks. Sanz (2004) showed that PI on Spanish direct object pronouns that involved mostly sentence-level input developed knowledge that allowed learners to produce connected discourse. Subsequent research confirmed this finding. Sanz and Morgan-Short (2004), again with PI on Spanish direct object pronouns, found positive effects on oral video retellings. Other types of discourse-level assessment tasks have been used in PI research. Cheng (2004) found positive effects for PI on Spanish copular verbs using a picture-based guided composition. More evidence can be found in Marsen's study (2006) on the acquisition of present indicative verb morphology in French. Results showed that learners who received PI that involved tasks at sentential level, showed improved performance in a speaking task and a written narrative task.

The aim of the writing and speaking tasks was to measure the effects of the interventions in participants' spontaneous production at discourse level. No specific direction was given to use the morpheme *-s* (3rd. person singular) or subject–verb agreement. However, the tasks were designed to promote the appearance of the key form.

The writing task included a short text as prompt to activate students' schemata and facilitate the generation of ideas. The text was followed by a set of questions intended to elicit the target form. It was a paper and pen task, so participants couldn't be assisted by digital spelling or grammar checking tools. Participants were instructed to write at least 20 lines. Time limit for completing the task was 20 minutes.

In the speaking task, students watched four short videos (3 minutes each) where different people talked about what they usually do on a regular day. After watching each video, they answered a set of questions about specific information appearing in the clips.

3.2.4 Pilot Testing

Pretests were piloted in a group of 15 students that had similar language background as the participants. They answered a pen and paper version of the tests. They didn't show any problem with instructions, neither in the grammaticality judgment task nor in the completion task. However, they tended to go back to check their answers in previous pages in the GJT to compare the grammatical and ungrammatical statements. Based on this, it was decided to deliver every task in electronic format. The piloting of the writing task revealed the need to make more specific questions as prompts to elicit the target form. Furthermore, the initial speaking task was also modified. In the first version of the speaking task, students had to watch four short clips (3 minutes total) where people described their daily routines. After watching all the clips, they had to answer a set of questions where present simple was salient such as *how does Nailea start her day?* Even though the target form appeared frequently in the clips and in the questions, every student used reported speech such as *she said that she took the train every morning*. They were asked why they chose that type of language, they reported that past forms appeared naturally since the clips were over. It seems that distance perceived located them at a point where they felt they have to retell something that already happened. According to Buckmaster (2014, p. 82) "we use *did* forms to mark distant [in time] objective facts" which explain student's language choice. In order to solve this problem, it was decided to shorten the perceived distance between speakers and input (clips) by showing them each clip at a time, so they watched one clip and answered questions, then the second video followed by questions and so on. This improvement in the task was effective to get speaking production samples of subject–verb agreement in the present tense.

3.3 The Intervention

3.3.1 Instructional Treatment

Two separate sets of computer-based materials were developed for the treatment. The PI group received materials that were input-based and processing oriented whereas the TI group received materials that were output oriented. Both sets were balanced in terms of number of exercises. Each lesson was designed for one hour of work. Feedback on performance was limited to a message saying whether each exercise was answered correctly or not.

3.3.2 Instructional Materials

The instructional materials were designed following the PI framework. This implied two phases: explicit instruction and SI activities. In the first phase, the two groups were given the same explicit information about how to form subject–verb agreement for example:

Table 3.3 Example of Explicit Explanation

Sometimes a subject is formed by a noun phrase plus some words or phrases which add extra information. **The verb must agree with the subject and not with the new information in between.** e.g. a) **The boy** in yellow pants **wants** to dance with her. b) **A man** sitting over there **keeps** looking at the sky. c) **The girl** talking to Ed Sheeran **looks** like she is going to faint at any moment. e) **That girl** over there in a green dress drinking a coke **seems** very happy.

Explicit explanation stopped there for the TI group but continued in the PI group. This group received additional information that focused on the strategy affecting the processing of subject–verb agreement (Table 3.4).

Table 3.4 Example of Explanation of the Processing Problem

In sentences that have words or phrases that add information, understanding who or what the verb refers to could be challenging, since they tend to place a great distance between the verb and the subject.

When reading or hearing a sentence, the ***-s*** at the end of the verb helps you to understand who is doing what.

Look:

Young people's **violence** that has been subject of debates **seems** difficult to resolve.

This singular verb "**seems"** (with *-s*) tells us that the subject is singular too.

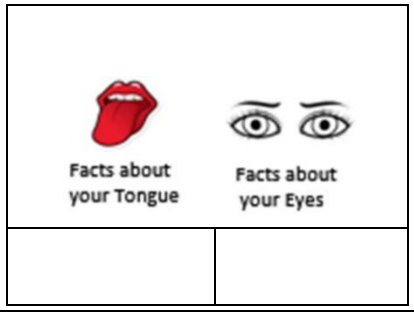
The second phase included SI activities. The SI activities were designed to push learners to rely on the form (*-s* morpheme) to answer each exercise correctly. Each lesson had two sets of SI activities with oral and written input.

Table 3.5 Example of SI Activities

I. Choose the best phrase to complete the sentence:

1. _____crunches like dry leaves underfoot.
   a) An unopened package of potato chips…
   b) Potato chips in an unopened package…
2. _____show that I am an exemplary student.
   a) My grades taken as an overall measure of my conduct,
   b) The measure of my conduct taken from my grades,
3. _____waits for the happy couple.
   a) The rose petals covering the bed…
   b) The bed covered with rose petals…

II. You are going to listen to nine sentences. The first part of each one has been removed and replaced by a *beep* sound. Determine which sentences are facts about the human tongue or human eyes. Drag and drop the corresponding number in the right column. You can pause the audio at any point.



Transcript of what participants hear:

1. (Human eyes) dried by cold or hard products cause your nose to run.
2. (Human tongue) just like humans' hands contains unique prints.
3. (Human eyes) that began to develop 500 and 50 million years ago, play an important role in everyday life.
4. (Human tongue) connected to the head by thin membranes, works without any support of the skeleton.
5. (Human tongue) containing specific segments responsible for sending signals to the brain, helps us to identify different stimulus.
6. (Human eyes) being under proper care take about 48 hours to heal from a scratch.
7. (Human eyes) from birth to death stay the same size, while your nose and ears continue to grow.
8. (Human tongue) that can give your doctor hints about your health, shows different colours during the day.
9. (Human eyes) composed by more than 2 million working parts keep active while you sleep.

The TI group worked with output-based activities. These included controlled drills such as, matching the correct verb form with the corresponding subject, and meaningful drills, where responses are still controlled but participants can make some language choices to complete the task (Ur, 2012b) (see table 7).

Table 3.6 Example of output-based activities

Choose the verb that agrees with the subject in each sentence.

1. An unopened package of potato chips crunches/crunch like dry leaves underfoot.
2. My grades taken as an overall measure of my conduct shows/show that I am an exemplary student.
3. The bed covered with rose petals waits/wait for the happy couple.

Complete the sentence with any of the verbs provided. Make sure it agrees with the subject.

look -swim – walk – belong – keep – run

1. The mother duck with all her little ducklings _____.
2. The bucket of blooming flowers_____.
3. The Victoria's Secrets angels _____.

To summarize, a vast number of studies have shown that subject–verb agreement is a difficult L2 language feature, and that the nature of learners' problems seems to be linked to processing issues. Contrary to the extensive body of research on the issue of why agreement is problematic, the role of explicit instruction in its acquisition has not been explored. Based on these arguments and others previously discussed, four different types of problematic agreement and IP principles were studied: agreement with relative clauses, local agreement with singular subjects, long-distance agreement with singular subjects plus attractor, and long-distance agreement with singular subjects plus modifier and plural attractor. The present study used a treatment/condition based experimental design. It utilized a between groups, pretest, posttest, and delayed posttest design. The intervention was carried out in a web-based mode. The participants were adult Chilean Spanish-speaking L2 Learners of English. A battery consisting of a grammaticality judgement task (GJT), a sentence completion task, a writing task, and a speaking task was used to measure participants' gains. Two separate sets of computer-based materials were developed for the treatment. The instructional materials for the PI group included three components, explicit explanation of the target form, SI activities, and affective activities. On the other hand, materials for the TI group consisted of controlled drills and meaningful drills.

Chapter 4 Results

Analysis of research data resulting from the four tasks used in this study is presented in this chapter. Quantitative results from data collected by means of a GJT, a sentence completion task and two discourse production tasks are examined. Results are presented following each research question. The analysis of total scores of the GJT and the completion tasks are complemented by the report of participants' scores by each of the four conditions studies (See 4.2 for a summary of conditions).

4.1 Performance on the Grammaticality Judgement Task

The first research question was directed to an examination of whether learners who received a PI treatment and a TI treatment improved their performance on grammaticality judgments for subject-verb agreement. A GJT was used. This consisted of 48 sentences half of which were grammatical and half of which were ungrammatical, plus 36 fillers items. The items of the task represented in equal proportion the four conditions studied (12 items each). One point was assigned to each correct answer and zero point to each incorrect answer. Learner's results of the GJT were calculated in terms of percentage of accuracy out of the total points of the task (48 points). Results are presented in two parts. First, the statistical analysis of the complete tasks and then by groups of items that correspond to each of the four conditions studied.

Table 4.1 shows descriptive statistics of the PI group and the TI group in the three measures pretest, posttest, and delayed posttest.

Table 4.1 Descriptive statistics for GJT results at pretests, posttests, and delayed posttests

					95% Confidence Interval	
Group (n)	Measures	Mean	*SD*	*SE*	Lower	Upper
PI (20)	Pretest	75.6	9.0	2.41	70.8	80.4
	Posttest	91.5	6.8	2.41	86.7	96.3
	Delayed Posttest	89.6	11.5	2.41	84.8	94.4
TI (20)	Pretest	69.4	12.7	2.41	64.6	74.2
	Posttest	88.2	9.4	2.41	83.4	93.0
	Delayed Post test	85.3	13.7	2.41	80.5	90.1

Table 4.2. illustrates a repeated measures ANOVA run to determine the effect of treatments over time on learners' interpretation of subject–verb agreement at sentence level. Analysis of participants' results on pretest, posttest and delayed posttest showed that there was a significant interaction between each treatment and learners' performance, p = < .001. In contrast ANOVA results indicated that there was no significant difference between treatments, p = .67.

Table 4.2 Repeated Measures ANOVA of the GJT results

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	7065.7	2	3532.8	58.443	< .001*	0.616
Treatment✻ Group	47.8	2	23.9	0.396	.675	0.010

Note. *p < .05

Post hoc comparisons (Figure 4.1) showed that there was no significant difference between pretests results of the TI and the PI group (p = 0.44*)*. Significant differences for the PI group from pretest (M =75.6) to posttest (M = 91.5; p = < .001) and from pretest to delayed posttest (M = 89.6; p = < .001) were observed. A similar pattern was found in the TI group's results. Scores increased significantly (p = < .001) in the posttest (M = 88.2) and in the delayed posttest (M = 85.3; p = < .001) compared to the pretest (M = 69.4).

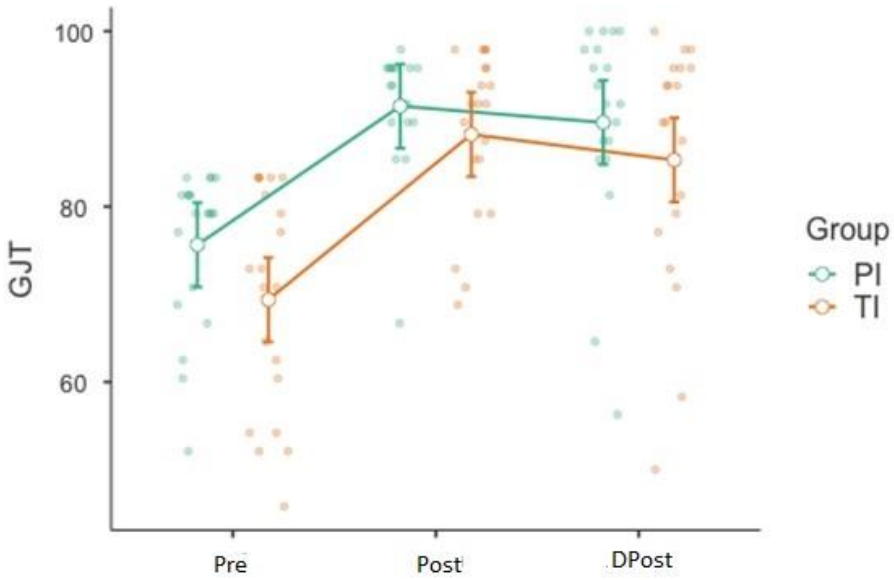


Figure 4.1 Estimated marginal means for PI and TI groups over time for scores on the GJT.

4.1.1 Analysis by Condition

A repeated measures ANOVA was conducted to determine whether there was a statistically significant interaction between treatments and each condition. The description of each condition is summarised in Table 4.3. The descriptive statistics for the two groups' performance on each condition of the GJT at pretest, posttest and delayed posttest is presented in Table 4.4.

Table 4.3 Summary of conditions

Condition	Agreement	Type of Subject	Processing Problem	Sample Sentence
C1	Relative Clauses	Plural subject in the main clause and singular subject in the subordinated clause.	The First Noun Principle The Lexical Preference Principle	These books are about a young man who becomes a wizard.
C2	Local	Singular indefinite pronoun.	The Lexical Preference Principle	Nobody knows what happened to all the cake.
C3	Long-distance	Singular plus attractor.	The Lexical Preference Principle The Availability of Resources Principle	Teaching young learners keeps her motivated.
C4	Long-distance	Singular plus modifier (prepositional phrase) and plural attractor.	The Lexical Preference Principle The Availability of Resources Principle	The mass production of humanoid robots brings new challenges and opportunities.

Table 4.4 Mean percentage accuracy and standard deviations at pretests, posttests and delayed posttests for GJT (results by condition).

Condition	Group[a]	Pretest		Posttest		Delayed posttest	
		Mean	*SD*	Mean	*SD*	Mean	*SD*
C1	PI	75.83	11.75	91.66	9.36	87.50	13.91
	TI	71.24	11.93	88.33	13.89	80.41	17.37
C2	PI	72.49	15.31	86.66	13.35	82.08	19.73
	TI	68.33	17.01	86.25	10.21	84.16	15.51
C3	PI	83.75	14.92	95.83	5.06	96.67	9.89
	TI	71.67	22.19	89.17	17.12	90.00	15.19
C4	PI	83.75	14.92	95.83	5.06	96.67	9.89
	TI	71.67	22.19	89.17	17.12	90.00	15.19

Note. [a]*n = 20*

4.1.1.1 GJT Condition 1

The set of items in this condition included subject–verb agreement in sentences with relative clauses where the subject of the main clause differs in number from the subject of the subordinated clause. The IP principle (VanPatten, 2002) involved here was the First Noun Principle, which states that learners tend to assign the role of agent or subject to the first noun they encounter in an utterance and make the verbs of the main and subordinated clause agree with it.

The ANOVA analysis run for this condition, shown in Table 4.5, revealed that treatments had statistically significant effect on learners' performance (p = < .001) over time (at pre, post and delayed tests). No significant difference between PI treatment and TI treatment was found (p = .73).

Post hoc comparisons (Figure 4.2) showed a significant change for the PI group, with a difference (p = .0001) occurring between learners' scores of pretest (M = 75.83) and posttest (M = 91.66) and between pretest and delayed posttest (M = 87.50; p = .008). The same pattern was observed for the TI group with participants' scores of pretest (M = 71.24) and posttest (M = 88.33) being significantly (p = .01) higher than pretest scores, but no significant difference (p = .12) between the pretest and the delayed posttest (M = 80.41) was observed. No significant difference was found between learners' performance between posttests and delayed posttests.

Table 4.5 Repeated Measures ANOVA of GJT results for condition 1

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	5553.1	2	2776.6	23.908	< .001*	0.386
Treatment✻ Group	73.0	2	36.5	0.314	.731	0.008

Note. *p < .05

To summarize, both the PI and the TI groups improved their performance from pretest to posttests. Furthermore, both groups' results showed no significant difference between posttest to delayed posttest, which suggests that gains were maintained over time. Only the PI treatment showed significantly increased scores from pretest to delayed posttest (p = .008), which can be interpreted as a tendency for PI to be superior in this condition.

4.1.1.2 GJT Condition 2

This condition involves singular indefinite pronouns subjects and local agreement. The processing problem studied was The Lexical Preference Principle.

The ANOVA analysis run for this condition, illustrated in Table 4.6, revealed that both treatments brought about significant difference over time (pretest, posttest, and delayed posttest) (p = < .001) and no significant difference between treatments' effects (p = .73).

