Does Revision Process Differ Across Language of Writing (L1 vs. FL), FL language Proficiency and Gender? An Empirical Study Using Keystroke Logging Data

2 authors:

Zulaikha Al-saadi
Colleges of Applied Sciences
4 PUBLICATIONS   **1** CITATION

SEE PROFILE

David Galbraith
University of Southampton
52 PUBLICATIONS   **1,245** CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:

Project   Differential effects on Writing performance (Learning to Write) and Topic Knowlegde (Writing to learn) View project

Project   Andrea Revesz View project

Research Matters

Does Revision Process Differ Across Language of Writing (L1 vs. FL), FL language Proficiency and Gender? An Empirical Study Using Keystroke Logging Data

Zulaikha Talib Al-Saadi and David Galbraith

Ministry of Higher Education Rustaq College of Education, Oman

Abstract

Drawing upon cognitive writing process theory and research, this study investigates the influence of language of writing, foreign language (FL) proficiency and gender on the revision processes of 77 undergraduate students studying at an English-medium college in Oman. Their first language (L1) was Arabic and their FL was English. The participants produced two argumentative authentic texts, one in L1 and one in FL. Their proficiency in English was assessed using the Oxford Placement Test (OPT). Participants' revisions were recorded and analysed, according to the measures amount, location and type, via keystroke logging. The results showed that the vast majority of revisions in both languages were immediate, i.e. at the point of inscription, and focused on language rather than content. In addition, there was consistent evidence that participants made more revisions in the FL than they did in L1. For 'total amount of revision' and 'immediate revisions,' there was a consistent interaction between gender and FL proficiency. The pattern of the interaction indicated two conflicting tendencies: (a) female participants appeared in general to be more motivated to make revisions in both languages than males, and (b) the less proficient they were in FL the more revisions they made. By contrast, the number of revisions made by the male participants did not depend on their FL proficiency. For 'distant,' i.e. already written text, and 'end,' i.e. after producing the first draft, revisions the amount of revision depended solely on the language of writing and gender.

Affiliations

Ministry of Higher Education Rustaq College of Education, Oman
Email: zulaikha_alsaadi.rus@cas.edu.om
David Galbraith, Southampton Education School, University of Southampton, Southampton SO17 1BJ United Kingdom
E-mail: d.w.galbraith@soton.ac.uk

equinox
www.equinoxpub.com

Furthermore, the results revealed that when writing in the FL, students with greater FL proficiency attended to content revision more than language revision. Findings are discussed in light of process-oriented writing research and implications for writing research and teaching are suggested.

1. Introduction

Writing is a dynamic process that requires managing simultaneously a number of cognitive and linguistic processes and resources (Breetvelt, van den Bergh, and Rijlaarsdam, 1994; Flower and Hayes, 1980; Hayes, 1996; Olive, 2004; Roca de Larios *et al.*, 2008). Therefore, one would expect that learners with different motivation, cognitive and linguistic abilities to approach the writing process with varying degrees of efficiency (Kormos, 2012; Schoonen *et al.*, 2003). Less developed FL proficiency affects the way FL writers approach their writing (Chenoweth and Hayes, 2001; Kormos, 2012; Schoonen *et al.*, 2003; Stevenson, Schoonen, and de Glopper, 2006). This can be reflected in, for example, the *amount*, *location* and *type* of FL revision carried out when writing in the FL (Al Ghamdi, 2010; Barkaoui, 2016; Chenoweth and Hayes, 2001; El-Aswad, 2002; Hayes, 2012a; Lindgren, Miller, and Sullivan, 2008; Stevenson *et al.*, 2006; Thorson, 2000). A number of studies have examined revision behaviours across languages and/ or different language proficiency levels (Al Ghamdi, 2010; Barkaoui, 2016; Chenoweth and Hayes, 2001; Lindgren *et al.*, 2008; Stevenson *et al.*, 2006; Thorson, 2000; Whalen and Menard, 1995). This article contributes to this line of research by addressing the influence of language of writing (L1 vs FL), FL proficiency and gender on writers' revision processes.

The paradigm shift of writing research from product oriented to process oriented has changed the focus of writing. For example, instead of exploring 'what writers write', researchers have become more interested in 'how writers write' (El Mortaji, 2010: 7). This is based on the belief that studying the writing process reveals more insights into the nature and the complexity of writing and concequently helps in improving the writing teaching materials and curriculum in order to meet students' needs (Zamel, 1982, 1983).

Despite this fundamental shift in writing research from product oriented to process oriented approaches, most English as a foreign language (EFL) writing research in the Arab world still focuses on either the final written product or on evaluating the effectiveness of various teaching methods in improving the quality of the written text (El Mortaji, 2010). Abdel Latif (2009) stated, 'Research on Arab ESL/EFL students' writing processes is still in its infancy and there remains much to be explored

about that process' (p. 2). Very few studies have compared L1 (Arabic) and FL (English) writing processes in general (e.g., Alhaisoni, 2012; El-Aswad, 2002; El Mortaji, 2010) and the revision process in particular. However, these studies are limited in a number of ways. This suggests that more process-based research comparing Arabic and English compositions is needed, including, for example, larger sample size and using a more non-interruptive data collection tool such as keystroke logging.

The most cited writing process models regarding L1 (Bereiter and Scardamalia, 1987; Hayes and Flower, 1980) have been widely used in the FL context. Indeed, practitioners have been advised to implement and adapt practices from L1 writing (Silva, 1993). This indicates that L1 and FL writing processes are assumed to be similar. In the broad sense, this could be true. Writers have been found to employ the same basic writing process elements, involving planning, formulation and revising, regardless of the language used for writing (Chenoweth and Hayes, 2001; Jones and Tetroe, 1987; Skibniewski, 1988). However, it has been observed that practitioners also need to understand the nature of the FL writing process before adopting and/or adapting L1 writing models or practices. For instance, Silva (1993) believes that comparing writing in L1 and FL may give more insights about the FL writing process and help in developing a comprehensive description of the similarities and differences between L1 and FL writing processes, and help in developing theories, research and practices in the FL writing context. L1 and EFL comparison research is needed with participants from different backgrounds, with different L1, and with different EFL language proficiency levels (Al haysony, 2008). Therefore, this current study is one of the few attempts to explore the L1 and FL revision processes of Arab students in the Arab world. In addition, this study is of a particular significance as there has been no empirical study that has investigated the Arabic and English revision processes of *Omani* undergraduate students thus the present study is an important addition to the literature on EFL writing.

Gender differences in writing have been, typically, treated correlationally, but the processes by which these differences have their effects have rarely been discussed. My current question here is how, and in what way, gender differences in revision process are mediated by linguistic ability, and how this, in turn, is mediated by differences in cognitive processing?

2. Background and Literature Review

2.1 The Complexity of the Revision Process

The revision process has been identified as a major component of cognitive writing process models (Chenoweth and Hayes, 2001, 2003; Hayes

and Flower, 1980; Hayes, 1996, 2012b; Olive, 2004; Zimmerman, 2000). Chenoweth and Hayes (2001), using think-aloud protocols of 13 students writing in L1 (English) and FL (French and German), proposed a model that describes an overall process of writing in L1 and FL writing whereby the 'proposer' is responsible for planning, goal setting and sending the idea package to the 'translator'. The 'translator' creates language strings based on the ideas received from the 'proposer' which are then evaluated by the 'reviser/evaluator'. If the language strings are accepted, they are passed to the 'transcriber' to put them into written words. The 'reviser' can be called to make a change recursively at any point. Chenoweth and Hayes's (2001) model assumes that written language is typically produced in bursts or strings of sentences rather than complete sentences. Chenoweth and Hayes (2001) distinguished between P-bursts, which refer to strings of language ending with a pause followed by written words, and R-bursts, which refer to strings of language followed by revision. Hayes' (2012b) most recent model indicates that the revising process is complex and could be considered a writing process in its own right. Revising involves not just evaluating a written text but also planning a solution for problems identified in the text, translating this solution into language, and then transcribing the proposed language either as new text or to replace the existing text (Hayes, 2012b). Stevenson *et al.*, (2006: 203) reiterate that revision is a complex process that can be carried out at different levels during writing, for example, content revisions are made in order to alter the information, while language revisions are carried out on aspects such as spelling, grammar, linguistic expression and punctuation. The complexity of the revising process has implications for how revision is carried out and what factors might influence it.

2.2 Cognitive Overload and the Revision Process

It has been established that writing, in general, requires activating and shifting between several writing processes that require access to the limited capacity of working memory (Olive, 2004). Flower and Hayes (1980: 33) stated, 'As a dynamic process, writing is the act of dealing with an excessive number of simultaneous demands or constraints ... a writer in the act is a thinker on full-time cognitive overload'. The idea of cognitive overload arose from the fact that different cognitive processes compete with each other as they draw on the same resources pool (Bourdin and Fayol, 2002; Galbraith, 2009; Hayes, 2006). For example, Chenoweth and Hayes (2003) found that the number of grammatical and spelling mistakes increased when writers were asked to repeat a single syllable while writing. This indicates that repetition of the syllable shares some resources with

the writing process' components that are responsible for text generation. It also implies that one writing component or process may interfere with the performance of another.