Post hoc comparisons (Figure 4.2) indicated that results of the PI group in the pretest (M = 72.49) increased significantly (p = .016) in the posttest (M = 86.66), being the only significant difference found. The descriptive statistics shown in Table 4.4 revealed that, means for condition 2 of the TI group were higher in the posttest (M = 86.25) than in the pretest (M = 68.33), and increased from pretest to the delayed posttest (M = 84.16). Post hoc comparisons indicated two significant comparisons: results of the TI group in the pretest were significantly higher (p = .0001) in the posttest and in the delayed posttest (p = .004). When looking at the difference between posttest and delayed posttest, no significant difference was found in either group.

Table 4.6 Repeated Measures ANOVA of GJT results for condition 2

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	5739	2	2869.3	16.527	< .001*	0.303
Treatment✻ Group	198	2	98.9	0.570	.568	0.015

Note. *p < .05

To conclude, both groups improved significantly after the interventions on condition 2 in the posttests. However, only the TI treatment showed significantly increased scores from pretest to delayed posttest. This may imply that the TI treatment resulted in superior gains, compared to the PI treatment in condition.

4.1.1.3 GJT Condition 3

In this condition, sentences with long-distance agreement, singular deverbal noun subject and plural attractor were studied. The IP principles involved were The Availability of Resources Principle and The Lexical Preference Principle. The Availability of Resources Principle suggests that L2 learners cannot process and store the same amount of information as native speakers can, since their processing resources are limited (considering that the processing load of long subjects is heavier than in simple sentences).

The ANOVA analysis run for this condition, shown in Table 4.7, revealed that there was a statistically significant effect of treatments on learners' performance (p = < .001). No significant difference was found between groups (p = .54).

Post hoc comparisons (Figure 4.2) for the PI group showed two significant differences: results in the pretest (M = 83.75) increased significantly (p = .002) in the posttest (M = 95.83) and in the delayed posttest (M = 96.67; p = .001). No significant difference (p = .96) was found from posttest to delayed posttest. A similar pattern was revealed in the TI group. Results were significantly higher (p = 0.01) in the posttest (M = 89.17) than results in the pretest (M = 71.67) and in the delayed posttest (M = 90.00; p = .007). No significant difference was found between posttest and delayed posttest for this group either (p = .98).

Table 4.7 Repeated Measures ANOVA of GJT results for condition 3

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	6190	2	3094.9	19.667	< .001*	0.341
Treatment⁎ Group	196	2	97.8	0.622	.540	0.016

Note. *p < .05

As a conclusion, it can be said that there was no difference between the effects of the TI treatment and the PI treatment on learners' gains in this condition, both were equally effective.

4.1.1.4 GJT Condition 4

This condition refers to long-distance agreement with singular subjects plus modifier and plural attractor. The IP principles involved were The Availability of Resources Principle and The Lexical Preference Principle.

The ANOVA analysis conducted for this condition, illustrated in Table 4.8, revealed statistically significant differences in both treatments (p = < .001). In contrast, no significant difference between treatments was observed (p = .86).

Post hoc comparisons (Figure 4.2) revealed two significant differences for the PI group: results in the pretest (M = 83.75) increased significantly (p = < .001) in the posttest (M = 95.83) and mean in the delayed posttest (M = 96.67) was significantly higher (p = < .001) than mean in the pretest. Similar results were found in the TI group; there was a significant increase (p = < .001) from pretest (M = 71.67) to posttest (M = 89.17) and from pretest to delayed posttest (M = 90.00; p = < .001).

Table 4.8 Repeated Measures ANOVA of GJT results for condition 4

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	12418.3	2	6209.2	42.688	< .001*	0.529
Treatment⁎ Group	43.1	2	21.5	0.148	.863	0.004

Note. *p < .05

In order to answer the research question whether there was a significant difference between the effects of PI and TI on learners' linguistic competence as measured by a GJT, the ANOVA analysis conducted for each condition revealed no difference in the overall results for each condition. However, in C1 (involving the First Noun Principle) the PI group showed significantly higher scores in the delayed posttest while the TI group did not. On the other hand, in condition 2 (involving the Lexical Preference Principle), TI learners' gains were significantly higher in the delayed posttest, which differs from results of the PI group in the same condition (See figure 4.2).

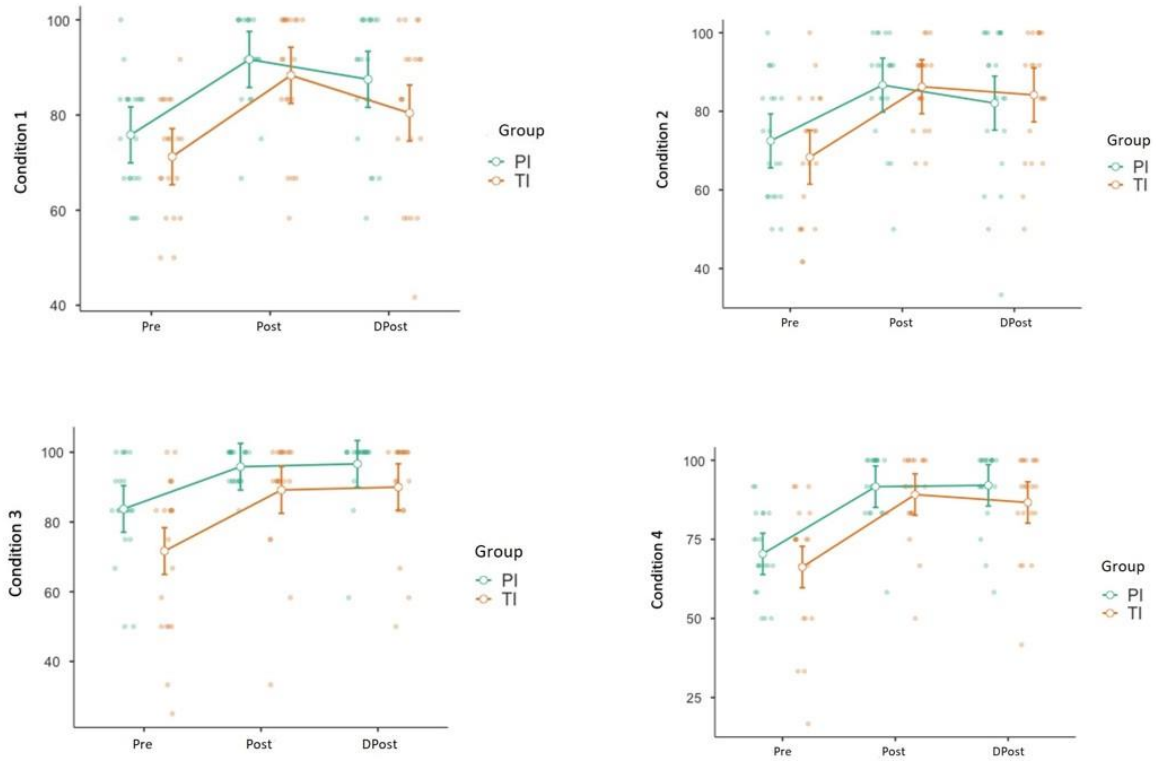


Figure 4.2 Estimated marginal means for the PI and TI groups over time for scores on the GJT by condition

4.2 Performance on the Completion Task

The second question considered whether learners significantly improved their performance in the production of subject–verb agreement at sentence level after the treatments. A sentence completion task was used. It had a total of 23 items, 16 for the target conditions (four items each) and 7 fillers. In each item, participants had to complete a sentence based on a prompt given in order to elicit the target subject–verb agreement condition. One point was assigned to each correct answer and zero point to each incorrect answer. Learner's results of the completion task were calculated in terms of percentage of obtained score over the total points of the task. Table

4.9 illustrates the means and standard deviation of the PI group and the TI group in the three measures pretest, posttest, and delayed posttest.

To answer this research question, a repeated measures ANOVA was conducted. The overall task results (Table 4.10) showed that both treatments had statistically significant effects on learners' performance (p = < .001). On the other hand, no significant difference was observed between treatments (p = .229). However, Post hoc comparisons (Figure 4.3) revealed that results of the TI group at pretest were significantly lower than scores of the PI group (p = 0.01). No other significant difference between treatments was observed. Post hoc comparisons also showed significant differences for the PI group from pretest (M = 85.6) to posttest (M =96.2; p = < .001) and from pretest to delayed posttest (M = 95.3; p = .001). A similar pattern was found in the TI group's results. Scores increased significantly (p = < .001) in the posttest (M = 91.8) and in the delayed posttest (M = 88.8; p = < .001) compared to the pretest (M = 75.6).

Table 4.9 Descriptive statistics for results of the completion task at pretests, posttests, and delayed posttests

					95% Confidence Interval	
Group (n)	Measures	Mean	*SD*	*SE*	Lower	Upper
PI (20)	Pretest	85.6	9.1	2.11	81.4	89.8
	Posttest	96.2	8.6	2.11	92.0	100.4
	Delayed Posttest	95.3	8.2	2.11	91.1	99.5
TI (20)	Pretest	75.6	14.3	2.11	71.4	79.8
	Posttest	91.8	7.0	2.11	87.6	95.9
	Delayed Post test	88.8	7.6	2.11	84.6	93.0

Table 4.10 Repeated Measures ANOVA for the completion task

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	4186	2	2092.9	39.60	< .001*	0.510
Treatment✻ Group	159	2	79.4	1.50	.229	0.038

Note. *p < .05

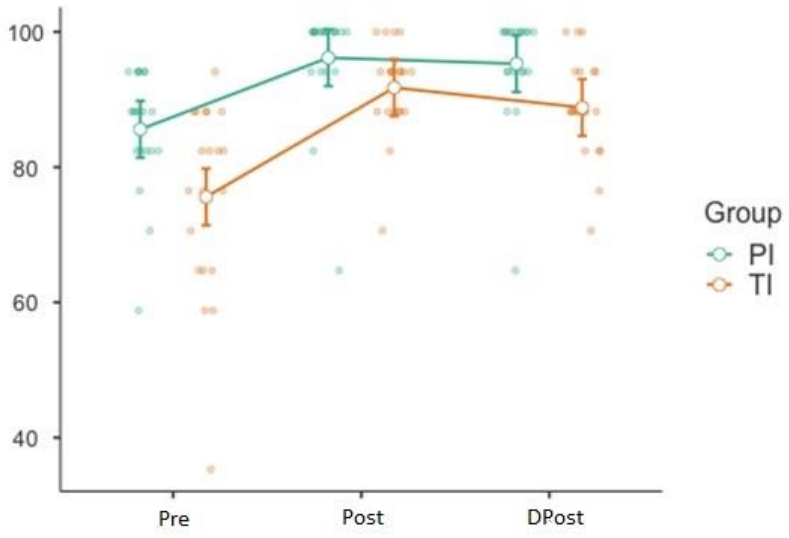


Figure 4.3 Estimated marginal means for PI and TI groups over time for scores on the completion task.

In sum, the results of the completion task were similar to the GJT regarding learners' gains after the interventions. Posttest and delayed posttest scores in the PI group and in the TI group were significantly higher than pretest scores. Thus, regarding the second research question, results suggest that both treatments brought about significant improved performance on the production of subject–verb agreement at sentence level.

4.2.1 Analysis by Condition

A repeated measures ANOVA was conducted to determine whether there was a statistically significant interaction between the treatments and each condition. The descriptive statistics for both groups' performance on each condition of the completion task at pretest, posttest and delayed posttest is presented in Table 4.11.

Table 4.11 Means and standard deviations at pretests, posttests and delayed posttests for the completion task results.

Condition	Group[a]	Pretest		Posttest		Delayed posttest	
		Mean	*SD*	Mean	*SD*	Mean	*SD*
C1	PI	83.75	14.67	95.00	13.07	95.00	10.26
	TI	80.00	22.36	96.25	9.15	93.75	13.75
C2	PI	83.75	18.63	91.25	18.63	91.25	14.67
	TI	77.50	13.81	91.25	14.67	91.25	12.23
C3	PI	92.50	14.28	100.00	0.00	98.75	5.59
	TI	81.25	17.91	97.50	7.69	95.00	17.39
C4	PI	81.25	19.66	98.75	5.59	96.25	9.16
	TI	63.75	24.96	82.50	16.42	73.75	20.64

Note. [a]*n* = 20

4.2.1.1 Completion Task Condition 1

Means and standard deviation of the three measures in the PI group and the TI group for this condition are presented in Table 4.12. The ANOVA analysis run showed significant differences (p = < .001) in both treatments. No significant differences were observed between treatments (p = .29).

Post hoc comparisons (Figure 4.4) showed no significant differences (p = .21) for the PI group from pretest (M = 83.75) to posttest (M = 95.00) and from pretest to delayed posttest (M = 95.00; p = .21). In contrast, results of the TI group showed two significant differences: scores in the pretest (M = 80.00) increased significantly (p = .008) in the posttest (M = 96.25) and means in the delayed posttest (M = 93.75) were significantly (p = .045) higher than in the pretest.

Table 4.12 Repeated Measures ANOVA of the completion task results for condition 1

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	4625	2	2312.5	11.525	< .001*	0.233
Treatment✻ Group	125	2	62.5	0.311	.733	0.008

Note. *p < .05

4.2.1.2 Completion Task Condition 2

The ANOVA analysis in condition two (Table 4.13) showed significant differences (p = < .001) in both treatments, PI and TI. No significant difference between treatments (p = .29) was found.

Post hoc comparisons (Figure 4.4) revealed no significant differences for the PI group from pretest (M = 83.75) to posttest (M = 91.25; p = 0.35) and from pretest to delayed posttest (M = 91.25; p = 0.35). On the other hand, results of the TI group showed two significant differences: scores in the pretest (M = 77.50) increased significantly (p = < .001) in the posttest (M = 91.25) and means in the delayed posttest (M = 91.25) were significantly higher (p = < .001) than in the pretest.

Table 4.13 Repeated Measures ANOVA of the completion task results for condition 2

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	3010	2	1505	14.34	< .001*	0.274
Treatment✻ Group	260	2	130	1.24	.295	0.032

Note. *p < .05

4.2.1.3 Completion Task Condition 3

In condition 3, the ANOVA analysis (Table 4.13) showed significant differences in participants' scores of in both groups, PI and TI. No significant differences between treatments were observed.

Post hoc comparisons (Figure 4.4) showed that differences in PI group's scores from pretest (M = 92.50) to posttest (M = 100.00) and from pretest to delayed posttest (M = 98.75) were not statistically significant. It is important to consider that the PI group was performing at ceiling level in this condition at pretest. TI group's results were significantly higher (p = < .001) in the posttest (M = 97.50) than in the pretest (M = 81.25) and in the delayed posttest (M = 95.00; p = .006). In addition, one significant difference was found between interventions: PI learners' results at pretest were significantly higher than TI learners' scores.

Table 4.14 Repeated Measures ANOVA of the completion task results for condition 3

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	3260	2	1630	11.85	< .001*	0.238
Treatment⁎ Group	448	2	224	1.63	.203	0.041

Note. *p < .05

4.2.1.4 Completion Task Condition 4

The ANOVA analysis conducted for this condition, illustrated in Table 4.1, revealed statistically significant differences in both treatments (p = < .001). In contrast, no significant difference between treatments was observed (p = .86).

Post hoc comparisons (Figure 4.4) revealed two significant differences for the PI group: results in the pretest (M = 81.25) increased significantly (p = < .001) in the posttest (M = 98.75) and mean in the delayed posttest (M = 96.25) was significantly higher (p = < .001) than mean in the pretest. Results of the TI group showed a significant increase (p = .005) from pretest (M = 63.75) to posttest (M = 82.50); however, improvement from pretest to delayed posttest (M = 73.75) was not significant (p = .74). Furthermore, it was observed that PI learners' scores at pretest were significantly (p = 0.02) higher than TI learners' scores.

Table 4.15 Repeated Measures ANOVA of the completion task results for condition 4

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	6885	2	3443	13.666	< .001*	0.265
Treatment⁎ Group	219	2	109	0.434	.649	0.011

Note. *p < .05

In conclusion, both treatments had positive effects in participants production of subject–verb agreement at sentence level in the four conditions studied. However, statistically significant effects of the intervention over time (see Figure 4.4) were mostly found in the TI group. Improvement on performance of the PI group was only significant in condition 4 (long-distance agreement and plural attractor).

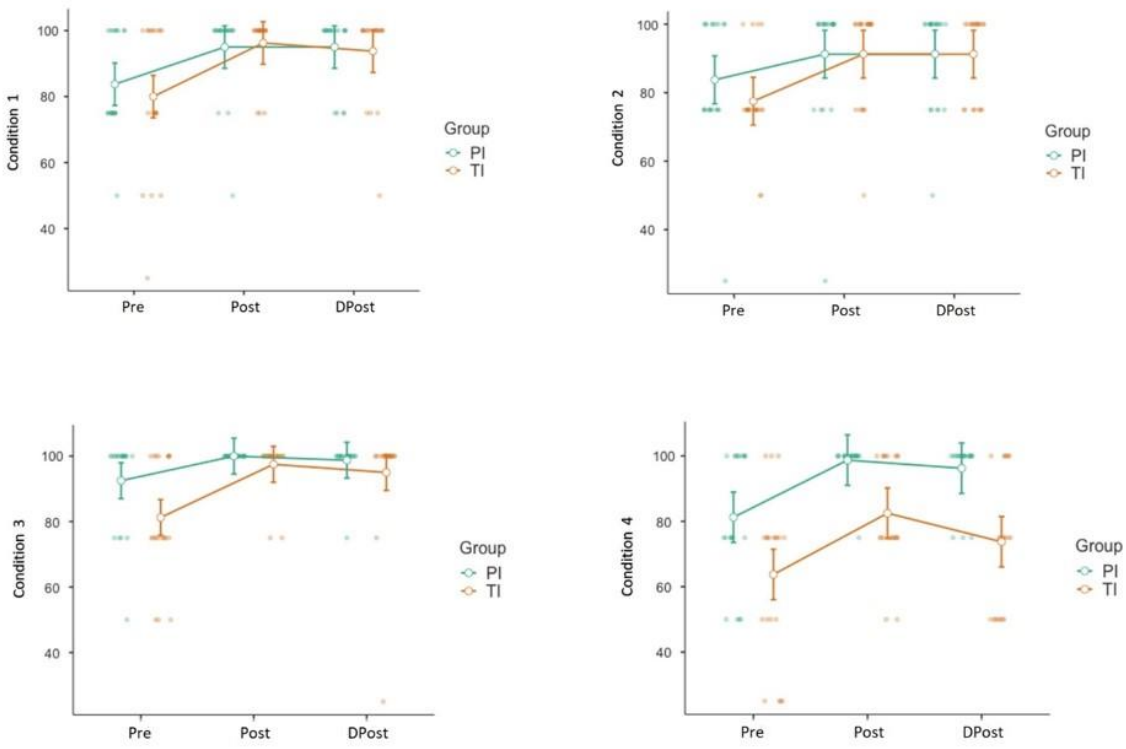


Figure 4.4 Estimated marginal means for the PI and TI groups over time for scores on the completion task by condition.

4.3 Discourse Production Tasks

The third research question was directed to identify whether a pedagogical intervention that involves sentence level tasks on subject–verb agreement has effects on spontaneous discourse production. In order to measure this, a spoken task and a written task were used. Participants' texts (oral and written) were analysed in terms of accuracy in the use of the morpheme *-s* for agreement in obligatory context. Calculation of scores was done according to Stauble (1984), that is to say, considering the times the morpheme is supplied in obligatory contexts and when it is overused (used where natives speakers do not do it). The total points of each participant were calculated by counting the number of times the morpheme was supplied, divided in the total number of obligatory contexts plus the total number of times the morpheme was overused (Figure. 4.5).

$$\text{Target Language Use} = \frac{\text{n correct suppliance in obligatory contexts}}{\text{(n obligatory contexts) + (n suppliance in non-obligatory contexts)}}$$

Figure 4.5 Formula for target-like use analysis of morphemes

4.3.1 Performance on the Writing Task

In the writing task, participants were asked to write a one-page composition based on a topic that was selected by the researcher considering its usefulness to elicit number agreement in present simple tense.

Table 4.16 shows means and standard deviations of the PI group and the TI group in the three measures pretest, posttest, and delayed posttest. Table 4.17 illustrates the repeated measures ANOVA run to determine the effects of treatments on participants' production of subject–verb agreement. The results showed a statistically significant interaction of PI and TI treatments on learners' performance (p = .001). There was no statistically significant difference between treatments (p = .72).

Table 4.16 Descriptive statistics for the results of the writing task at pretests, posttests, and delayed posttests

					95% Confidence Interval	
Group (n)	Measures	Mean	*SD*	*SE*	Lower	Upper
PI (20)	Pretest	71.11	5.72	3.05	65.1	77.2
	Posttest	96.50	9.0	3.05	90.4	102.6
	Delayed Posttest	89.38	14,16	3.05	83.3	95.4
TI (20)	Pretest	68.56	14.61	3.05	62.5	74.6
	Posttest	90.61	17.58	3.05	84.6	96.7
	Delayed Post test	87.85	16.80	3.05	81.8	93.9

Table 4.17 Repeated Measures ANOVA for the writing task results

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	12522	2	6261.1	39.447	< .001*	0.509
Treatment✻ Group	104	2	52.0	0.327	.722	0.009

Note. *p < .05

Post hoc tests showed that participants of the PI group significantly improved their performance in the posttest (*M* = 96.50; *p*= < .001) and in the delayed posttest (*M* = 89.38; *p* = < .001) compared to the pretest (*M* = 71.11). The same significant differences were observed in the TI group's results. There was a significant (*p* = < .001) increase from pretest (*M* = 68.56) to posttest (*M* = 90.61) and from pretest to delayed posttest (*M* = 87.85; *p* = < .001) (Figure 4.6).

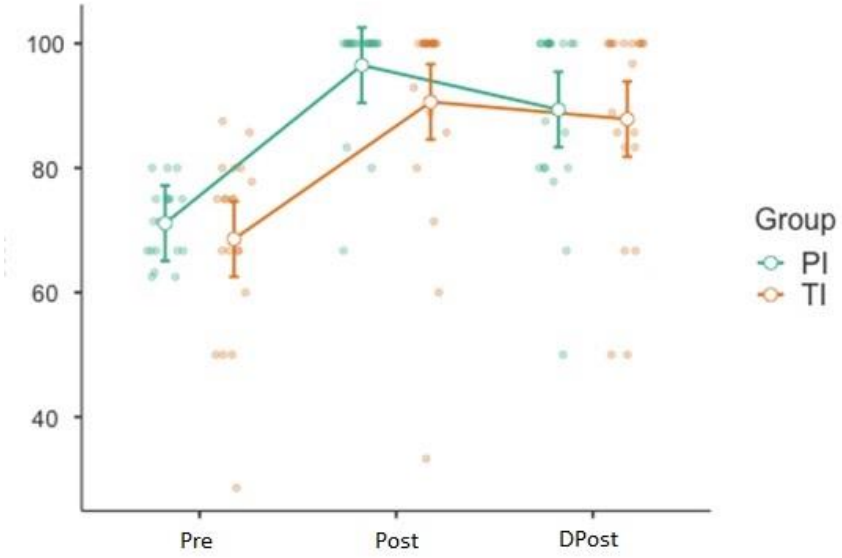


Figure 4.6 Estimated marginal means for the PI and TI groups over time for scores on the writing task.

4.3.2 Performance on the Speaking Task

Descriptive statistics of PI group and the TI group in the three measures pretest, posttest, and delayed posttest are presented in Table 4.18.

Results of the repeated measures ANOVA analysis of the speaking task (Table 4.19) showed significant interactions of PI and TI treatments and learners' results (*p* = < .001). No significant difference was found between treatments (*p* = .672).

Table 4.18 Descriptive statistics for the results of the speaking task at pretests, posttests, and delayed posttests

					95% Confidence Interval	
Group (n)	Measures	Mean	*SD*	*SE*	Lower	Upper
PI (20)	Pretest	76.0	15.5	2.78	70.5	81.6
	Posttest	86.0	13.5	2.78	80.5	91.6
	Delayed Posttest	87.1	12.8	2.78	81.6	92.6
TI (20)	Pretest	77.2	11.6	2.78	71.8	82.8
	Posttest	84.9	11.4	2.78	79.4	90.5
	Delayed Post test	85.1	8.3	2.78	79.6	90.7

Table 4.19 Repeated Measures ANOVA for the speaking task

	SS	*df*	*MS*	*F*	*p*	η^2_p
Treatments	2246.9	2	1123.4	15.874	< .001*	0.295
Treatment✻ Group	56.6	2	28.3	0.400	.672	0.010

Note. *p < .05

Post hoc comparisons revealed that the difference between the pretest and the posttest in the PI group was statistically significant (p = .005), on the contrary results of the TI group in the same pair of tests were not significantly different (p = .076). A similar pattern was observed in the delayed posttest; the difference between the pretest and the delayed posttest was statistically significant in the PI group (p = .001) while it was not (p = .064) in the TI group. This suggests that PI had better effects than TI in the speaking production task (See Figure 4.7).

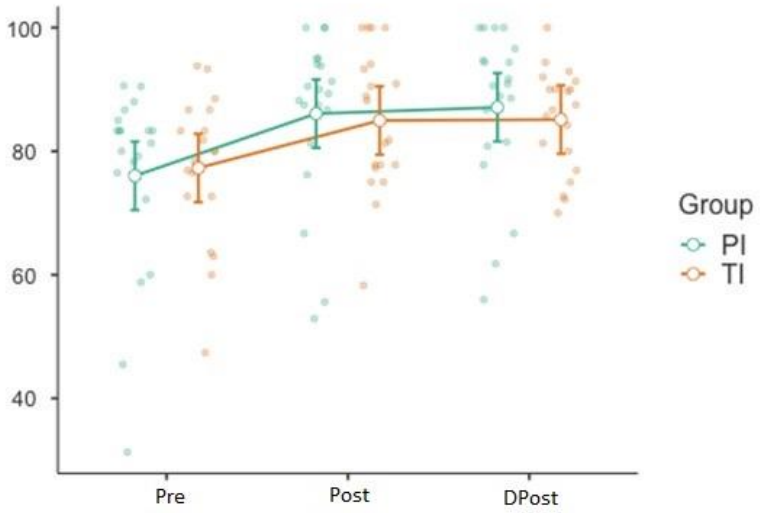


Figure 4.7 Estimated marginal means for the PI and TI groups over time for scores on the speaking task.

In conclusion, overall results of the discourse production tasks showed that both interventions had positive effects on learners' production of subject–verb agreement. Significant differences were found on both groups in the writing task; however, improvement on learners' performance on the speaking task was only significant in the PI group.

4.3.3 Summary of Results

To summarise, the overall results of the GJT showed significant improvement in the scores of both PI and TI learners from pretest to the posttest, as well as from the pretest to the delayed posttest. This indicates that both interventions had positive effects on learners' grammaticality judgements, and that the gains were maintained over time. The analysis by condition revealed no differences between the two treatments in the overall results for each condition. However, in condition one (involving the First Noun Principle), the PI group showed significantly higher scores in the delayed posttest compared to the TI group. Conversely, in condition two (involving the Lexical Preference Principle), TI learners' gains were significantly higher in the delayed posttest, which differed from the results of the PI group in the same condition.

Regarding the sentence production task, the posttest and delayed test scores for both PI and TI were significantly higher than the pretest scores, with no significant differences between the interventions. The analysis by condition revealed that both treatments had positive effects on participants' production of subject–verb agreement at sentence level in all four conditions

studied. However, statistically significant effects of the intervention over time were mostly found in the TI group. The PI group's improvement in performance was only significant in condition four (long-distance agreement and plural attractor).

Significant and consistent improvement in PI participants' production of subject–verb agreement was observed in the two discourse production measures. Results of the writing task indicated that both PI and TI had a positive influence on learners' production of subject–verb agreement, with significant differences found in both groups from pretests to posttests. In the speaking task, divergent results were observed between the two groups at the posttest and delayed posttest. A significant difference was found in the PI group's scores from the pretest to the posttest and from pretest to the delayed test, while no statistically significant improvement was observed in the TI group. These findings suggest that the PI group outperformed the TI group in the speaking task at the posttest and delayed test.

Chapter 5 Discussion and Conclusions

The present study aimed to contribute to the field of instructed second language acquisition and particularly to its effects on language features that are challenging for L2 learners, by investigating the extent to which Processing Instruction (PI), contributes to learners' acquisition of English subject–verb agreement compared with Traditional Instruction (TI), an output-based pedagogical instruction. To this end, the study addresses the following research questions (RQs):

RQ1. Does Processing Instruction bring about significant gains on learners' linguistic competence as measured by a grammaticality judgement task (GJT) compared with TI?

RQ2. Does Processing Instruction bring about significantly improved performance on learners' production of subject–verb agreement at sentence level compared with TI?

RQ3. Does Processing Instruction bring about significantly improved performance on learners' production of subject-verb agreement at discourse level compared with TI?

This chapter provides a detailed analysis of key research findings across the four measures presented in chapter 4, with reference to each of the research questions. The results of the study are also discussed in relation to previous research studies and SLA theory. The first section (Section 5.1) discusses the effects of PI and TI on participants' grammaticality judgments of subject–verb agreement. Variation in the performance of participants in the production of subject–verb agreement at sentence and discourse level after the interventions is discussed in Section 5.2. In the third section (5.3) the results of the GJT and the completion test by conditions are discussed. Conclusion and limitations of the study are discussed in the last sections of the chapter.

5.1 Effects of Processing Instruction on Learners' Grammaticality Judgements

In the GJT participants had to decide which sentences, either containing or omitting the morpheme -s as a subject–verb agreement marker, were acceptable or not in English. GJTs allow researchers to investigate grammatical structures that may be difficult to investigate in learners' production, since they do not occur frequently (Mackey and Gass, 2005) which applies to the conditions studied in the present work. GJTs are also useful for assessing L2 learners' competency (abstract knowledge) rather than their performance (real use of language in context) (Gass, 1994). Another reason for using a GJT is to respond to criticism regarding methodology used in PI

research. It has been pointed out that the tasks used to measure learners' performance in interpretation tasks are similar to the activities used in PI treatment, which may influence results that show PI superior to TI.

Overall results of the GJT showed significant equivalent improvement in PI and TI learners' scores from pretest to posttest and from pretest to delayed posttest, indicating that both interventions had positive effects on learners' grammaticality judgements and that gains were maintained over time. These results accord with Toth's (2006) study, who also used a GJT to measure the effects of PI and an output-based instruction but in another form, Spanish anticausative clitic *se*. Even though in Toth's study the point of comparison was not TI but meaningful output instruction, results of the GJT showed that PI was not superior to the other treatment. One possible explanation for PI learners' results may be found in the nature and purpose of PI. VanPatten (1996, p. 60) states that "the goal of processing instruction is to alter the processing strategies that learners take to the task of comprehension and to encourage them to make better form–meaning connections." The specific role of structured input activities (SI) is to ensure that learners process the target form adequately to get meaning (VanPatten, 1996). In the case of this study, SI practice seems to result in helping learners to make the proper form–meaning mapping by reducing or possibly eliminating redundancy of the *-s*, and also in placing this form in a more salient position so that it could be processed by learners. As suggested by VanPatten (2002), SI activities might help learners adjust their mechanisms for dealing with input and organizing linguistic data when their processors fail to process an input sentence correctly.

If the IP principles explain the mechanisms driving the PI group's improved linguistic performance; what mechanisms might account for the TI group improvement? How TI aided learners in making form-meaning connections, resulting in benefits comparable to those of PI? It is critical to analyse the effect that explicit knowledge of the grammar rule, as a component of both interventions, may have had in this regard. Numerous studies have demonstrated that the presence or absence of explicit information has no effect on the effectiveness of structured input activities, with no difference in learning gains observed between learners who received complete PI (explicit information plus SI activities) and those who completed SI input activities only (e.g., VanPatten and Oikkenon, 1996; Benati, 2004; Sanz and Morgan-Short, 2004a; Wong, 2004; Morgan-Short et al., 2010; Stafford, Bowden and Sanz, 2012) Although these findings support the assertion that SI activities are a "necessary and perhaps sufficient component of PI" (Farley, 2004, p. 238), numerous research studies (e.g., Farley, 2004; Culman, Henry and VanPatten, 2009; Henry, Culman and VanPatten, 2009; VanPatten and Borst, 2012) have demonstrated the facilitative effect that explicit information can have on the acquisition of a specific grammatical feature. A series of research proved that providing explicit information increased learners' rate at

which learners began processing a grammatical feature correctly (Culman et al., 2009; Henry et al., 2009; VanPatten and Borst, 2012). Additionally, Wong (2004) argued that explicit information may be advantageous for instructional approaches that do not require students to focus on the target form–meaning connections.

Based on the foregoing observations, it could be concluded that explicit information provided about the grammar rule for subject–verb agreement in English can account for the TI group achieving comparable learning gains to the PI group in the GJT. Thus, as Wong (2004) noted, explicit information may have aided in eliciting awareness of the form–meaning relationship inherent in the morpheme -s for agreement, even when it was not required for the activities learners were completing. However, it is worth noting that a large body of research has demonstrated that simply delivering explicit information does not result in learning increases (e.g., VanPatten and Oikkenon, 1996; Benati, 2004; Sanz, 2004; Sanz and Morgan-Short, 2004a; Fernández, 2008; Marsden and Chen, 2011; Stafford, Bowden and Sanz, 2012). As a result, one cannot conclude that the TI group's learning gains are exclusively due to the explicit pre-practice information. Indeed, it appears that the success of the TI intervention is embedded in the interaction between explicit information and the treatment practice. The explicit information component equipped learners with portable, declarative knowledge of the target feature and its function within the input (Culman *et al*., 2009), as well as supported them in focusing on the target grammatical form. This combination may have resulted in the TI learners paying attention to form–meaning connections in the input. As a result, the TI group's processing of subject–verb agreement improved to the same extent as the PI group's processing.