According to Olive (2004), the ways writing sub-processes are processed in the course of writing without exceeding the capacity of working memory vary in terms of writers' knowledge and skills and in terms of writing types. It is also thought that writing processes at all levels have a cognitive cost, although some processes that are sufficiently automated, might require less cognitive cost (Bourdin and Fayol, 1994, 1996; Hayes, 2012a, 2012b; Kormos, 2012; Olive, 2004; Stevenson *et al.*, 2006). A series of experiments conducted by Bourdin and Fayol (1996, 1994, 2002) to compare L1 written and oral recall of children and adults suggest that low-level writing activities (spelling and handwriting) can constrain the retention of words. For example, Bourdin and Fayol (1994) asked second and fourth grade children and undergraduate students to recall a series of words in oral or written mode. The authors reported that children recalled fewer words when they responded in a written mode than when they responded orally. No differences were reported in adult performance in the two modes. The authors assumed that the elementary processes involved in writing (graphic transcription and orthographic) are more automated in university students than primary school children. Therefore, such processes may not cause cognitive load and consequently would not impair word-retrieval with adults. However, Bourdin and Fayol (2002) found adults performed worse in L1 written production compared to oral production when the complexity of the recall task increased. This suggests that even when lower-level processes involved in writing (e.g., handwriting and spelling) are highly automated, they can still negatively affect memory retrieval.

This line of research suggests that the lower-level processes involved in writing in general can impose cognitive cost in writing even if they are well practised and automated. It also implies that automatizing such activities may reduce cognitive overload and consequently free resources in working memory to perform higher-level processes like idea retrieval. One would conclude that processes that have not been adequately automatized are more likely to cause cognitive overload. Consequently, individuals' efficiency and speed in performing writing processes vary depending on their working memory capacity (Kormos, 2012).

2.3 Language Proficiency and the Revision Process

As implied in Section 2.2, writing in an FL imposes additional demands and constraints on writers' writing processes, particularly for those with less well-developed language skills (Barkaoui, 2016; Chenoweth and Hayes,

2001; Stevenson *et al.*, 2006; Whalen and Menard, 1995). The chance of cognitive overload is higher in the case of FL writing as FL writers need to deal with language problems along with writing process demands (Al Ghamdi, 2010; Schoonen, Snellings, Setevnson, and Von Gelderen, 2009; Schoonen *et al.*, 2003). This indicates that being linguistically competent in the FL plays an important role in the writing process. Schmidt (1992) distinguished between two types of language processing: controlled and automatic. Automatic processing differs from controlled processing in a number of aspects including speed and memory capacity. According to Schmidt (1992), as *language proficiency* increases a shift from controlled to automatic process takes place. His theory suggests that acquiring greater language proficiency results in more automatic and faster retrieval of the language resources needed in writing, with less demand on limited working memory capacity.

A number of researchers have argued that *writing skill development* depends on increasing the linguistic processes and knowledge required for text production (e.g., Abdel Latif, 2009; Al amargot and Fayol, 2009; Al Ghamdi, 2010; Chenoweth and Hayes, 2001; Manchón and Roca de Larios, 2007a; Roca de Larios *et al.*, 2008). This is specifically applied in Stevenson *et al.*'s (2006) Inhibition Hypothesis which postulates that the linguistic demands involved in FL writing might consume cognitive resources and consequently inhibit writers' attention to high-level thinking skills such as content revision. This indicates that FL writers' attention to lower-level revisions, e.g., language revision, might have 'an inhibitory effect' in carrying out revisions at the content level (Stevenson *et al.*, 2006: 203). Research has shown that writers revise their text more frequently at the language level when they write in the FL compared to L1 (Chenoweth and Hayes, 2001; El-Aswad, 2002; Lindgren *et al.*, 2008; Stevenson *et al.*, 2006; Whalen and Menard, 1995). Furthermore, FL writers need to revise less as they become linguistically more proficient in the FL (Al Ghamdi, 2010; Barkaoui, 2016; Chenoweth and Hayes, 2001; Lindgren *et al.*, 2008).

FL writers, particularly those with less FL ability, are mainly driven by their FL proficiency and this has implications for what and when they revise. For example, FL writers are found to concentrate more on lower-level linguistic processing, and that would consequently reduce the amount of attention given to higher-level processing (Broekkamp and van den Bergh, 1996; Manchón and Roca de Larios, 2007; Schoonen *et al.*, 2003; Stevenson *et al.*, 2006). Empirical evidence concerning the revision process, for example, is given in Whalen and Menard (1995), who used think-aloud protocols to study the writing processes of Canadian students studying French as an L2. They reported that writers' limited L2 proficiency caused them to plan and revise relatively more at the language level than at the textual

and pragmatic level when writing in a second language (L2) (French). Their participants tended to revise more frequently at the linguistic level in both L1 and L2. However, revisions in L2 were more about spelling and morphemes compared to phrase and sentence level in L1 revisions. This example suggests that language proficiency in FL has a major impact on how the writing process is carried out.

2.4 Previous Studies on the Revision Process

Thorson (2000) used *keystroke logging* to compare the number and types of revisions made by 18 English (L1) undergraduate writers learning German as an FL. His study distinguished between two types of revisions: (a) *immediate revision*, and (b) *distant revision*. He assumed that making more distant revisions would indicate that writers interact more with their text. He also hypothesized that FL would produce more distant revisions than L1 as FL writing involves going back and forth between sentences and paragraphs to revise words and phrases or add or delete information. Thorson (2000) found that FL writers made more immediate and distant revisions when writing in a FL than in their L1.

Similarly, Stevenson *et al*. (2006) studied the revision processes of 22 FL high school Dutch writers when writing in L1 (Dutch) and FL (English), and correlated it to the quality of the text produced using think-aloud protocols and *keystroke logging*. They found that their participants made more revisions when writing in the FL than in their L1, regardless of the writers' writing proficiency level (high or low) or writers' characteristics (bilingual or monolingual). They also found that the frequency of language revisions (spelling, vocabulary and grammar) was significantly greater in FL than L1, whereas the punctuation and phrasing revisions were relatively similar in both languages. Similar findings, in terms of the frequency of language revisions in FL writing, were also reported by a number of other studies (Al Ghamdi, 2010; Barkaoui, 2016; El-Aswad, 2002; Whalen and Menard, 1995). Similarly, Stevenson *et al*. (2006) also reported that their participants made content revisions infrequently in both languages. Their study did not report any significant difference between the two languages in terms of content revision. Indeed, the study failed to support the Inhibition Hypothesis as the researchers did not find that inhibition regarding higher-level revisions was only restricted to FL writing.

In the same vein, Al Ghamdi (2010) found that immediate revisions were the most common revisions performed by her EFL participants. This may imply that her participants could follow a linear writing process technique and that they fail to realize the recursive and modifiable nature of writing process. According to Thorson (2000), these writers (who are reluctant to

move around their text to make changes after the text has been produced) lack the ability to interact with their writing process and to move around their text and modify it after they produced it and proceeded with their writing. Al Ghamdi's (2010) study is interesting in that it provides some evidence to support the Inhibition Hypothesis; it showed that being more proficient in the FL resulted in more content revision and less language revision. Lindgren *et al.* (2008) also reported that their 14–15 year old writers' focus on conceptual revisions increased as their L1 (Swedish) and FL (English) proficiency increased. This indicates that the lack of sufficient FL proficiency more likely causes FL writers to focus on lower-level processing activities, e.g., spelling and grammatical revisions, thus, higher-level processing, e.g., textual and content revisions, are left unattended. Similar findings were also reported by Barkaoui (2016) as his FL (English) writers tended to make more precontextual (immediate) revisions. His study reported that 46% of revisions carried out by his writers were typographical, 32% were language and 13% of these revisions were content. Barkaoui's (2016) study also revealed that his FL writers' revision was affected by their FL proficiency as they tended to revise more the less they were proficient in FL and that the amount of revision decreased as their FL proficiency increased. Although, Barkaoui (2016) found that writers with lower FL proficiency made significantly more language revisions than writers with higher FL proficiency, his study did not report a significant difference between the two FL proficiency levels (high vs low) and the amount of content revision.

It can be concluded that FL writers tend to make more language revisions when writing in the FL than L1. However, the frequency of language revisions decreases as writers' command of the FL increases. Their tendency to focus on form could be because of their limited language skills, thus, language issues such as spelling, grammar and vocabulary would be a concern while writing. Previous research has tended mostly to compare the amount and the type of revision across L1 and FL. Research that has considered the influence of factors such as FL proficiency and gender on revision process is scarce. Furthermore, research on revision process has produced conflicting results regarding inhibition in FL writing.

2.5 Gender Differences and the Writing Process

Although gender has been recognized as a large factor in education, studies in gender differences in writing processes are very limited (Castro and Limpo, 2018; Zhang, Bennett, Deane, and Rijn, 2019). The few studies that exist, which mainly focus on L1 writing particularly with children, have provided some evidence that gender is an important predictor of

the writing performance of children as well as adults, typically favouring females (Adams and Simmons, 2019; Beard, and Burrell, 2010; Berninger and Fuller, 1992; Olinghouse, 2008; Troia, Harbaugh, Shankland, Wolbers, and Lawrence, 2013; Zhang *et al.*, 2019). Females have been found to perform better than males in many aspects of L1 writing, particularly in the UK and America (Berninger and Fuller, 1992; Malecki and Jewell, 2003; Pajares and Valiante, 2001a). Furthermore, a number of studies have revealed that females outperformed males in writing fluency and overall text quality (Berninger and Fuller, 1992; Olinghouse, 2008; Zhang *et al.*, 2019). Of particular interest, Zhang *et al.*, (2019) compared the L1 writing processes and text quality of 2,619 middle-school students (grades 6–9) using *keystroke logging*. Six essays produced by the participants, were used to track and compare females' and males' writing processes and text quality. Their study reveals that females consistently obtained higher essay scores, composed more fluently, edited their texts more and paused less compared to males.

Different accounts have been offered to explain gender differences in writing. As explained in Section 2.2 the mastery of transcription process, the process of converting language strings into written text, is associated with achievement in writing (Bourdin and Fayol, 1994, 2002; Castro and Limpo, 2018; Limpo and Alves, 2017). Girls are thought to master transcription skills earlier and more effectively than boys (Adams *et al.*, 2015; McCutchen, 1996, 2000). This might explain their superiority in fluency as well as text quality. Aspects of individual motivation have been also identified in explaining gender disparities in writing. Among these is self-efficacy – individuals' confidence about their own writing skills – which has been recognized as an important predictor of writing performance (Abdel Latif, 2009; Castro and Limpo, 2018). Research has shown the potential role of self-efficacy in explaining the disparities in gender in writing (Adams and Simmons, 2019; Castro and Limpo, 2018; De Smedt *et al.*, 2018; Pajares, Miller, and Johnson, 1999; Pajares and Valiante, 2001b; Troia *et al.*, 2013). For example, Pajares and Valiante (2001b) and Pajares, Miller, and Johnson (1999) in their studies of school students, 8–10 years, found that girls hold stronger writing self-efficacy beliefs and scored higher in writing tasks compared to boys, whereas boys tended to be more apprehensive about their writing skills and writing tasks. They also revealed that self-efficacy is a significant predictor of writing performance and text quality. Motivation has been recognized as an important factor that explains differences of individual performance in writing (Castro and Limpo, 2018; Hayes, 2012b). Motivation was not addressed in the original model of Hayes and Flower (1980s), but was included in Hayes' model (1996). Hayes (2012b) argues that *motivation* is intimately involved in a number of aspects of the writing process, including individuals' willingness to write, how long they can

engage in writing and editing, and how much they are concerned about the quality of their writing.

Studies in gender difference in writing are consistently suggesting that gender difference is more apparent with younger age. Studies with older students seemed to suggest that there is limited evidence for gender difference. For example, Jones and Myhill (2007) studied adolescents (13–16 years old) and found very limited evidence to suggest that girls performed better than boys in L1 writing. Similarly, Spelman Miller *et al.* (2008) in her longitudinal study of 17 Swedish high school students (14 years old), revealed no significant effect of gender in FL (English) writing process, i.e., writing fluency, text length, time on task, revision, pause time, pause length, as well as text quality. Furthermore, most of the gender difference research in writing has been exclusively limited to L1 writing with school students, mostly in America and the UK. Gender difference has been rarely studied in FL cognitive writing context with adult writers. The case might be different in FL adult learners since their linguistic skills in FL are less good. One potential difference between genders is language abilities as girls have been found to be linguistically better than boys (Huttenlocher, Haight, Bryk, Seltzer, and Lyons, 1991; Hyde and Linn, 1988; Özçalişkan and Goldin-Meadow, 2010). However, research on writing typically has not explicitly dealt with this (language ability and gender differences) as a major issue. Little discussion has been given to how gender differences in cognitive writing, in general and revision process in particular, might be mediated by linguistic factor. For these reasons, the current study did not consider detailed review of how gender might play a role on revision process. Furthermore, using computer-based tracking methods to observe gender differences in writing processes should be considered, given that most of the previous studies used paper-based tasks and methods. Employing computer-based tools to track writing processes, such as keystrokes, might probe the debate about gender difference further (Zhang *et al.*, 2019). This might contribute to our understanding of what underlies gender differences in writing in general and, in turn, advance theory with respect to gender differences in writing processes.

3. The Present Study – Method

Section 2 suggests that more research is needed to better understand the revising process. The present study explores whether language (L1 vs FL), writers' FL proficiency and gender influence the amount, location (immediate, distant, or end) and type (content or language) of revisions carried out by undergraduate writers studying an ELT program. The study addressed the following question:

1. To what extent does the revision process vary across language of writing (L1 vs FL), FL proficiency and gender?

3.1 Participants

Seventy-seven ELT undergraduate students (43 male and 34 female) studying at an *English-medium* college in Oman, whose ages ranged between 20 and 23 years, took part in this study. Arabic was the first language of all participants. The participants received instruction in English language subjects like phonetics, phonology, grammar, reading and vocabulary, essay writing, children's literature, English literature, listening and speaking, teaching methods, reading in applied linguistics and sociolinguistics. Furthermore, they received a considerable amount of instruction in EFL academic writing as most of their modules' assessments depend on academic writing. For example, they were regularly required to submit written research, reports, and written assignments in English to fulfil the requirements of their academic courses and their exams are mostly based on academic essay writing. The participants were drawn from two different academic years (the second and the fourth). The rationale of selecting two academic years was that these two groups would have different levels of FL proficiency.

3.2 Measure of FL proficiency – Oxford Placement Test

The writers' FL proficiency was assessed using the OPT. The OPT is composed of two parts: listening and grammar. The test consists of 100 multiple-choice items, 50 items in each part. On average, the completion of this test takes one hour, 10 minutes for the listening section and 50 minutes for the grammar part, and its total score is 100. The grammatical structures included in the test were chosen from the structures regularly covered by most of the course books, and public examinations such as those used by the British Council (Abdel Latif, 2009). The OPT has been administered to students of over 40 nationalities at a range of English language levels. It is maintained that the language used in OPT is controlled and counterbalanced, so the reliability of the test is high (Allen, 2004).

The reliability score for the OPT using Cronbach's alpha is .806, thus the use of the OPT for the current study is sound. The participants in the study were categorized as 'lower intermediate – modest users' (see Allen, 2004) based on their scores in the OPT (Mean = 121.61, *SD* = 10.37). In order to assess how FL proficiency varied depending on year of study and gender, a two-way analysis of variance was carried out, with participants' year of study and gender as between factors, and English language proficiency as the dependent variable. Effect size was evaluated using Cohen's

(1988) criteria, which suggest that partial eta square (η^2_p) values at or above .01, .06, and .14 indicate small, medium and large effect sizes respectively. The analysis indicated that there was a significant main effect of year of study ($F(1,73) = 5.35$, $p = .024$, $\eta^2_p = .07$), with students in year 4 (Mean = 123, $SD = 11.18$) performing better than students in year 2 in OPT (Mean = 120.5, $SD = 9.6$), and a significant main effect of gender ($F(1,73) = 11.41$, $p = .001$, $\eta^2_p = .13$), with females (Mean = 125, $SD = 8.6$) performing better than males (Mean = 118.9, $SD = 10.9$). Figure 1 shows the OPT mean scores as a function of year of study and gender. As can be seen, females scored higher overall than males in each of the years of study. In addition, performance was consistently better in year 4 than year 2, indicating that students' language performance had improved between years 2 and 4.

In light of the significant association between FL proficiency and gender, subsequent analyses assessed whether any gender differences in performance in the FL writing task were mediated by FL proficiency.
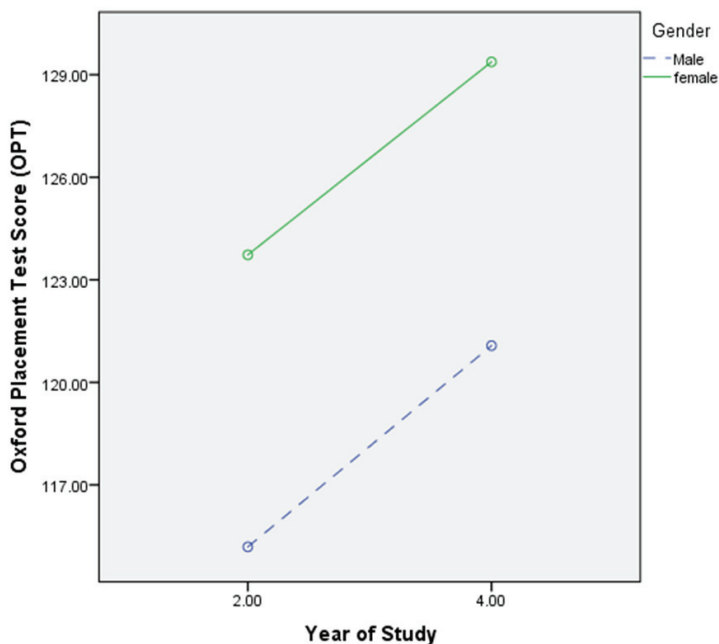

Figure 1. The participants' OPT mean scores as a function of year of study and gender

3.3 The writing tasks

The current study used argumentative tasks to encourage writers to engage in problem-solving activity and in incorporating their personal perspectives and experiences. In order to counterbalance the topic effect, the participants were given two general writing topics, which they were comfortable and familiar with (see Appendix A). The decision to present the writing prompt in L1 (Arabic) as well as FL (English) was important for clarity and comprehensibility (Kroll and Reid, 1994; Reid and Kroll, 1995). Furthermore, by giving the participants the writing prompt in Arabic it was hoped to reduce 'the possible effect of varied task comprehension [by students] in the foreign language' (Al Ghamdi, 2010: 80). Additionally, on the basis that Akyel (1994) suggests specifying the audience and the purpose of the writing is important, and because offering an authentic context and audience might encourage a variety of writing processes, the participants were asked to write an article for an authentic college magazine.