It is also important to consider the role that L1 may have had in facilitating the processing of the morpheme *-s*. According to The Morphological Congruency Hypothesis (Jiang *et al.*, 2011) a morpheme is more acquirable when a comparable morpheme with a similar function exists in the learner's L1, and significantly less acquirable when there is no such morpheme in the learner's L1. Therefore, for the participants of the study, L1 Spanish, the agreement meaning is already part of the automatically activated and represented meanings since they have an agreement marker in L1. There is no need to learn to activate such meanings (Jiang, *et al*., 2011). The treatment that the TI received may have helped to strengthen such meaning-morpheme links, influencing their good results in the posttest.

5.2 Effects of Processing Instruction on Learners' Production of Subject–verb Agreement

5.2.1 Sentence-level Production

In previous studies on PI, it could be argued that sentence-level production tasks invited monitoring, since they appeared to be form focused and quite controlled. For example, in Cadierno (1995), the production task was a fill-in-the-blank task in which subjects only had to provide a verb. The learners needed only focus on the grammar to be used, since all lexical material and context were supplied by stimuli. In the sentence production task of the present study, participants were asked to complete a sentence to make correct subject–verb agreement and at the same time they had to replicate the meaning of another sentence given as prompt. The task was designed in this way in the hope of reducing learners' use of conscious knowledge of subject–verb agreement grammar rule.

Results showed that posttest and delayed tests scores for both PI and TI were significantly higher than pretest scores and no significant differences between interventions were observed. This is in line with previous studies where PI was as effective as TI at sentence level tasks (e.g., VanPatten and Cadierno, 1993; Cadierno, 1995; Benati, 2001; Farley, 2001; Wong and VanPatten, 2003) which established that input-based instruction can help learners increase their ability to produce the target grammatical feature even when the instruction does not explicitly promote production. According to Wong (2004), an improvement in learners' productive capacity following instruction without output practice indicates that "some form of change" (p. 52) has occurred in their interlanguage system, which is accessible during production.

Nonetheless, the sentence production task has some limitations that should be considered when interpreting these findings. Even though the completion task was designed to encourage learners' output, learners' responses were nevertheless controlled, and we cannot rule out the possibility that learners used declarative knowledge of the grammar rule for agreement in their responses. In this regard, the current work used written and oral discourse production tasks to determine whether the benefits of PI extended beyond the sentential level and remained true for more communicative tasks, and on the grounds that learners would have less time to access their explicit knowledge to monitor accuracy (Ellis, 2005).

5.2.2 Discourse-level Production

Various earlier PI studies have used discourse-level tasks to provide a more robust assessment of learners' productive ability; nevertheless, these tasks have tended to be written composition tasks rather than oral composition tasks (e.g., Cheng, 2004; Sanz, 2004; Sanz and Morgan-Short, 2004). The outcomes of studies utilizing an oral measure of output have been inconsistent. Marsden (2006), for example, observed a significant improvement in one group's performance on oral production tasks following PI, whereas other research discovered no, or a minimal, influence of PI on learners' oral production performance (e.g., VanPatten and Sanz, 1995; Marsden, 2006; Marsden and Chen, 2011). However, in the current study, a significant and consistent improvement in PI participants' production of subject-verb agreement in the two discourse production measures was observed.

Results of the writing task showed that both PI and TI had a favourable influence on learners' production of subject–verb agreement. Significant differences were found on both groups from pretests to posttests. According to VanPatten (1996), the positive effects of both treatments have different sources. The PI group performed with acquired knowledge that had become part of their developing system, which enabled them to improve on production tasks, even if they did not produce the target form during the treatment. On the other hand, given that the TI group practiced producing the target items with their explicit knowledge, it is likely that they gained some ability to use this knowledge on the writing task. Learners' improved performance on the production of subject–verb agreement in the written discourse task may confirm VanPatten and Cadierno's (1993, p. 238) claim that "processing instruction altered the way in which learners processed input, which in turn had an effect on the developing system and what the subjects could access for production."

An alternative explanation for the PI and TI groups' similar gains in the writing task, as asserted by Marsden (2006), may be that both interventions might have reactivated learners' explicit knowledge of subject–verb agreement, and this type of knowledge might have been particularly accessible in the writing task. It could also be that learners' prior experience of focus-on-forms (in their regular language lessons) allowed them to develop the accuracy of their written productive system while doing input activities (Marsden, 2006). However, results of the speaking tasks where PI outperformed TI may come to contradict this assumption.

As previously discussed, a similar pattern was observed in the results of PI and TI groups across most of the outcome measures. However, there was one exception to the equivalent gains made by the PI group and the TI group. On the speaking task, divergence was observed between the two groups at posttest and delayed posttest. A significant difference was observed between

PI group's scores from pretest to post test and from pretest to delayed test, while improvement on the TI group was not found to be statistically significant. These findings indicated that the PI group was outperforming the TI group at post and delayed tests on the speaking task. This is a remarkable finding considering the task's demand. During oral production, not only did learners have to access their developing systems and retrieve the correct morphological form for subject–verb agreement, but they also had to put together entire sentences using correct vocabulary and tense under communicative pressure. Results suggest that PI was successful in modifying knowledge of subject–verb agreement in learners' developing system and that the output mechanisms could make use of this new knowledge even in communicative and discourse-oriented types of tasks. The competence gains from PI were sufficiently robust to bring improvements in oral production, while the TI produced gains in noticing patterns and reacting to rules.

5.2.3 Effects of Processing Instruction and Problematic Agreement

Four conditions representing problematic features of agreement and IP principles were included in the current study (Table 5.1). To study the First Noun Principle and agreement, sentences with relative clauses, where the subject of the main clause differed in number from the subject of the relative clause, were used. The Lexical Preference Principle and agreement was studied through sentences with local agreement with indefinite pronoun subjects. The Availability of Resources Principle was studied in combination with two conditions, both declarative sentences with 3rd. person singular subjects and plural attractors. In these conditions, distance between subject and the agreeing verb varied. In the third condition, the intervening elements between the subject and the verb were only two. In the fourth condition, distance was increased by adding a modifier (e.g., prepositional phrase) between the subject and the verb.

Table 5.1 Summary of results comparing PI and TI by condition.

Condition	GJT	Sentence Completion Task
Agreement with relative Clauses	PI>TI	TI>PI
Indefinite pronouns subjects and local agreement	TI>PI	TI>PI
Long-distance agreement with singular subject plus attractor	PI=TI	TI>PI

Long-distance agreement with singular subjects plus modifier and plural attractor	PI=TI	PI>TI

Effects of PI on each condition were measured by the GJT and the sentence completion task. PI had positive effects on learners' grammatical judgements in the four conditions studied, showing durable effects on condition one, three and four. Different results were found in the completion task, where significant effects were only found in condition three. A possible explanation for PI results regarding the absence of significant differences in the other types of agreement can be found on pretest results. PI learners' scores of the completion test in conditions one, two and three were already high in the pretest (over 83 %). In addition, PI learners were close to ceiling level performance on condition three (M = 92.50) which left no chance of measuring improvement.

In the set of items of the GJT for subject–verb agreement in sentences with relative clauses (condition one), the statistical analysis revealed that although the PI group and the TI group performance improved from the pretest to the posttest, only in the PI group gains were maintained over time as shown in the delayed posttest. The IP principles involved were the First Noun Principle and the Lexical Preference Principle. Based on learners' improvement after the interventions, it can be argued that learners were encountering a processing problem at pretest, such as the one predicted by VanPatten's (1996, 2004) First Noun Principle: they were relying primarily on word order and taking the subject of the main clause (which is in initial position) as the subject that the verb of the relative clause should agree with. It is important to point out that the PI intervention included a focus on the First Noun Principle and the Lexical Preference Principle. Learners were informed of both processing problems and SI activities were designed to help them move away from these inefficient strategies. On the contrary, the TI group only received information about the grammar rule (e.g., the verb of the main clause should agree with the subject of the main clause and the verb of the relative clause must agree with the subject of the relative clause), which together with practice, may have drawn learners' attention to the input processing problem even it was not explicitly explained, which may have had some impact on learners' judgements regarding this condition as shown in increased scores at posttest, but that was not enough to produce a change in learners' grammar that could be observed over time.

Different results regarding PI and TI effects were also found on items for local agreement with indefinite pronouns (e.g., *everyone, nobody*, or *anyone*) in the GJT and the completion task. This type of subject was included in the current study since the discrepancy between notional number (plural) and grammatical number (singular) makes it challenging for L2 learners (Gunawan, Indah and Mulyani, 2018). It was hypothesized that PI would bring more benefits than

TI since components of the PI treatment included both a focus on the notional/grammatical number issue (through the explicit information component) and a focus on the Lexical Preference Principle. However, results showed significant gains in both groups from pretests to posttests but only the TI group had significantly better results in the delayed posttest compared to the pretest. The TI group outperformed the PI in the completion task as well, which may indicate that problems with agreement with indefinite pronouns are not so affected by The Lexical Preference Principle, but mainly by the influence of conceptual number. Support for this assertion can be found in Eberhard (1999) who investigated whether the conceptual number of a subject phrase can control verb agreement in English. She found evidence for the role of conceptual accessibility and agreement errors, suggesting that the dominant influence of a subject phrase's grammatical number can be overridden by its conceptual number when the phrase is conceptually accessible (i.e., easy to imagine). Therefore, it can be concluded that by different means (SI activities and output-based practice), both interventions were successful in diminishing the influence of conceptual number of indefinite pronouns.

Results of both interventions on long distance agreement and attractor (condition three and four) showed significantly increased accuracy on grammaticality judgements from pretest to posttest and delayed posttest. Results of PI indicate that a focus on the default learners' strategy to process the -s morpheme may also have had an effect on diminishing learners' errors triggered by distance and attractor. As discussed in previous chapters, it has been identified that linear distance between agreeing parts influences L2 speakers' capacity to detect agreement violations (Keating, 2009, 2010; Foote, 2011), supporting the Shallow Structure hypothesis (SSH) which claims that parsing in a second language is shallower than in a native language, with a greater reliance on semantic and surface information rather than syntactic cues (Clahsen and Felser, 2006). Results may indicate that PI was successful in assisting learners rely less on lexical cues, attend to meaning of the morpheme *-s* and make the corresponding connections, which in turn helped learners derive richer intake from input, having a beneficial effect on their developing system.

In addition, PI was also effective in reducing retrieval interference caused by plural attractors by drawing learners' attention to the meaning of the morpheme *-s* (third person singular) and make form–meaning connections. Agreement attraction represents errors that occur during cue-based memory retrieval (Wagers, Lau and Phillips, 2009). When speakers read or produce a verb, they employ its morphosyntactic properties as cues to retrieve a suitable controller from working memory. Because memory access techniques are noisy and prone to retrieval interference, the plural attractor is occasionally selected instead of the corresponding singular subject, misleading speakers into using a plural verb. According to VanPatten (2004),

what provides for the availability of processing resources is proficiency level and the nature of learners' ability to access lexical items they have already incorporated into their developing linguistic systems. If lexical retrieval is not laborious during comprehension, resources are not as strained as they would be at an earlier stage. It could be that the PI intervention made the retrieval of the *-s* morpheme less laborious for learners, which in turn released resources to process agreement more efficiently. This assertion is supported by results of the completion task, where learners also showed improved performance on the production of long-distance agreement and attractor. As concluded in previous research on PI, gains on production may imply that there had been changes in learners' developmental system that are available also for productive tasks. When comparing PI results with TI in these conditions, similar positive effects were observed in the GJT; however, different results appeared in the completion task, where PI outperformed TI in distance agreement, since gains were only retained over time in the PI group but not in the TI. These results suggest that knowledge learned by practicing output exercises has less likelihood of having an effect on learners' developmental system since it seems it was not available for the production task.

5.3 Conclusions

5.3.1 Summary of the Study

This thesis presented the findings of an experimental study investigating the effects of Processing Instruction (PI) on the acquisition of subject–verb agreement compared with Traditional Instruction (TI). Effects of treatments on particular conditions representing different types of subjects considered challenging for L2 were also explored.

The present study used a treatment/condition based experimental design. It utilized a between groups, pretest, posttest, and delayed posttest design, in order to determine learners' gains made following two different treatments. The independent variable was students' performance on subject–verb agreement and the dependent variable was the type of treatment they received in the instructional intervention (PI or TI).

The participants of this study were adult Chilean Spanish-speaking L2 Learners of English. The study included four main stages: pretests, intervention, posttests, and delayed posttests. A battery consisting of four tasks was used to measure participant gains after the treatment. It included a grammaticality judgement task (GJT), a sentence completion task, a writing task, and a speaking task. Two separate sets of computer-based materials were developed for the treatment.

The PI group received materials that were input-based and processing oriented whereas the TI group received materials that were output oriented.

Results showed that PI brought about significant gains in learners' accuracy across the four measures included in the study. When comparing PI effects with TI, similar positive improvement on learners' performance was observed in the GJT and the writing task, which may suggest that both types of pedagogical treatments, by different mechanisms, were effective in providing richer intake for the developing of learners' competence. However, there are also findings which indicate a superiority of PI. First, PI learners could not only process subject–verb agreement better, but their acquired knowledge was also available for production, even though the treatment they received did not provide output practice. In this way "with PI, learners get two for one" (VanPatten, 2004, p.97). Second, in the speaking task, where learners were required to produce subject–verb agreement in a more spontaneous and discourse-level task, PI also outperformed TI. Third, results by conditions of the GJT and the completion task showed that the type of subject where PI seemed to be more effective were the ones that required more attentional resources or efforts to process (or track) agreement relationships caused by distance between subject and verb.

The results from the study presented clearly indicate that PI is a successful instructional treatment, as it helped learners to make form–meaning connections which resulted in improved performance of learners' grammaticality judgements and production of English subject–verb agreement. These findings would therefore support the proposal that PI can serve to push learners away from not optimal processing strategies, thereby optimizing learners' processing of target language input and providing richer intake for the developing system (VanPatten, 2002, 2007; Wong, 2004).

5.3.2 Limitations of the Study

Some limitations also need to be discussed regarding the present study. First, one issue relates to excluding the effects of the explicit information component of the treatments for both groups. It might be argued that the TI group's gains could have been influenced by the explicit information component of the instructional package. Explicit information may have helped to raise awareness of the connection between the morpheme -s and its function as agreement marker. Future research could therefore compare PI with the practice component of TI only.

Another consideration relates to the completion task. The fact that some participants performed at ceiling level in the pretest of the completion task did not allow to measure much improvement. One explanation for this may be the lack of time pressure which may have allowed

learners to make use of conscious knowledge and monitor their production. An alternative explanation could be that the GJT, that was taken before the completion task but in different days, may have drawn learners' attention to the target form. Future research could include a timed sentence production task and evaluate the effects that the order in which tasks are taken may have on participants' results.

Participants' prior knowledge is another issue that should be examined more carefully. Although the current study employed a pretest to ensure that participants were at intermediate level of English proficiency, it was, nevertheless, impossible to completely eliminate the potential influence of prior knowledge of the target form. It is also important to point out that participants were undergraduate students of an English Teaching Program. Some of their courses have a clear emphasis on metalinguistic knowledge which may influence their way to interact with instructional materials. Future research could explore the effects of PI on subject–verb agreement on a group of students from a different educational context.

Research on the effects of instruction on SLA has revealed a positive overall impact of focus on form grammar instruction (Norris and Ortega, 2000). However, the question of long-term effects remains. VanPatten and Fernández (2004) raise important questions about whether the beneficial effects observed in previous research persist over time or if they diminish within weeks after the experimental treatment. This issue is especially significant given the general claims about grammar instruction. If the effects of interventions are short-lived, it implies that acquisition results solely the consequence of input exposure and nothing else. On the other hand, if long-term effects can be demonstrated, it challenges this position (VanPatten and Fernández, 2004).

Given that the goal of PI is to influence the mechanisms used for processing and acquisition, it is reasonable to expect that its effects are not temporary improvements followed by a decline in performance, but rather that they persist over time post-treatment. The findings of the present study indicate that both the PI and the traditional instruction (TI) groups maintained the gains they made on the outcome measures at the delayed post-tests. However, only the PI group showed significant improvement in the speaking task from pretest to the delayed test. It is worth noting that the delayed post-tests were conducted six weeks after the intervention, which is longer than the studies reported in Norris and Ortega's (2000) meta-analysis (where delayed post-tests were administered one to four weeks after the intervention). This finding strengthens the evidence that PI is effective not only in the short-term but also in the long-term. However, it is important to recognise that it is not possible to state with certainty that learners would have maintained these gains in the long run. Thus, future research could explore the effects of PI on

subject-verb agreement in discourse-production tasks measured after longer periods following the intervention.

5.3.3 Implications of the Study

In contrast to the vast amount of research regarding why agreement is problematic, the role of instruction in its acquisition has not been widely explored. The present work contributes to bridging this gap and offers evidence of the usefulness of PI for facilitating the acquisition of subject–verb agreement. It is relevant to recall that the present work not only focused on local agreement of simple sentences but also on different sources of agreement errors such as distance between agreeing parts, agreement attraction and semantic vs. grammatical number of subjects.

As discussed in the previous chapters, functional morphology has been identified as a language feature that can be affected by IP principles (VanPatten, 2004); however, other features of agreement that may trigger L2 errors had not been addressed within an IP framework. One contribution of the present thesis is to show that IP principles can also explain other sources of problems related to subject–verb agreement such (e.g., distance, attraction). Even though agreement problems due to distance and attraction have been thoroughly documented, none of the explanations provided are linked to pedagogical interventions. Therefore, when we realize that learners' errors triggered by distance or attraction can also be influenced by inefficient processing strategies as described by the IP Model, at the same time, we access a pedagogical tool that may benefit learners in instructional settings. Following VanPatten, "if we know something about input processing, can we use this information to structure activities to improve processing?" (VanPatten and Williams, 2007, p. 1), findings of the present study showed that we can use what we know about subject–verb agreement processing to structure activities to improve its processing. In addition, the fine-grained analysis of PI and TI learners' results in the four agreement conditions studied across the tasks used, makes a relevant contribution to research in this field.

Previous research on PI has consistently shown positive effects on learners' production (e.g., Benati, 2001, 2004, 2005; Farley, 2004; VanPatten and Wong, 2004). However, most of this research has used controlled production task such as gap-fill and sentence transformation. These tasks involve producing the target feature within a highly regulated linguistic environment, which may promote the application of explicit rather than implicit knowledge. Therefore, there is a need to investigate the effects of PI on more spontaneous and less controlled tasks involving discourse production. The present study contributes to this line of research.

Interesting, learners demonstrated significantly improved performance on both the writing and speaking tasks after receiving PI. This finding is relevant because during the PI treatment learners only engaged in structured input activities that did not require them to produce the target form. Despite this, learners were able to produce subject–verb agreement more accurately after the treatment, suggesting that instruction in processing input transferred to production of the target feature. It is important to emphasize that the positive effects of PI on learners' more spontaneous production, as evidenced by the speaking task data, should not be mistaken as the development of communicative output skills. PI does not lead to skill development but rather assists learners in developing underlying knowledge that can be accessed and utilized in the development of skill (VanPatten, 2015, p. 100).

It is quite common to assert that certain theories of SLA do not provide predictions concerning language instruction. For example, the generative approach to L2 acquisition has been interested in L2 acquisition phenomena that are not familiar for language teachers (Slabakova, 2013). However, recent research on identifying what is difficult or easy to learn when learning a second language (e.g., Dekeyser, 2005; Slabakova, 2014; Housen et al., 2016) may come to break this tradition. Regarding difficult L2 features such as subject–verb agreement, The Bottleneck Hypothesis and The Input Processing Model support the claim that some attention to grammatical forms, or focus on form and grammar practice, are crucial for successful L2 learning and that current communicative teaching strategies that are popular in language classrooms are not enough for "building a mental grammar of the target language" (Slabakova, 2013, p. 291). The nature of the English -s morpheme, (e.g., multiple mappings, phonologically less salience than nouns, communicative redundancy) makes it opaque in the input and it is more challenging for learners to make form–meaning connections if input is not modified by pedagogical interventions to draw students' attention to the morpheme and its function. The positive results of the present study that showed that PI is useful in supporting the development of grammatical competence confirm this claim and contribute to support that SLA theory regarding difficult language features has implications for language pedagogy.

Among pre-service and in-service teachers, there is a prevalent belief that teaching the rule of using the morpheme *-s* for agreement and practising it is sufficient for its acquisition. There is no further instruction on problematic subject–verb agreement (e.g., distant agreement, attraction) beyond initial levels. However, this study showed that explicit instruction on this complex L2 feature can facilitate its acquisition, as evidenced by the positive results observed in both treatments (PI and TI). Moreover, the study suggests that a pedagogical intervention at input level is more effective, as learners encounter more difficulties in that phase. These findings provide additional evidence for the positive effects of PI and shed light on what learners do when

trying to comprehend input and advocate for teaching innovation in grammar instruction that focuses on assisting learners in the psycholinguistic processes involved in SLA, such as processing strategies and form–meaning connections. In this alternative approach, teachers should assess learners' progress based not only on their production but also on how they process input. As suggested by Lee and VanPatten (2003, p.142), this new grammar instruction should address questions like "Are learners attending to grammatical information? or "Are learners making correct form-meaning corrections?". To facilitate this paradigm shift, teachers need to be more aware of the role of input in SLA and the processing strategies employed by L2 learners that may hinder SLA.

Weaknesses in pre- and in-service teacher training regarding input-based instruction, particularly in PI are evident. It appears that PI is not commonly included in coursebooks or books frequently used in language teaching programs (e.g., Harmer,2007; Ur, 2012a), instead they mainly focus on output driven instruction. This prevailing focus on output-based instruction in language teaching resources and training may have resulted in many teachers being unaware of the necessity, rationale and goals of PI. Even when teachers have opportunities to learn about PI, a gap between theory and practice persists. While pre-service teachers may respond positive to the relevance of learners' input processing and PI, institutional constraints imposed on them to teach grammar rules through traditional methods often prevent them from making links between what they know in theory and what they do in the classrooms. To address this issue, course designers and materials writers should give greater emphasis to the use of PI, particularly when targeting language forms that are challenging for L2 learners. They should show how PI materials are informed by input processing and its principles, thereby facilitating its implementation, and fostering innovation in modern language classrooms.

SLA research findings and theories concerning the difficulty of acquiring certain L2 language features, such subject–verb agreement and the morpheme *-s* as examined in this work, as well as the delayed acquisition of specific language features (e.g., The Bottleneck Hypothesis, The Missing Surface Inflection Hypothesis, Input Processing Model), pedagogical treatments to facilitate its acquisition in instructional settings (e.g., PI) should not be confined to researchers. Bridging the gap between SLA and L2 pedagogy is essential to bring about real change in grammar instruction. Given the relevant role teachers play in implementing PI, future research should examine the extent of teachers' awareness regarding the input-based nature of SLA and the complexity of the processes involved, as well as their readiness to effectively implement PI.

Appendix A Tasks

A.1 Grammaticality Judgement Task: Items by Condition (Pretest)

Condition 1: Agreement with relative Clauses. Plural subject in the main clause and singular subject in the subordinated clause.

Task Items

a. These books are about a young man who becomes a wizard.
b. They need a friend who owns a liquor store.
c. We have a computer that teaches you how to speak Chinese.
d. People say that a successful man is one who makes more money than his wife.
e. My friends believe that alcohol is a bitter fluid that helps white people dance.
f. They know that the company that employs her is one of Obama's business.

Nonacceptable items

a. These poems are about an old man who become a zombie.
b. We need a friend who own a private jet.
c. They have an app that teach you how to fix broken hearts.
d. Men say that a successful woman is one who make more money than her parents.
e. Scientists believe that liquor is a nice fluid that help people see beauty everywhere.
f. We know that the factory that hire him is one of George Clooney's business.

Condition 2: Indefinite pronouns subjects and local agreement

Acceptable Items

a. Every case I handle gives me much more experience.
b. Everybody thinks they can sing really well.
c. Nobody knows what happened to all the cake.
d. Anyone who wants to apply for the job must wear a bikini.
e. Every student walks up the hill on weekdays.
f. Nobody opposes the war in Iraq.

Nonacceptable items

a. Every case I handle give me much more knowledge.
b. Everybody think they can dance like professionals.
c. Nobody know what happened to all the cookies.
d. Anyone who want to apply for the job must dress up.
e. Every teacher walk up the hill every day.
f. Nobody oppose the merge.

Condition 3 Long-distance agreement with singular subject plus attractor.

Acceptable Items

a. Reading palm lines requires a clear understanding of life.
b. Playing video games makes you smarter.
c. Teaching young learners keeps her motivated.
d. Telling creepy stories gives us a sense of adventure.
e. Expressing your feelings helps you to move on.
f. Seeing dead birds means that something bad will happen.

Nonacceptable items

a. Reading tea-leaves require a lot of imagination.
b. Playing card games make you more creative.
c. Teaching adults keep him interested.
d. Telling funny stories give them catharsis.
e. Expressing your opinions help you to try out your ideas.
f. Seeing shooting stars mean that something good will happen.

Condition 4: Long-distance agreement with singular subjects plus modifier and plural attractor.

Acceptable Items

a. His incredible house filled with living trees encourages kids to leave their gadgets and play.
b. The mass production of humanoid robots brings new challenges and opportunities.
c. The generosity of the farmers fills the barns of America.
d. An ordinary-looking man with light eyes stares at the window.
e. The spiral motion of air above a low-pressure area always flows in a counter-clockwise direction.
f. Women's immune response to allergens weakens with each successive pregnancy.

Nonacceptable items

a. Her amazing pool filled with seashells encourage children to explore their senses.
b. The spread of smartphones and tablets bring new challenges for education.
c. The richness of the fields fill the barns of America.
d. A good-looking man with bright eyes stare at the window.
e. The spiral motion of toilet bowl water always flow in a clockwise direction.
f. Men's chance of fathering healthy children weaken after the age of 45.

A.2 Grammaticality Judgement Task

Instructions:

In this task, we need you to judge whether each sentence sounds right or wrong. A sentence sounds right if you think a native speaker would say it. On the contrary, a sentence sounds wrong if you think a native speaker would never say it. Please, do not spend much time thinking of your answer. We are interested in your immediate reaction to the sentences.

1. Playing card games make you more creative.

   Right
   Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

2. Alfredo felt like a lucky man when he had do the dishes.

   Right
   Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

3. We know that the factory that hire him is one of George Clooney's business.

   Right
   Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

4. Men's chance of fathering healthy children weaken after the age of 45.

   Right
   Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

5. His heartbeat had change depending on the exercise he does.

   Right
   Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

6. Expressing your opinions help you to try out your ideas.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

7. Light had travel faster through diamonds than through water.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

8. Every teacher walk up the hill every day.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

9. The spread of smartphones and tablets bring new challenges for education.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

10. While she read her Facebook notifications a bus was hitting her and died.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

11. Women's immune response to allergens weakens with each successive pregnancy.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

12. Seeing shooting stars mean that something good will happen.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

13. Expressing your feelings helps you to move on.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

14. Cristina was walking in the park when an evil spirit appeared.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

15. My friends believe that alcohol is a bitter fluid that helps white people dance.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

Sound had travelled faster through steel than through air.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

16. Men say that a successful woman is one who make more money than her parents.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

17. Seeing dead birds means that something bad will happen.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

18. Bill ran away from love when he was meeting Susan.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

19. Nobody knows what happened to all the cake.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

20. While I was texting a car hit me and dragged me half a block.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

21. Playing video games makes you smarter.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

22. Scientists believe that liquor is a nice fluid that help people see beauty everywhere.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

23. Four coyotes had attacked 10 people in California.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

24. People say that a successful man is one who makes more money than his wife.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

25. Justin was driving his new car when the earth opened and swallowed him.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

26. Telling funny stories give them a cathartic release.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

27. Anyone who want to apply for the job must dress up.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

28. His incredible house filled with living trees encourages kids leave their gadgets and play.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

29. The richness of the fields fill the barns of America.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

30. While he was updating his Facebook status he accidentally posted that he was dead.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

31. A good-looking man with bright eyes stare at the window.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

32. Everybody think they can dance like professionals.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

33. Two sharks had attack 13 people in Italy.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

34. They know that the company which employs her is one of Obama's businesses.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

35. Mary was running away from the Lord when the miracle happens.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

36. Nobody know what happened to all the cookies.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

37. Teaching young learners keeps her motivated.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

38. While Tom updated his WhatsApp profile he was suddenly deleting it.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

39. These poems are about an old man who become a zombie.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

40. Every case I handle give me much more knowledge.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

41. Reading palm lines requires a clear understanding of life.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

42. Her amazing pool filled with seashells encourage children to explore their senses.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

43. Nobody oppose the merge.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

44. We have a computer that teaches you how to speak Chinese.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

45. The spiral motion of toilet bowl water always flow in a clockwise direction.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

46. Selena drove her motorbike when an UFO was adducing her.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

47. Teaching adults keep him interested.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

48. An ordinary-looking man with light eyes stares at the window.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

49. The generosity of the farmers fills the barns of America.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

50. Nobody opposes the war in Iraq.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

51. The mass production of humanoid robots brings new challenges and opportunities.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

52. Ellen swam in the lake when a crocodile was appearing.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

53. They need a friend who owns a liquor store.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

54. Every case I handle gives me that much more experience.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

55. Her heartbeat had changed depending on the music she listens to.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

56. The spiral motion of air above a low-pressure area always flows in a counter-clockwise direction.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

57. These books are about a young man who becomes a wizard.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

58. Felipe felt like a man of virtue when he had done the laundry.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

59. Every student walks up the hill on weekdays.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

60. They have an app that tell you how to fix broken hearts.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

61. Everybody thinks they can sing really well.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

62. Anyone who wants to apply for the job must wear a bikini.

Right
Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

63. Telling creepy stories gives us a sense of adventure.

Right

Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

64. We need a friend who own a private jet.

Right

Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

65. Reading tea leaves require a lot of imagination.

Right

Wrong

If your answer was “wrong”, write the sentence correcting the mistake in the box below.

A.3 Sentence Completion Task

Instructions

Complete the sentence keeping the meaning as the first one. You must use from two to four words, including the one in parentheses.

1. An enjoyable escape from your routine is dancing with friends.

Dancing _____escape from your normal daily routine. (provide)

2. There's no point in asking Piper to help as she's really busy.

It's _____asking Piper to help as she's really busy. (waste)

3. The importance of a strong script and good actors is confirmed by Tarantino's movie.

Tarantino's movie starred by good actors, _____of a strong script. (confirm)

4. Different architecture styles are shown in each ancient city.

Every _____different architecture styles. (show)

5. I'm sure it was Karla I saw in town as I recognized her scarf.

It_____ Karla I saw in town as I recognized her scarf. (must)

6. We demanded to see the restaurant manager to make our complaint.

We_____ seeing the restaurant manager to make our complaint. (insist)

7. A different consciousness in humans is needed to establish sustainable life.

Establishing sustainable _____ a new consciousness in human beings. (require)

8. Many people wish the best smartphone that money can buy.

Everyone _____that money can buy. (want)

9. I was too tired to go to the party.

I was _____I couldn't go to the party. (that)

10. A helpful tool for time management is to write lists of things to do.

Writing to-do lists _____ time. (help)

11. Stress is reduced by talking to others about negative feelings.

Sharing negative feelings with _____ stress. (reduce)

12. I'm now chilled by the forest that used to shelter me and my friends.

The forest that used to shelter me and my _____me. (scare)

13. The boss wouldn't object to you going early today.

The boss would not have _____ you going early today. (objection)

14. University students' drinking problems are considered a public matter.

Problematic drinking among _____ a major public health concern. (represent)

15. Tickets for the music festival are sold before revealing its line-up.

They know that _____its line-up after the ticket sales. (reveal)

16. There is a new dance club for teenagers only. Everyone between 13 and 17 is welcome.

My friends go to a dance club that _____13 and 17. (admit)

17. We are sure that future is volatile.

Nobody _____is volatile. (doubt)

18. We all know who stole the money.

Everyone _____ took the money. (know)

19. "Have you been on holiday recently, Tony?" asked Pamela.

Pamela asked Tony_____ on holiday recently. (be)

20. The vivid colours that filled the landscape make us look up at the drifting clouds.

The landscape full of _____the eye to the strands of drifting clouds. (lift)

21. Apparently, salary is the main difference between good and bad jobs.

They suggest that salary _____the main difference between good and bad jobs. (seem)

22. Nurses know more about patients' health than doctors.

They say that a nurse _____ patients' health than a doctor. (know)

A.4 Speaking task (Pretest)

Instructions:

This task is based on four short videos. After watching each clip you will be asked some questions. Answer them as full as possible.

We need you to speak as much as you can. Feel free to talk. Don't worry about any mistakes you may make.

Questions for clip 1:

- Where do you think they are? Why?
- What does the first kid do every morning?
- What will the videos be about?

Questions for clip 2:

- How does she start her day?
- How does she feel in the train? Why?
- Do you think a Chilean kid feels the same in transantiago? Why?

Questions for clip 3:

- Why does he eat something sweet for breakfast?
- Describe Edward's typical day. What kind of things does he do?
- Is his day similar or different to a Chilean kid's?

Questions for clip 4

- What's her opinion about The Bronx?
- Do you think the same about the Bronx? Why?
- Do you think a person's hometown shapes his/her personality? Why?