3.4 Design and procedure

The study took place in the spring of 2016 in college computer labs. In order to counterbalance the *topic effect*, the participants were placed into four different groups: two groups were from the second year (42 students) and the other two were from the fourth year (35 students). The first participant in the first group wrote about topic one in L1 and topic two in FL, while the second participant wrote about topic two in L1 and topic one in FL. This pattern was followed with the other groups. In order to counterbalance the *language effect*, two groups (one group from the second year and one from the fourth year) carried out the FL task first and then the L1 task, while the other two groups completed the L1 task first followed by the FL task.

The setup of the study required each participant to attend two writing sessions in order to complete two writing texts, one in L1 and one in FL, on the computer. The sessions were around one week apart. The students' writing processes were recorded using Inputlog 7.0.0.11, downloaded from www.inputlog.net (Leijten and van Waes, 2013; van Waes, Leijten, and van Weijen, 2009). During each session, the participants were given 40 minutes to write a 300-word authentic academic text, as this is the most typically encountered writing method at the college. Having been given the writing prompts, the students clicked on the recording button for the keystroke logging software and started writing. When the participants had finished the writing task, they clicked the stop icon.

3.5 Keystroke logging program

Keystroke logging enables researchers to address different aspects of the writing process (e.g., the frequency, length and occurrence of pauses during writing) and to conduct studies on a large scale (Leijten and van Waes, 2013). Inputlog is a word processor program with normal text editing functions. The distinctive feature of this research tool is that it 'provides an unobtrusive record of the moment-by-moment creation of the text' (Baaijen *et al.*, 2012: 247). The excessive use of think-aloud protocols to record and observe writing processes in most of the previous writing process research has been an important methodological limitation. Think aloud protocols could interfere with the writers' thinking process while they are writing (Wang, 2003) and hence may cast doubt on the validity of the findings. This may be particularly important for comparison of L1 and FL as it involves a switch between L1 (for the protocols) and FL (for the text), and may affect the balance between L1 and FL use during writing (Barbier, Jullien, and Provence, 2009). Therefore, this study used keystrokes logging to record and observe the writing processes without any interference with the writing process. Inputlog is installed and activated before the writing session starts, so it does not interfere with the writing activity (Abdel Latif, 2008; Spelman Miller, 2000). The writers can control and use the computer keys as they normally do with any text editor. When the writing session finishes, the recorded logged data is saved as XML files (van Waes *et al.*, 2009). These files provide rich data about the time and the occurrence of different activities like revision, P-bursts, pauses, time, cursor movement, deletions, spacebar. The replay function can be used to elicit writers' reflections on their own writing after the writing session (Spelman Miller, Lingren, and Sullivan, 2008; Thorson, 2000). It also allows the researcher to replay the keystroke-recorded writing sessions to study the writing process in more depth. The logged data can be also archived and used by other researchers (van Waes *et al.*, 2009).

4. The Present Study – Data Analysis

4.1 The Six Revision Measures

In order to provide an overview of the six revision measures used for this analysis, two examples of the process graphs produced by Inputlog are shown in Figure 2. These are taken from the same writer, and show the process graphs for the writing tasks carried out in L1 and FL. These graphs show the elapsing of time on the x-axis, and the cumulative number of characters produced on the right-hand y-axis. (The left-hand axis shows pause time and is not relevant in the present context.) Two separate lines

are plotted: the upper, blue line represents the characters produced in the keystroke log; the lower, green line shows the characters retained in the final product. The gap between the lines therefore represents the extent to which characters produced during writing were deleted. When the two lines continue uninterrupted, this gap represents the amount of immediate revision taking place: text is deleted and modified at the point of inscription. When text production is interrupted, and the writer returns to an earlier point in the text to delete or add text, this is represented by a vertical line showing the movement back in the text and is characterized as *distant revision*. At the end of the writing session, writers often read back over the text, editing and revising. This is represented by a vertical line towards the end of the writing process and is characterized as *end revision* rather than as distant revision.
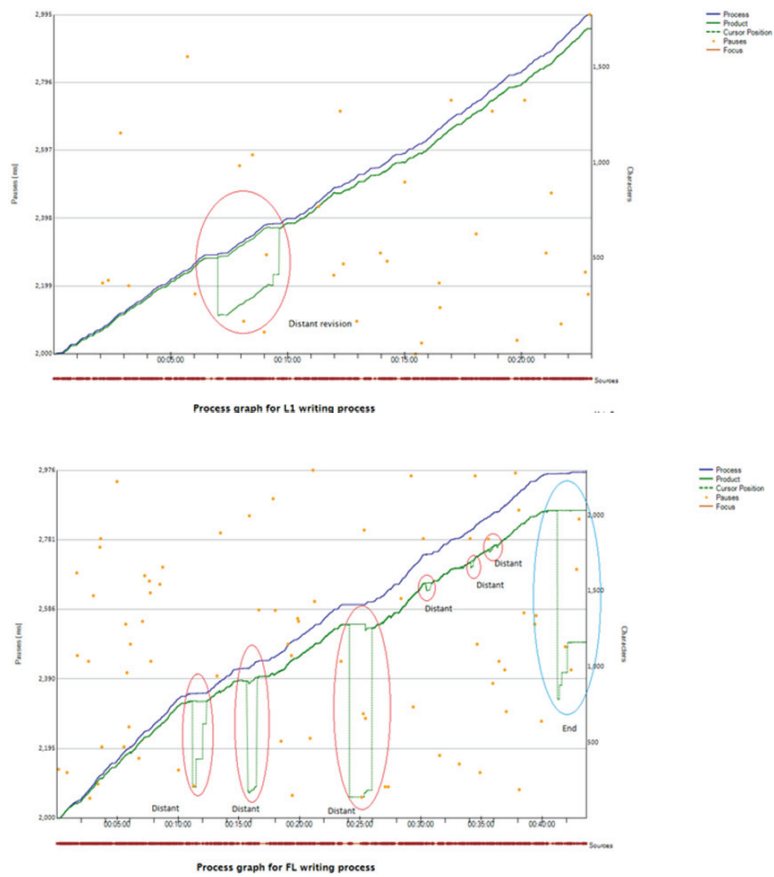

Figure 2. Process graphs for L1 and FL writing processes

In the example shown in Figure 2, the first graph represents the writing process in L1, and the second graph represents the writing process of the same writer in the FL. As can be seen in the figure, writing in L1 for this task was a very linear process. There was relatively little revision, with the majority of the revision being *immediate* (represented by the gap between the blue and green lines). There was only one instance of a distant revision and no evidence of end revision. By contrast, writing in FL was much less linear. There were more immediate revisions (as presented by the wider gap between the blue and green lines), a high number of distant revisions, and more evidence of end revision. This broad contrast is typical of the majority of the participants.

Six different measures were calculated from the keystroke logs. These consisted of three different types:

1. Global measure of revision, designed to provide a broad overview of *amount* of revision. This included (a) the total number of revisions per text.

2. Measures of revisions made at different locations. These consisted of (b) the number of *immediate* revisions per text, (c) the number of *distant* revisions per text, and (d) the number of end revisions per text.

3. Measures of the extent to which revision consisted of language editing or involved more substantial changes in content. Due to the fact that the computer keyboard is laid out differently in Arabic, extracting and analysing language and content revisions in Arabic was not possible. This analysis therefore was carried out only on the English language (FL) texts. The measures taken were: (e) the number of language revisions per text, and (f) the number of content revisions per text.

For all of these measures, the number of revisions was divided by the total number of words produced to control for variations in text length. The normal Quantile-Quantile plot, histogram and test of normality indicated that the revision variables were positively skewed. Therefore, the variables were log-transformed to approximate normality. Five extreme outliers were found and excluded from this analysis. Consequently, the data achieved satisfactory approximations to the normal distribution. Bivariate correlations were calculated to identify the relationships between the variables. Repeated measures analysis of covariance (ANCOVA), which combines analysis of variance and multiple linear regression, was carried out to assess the effects of the independent variables on the dependent variables (revision measures). Language of writing (L1 vs FL) was used as a within-subject variable, and gender and OPT scores (designating FL proficiency)

Table 1. Mean and SD scores for each of the revision variables, along with the bivariate correlations between the variables, OPT mean score and gender

Variable name	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. L1 total number of revisions (logn)	.32	.15											
2. FL total number of revisions (logn)	.42	.14	.40**										
3. L1 immediate revisions (logn)	.27	.13	.92**	.45**									
4. FL immediate revisions (logn)	.34	.14	.44**	.88**	.51**								
5. L1 distant revisions (logn)	.009	.008	.64**	.20	.52**	.23*							
6. FL distant revisions (logn)	.014	.010	.45**	.46**	.40**	.33**	.42**						
7. L1 end revisions (logn)	.002	.003	.33*	.28*	.09	.23	.15	.15					
8. FL end revisions (logn)	.003	.004	−.09	.26*	−.11	−.01	−.10	.34**	.17				
9. FL language revisions (logn)	.41	.14	.42**	.99**	.45**	.85**	.27*	.48**	.27*	.22			
10. FL content revisions (logn)	.01	.008	.14	.24*	.16	.13	.12	.16	.11	.19	.19		
11. OPT	121.190	10.60	.06	−.12	.04	−.18	.14	.14	.06	.09	−.14	.23*	
12. Gender*			.28*	.22	.19	.17	.25*	.20	.30*	.09	.24*	.13	.30**

Note. $*p < .05$, $**p < .01$, (two-tailed tests) *Dummy coded, Male = 1, Female = 2

were used as between-subject measures. Each dependent variable was examined separately. Independent variables were examined in sets: main effects, two-way interactions and three-way interactions. Non-significant terms were gradually removed in order to simplify the model. The results of the final simplified model are presented at Table 1. Complementary analyses using repeated measure ANOVA and mediation analysis Hayes (2013) were carried out in later stages.

Table 1 shows the mean (*M*) and standard deviation (*SD*) for each of these variables in the two languages tasks, along with the bivariate correlations between them, and with FL proficiency (OPT) and gender.

First, it is worth noting that all revision measures in one language were moderately correlated with the corresponding measure in the other language, except for 'end revision', as Table 1 shows. This indicates that participants applied consistent revision patterns across the two languages. Second, it should be noted that the overwhelming majority of the revisions were immediate (Mean = .37 revisions per text, *SD* = .16), rather than being either distant (Mean = .012, *SD* = .009) or end revisions (Mean = .003, *SD* = .004), ($F(2,130) = 353.16$, $p < .0001$, $\eta^2_p = .84$).

4.2 Total Number of Revisions

Table 1 shows that the participants made a higher number of revisions in the FL task than in the L1 task, and that females made more revisions in both languages than males, though this failed to reach significance in FL. There was no evidence for a simple bivariate relationship between FL proficiency and total amount of revision. The initial regression analysis assessing the effects of language of writing and gender confirmed that there was a significant main effect with regard to language of writing ($F(1,64) = 24.43$, $p < 0005$, $\eta^2_p = .26$), and a significant main effect of gender ($F(1,64) = 5.734$, $p = .020$, $\eta^2_p = .08$). However, when FL proficiency was added to the model, this revealed a significant interaction between gender and FL proficiency ($F(1,64) = 4.642$, $p = .035$, $\eta^2_p = .07$). The key feature of this interaction was that it applied to both the FL and L1 writing tasks.

Figure 3 shows the relationship between FL proficiency and the total number of revisions averaged across the two languages of writing. As can be seen, the interaction reflects the fact that the female participants carried out more revisions the less proficient they were in FL. By contrast, there was no relationship between the amount of revision males carried out and their FL proficiency.

Mediation analysis was then carried out separately for the two languages of writing to assess whether the effect of gender on total amount of revision was mediated by FL proficiency. As can be seen at Figure 4, gender
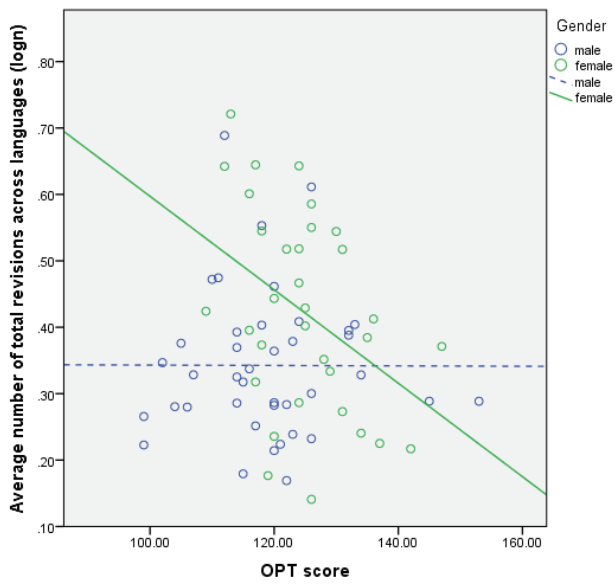
Figure 3. The participants' total number of revisions per text (logn) averaged across both languages as a function of gender and FL proficiency

had two separate effects on the total amount of revision. First, there was a significant direct effect ($b = .08$, $se = .03$, $p < .05$), with females generally carrying out a greater amount of revision than males. Second, there was also a significant indirect effect through FL proficiency ($b = -.02$, $se = .01$, $p < .05$), with females' higher FL proficiency being related to a reduction in
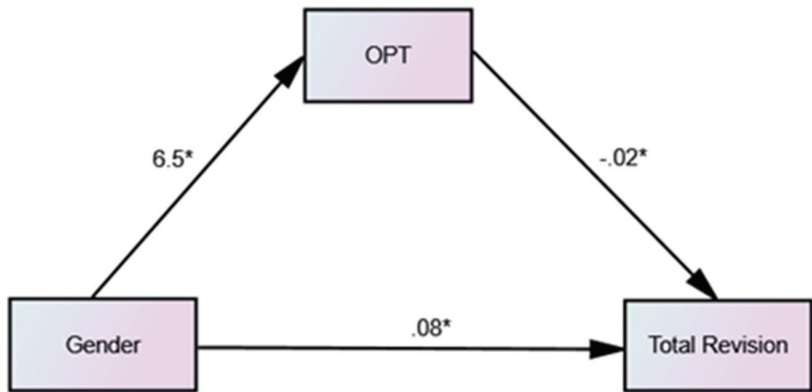

Figure 4. The relationship between gender, FL proficiency and the total number of revisions in FL writing (unstandardized coefficient)

equinoxonline

the amount of revision carried out. These results indicate that females, in general, carried out more revisions than males in FL. However, the more proficient the females became in the FL the fewer revisions they carried out in the FL. By contrast, for L1, although there was a significant direct effect of gender on amount of revision ($b = .09$, $se = .04$, $p <. 05$), there was no significant indirect effect through FL proficiency ($b = −.002$, $se = .01$, $p > .05$). This is consistent with the general tendency for females to revise more than males but it also indicates that FL proficiency does not have a *negative* mediating effect on the amount of revision carried out in L1.

4.3 Immediate revisions

In Table 1 we can see that participants made more immediate revisions in FL than L1, but that there was no significant relationship between gender and FL proficiency and the number of immediate revisions carried out in L1 and FL. Regression analysis showed essentially the same pattern of results as for the total number of revisions. Thus, the initial regression analysis assessing the effects of language of writing and gender confirmed that there was a significant main effect of language of writing ($F(1,64) = 17.20$, $p <. 0005$, $\eta_p^2 = .21$) and a marginally significant main effect of gender ($F(1,64) = 3.61$, $p = .06$, $\eta_p^2 = . 05$). However, as in section 4.2, when FL
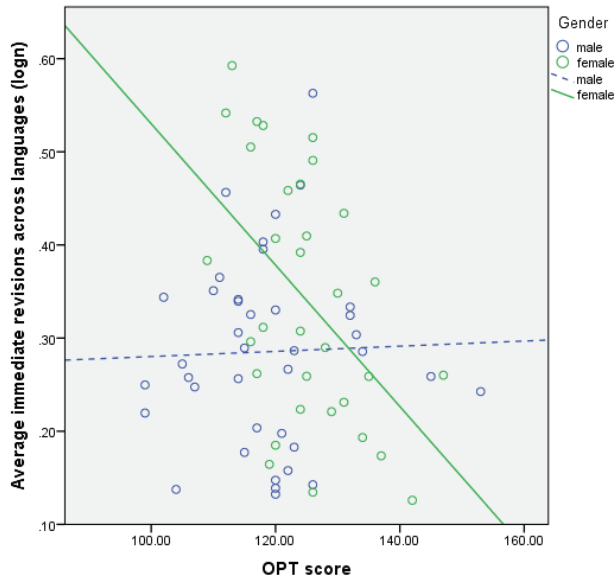

Figure 5. The participants' immediate revisions per text (logn) averaged across both languages as a function of gender and OPT

proficiency was added to the model, this revealed a significant interaction between gender and FL proficiency, applying to both writing tasks ($F(1,64)$ = 7.14, p = .010, η^2_p = .10). As can be seen in Figure 5, where the OPT score is plotted against the number of immediate revisions, this shows the same pattern as for the total number of revisions. The number of immediate revisions carried out by females was negatively related to their FL proficiency, whereas the number of immediate revisions carried out by males was lower than females and unrelated to their FL proficiency. Mediation analysis also showed the same pattern of result as for total number of revisions. Thus, in FL, there was both a significant direct effect of gender on the amount of immediate revisions (b = .07, se = .03, p < .05) and a significant indirect effect through FL proficiency (b = −.02, se = .01, p < .05). By contrast, there were no significant direct or indirect effects for L1 (p > .05 in both cases).