A.5 Writing Task (Pretest)

Answer the following questions

1. How would you define "success"?

_____

_____

_____

_____

2. Describe a member of your family **who is** the most successful one by answering:
   a) Who is this person?
   b) How often do you see each other?
   c) What does he/she usually do?
   d) Why is he/she successful?

Write at least 25 lines

1_____

2_____

3_____

4_____

5_____

6…

A.6 Proficiency test

Instructions: Please complete the sentences by selecting the best answer from the available answers below.

1. Water_____at a temperature of 100° C.
   is to boil
   is boiling
   boils

2. In some countries_____very hot all the time.
   there is
   is
   it is

3. In cold countries people wear thick clothes_____warm.
   for keeping
   to keep
   for to keep

4. In England people are always talking about_____.
   a weather
   the weather
   weather

5. In some places_____almost every day.
   It rains
   there rains
   It raining

6. In deserts there isn't_____grass.
   the
   some

any

7. Places near the Equator have_____weather even in the cold season.
   a warm
   the warm
   warm

8. In England_____time of year is usually from December to February.
   Coldest
   The coldest
   colder

9. people don't know what it's like in other countries.
   The most
   Most of
   Most

10. Very_____people can travel abroad.
    Less
    Little
    few

11. Mohammed Ali_____his first world title fight in 1960.
    has won
    won
    is winning

12. After he_____an Olympic gold medal, he became a professional boxer.
    had won
    have won
    was winning

13. His religious beliefs_____change his name when he became a champion.
    have made him
    made him to
    made him

14. If he_____lost his first fight with Sonny Liston, no one would havebeen surprised.
    Has
    Would have
    had

15. He has traveled a lot_____as a boxer and as a world-famous personality.
    both
    and
    or

16. He is very well known_____the world.
    all in all
    over in
    all

17. Many people_____he was the greatest boxer of all time.
    is believing
    are believing
    believe

18. To be the best_____the world is not easy.
    from
    in
    of

19. Like any top sportsman, Ali_____train very hard.
    Had to
    Must
    should

20. Even though he has now lost his title, people_____always remember him as a champion.
    would
    will
    did

Instructions: Please complete the sentences below by choosing the best option from the drop-down menu. Note that they make a connected story, and that you must take the context in consideration when answering each one.

21. The history of_____is

    airplane
    the airplane
    an airplane

22. _____ short one. For many centuries men
    quite a
    a quite
    quite

23. _____ to fly, but with
    are trying
    try
    had tried

24. _____ success. In the 19th century a few people
    little
    few
    a little

25. succeeded_____in balloons. But it wasn't until
    to fly

in flying
into flying

26. the beginning of_____century that anybody
last
next
that

27. _____ able to fly in a machine
were
is
was

28. _____ was heavier than air, in other words, in
who
which
what

29. _____ we now call a ‘plane’. The first people to achieve
who
which
what

30. ‘powered flight’ were the Wright brothers._____was the machine
His
Their
Theirs

31. which was the forerunner of the Jumbo jets and supersonic airliners thatare
_____ common.
such
such a
some

32. sight today. They_____hardly have imagined that in 1969,
could
should
couldn’t

33. _____ more than half a century later,
not much
not many
no much

34. a man_____landed on the moon.
will be
had been
would have

35. Already_____ is taking the first steps towards the stars.

a man
man
the man

36. Although space satellites have existed_____less
since
during
for

37. than forty years, we are now dependent_____them for all
from
of
on

38. kinds of_____. Not only
informations
information
an information

39. _____ being used for scientific research in
are they
they are
there are

40. space, but also to see what kind of weather_____.
is coming
comes
coming

Instructions: For the following section, please choose the correct form of the tag question.

41. John is coming to see you, _____?
hasn't he?
wasn't he?
isn't he?

42. It's been a long time since you've seen him, _____?
hasn't it?
isn't it?
haven't you?

43. He's due to arrive tomorrow, _____?
won't he?
isn't he?
will he?

44. He won't be getting in till about 10.30, _____?
isn't he?
is he?
will he?

45. You met him while you were on holiday, _____?
    didn't you?
    weren't you?
    haven't you?

46. I think I'm expected to pick him up, _____?
    aren't I?
    don't I?
    are you?

47. No doubt you'd rather he stayed in England now, _____?
    didn't you?
    wouldn't you?
    shouldn't you?

48. Nobody else has been told he's coming, _____?
    is he?
    has he?
    have they?

49. We'd better not stay up too late tonight, _____?
    didn't we?
    have we?
    had we?

50. I suppose it's time we called it a day, _____?
    didn't we?

Appendix B Instructional Materials

B.1 Processing Instruction Materials

B.1.1 Condition 1: Agreement with relative Clauses.

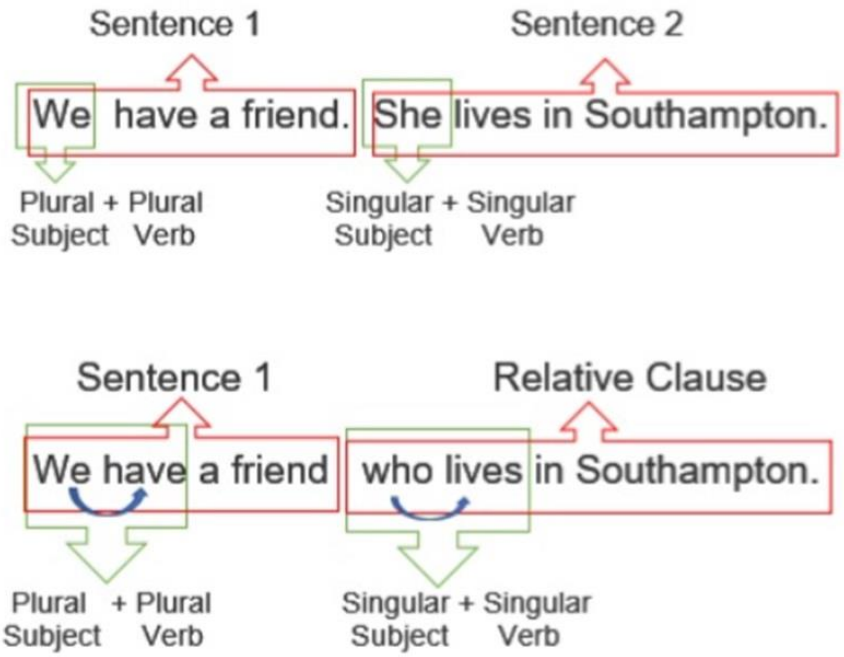
Explicit Information

A relative pronoun such as who, which and that can act as a conjunction connecting two sentences.

Examples:

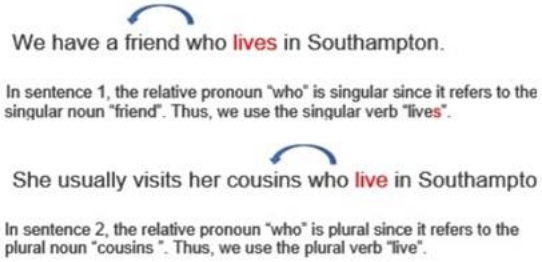
We have a friend. She lives in Southampton.

We have a friend who lives in Southampton.



When joining two sentences like these, we replace the subject of the second sentence by a relative pronoun.

In this way, the relative pronoun turns into the subject of the clause. Thus, the verb must agree with the relative pronoun.

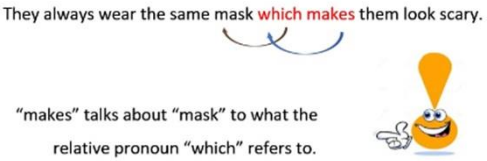


Tips

When reading or listening to sentences that are joined by a relative pronoun, we should see what each verb refers to.

The second verb appearing in the sentence refers to the relative pronoun not to the first word you see or hear.

Examples:



The final "s" in the verb, helps you to keep track of what or who it is talking about.

Structured Input Activities

Task 1

Choose the right answer

1. The kids like a cartoon that teaches maths. Who/What teaches math?

Choose the right answer.

- The kids
- A cartoon

2. Paula hates stories that try to teach you a lesson. Who/What tries to teach you a lesson?

- Paula
- (●) Stories

3. We work for an international company that sells computers. Who sells computers?

- We
- A company

4. Adam and Justin own an innovative business which benefits the environment. Who/What benefits the environment?

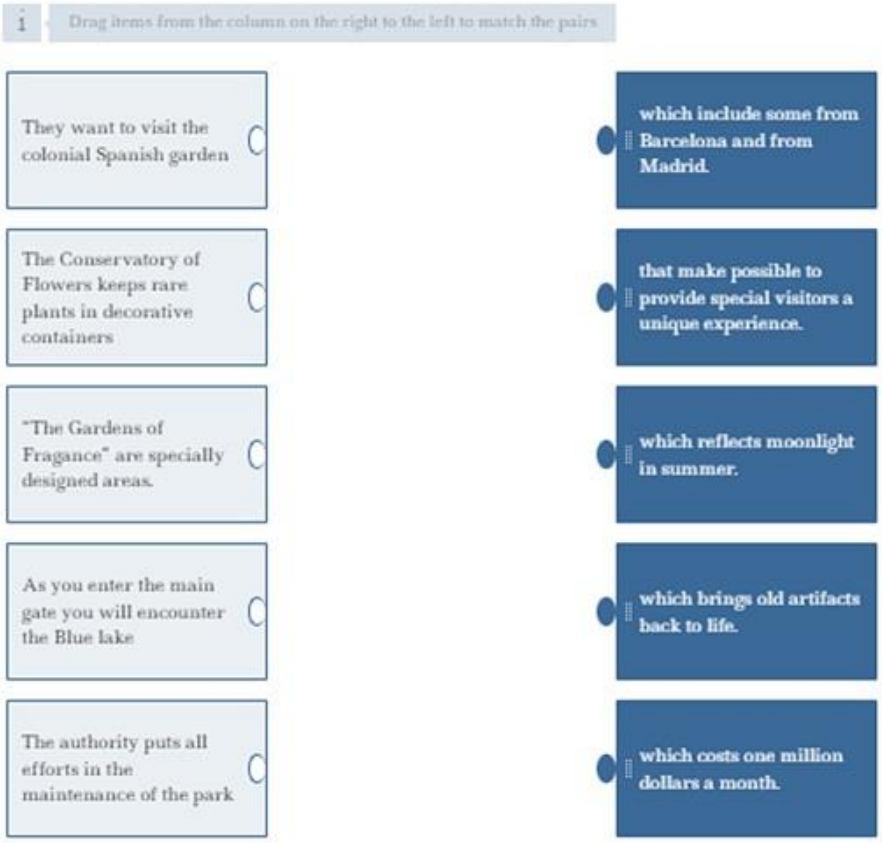
- Adam and Justin
- (●) A business

✔ Correct answer

Task 2

When San Franciscans refer to ‘the park’ there’s only one that gets the definite article: Golden Gate Park

The following sentences are about the Golden Gate Park. Match the first part of each sentence with its second part.



Answers:

They want to visit the colonial Spanish garden *that makes possible to provide special visitors a unique experience.*

The Conservatory of Flowers keeps rare plants in decorative containers *which include some from Barcelona and from Madrid.*

The Gardens of Fragrance are specially designed areas *which cost one million dollars a month.*

As you enterer the main gate you will encounter the Blue Lake *which brings old artifacts back to life.*

The authority puts all efforts in the maintenance of the park *which reflects moonlight in summer.*

Task 3

You are going to listen to eight sentences. A section in each on has been removed and replaced by a “beep” sound.

Choose the best option from the drop-down menu that completes the sentence. You can pause the audio at any point.

Listen and choose.

Transcript:

1. Camila knows an (island) which remains famous despite of time.
2. Only birds live now in (a prison) which seems too expensive to afford.
3. Cruises provide audio (tours) that tell about the daily life in Alcatraz.
4. The Alcatraz tour includes a doing time with (actors) who feature officers and prisoners.
5. Visitors can't enter to the (hospital wing) which remains closed due to restoration.
6. Tourist guides must sign (a consent form) which outlines their responsibilities.
7. Nataly and Susan want to take the Alcatraz (morning tour) which includes a live narration.
8. You can also experience the island at night on the (Alcatraz Night Tour) which consists in a program limited to twenty visitors each evening.

Affective activity

Read the text and complete the activity below.

Ila Prison, situated near Oslo, is a nice and comfortable place where each of prisoner is assigned to a private cell, with ensuite bathroom. Not only do the cells have windows, they have windows without bars to let in more light.

Here, Anders Behring Breivik is serving a 21-year sentence for the murder of 77 people, most of them teenagers, at a political summer camp on Utoya Island.

Given his status as one of the world's worst mass murderers, Breivik should not be at Ila but at Ringerike**,** which seems to be Norway's most secure and least enjoyable prison. But instead, Ringerike has excellent views of Utoya Island and was therefore ruled out.

None of this appears to worry the remorseless Breivik**,** who kicks off each day with a bowl of homemade bread served with ham or cheese and a hot jug of coffee.

Breivik lives in an extra-large cell which contains a study equipped with a computer and a flat screen with 15 local channels. His cell is three times the size of the one pictured above which increases the distance between him and the general population cell.

Confinement to the isolation wing has other advantages. And he only has to press a room service-style bell which allows him to get cigarettes, that he smokes in an enclosed yard.

The rest of the prison population enjoy a similar lifestyle. Like Breivik, they, are allowed to meditate, read books or write letters. Sentenced to 21 years for killing 77 people, most of them teenagers at a political summer camp.

Do you agree or disagree with the following statements?

1. Criminals like Breivik should not be at Ila but at Ringerike**,** which seems to be Norway's most secure and least enjoyable prison.

   a) agree b) disagree

2. Breivik, who kicks off each day with a bowl of homemade bread served with ham or cheese and a hot jug of coffee, shows no worries for being in jail.

   a) agree b) disagree

3. Some people say that a cell which contains a study equipped with a computer and a flat screen with 15 local channels, is not a real prison.

   a) agree b) disagree

4. Studies confirm that a prisoner who spends time meditating and reading in a comfortable place can become a better person.

   a) agree b) disagree

B.1.2 Condition 2: Indefinite pronouns subjects and local agreement

Explicit Information

Indefinite pronouns are used to refer to people or things without saying who or what they are. Most of them are treated as singular.

Singular Indefinite Pronouns
Each – One – No one – Other
Ending in -one: *anyone, everyone, someone*
Ending in -body: *anybody, somebody, nobody*
Ending in -thing: *nothing, everything*

Examples:

Anyone who **hikes** in these hills must watch for bears.

Everybody plays and **enjoys** the game together.

Everybody thinks that Andrea should be given the job.

Nobody likes taking too much risk when investing money.

Somebody needs to come and pick up the pieces of my broken heart.

Each interview takes approximately ten minutes.

Plural Indefinite Pronouns:

Both – Few – Many – Others – All – Some – Several

Examples:

Both want the best for the country.

Few remain alive after the bomb attack.

Many go back home sad and hurt.

Some prefer to get enrolled in the army.

Even we may find easy to remember which indefinite pronouns should be treated as singular, we can still think of them as plural. The idea of “many people/things in a group” can persist in our minds and confuses us.

Study the following example:

THE FINALISTS

Everybody in the finalists' group **wants** to be famous. **Anyone** who **follows** the same dream will keep on facing a new challenge each week. In this season, where **nobody seems** to worry about privacy, 100 cameras follow the finalists' work showing how **each** hour they spend together **makes** their friendship stronger. What they don't know is that **someone** in the group already **knows** who is going to win.

Even the author is talking about eight finalists of a show, the use of indefinite pronouns and singular verbs tells us that he refers to each participant individually.

Tips

When reading or listening to sentences with indefinite pronouns, it is useful to pay attention to the *-s* of the verbs. This will help you to notice whether a sentence is about one or many things/people.

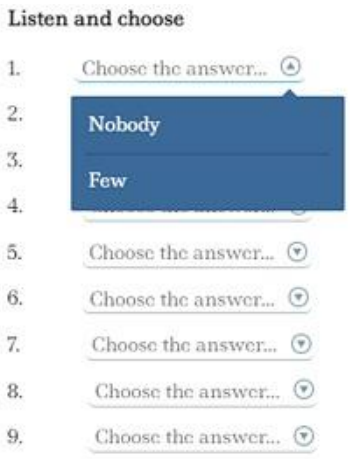
Task 1.

Decide who each sentence refers to: one person or more than one person. Drag and drop each sentence under the corresponding picture.

Task 2.

You are going to listen to eight sentences. A word in each one has been removed and replaced by a “beep” sound.

Choose the best option from the drop-down menu that completes the sentence. You can pause the audio at any point.