4.4 Distant revisions

Table 1 shows that participants made more distant revision in FL than in L1, and that gender was positively correlated with the number of distant revisions (though the correlation for FL failed to reach significance). There were no significant correlations for FL proficiency. Regression analysis confirmed that the effects of language of writing on the number of distant
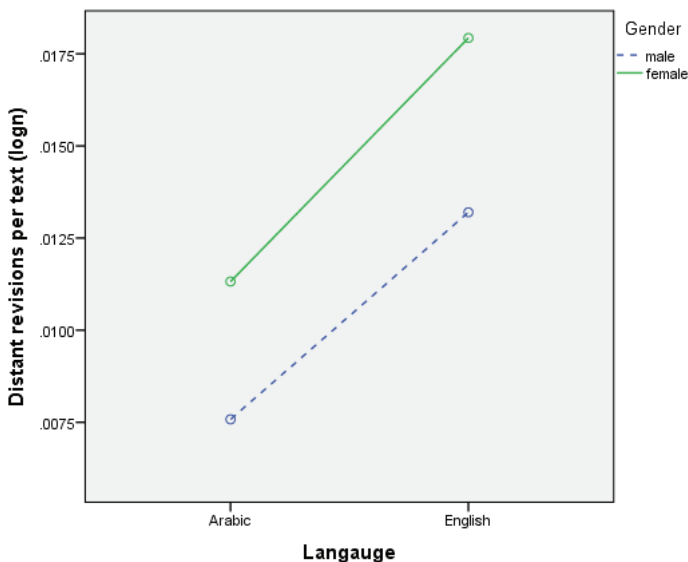

Figure 6. The participants' distant revisions per text (logn) as a function of language of writing and gender

revisions per text was statistically significant ($F(1,65) = 18.64$, $p < .005$, $\eta^2_p = .22$). Gender also proved to have a significant main effect ($F(1,65) = 4.38$, $p = .040$, $\eta^2_p = .06$) with females making more distant revisions than males in both languages (see Figure 6). There was no evidence of any significant main effect or interaction with FL proficiency. Overall, then, these results were similar to those for immediate revisions in that more distant revisions were carried out in FL than L1, and females made more distant revisions than males. However, unlike the immediate revisions, there was no evidence of a link with FL proficiency.

4.5 End Revisions

Table 1 shows that more end revisions were carried out in FL than in L1. In addition, there was a significant correlation between gender and end revision for L1. Regression analysis confirmed that the effect of language of writing was significant ($F(1,65) = 6.79$, $p = .011$, $\eta^2_p = .10$). Gender also proved to have a significant main effect ($F(1,65) = 4.38$, $p = .040$, $\eta^2_p = .06$), with females carrying out more end revisions in both languages than males (see Figure 7). Although the difference between the genders appears to be more pronounced for L1, there was no evidence of a significant interaction
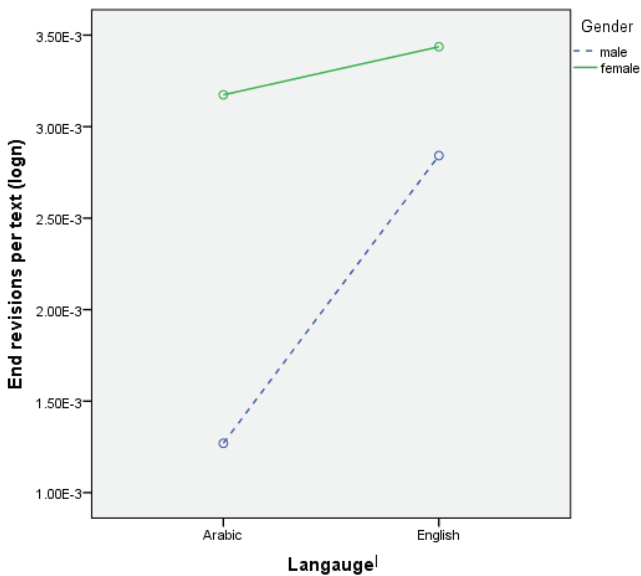

Figure 7. The participants' end revisions per text (logn) as a function of language of writing and gender

between gender and language of writing ($p >. 50$). Similarly, there was no evidence of a main effect or interaction with FL proficiency ($p > .4$) in all cases.

4.6 Language and Content Revisions in English (FL)

The final analysis assessed the extent to which revision focused on editing language or on changing content. 'Language revision' was defined as any revision that was carried out to modify language; this could be concerned with correcting typography, spelling, grammar or punctuation. 'Content revision' was defined as any revision that was carried out to change the content of a text (Spelman Miller *et al.*, 2008; Stevenson *et al.*, 2006). To illustrate the difference between these two revision types, the following excerpts have been taken from two different writers.

Excerpt A:

> Co education·is·one·of·the·way·whic[j][1] {h}·is·followed·by·most·of·the·[countries][2] {institutions·around·the·world}…and·that·will·reflect·on·their·[achievem][3] {performance}·in·c[i][4]ourses.

In this excerpt, the writer made four revisions. The first and the fourth revisions are correction of typography errors where the writer pressed j and I keys (respectively) accidently and immediately corrected their mistakes. The second and third are more related to content revision as the writer replaced countries with institutions around the world, presumably to specify their argument. They also replaced the achievement with performance, maybe to reflect more specific meaning.

Excerpt B:

> Co.education·is·a·new·system·[2]{that.h[3][ave]{as}·appli[4][e]{ed·in·X·schools·and·colleges·recentaly}.

It·means·that·boys·and·girls·study·together·in·one·class[1][e]{room}
In this excerpt the writers made four revisions; typographical, grammatical, and content. The first and fourth revisions are both corrections of typography as the writers seemed to press the keys accidentally. The third is a grammatical correction as the writer replaced the word 'have' with 'has'. The second, which is underlined, is a content revision, as the writer decided to add this sentence at a subsequent stage of the writing process, maybe after realizing that being specific at that particular point was important.

As a preliminary observation, it should be noted that, as can be seen in Table 1, the majority of the revision consisted of language revision rather than content revision ($F(1,69) = 4.62$, $p = .035$, $\eta^2_p = .06$).

4.7 Language Revisions in FL

A two-way between-subjects ANCOVA revealed that gender had a main effect on the number of language revisions in FL ($F(1,72) = 4.43$, $p = .039$, $\eta_p^2 = .06$) with females (Mean = .45, SD = .17) carrying out more language revisions than males (Mean =.38, SD = .11). FL proficiency proved to have a main effect ($F(1,72) = 6.82$, $p = .011$, $\eta_p^2 = .09$) as writers with greater FL proficiency carried out fewer language revisions. However, there was also a marginally significant interaction between gender and FL proficiency ($F(1,72) = 3.59$, $p = .06$, $\eta_p^2 = .05$), indicating that females' language revisions decreased as their FL proficiency increased (see Figure 8). This pattern of results is similar to the pattern for immediate revisions, which is consistent with the fact the majority of the revisions in the text were immediate and focused on language. Mediation analysis showed that gender had both a direct and indirect effect on language revision. The direct effect reflected the fact that females carried out more language revisions than males ($b = .09$, $se = .03$, $p < .05$). The indirect effect reflected the fact that FL proficiency of females reduced the extent to which they had to revise language ($b = -.02$, $se = .01$, $p < .05$).
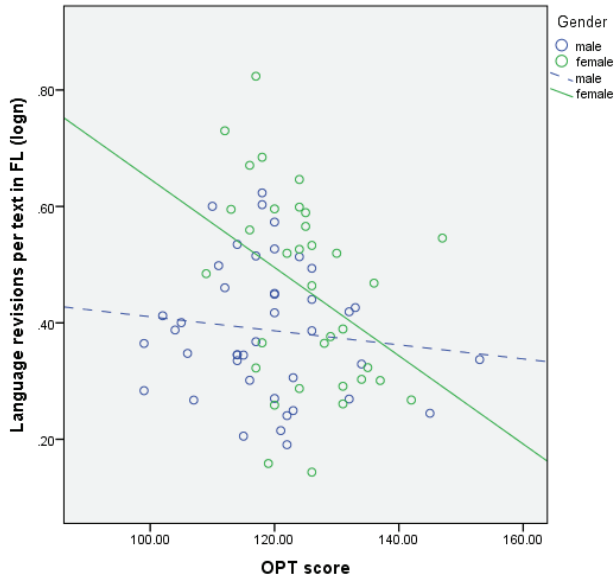

Figure 8. The participants' language revisions per text (logn) in FL as function of gender and OPT

4.8 Content Revision

Table 1 shows that there was a significant positive correlation between FL proficiency and the amount of content revision, but no significant direct relationship with gender. A two-way between-subjects ANCOVA confirmed that there was a significant main effect of FL proficiency on the amount of content revision in FL ($F(1,67) = 4.01$, $p = .049$, $\eta^2_p = .06$). There was no evidence of a main effect of gender or for an interaction with gender ($p > .20$, in both cases). Although there was no direct effect of gender on content revision, mediation analysis showed that there was an indirect effect through FL proficiency ($b = .11$, $se = .06$, $p < .05$). A key feature of the overall effect and this mediation effect is that they were positive, with higher levels of FL proficiency being associated with greater content revision, the opposite direction to the relationship between FL proficiency and language revision. This suggests that higher FL proficiency helps writers to reduce the need to revise language and allows them to focus more on content revision.

4.9 Summary of Results for the Six Revision Measures

These results show that the vast majority of revisions in both languages were immediate and focused on language rather than content. In addition, there was consistent evidence that participants revised more in FL than in L1 across the six revision measures. For immediate revisions and language revisions, as well as the overall measure of total amount of revision, primarily a reflection of immediate language revisions, there was a *consistent interaction between FL proficiency* and *gender.* The key feature of this interaction was that it applied to *writing in both L1 and FL.* This suggests that the effect is not just dependent on FL proficiency but also on other factors associated with immediate language revision. The most plausible reasons are that the immediate revision measure is associated with general language proficiency and/or motivation to perform well on language tasks as well as the FL proficiency test itself. As shown in Sections 4.2 and 4.3 that the pattern of the interaction indicated that there were two conflicting tendencies. Females appeared in general to be more motivated to revise in both L1 and FL than males, and this had a direct effect on the amount of revision carried out by males and females respectively. But, given this greater tendency to revise, females' revisions were more dependent on their FL proficiency. They demonstrated that the less proficient they were in FL language the more revisions they made. By contrast, males' revisions did not depend on their FL proficiency.