Transcript audio task 2

1. (Nobody) understands the importance of culture.
2. (Everybody) knows what happened in the car accident.
3. (Anyone) who refuses to sign his declaration will be arrested.
4. I know that (nothing) matters the way this matters.
5. (Few) corruption involve the police department.
6. Since last year, (others) let you gamble for real money
7. (Someone) who expects a whole life for real love may finally find it.
9. (Others) complain when there is a crisis.

Task 3

Drag and drop the right word from the box to complete the text.

few -everyone – something – everybody – nobody – one - anybody

I go on a new trip every week. _____ visit the park where I go because _____ visits Yellowstone. Every time I sit near a big oak, I see _____ that moves in the woods. Then there is more movement and _____ sees it. Either can be a bear or both are just the wind. Nobody here seems to figure it out, but we have many guesses. The scenery here is gorgeous; _____ sees for miles. _____ loves this one view of the valley because nothing is more beautiful.

Answers:

I go on a new trip every week. (Few) visit the park where I go because (everybody/everyone) visits Yellowstone. Every time I sit near a big oak, I see something that moves in the woods. Then there is more movement and (everyone/ everybody/nobody) sees it. Either can be a bear or both are just the wind. Nobody here seems to figure it out, but we have many guesses. The scenery here is gorgeous; (one) sees for miles. (everybody/anybody/everyone) loves this one view of the valley because nothing is more beautiful.

Affective Activity

Task 4

In the following excerpt from an article, the author describes the five top traits of a girlfriend. Do you agree with his ranking?

The Best Traits of a Girlfriend

You know what? We're feeling a little misty-eyed thinking about true love. Maybe it really does exist, you know? Despite the odds, and everything. Maybe there's more to life than playing the field. Well, you can create your own relationship success by looking for the right traits in a woman instead of just swiping right on everyone on Tinder. Let's take a look at the top things in a significant other that'll make for a lasting relationship.

1. She is independent

No one gets into a relationship to be a babysitter. If she's had a rough day at work, it's great to be her shoulder to cry on. But if she can't seem to function without you, you'll eventually suffocate, and if you're smart, you'll run for the nearest exit.

2. She is intelligent

I hate to be the one that tells you this, but the bimbo routine gets real old, real fast. A woman who can meet you at an intellectual level is a total turn-on. You want someone who constantly surprises you.

3. You are attracted to her

I know, this one is kind of obvious, but important, nonetheless. A great girlfriend is someone who wants to look good for you and for herself. Anyone who sees you with her will also see an improved version of you.

4. She lets you be a man

Do not — I repeat — do not get involved with anyone who tries to get you to eat cheese and fruit for breakfast and insists that you give up poker night with the guys. You will end up resenting her more than you can imagine. Anybody who lets you be a guy in all your glory, poker night and all deserves your love. If she's a great girlfriend, she'll even bring you and your friends a couple of beers and make you some of her famous sandwiches.

5. She gets along with your friends and family

A great girlfriend makes and effort to get to know your people. This is something that really matters if you are thinking of moving to the next level in the relationship. A good girlfriend helps your parents out at Christmas, tries to understand your brother's humor and wants to get to know your friends.

Do you agree or disagree with the author's opinions about the best trait of a girlfriend? Choose a) or b)

1. Nobody gets into a relationship to be a babysitter. A girlfriend must be independent.

    a) agree b) disagree

2. You want someone who constantly surprises you. A girlfriend must be intelligent.

    a) agree b) disagree

3. Anyone who sees you with her will also see an improved version of you.

    a) agree b) disagree

4. Anybody who lets you be a guy in all your glory, poker night and all deserves your love.

    a) agree b) disagree

5. A great girlfriend makes and effort to get to know your people. This is something that really matters.
   a) agree b) disagree

B.1.3 Condition 3 Long-distance agreement with singular subject plus attractor.

Explicit Information

Each gerund should be treated as singular since it is the "name" of one action

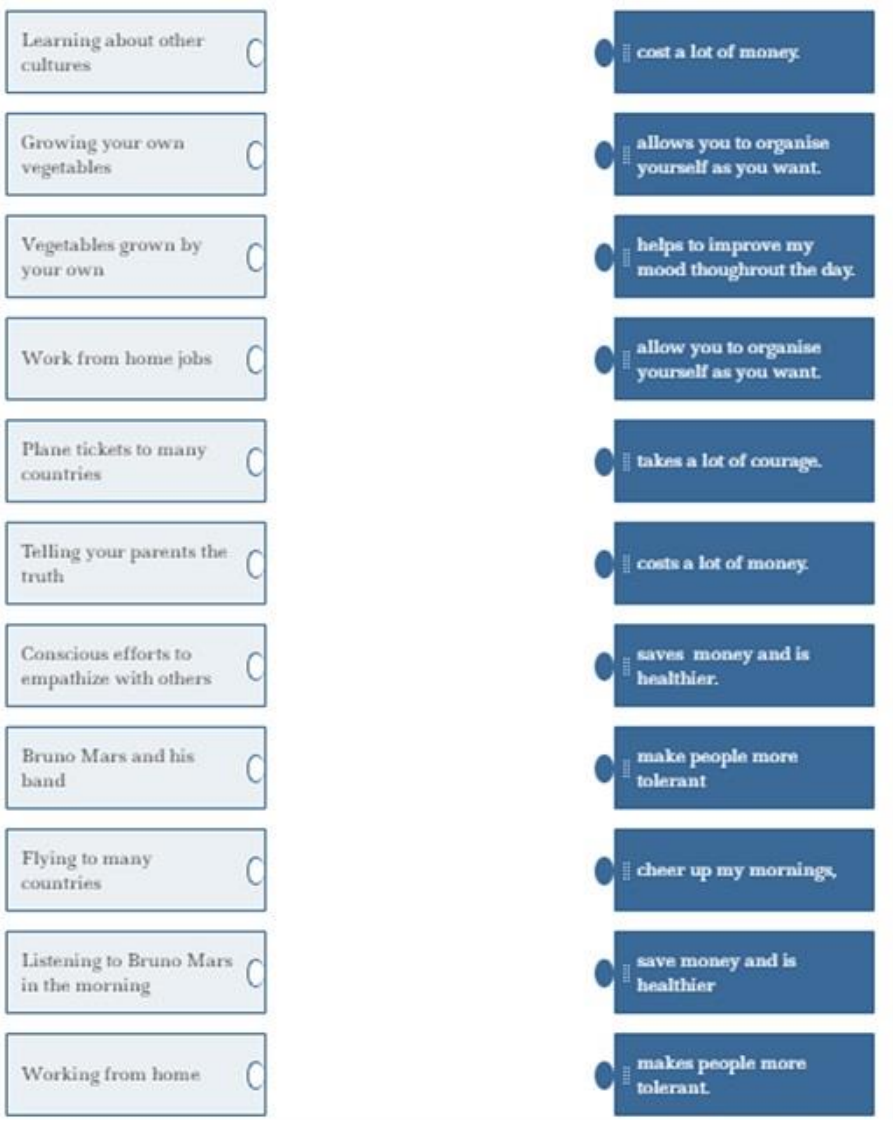
Action	Action Name	Example
To smoke	Smoking	Smoking cigarettes damages your body.
To eat	Eating	Eating peanuts makes you gain weight.
To work	Working	Working with kids results to be too difficult for her.

When reading or hearing sentences like these don't rely on the word near the verb to see what or who it refers to. The real subject is the gerund ("-ing noun"). Pay attention to the *-s* in the verb. This will remain your what or who the verb is talking about.

Examples:

Task 1

Drag items from the column on the right to the column on the left to complete the sentences.



Answers:

1. Learning about other cultures makes people more tolerant.
2. Growing your own vegetables saves money and is healthier.
3. Vegetables grown by your own save money and is healthier.
4. Work from home jobs allow you to organize yourself as you want.
5. Plane tickets to many countries cost a lot of money.
6. Telling your parents, the truth takes a lot of courage.
7. Conscious efforts to empathize with others make people more tolerant.
8. Bruno Mars and his band cheer up my mornings.
9. Flying to many countries costs a lot of money.
10. Listening to Bruno Mars in the morning helps to improve my mood throughout the day.
11. Working from home allows you to organise yourself as you want.

Task 2

The following text is about how to teach your puppy to walk on a leash. Choose the correct subject to complete the sentences.

Teaching puppies to walk on a leash takes a little bit of practice. The puppy will be playful but not very focused.

Choose the answer... become very important. For a puppy, you will want one that attaches

Finding the right harness

Harnesses types

k. Choose the answer... causes the body of the dog to

r pulls against you, don't force it.

t of the dog seems another good way to get the dog to walk ahead.

r hand.

Then, walk forward. The dog's nose will follow. Don't let the dog have the treat right away. Let the dog take a few steps before rewarding the dog.

Using a tasty treat to encourge a specific behavior prevail as very effective trick, as well. With a little bit of practice, a lot of patience, and love, your puppy will become your walking companion.

Answers:

1. (Harness types) become very important. For a puppy, you will want one that attaches to the dog's chest not the dog's neck.
2. (Pulling the puppy) causes the body of the dog to move forward.
3. (Putting treats) in front of the dog seems another good way to get the dog to walk ahead.

Affective Activity

What are the good and bad points of online shopping? Classify the following opinions about online shopping into advantages and disadvantages.

1. Offering free flat rate shipping still comes at a cost sometimes. For instance, a clothing store may provide free shipping but at a minimum of a $50 purchase.

2. Shopping online allows you to shop from any vendor, at anytime, anywhere in the world. Virtual window shopping enables all users to shop at their leisure and across multiple marketplaces.

3. Driving to the mall results in an annoying experience specially if you live in a dense urban area. Traffic jam and long distances may even make you regret about leaving home. Lining up to get to the cashier turns into going to your cart whenever you want.

4. Getting your money back depends on where you purchased your item. If an item comes damaged or not as described, you will want to return the item or be refunded your money. Shipping back the item involves a tedious and prolong process. Then you have to wait on the buyer to refund your payment.

5. Getting discount coupons in return gives another "thumb up" to online shopping. Many companies send their latest product or service to customers who have opted into their email marketing campaigns.

6. Waiting for your product becomes a pain If you're an impatient person. Receiving your items late comes to be a real possibility.

Advantages	Disadvantages

B.1.4 Condition 4: Long-distance agreement plus modifier and plural attractor.

Explicit Information.

Often a subject, is just a noun, a pronoun, an adjective with a noun or a determiner and a noun.

Examples:

a) **Garfield** is an overweight cat.
b) **He** lives with his owner Jon and a dog called Oddie.
c) **His** favourite food is lasagne.
d) **These animals** have a nice life.

Sometimes a subject is formed by a noun phrase plus some words or phrases which add extra information.

Examples:

a) A monkey **with a knife**.
b) They boy **in the yellow pants**.
c) A man **sitting over there**.
d) The girl **talking to Ed Sheeran**.
e) The boat **that Jack bought**.
f) The woman **who wrote Harry Potter**.

g) An eleven-year-old boy with a gun **who tried to rob a toy shop**.

In sentences that have words or phrases that add information, understanding who or what the verb refers to could be challenging, since they tend to place a great distance between the verb and the subject.

When reading or hearing a sentence, the *-s* at the end of the verb helps you to understand who is doing what.

Look at these examples:

Young people's **violence** that has been subject to debates **seems** difficult to resolve.

This singular verb (with -s)

tells us that the subject is singular too.

The **debates** concerning young people's violence **seem** difficult to resolve.

This plural verb (with no -s)

tells us that the subject is plural too.

Tips

Don't get confussed trying to understand long subjects.

Look at the verb in the sentence and see what noun it agrees with.

In this way, you will find what/who the verb is referring to.

And remember

A verb ending in **-s** says that the subject is singular.

Task 1

Choose the best phrase to complete each sentence.

_____waits for the happy couple.

- a) The rose petals covering the bed...
- b) The bed covered with rose petals...

_____makes a movie good.

- A good actor not fancy directors...
- Fancy directors, not good actors...

_____helps to prevent headaches.

- Aspirin taken after physical exercises...
- Physical exercises done after taken an aspirin...

_____knows whether you've been naughty or nice.

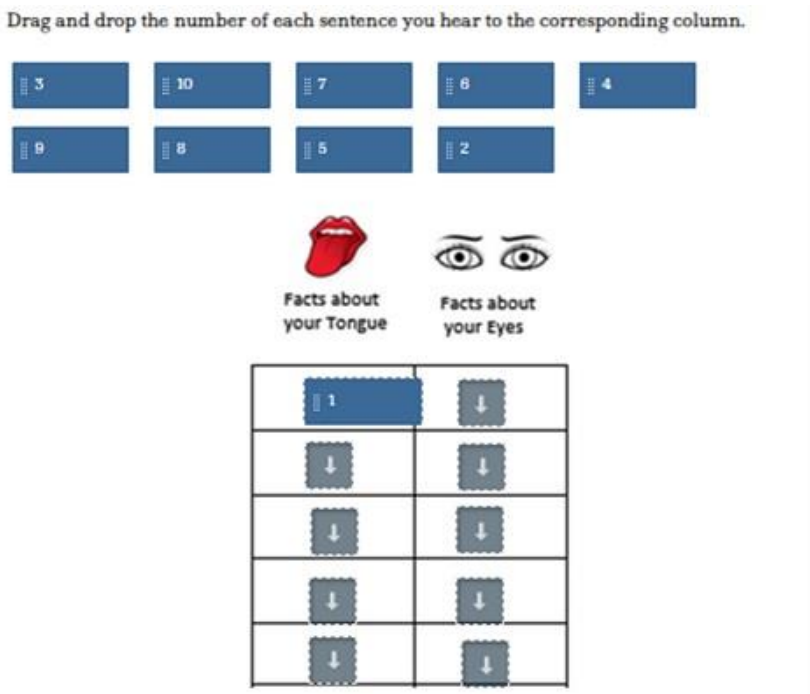
- Santa Claus' multiple spies...
- Santa Claus, with the aid of multiple spies...

Answers:

1. (An unopened package of potato chips) crunches like dry leaves underfoot.
2. (My grades taken as an overall measure of my conduct), show that I am an exemplary student.
3. (The bed covered with rose petals) waits for the happy couple.
4. (A good actor not fancy directors) makes a movie good.
5. (Aspirin taken after physical exercises) helps to prevent headaches.
6. (Santa Claus, with the aid of multiple spies) knows whether you've been naughty or nice.

Task 2

You are going to listen to nine sentences. The first part of each one has been removed and replaced by a "beep" sound. Determine which sentences are facts about the human tongue or human eyes. Drag and drop the corresponding number in the right column. You can pause the audio at any point.



Transcript

1. (Human eyes) dried by cold or hard products cause your nose to run.
2. (Human tongue) just like humans' hands contains unique prints.
3. (Human eyes) that began to develop 500 and 50 million years ago, play an important role in everyday life.
4. (Human tongue) connected to the head by thin membranes, works without any support of the skeleton.
5. (Human tongue) containing specific segments responsible for sending signals to the brain, helps us to identify different stimulus.
6. (Human eyes) being under proper care take about 48 hours to heal from a scratch.
7. (Human eyes) from birth to death stay the same size, while your nose and ears continue to grow.
8. (Human tongue) that can give your doctor hints about your health, shows different colors during the day.
9. (Human eyes) composed by more than 2 million working parts keep active while you sleep.

Task 3

The following sentences are about Easter Island. Choose the appropriate subject from the drop-down menu to complete each sentence. Make sure it agrees with the verb.

. Choose the answer... with many tourists, keeps speeding around the curve.

2. Often Choose the answer... of the Kwakiutl dances toss burning ashes into the crowd.

3. The Choose the answer... for manutara eggs requires a great strength and physical prowess

competition

races

4. Ch ed mostly to chiefs, influences people's life in Easter Island.

5. Ch like that by the natives, consists of glyphs carved on wood or tablets.

6. Choose the answer... about the meaning behind Rongorongo scripture remain a mystery.

7. Choose the answer... , carved using shark teeth or obsidian flakes, seem to represent anthropomorphic beings in different positions.

8. The Rapa Nui ancestral Choose the answer... transmit legends about gods, spirit warriors, the rain or love.

9. Choose the answer... , a male dance characterized by spectacular stunts and quick and pelvic movements, represents hostile activity.

10. Choose the answer... , called Red-tailed Tropicbird, lives in the Rano Raraku volcano.

Answers

1. The (bus) with many tourists, keeps speeding around the curve.
2. Often the (dancers) of the Kwakiutl dances toss burning ashes into the crowd.
3. The (competition) for manutara eggs requires a great strength and physical prowess.
4. (A spiritual energy), attributed mostly to chiefs, influences people's life in Easter Island.
5. (Rongorongo), called like that by the natives, consists of glyphs carved on wood or tablets.
6. (The symbols) about the meaning behind Rongorongo scripture remain a mystery.
7. (The symbols), carved using shark teeth or obsidian flakes, seem to represent anthropomorphic beings in different positions.
8. The Rapa Nui ancestral (theories) transmit legends about gods, spirit warriors, the rain or love.
9. (Tamuré), a male dance characterized by spectacular stunts and quick and pelvic movements, represents hostile activity.
10. (A native bird), called Red-tailed Tropicbird, lives in the Rano Raraku volcano.