   One feature of the results that suggests that FL proficiency may reflect more than one cause is that it only mediated the gender difference in

revision for the FL task. By contrast, there was no evidence that this medi-ated the effect in L1. It may be that the effect of FL proficiency on L1 is a consequence of associations with motivation and general language profi-ciency, whereas the effect in FL is a consequence of proficiency in the FL itself.

Sections 4.4, 4.5 and 4.8 showed that the pattern of results for distant and end revisions, and for content revisions, was different from the pat-tern for immediate language revisions. For distant and end revisions, the amount of revision depended only on language of writing (more revision in FL) and gender (more revision for females). There was no evidence for an effect of FL proficiency. This suggests that revision carried out separately from the immediate process of text production may be different in form from immediate revision, and less dependent on language proficiency. By contrast, content revision was associated with FL proficiency. The key fea-ture of this relationship was that, in contrast to the relationship with lan-guage revision, it was positive. Better FL proficiency was associated with more content revision and less language revision.

5. Discussion

The current study was guided by the research question: *To what extent, does the revision process vary across language of writing (L1 vs FL), FL pro-ficiency and gender*? The question will be discussed here using the findings of the current study and with reference to the background and literature review.

5.1 Revision Processes and Cognition in L1 and FL

The six revision measures map into different writing processes. With regard to the *location* of the revision, it is important to make a distinction between revisions carried out to correct errors within the *translation and transcription processes*, which one might expect to be *immediate* revisions, and *distant* or *end* revisions. To the extent the revision is focused on *lan-guage* errors rather than on *content* and other aspects of writing organiza-tion, one might expect a higher level of immediate revision. Immediate revisions are more related to the point of utterance therefore, they are more likely related to *translation and transcription processes* as writers try to produce correct language or correct the text they have just produced before moving forward. Distant and end revisions represent more *global revision* (reflecting on the text as a whole) and therefore modifying the text's content and organization is most likely when using these measures (Hayes, 2012b). Sections 2.2 and 2.3 implied that FL writers are expected

to carry out more immediate revisions as they are more likely concerned with correcting language errors as opposed to content and organization. By contrast, the L1 writer might carry out more end and distant revisions because their memory is not cognitively overloaded with language concerns and therefore, they make more global changes to their text.

Furthermore, it has been suggested in Section 2.4 that making a distinction between immediate and distant revisions would help to indicate whether writers use a mainly linear or recursive manner of writing (Al Ghamdi, 2010; Thorson, 2000). The current study revealed that undergraduate college students, in this sample, were most likely to carry out their writing in a linear manner since they mainly made immediate adjustments to their texts. On average, more than 95% of their total revisions were immediate revisions in both Arabic and English.

5.2 The Effect of Language of Writing on Revision

The study data, in general, demonstrated that writers make more revisions when writing in FL as opposed to L1. This is in line with the proposition that compared to L1 writing, FL writers carry out more immediate and distant revisions because FL writing 'would necessitate increased interaction with the text during the composing process' (Thorson, 2000: 162). These findings correspond to the results reported by Stevenson *et al.* (2006) and Thorson (2000) that writers make less immediate revision in L1 and that distant revisions were less frequent in L1 compared to FL. The immediate revision results of the current study correspond directly to Chenoweth and Hayes' (2001) R-bursts (bursts of writing that are followed by revision of the text already produced, see Section 2.1). R-burst can be seen as a breakdown of language production because of translation process's problems that have to be immediately corrected. That is to say, in the current study, 98% of the participants' total number of revisions in the FL was language based and less than 2% of their revision was directed to modify content.

5.3 The Effect of FL Proficiency on Revision

In discussing participants' revision processes, a distinction between (a) FL proficiency effects (which is specifically more related to FL writing than L1), (b) motivation effect (how much effort individuals are willing to make to correct their writing), and (c) general writing strategies (not very much as process and writers might apply them regardless of the language of writing) must be considered. An important question in this respect is whether there is a difference between languages (L1 vs FL) or whether this is a common reflection of a general writing strategy or a motivational effect. That the percentage of immediate revisions was high in both languages in the study

implies that this is more related to a general writing strategy. Stevenson *et al.* (2006) also found that point-of-inscription revisions (which most likely reflect immediate revisions) are the most common revisions in both languages (L1 and FL). The fact that the participants, in general, tended not to revise afterwards also confirms that revision patterns, at least with this study sample, reflects a general writing strategy. The high percentage of immediate revision in both languages and the percentage of language revision in FL may partly be a consequence of the writing instructions, which overemphasize the importance of producing as few grammatical mistakes as possible (El-Aswad, 2002). Barkaoui (2016) and Victori (1999) argued that writers might associate text quality with language accuracy, thus linguistic accuracy of the text becomes more important than the content. It could be that the participants believed that focusing on linguistic accuracy would help in producing better text quality, thus they made more language revisions. The excessive percentage of immediate and language revisions could also be evidence that these students failed to realize the recursive nature of writing, a problem that has been associated with other FL and L1 writers in other contexts (e.g., Al Ghamdi, 2010; Stevenson *et al.*, 2006; Thorson, 2000). Applying a linear mode of writing, which characterized novice writers' writing (Bereiter and Scardamalia, 1987; Flower, 1979), indicates that participants were more likely affected by the spoken mode of language (Al Ghamdi, 2010). Thus, one implication of this research on writing instruction is to highlight the importance of making students interact with their text by encouraging them to move forward as well as backward in the course of writing.

Given the positive effect of FL proficiency on the number on content revision indicates the importance of FL proficiency in enabling writers to develop higher-level revision skills. These results are aligned with Stevenson *et al.*'s (2006) 'Inhibition Hypothesis' (see section 2), as less-advanced language proficiency reduced the amount of higher-revisions and increased the amount of language revisions. However, as FL proficiency developed, the writers became less inhibited to carry out more – higher-level content revisions and fewer language revisions.

5.3 The Effect of Gender on Revision

With regard to the difference between the performances of each gender, this study produced apparently paradoxical finding: males, who had weaker FL proficiency than females, carried out significantly fewer revisions than females in both languages across all revision measures. To solve this puzzle, a distinction should be drawn between how many errors individuals make which need revision, and how much effort individuals want to expend on

revision, which reflects motivation. First, females' revision patterns were influenced by their FL proficiency, according to the findings of the current study. For example, their total number of revisions and immediate revisions in both languages and the amount of language revision in FL decreased as their FL proficiency improved. Schmidt (1992) might give the interpretation that less controlled process of language production means quicker and more automatic retrieval of language knowledge. This implies that writers with good command of FL struggle less when searching for lexical and grammatical structures.

The results of the study in terms of gender difference in the amount of revision carried out conflicts with the argument that an increase in FL proficiency decreases the amount of revision needed. Consequently, one would expect that, given the sample, females would carry out fewer revisions than the males since their FL proficiency is higher than the males. However, the findings of this study revealed that females revised more across all revision measures in both languages. Zhang *et al*. (2019) also reported that females in their study made more revisions than males. There are a number of possible explanations for this paradoxical finding. First, it could be due to the females' recognition of the importance of producing texts that is mistake free, thus, they revised more frequently. Weisberg, DeYoung, and Hirsh (2011) and Zhang *et al*. (2019) also found that females engaged in editing their written texts more than males. They suggested that this could be associated with differences in gender characteristics such as orderliness. This might imply that females' desire to produce more presentable texts motivates them to take more care of their texts and carry out more revisions. It can be concluded that females' motivation to produce good text and their awareness of the importance of a text's linguistic accuracy motivated them to revise more frequently than males. This is consistent with the remark made by Hayes (2012b) that 'writers who are strongly motivated to produce high-quality text will be more likely to edit proposal language than are writers who are less motivated' (p. 373). Section 2.5 implied that previous research has consistently reported that females have more positive attitudes towards writing than boys (Pajares and Valiante, 2001; Troia *et al*., 2013).

6. Conclusions

The study provided further evidence that FL writers are influenced by their *FL proficiency*. Their linguistic concerns in FL were evident from their reluctance to revise their text more globally and their preference to carrying out their writing process linearly. However, as the writers' language proficiency developed in FL, they became less inhibited in carrying out

more high-level content revisions and fewer language revisions. However, the study also showed that writers did not do much distant and end revision in L1 either. This could indicate that the writers had less well-developed writing strategies, given that this tendency was evident in both languages. This concluding observation implies that there is a need to train FL writers in improving their revision strategies.

This study provided consistent evidence for a gender difference in the revising behaviours of the students in this sample. The study offered some evidence to suggest that motivation might account for the variation in revising patterns between the two genders, at least within this sample. Being more motivated than males, females of this study were keen to produce text that is more accurate by revising more. However, to rule this possibility out, future research would need to measure motivation to write, and control for it in analyses of the effects of other variables. Also, future research might consider including much larger sample size, different contexts and languages in order to verify this possibility.