Affective Activity

Read three short descriptions about places of interest in Easter Island. Rank them according to your preference. From 1 to 3.

Rano Kau and Orongo Ceremonial Village

_____**Orongo ceremonial village**, perched 400m above, on the edge of the crater wall on one side and abutting a vertical drop plunging down to the cobalt-blue ocean on the other side, **boasts** one of the South Pacific's most dramatic landscapes. It overlooks several small motu (offshore islands), including Motu Nui, Motu Iti and Motu Kau Kau.

Rano Raraku

_____The volcano of Rano Raraku, known as 'the nursery,', stands about 18km from Hanga Roa, is the quarry for the hard tuff from which the moai were cut. You'll feel as though you're stepping back into early Polynesian times, wandering among dozens of moai in all stages of progress studded on the southern slopes of the volcano. At the top the 360-degree view is truly awesome. A small glistening lake within the crater, surprises every visitor.

Ahu Tongarikieading

_____The monumental Ahu Tongariki, with 15 imposing statues, has plenty to set your camera's flash popping. The statues located nearby some petroglyphs, gaze over a large, level village site, with ruined remnants scattered about; some figures include a turtle with a human face, a tuna fish, and a birdman motif.
This site restored by a Japanese team between 1992 and 1995, still shows damages caused by a tsunami in 1960 which flattened the statues and scattered several topknots far inland.

B.2 Traditional Instruction

B.2.1 Agreement with relative Clauses.

Relative clauses are formed with a relative pronoun (who, that, which, when, whose) and a clause:

Ricardo likes people **who** make him look good.

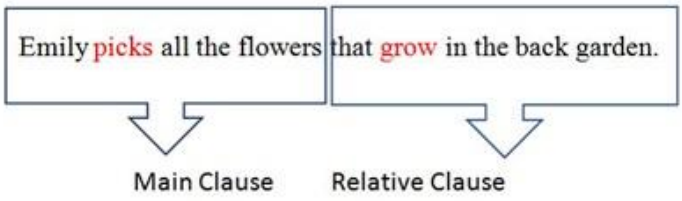
He always wears a black suit **which** makes him look smart.

Friday is the day **when** we finish the work week.

You're a person **whose** job involves a lot of travel.

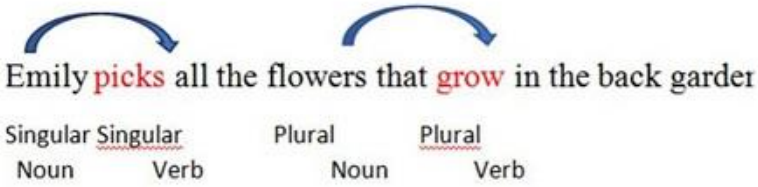
In this kind of sentences, you encounter more than one verb, one for the main clause and another one for the relative clause

Example:



The verb of the main clause should agree with the subject of the main clause and the verb of the relative clause must agree with the subject ofi t.

Example:



Task 1.

Identify each subject and the verb they agree with. Write the noun and the corresponding verb in the space provided.

Example:

We **know** the old lady who **lives** next door. *We know – lady lives*

1. She knows a lot of people who live in the country. _____
2. Barbara supervises thirty employees that work from Monday to Sunday. _____
3. Retired avengers work for an international company that sells computers. _____
4. Adam and Justin own an innovative business which benefits the environment. _____
5. Justin also owns four expensive cars which cost about US 5,000 each. _____

Task 2.

Combine the following pair of sentences using a relative pronoun. Make sure to use the correct form of the verb.

1) Stuart and Lucy know a great photographer. The photographer _____ (work) for an important magazine.
2) My mom works with a very good doctor. The doctor _____ (receive) many visits from celebrities and famous people.
3) This is the road. The road _____ (lead) to the railway station
4) Bring me the file. The file _____ (lie) on the table
5) I study every Friday with a student. The student _____ (learn) fast everything I teach him.
6) Walmart donates free food and clean-water to children in poverty. The food and clean-water _____ (contribute) to improve their lives
7) My father has an old iPhone. The iPhone _____ (look) better than my new iPhone 7
8) My family works the land. The land _____ (give) us organic food
9) Every time I study, I listen to music. The music _____ (help) me to concentrate
10) She always wears the same bracelet. The bracelet _____ (seem) very old-fashioned

Task 3

Choose the right alternative to complete the sentence. Bear in mind the subject -verb agreement.

1. I know a man…
   who wears a prosthetic leg.
   who wear a prosthetic leg.
2. I will buy my favourite book in the bookshop…
   which open next week.
   Which opens next week.
3. Our grandma tells us old stories…
   that sound incredible unrealistic.
   that sounds incredible unrealistic.
4. We adopted a dog…
   who want to play all the time.
   who wants to play all the time.
5. The CEO is talking about her new restaurant…
   which opens next September.
   which open next September.
6. We include many vegetables in our diet…
   which seem to be improving our health.
   Which seems to be improving our health.
7. Mathew and Sarah work with and old man…
   who believes he talks to aliens every night.
   who believe he talks to aliens every night.
8. We live next to a building…
   which look haunted.

which looks haunted.

9. Christopher and his family are hosting a charity event…
   which seeks to help young people in need.
   which seek to help young people in need.
10. The cute cat plays with the crystal ball…
   which seem about to fall from the table.
   which seem about to fall from the table.

Task 3

The writer of the following sentences made some mistakes in their subject-verb agreement. Find the mistake and rewrite the sentences correctly.

When a sentence is right, just write "subject-verb agreement ok"

11. This summer Ferrari inaugurates a new thematic park which expect to receive thousands of visitors per day. _____
12. Ferrari Land has the tallest roller coaster in the world which reach 112 mts. High. _____
13. People are still working to assemble the roller coaster which requires two cranes to lift the pieces. _____
14. Very sophisticated mechanical technology is used which allows people to experience the same speed Formula 1 drivers feel during races. _____
15. This is the most ambitious project in the last few decades that count with the investment of around 50 different companies. _____
16. It takes 180 seconds to complete the trail which measures 880 meters long. _____
17. The CEO of the company hopes to boost the economy of the area with the new project which employ 150 people at the moment. _____
18. The inauguration of the park excites many people which hopes to experience some real Formula 1 speed. _____

B.2.2 Condition 2: Indefinite pronouns subjects and local agreement

Explicit Information

Indefinite pronouns are used to refer to people or things without saying who or what they are. The following indefinite pronouns are always singular:

One, no one, anyone, everyone, someone, anybody, somebody, nobody, everybody, each.

Thus, the verbs that go with them in a sentence, must be singular too.

Example:

Everybody plays and enjoys the game together.

Everyone thinks that Andrea should be given the job.

Nobody likes taking too much risk when investing money.

Anyone who hikes in these hills must watch for bears.

Someone needs to come and pick up the pieces and drive things forward.

These indefinite pronouns may feel plural, as they refer to a whole group, so we tend to attach plural verbs to them.

Example:

Not: Anybody who spill grape juice on my white carpet will have to clean it immediately. X

Someone with some strange ideas have sent Sofia a life-size replica of her Great Dane made entirely out of gum wrappers. X

Everyone who see Luke and Leyla wearing silk gloves, would think they look silly. X

Tips

Think of these pronouns as referring to each one member of the group. Focus on the “one” not on the group this is part of.

Transcript audio task 1

1. Nobody (understands) the importance of culture.

2. Everybody (knows) what happened in the car accident.

3. Anyone who (refuses) to sign his declaration will be arrested.

4. I know that nothing (matters) the way this matters.

5. Few corruption (involve) the police department.

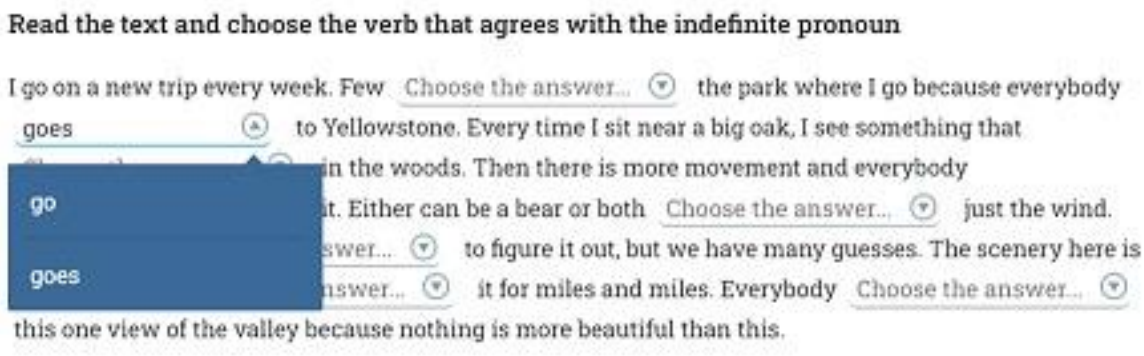
6. Since last year, others (let) you gamble for real money

7. Someone who (expects) a whole life for real love may finally find it.

9. Others (complain) when there is a crisis.

Task 2

Read the text and choose the verb that agrees with the indefinite pronoun



Answer:

I go on a new trip every week. Few (visit) the park where I go because everybody (visits) Yellowstone. Every time I sit near a big oak, I see something that moves in the woods. Then there is more movement and nobody (sees) it. Either can be a bear or both are just the wind. Nobody here seems to figure it out, but we have many guesses. The scenery here is gorgeous; one (sees) for miles. Everybody (loves) this one view of the valley because nothing is more beautiful.

Task 3

Read the following excerpt from an article. The author describes the 5 top traits of a girlfriend. Then answer the questions including at least 3 indefinite pronouns in each answer.

The Best Traits of a Girlfriend

You know what? We're feeling a little misty-eyed thinking about true love. Maybe it really does exist, you know? Despite the odds, and everything. Maybe there's more to life than playing the field. Well, you can create your own relationship success by looking for the right traits in a woman instead of just swiping right on everyone on Tinder. Let's take a look at the top things in a significant other that'll make for a lasting relationship.

1. She is independent

No one gets into a relationship to be a babysitter. If she's had a rough day at work, it's great to be her shoulder to cry on. But if she can't seem to function without you, you'll eventually suffocate, and if you're smart, you'll run for the nearest exit.

2. She is intelligent

I hate to be the one that tells you this, but the bimbo routine gets real old, real fast. A woman who can meet you at an intellectual level is a total turn-on. You want someone who constantly surprises you.

3. You are attracted to her

I know, this one is kind of obvious, but important, nonetheless. A great girlfriend is someone who wants to look good for you and for herself. Anyone who sees you with her will also see an improved version of you.

4. She lets you be a man

Do not — I repeat — do not get involved with anyone who tries to get you to eat cheese and fruit for breakfast and insists that you give up poker night with the guys. You will end up resenting her more than you can imagine. Anybody who lets you be a guy in all your glory, poker night and all deserves your love. If she's a great girlfriend, she'll even bring you and your friends a couple of beers and make you some of her famous sandwiches.

5. She gets along with your friends and family

A great girlfriend makes and effort to get to know your people. This is something that really matters if you are thinking of moving to the next level in the relationship. A good girlfriend helps your parents out at Christmas, tries to understand your brother's humor and wants to get to know your friends.

1. Do you agree with his ranking? Why?

_____

2. Which trait from the list would be the top 1? Why?

_____

B.2.3 Condition 3: Long-distance agreement with singular subject plus attractor.

Each gerund should be treated as singular since it is the "name" of one action

Action	Action Name	Example
To smoke	Smoking	Smoking cigarettes damages your body.
To eat	Eating	Eating peanuts makes you gain weight.
To work	Working	Working with kids results to be too difficult for her.

Task 1

The following text is about how to teach your puppy to walk on a leash. Choose the correct subject to complete the sentences.

Teaching a new puppy to walk on a leash takes a little bit of practice. The puppy will be playful but not very focused.

take

takes

Finding the right harness Choose the an... For a puppy, you will want one that attaches to the dog's chest not the dog's ne... se the answer... the body of the dog to move forward. If the dog resists... rce it.

Putting a treat in front of the dog Choose the answer... another good way to get the dog to walk ahead. Let the dog smell the treat in your hand.

Then, walk forward. The dog's nose will follow. Don't let the dog have the treat right away. Let the dog take a few steps before rewarding the dog.

Using a tasty treat to encourge a specific behavior Choose the answer... as very effective tecnique, as well. With a little bit of practice, a lot of patience, and love, your puppy will become your walking companion.

Answers:

4. Teaching a new puppy to walk on a leash (takes) a little bit of practice.
5. Finding the right harness (becomes) very important. For a puppy, you will want one that attaches to the dog's chest not the dog's neck.
6. Pulling the puppy (causes) the body of the dog to move forward.
7. Putting treats in front of the dog prevails as very effective technique…

Task 2

Complete the sentences with the write form of the verb in parenthesis

1. Learning about other cultures _____(make) people more tolerant.
2. Growing your own vegetables _____(save) money and is healthier.
3. Vegetables grown by your own _____(save) money and is healthier.
4. Work from home jobs _____ (allow) you to organize yourself as you want.
5. Plane tickets to many countries _____ (cost) a lot of money.
6. Telling your parents, the truth _____ (take) a lot of courage.
7. Conscious efforts to empathize with others _____(make) people more tolerant.
8. Bruno Mars and his band _____(cheer) up my mornings.
9. Flying to many countries _____(cost) a lot of money.
10. Listening to Bruno Mars in the morning _____(help) to improve my mood throughout the day.
11. Working from home _____(allow) you to organise yourself as you want.

Task 3

Read the text about online shopping and create a list of 5 activities E-Bay enables its users to do. For example:

1) *Listing items they want to sell.*
2) _____
3) _____
4) _____
5) _____

Ebay — Buying, Selling and Trading

Ebay is the Internet version of the "flea market". People can list items they would like to sell and find items they'd like to buy. The eBay site allows users to search for item descriptions. Sellers can post their items, change the item category, showcase the item and view bids on the item.

Purchasers can verify the authenticity of an item, purchase insurance, put the item in escrow and even get help with disputes when there is a disagreement. Buying, selling and trading are very efficiently done via the web.

B.2.4 Condition 4: Long-distance agreement plus modifier and plural attractor.

Explicit Information.

Often a subject, is just a noun, a pronoun, an adjective with a noun or a determiner and a noun.

Examples:

e) **Garfield** is an overweight cat.
f) **He** lives with his owner Jon and a dog called Oddie.
g) **His** favourite food is lasagne.
h) **These animals** have a nice life.

Sometimes a subject is formed by a noun phrase plus some words or phrases which add extra information.

<u>The verb must agree with the subject and not with the new information in between.</u>

Examples:

a) The boy in the yellow pants wants to dance with her.

c) A man sitting over there keeps looking at the sky.

d) The girl talking to Ed Sheeran looks like she is going to faint at any moment.

i) That girl over there in a green dress drinking a coke seems very happy.

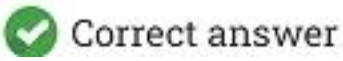
Task 1
Choose the verb that agrees with the subject.

1. Your friendship over the years means a great deal to us.
2. The man in the black suits carr [mean / means] looks like really sad .
3. Every year during the midsumn ge bonfires fills the sky.
4. Hamilton Family Center, a shelter for teenage runaways in San Francisco, offers a wide variety of services.
5. The center on the basketball team bounces the ball too high.
6. Those red-haired ladies in fur hats live across the street.
7. The CEO based on his retrograde ideas decides on the policies of the company.
8. A man very fond of all sort of exotic birds lives on my street.
9. Far below, a landscape of rolling brown hills trees lies in disharmony with the grim structures of steel and cement.
10. The reasons for Dave's constant success in his university courses seems to be hard work and natural ability.

Task 2

Does the verb in each sentence agree or not with its subject? Choose "right" or "wrong" from the drop-down menu.

1. The subjects taught by Mr. Holt involve a lot of hard work and patience. right
2. Santa Claus helped by his reindeer deliver the presents all over the world. wrong
3. Jack's first days in the infantry make her mother suffer a lot. right
4. The suitcase filled with clothes and make-up belongs to my sister. right
5. The presence of certain bacterias in our bodies determine our overall health. right
6. The buildings on each campus look more modern after the renovation. right
7. The nightime coach full of passengers pass quickly around the city. wrong
8. The designs on Indian pottery fascinate me. right
9. Each year the winner from all the schools throughout the state seem to be very much surprised. wrong



Task 3

Complete each sentence with any of the verbs provided in present simple. Make sure it agrees with the subject.

look - swim - walk - belong - keep - run

The boxes of cake mix_____

The children playing in the garden _____

The mother duck with all her little ducklings _____

The bucket of blooming flowers _____

The Victoria's Secret Angels _____

The lady wearing an old pair of jeans _____

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