Furthermore, the study found that revising behaviours of these writers were consistent across L1 and FL. The study revealed that these FL writers' attention is more localized, as reflected in the excessive number of immediate revisions they carried out in both languages. The study also demonstrated that these writers are reluctant to interact and move around their text to make more global changes. An important avenue to explore in accounting for these cross-language similarities in revising behaviours is to view them from a multi-competence perspective. L1 and FL should not be viewed as fixed systems but rather as 'fluid repertoires' that might interact and overlap (Rinnert and Kobayashi, 2016: 267). Cenoz and Gorter (2011) stated that compared to monolingual speakers, multilingual individuals' linguistic repertoire have more resources which aids them to achieve their communicative goals. This indicates that FL writers should be viewed as multilingual rather than two monolinguals, and therefore some aspects of their writing skills in L1 can be used in FL and vice versa.

Given that the writers in this study are relative novices, with limited writing experience in both languages, and they applied similar revision processes across L1 and FL, suggests that their writing competency, i.e. what they know about writing and whether they acquired this competency in L1 or FL, guided their revising behaviours. Furthermore, we might conclude that since the writers' FL proficiency was at undergraduate level (years 2 and 4), their writing processes and strategies were similar to those used when writing in L1. This can be explained as a compensating strategy that multilingual writers apply to ease and accomplish the writing task they are faced with (Cenoz and Gorter, 2011; Kobayashi and Rinnert, 2013). In the current study, it may be that these writers compensated for

their limited linguistic and writing skills by drawing on whatever shared underlying knowledge was available in their language repertoire to finish the writing task thus, their revising processes were relatively consistent across languages. More interestingly and as a way of extending the concept of multi-competence, would be finding out how FL affected L1 writing performance too. The fact that FL proficiency also affected the L1 revising process might suggest that the OPT reflects general linguistic ability, but it might also indicate that the writers' linguistic repertoire is wider compared to that of monolingual writers.

About the Author

Dr. Zulaikha Talib Al-Saadi is a lecturer in the English Department of the Ministry of Higher Education Rustaq College of Education, Oman.

David Galbraith is Associate Professor in Psychology at the Southampton Education School of the University of Southampton. His main research interests are in the psychology of writing and the development of understanding through writing. This involves basic research into the cognitive and social processes involved in writing, and is focussed on the development of a dual process model of writing. He is an associate editor of the *Journal of Writing Research* and a member of the editorial boards for the *Journal of Educational Psychology, Learning and Instruction* and *Educational Research Review*.

References

Abdel Latif, M. (2008). A state-of-the-art review of the real-time computer-aided study of the writing process. *International Journal of English Studies*, *8*(1), 29–50.

Abdel Latif, M. (2009). *Egyptian EFL students teachers writing processes and products: The role of linguistic knowledge and writing affect*. PhD Thesis. University of Essex, UK.

Adams, A. M., and Simmons, F. R. (2019). Exploring individual and gender differences in early writing performance. *Reading and Writing*. https://doi.org/10.1007/s11145-018-9859-0

Adams, A., Simmons, F., and Willis, C. (2015). Exploring relationships between working memory and writing: Individual differences associated with gender. *Learning and Individual Differences*, *40*, 101–107. https://doi.org/10.1016/j.lindif.2015.04.011

Akyel, A. (1994). First language use in EFL writing: Planning in Turkish vs. planning in English. *International Journal of Applied Linguistics*, *4*(2), 196–196. https://doi.org/10.1111/j.1473-4192.1994.tb00062.x

Al amargot, D., and Fayol, M. (2009). Modelling the development of written composition. In R. Beard, D. Myhill, J. Riley, and M. Nystrand (Eds), *The SAGE Handbook of Writing Development,* 23–47. London: Sage Publications. https://doi.org/10.4135/9780857021069.n3

Al Ghamdi, F. M. (2010). *Computer assisted tracking of university student writing in English as a foreign language.* PhD Thesis. University of Southampton,UK.

Al haysony, M. (2008). *Saudi female English major students' writing strategies in L1 (Arabic) and L2 (English).* PhD Thesis. University of Essex, UK.

Alhaisoni, E. (2012). A think-aloud protocols investigation of Saudi English major students' writing revision strategies in L1 (Arabic) and L2 (English). *English Language Teaching,* 5(9), 144–154. https://doi.org/10.5539/elt.v5n9p144

Allen, D. (2004). *Oxford Placement Test 2 (New edition).* Oxford University Press.

Baaijen, V., Galbraith, D., and de Glopper, K. (2012). Keystroke analysis: Reflections on procedures and measures. *Written Communication,* 29(3), 246–277. https://doi.org/10.1177/0741088312451108

Barbier, M., Jullien, N., and Provence, A. (2009). On-line tools for investigating writing strategies in L2. *German as a Foreign Language,* 2(3), 23–40.

Barkaoui, K. (2016). What and when second-language learners revise when responding to timed writing tasks on the computer: The roles of task type, second language proficiency, and keyboarding skills. *Modern Language Journal,* 100(1), 320–340. https://doi.org/10.1111/modl.12316

Beard, R. and Burrell, A. (2010). Writing attainment in 9- to 11-year-olds: Some differences between girls and boys in two genres. *Language and Education,* 24(6), 495–515. https://doi.org/10.1080/09500782.2010.502968

Bereiter, C. and Scardamalia, M. (1987). *The Psychology of Written Composition.* Hillsdale, NJ: Erlbaum.

Berninger, V. W. and Fuller, F. (1992). Gender differences in orthographic, verbal, and compositional fluency: Implications for assessing writing disabilities in primary grade children. *Journal of School Psychology,* 30(4), 363–382. https://doi.org/10.1016/0022-4405(92)90004-O

Bourdin, B. and Fayol, M. (1994). Is written language production more difficult than oral language production? A working memory approach. *International Journal of Psychology,* 29(5), 591–620. https://doi.org/10.1080/00207599408248175

Bourdin, B. and Fayol, M. (1996). Mode effects in a sentence production span task. *Cahiers De Psychologie Cognitive-Current Psychology of Cognition,* 15(3), 245–264.

Bourdin, B. and Fayol, M. (2002). Even in adults, written production is still more costly than oral production. *International Journal of Psychology,* 37(4), 219–227. https://doi.org/10.1080/00207590244000070

Breetvelt, I., van den Bergh, H., and Rijlaarsdam, G. (1994). Relations between writing processes and text quality: When and how? *Cognition and Instruction,* 12(2), 103–123. https://doi.org/10.1207/s1532690xci1202_2

Broekkamp, H. and van den Bergh, H. (1996). Attention strategies in revising a foreign language text. In G. Rijlaarsdam, H. van den Bergh, and M. Couzijn

(Eds), *Theories, Models and Methodology in Writing Research*, 170–181. Amsterdam: Amsterdam University Press.

Castro, S. L. and Limpo, T. (2018). Examining potential sources of gender differences in writing: The role of handwriting fluency and self-efficacy beliefs. *Written Communication*, *35*(4), 448–473. https://doi.org/10.1177/0741088318788843

Cenoz, J. and Gorter, D. (2011). Focus on multilingualism: A study of trilingaul writing. *The Modern Language Journal*, *95*(3), 356–369. https://doi.org/10.1111/j.1540-4781.2011.01206.x

Chenoweth, N. and Hayes, J. (2001). Fluency in writing: Generating text in L1 and L2. *Written Communication*, *18*(1), 80–98. https://doi.org/10.1017/S0272263109990015

Chenoweth, N. and Hayes, J. (2003). The inner voice in writing. *Written Communication*, *20*(1), 99–118. https://doi.org/10.1177/0741088303253572

Cohen, J. (1988). *Statistical Power Analysis for the Behavioural Sciences* (2nd ed). Hillsdale, NJ: Erlbaum.

De Smedt, F., Merchie, E., Barendse, M., Rosseel, Y., De Naeghel, J., and Van Keer, H. (2018). Cognitive and motivational challenges in writing: Studying the relation wth writing performance across students' gender and achievement level. *Reading Research Quarterly*, *53*(2), 249–272. https://doi.org/10.1002/rrq.193

El-Aswad, A. (2002). *A Study of the L1 and L2 writing processes and strategies of Arab Learners with special reference to third-year Libyan University students*. PhD Thesis. University of Newcastle, UK.

El Mortaji, L. (2010). *A cognitive Study of Moroccans Writing in Arabic (L1) and English (L3): Writing Ability, Processes, Rhetorical Genres, Language, Gender*. VDM Verlag Dr. Muller Aktiengesellschaft & Co. KG.

Flower, L. (1979). Writer-based prose: A cognitive basis for problems in writing. *College English*, *41*(1), 19–37. https://doi.org/10.2307/376357

Flower, L., & Hayes, J. (1980). The dynamics of composing: Kaking plans and juggling constraints. In L. W. Gregg & E. R. Steinberg (Eds.), *Cognitive process in writing* (pp. 31–50). Hillsdale, NJ: Erlbaum.

Galbraith, D. (2009). Cognitive models of writing. *German as a Foreign Language*, *2*(3), 7–22.

Hayes, A. F. (2013). *An Introduction to Mediation, Moderation, and Conditional Process Analysis: A regression-based Approach*. New York: Guilford Press.

Hayes, J. (1996). A new framework for understanding cognition and affect in writing. In M. Levy and S. Ransdell (Eds.), *The Science of Writing: Theories, Methods, Individual Differences and Application,* 1–27. Mahwah, NJ: Lawrence Erlbaum.

Hayes, J. (2006). New directions in writing theory. In C. MacArthur, S. Graham, and J. Fitzgerald (Eds.), *Handbook of Writing Research,* 28–40. New York: The Guilford Press.

Hayes, J. and Flower, L. (1980). Identifying the organization of writing processes. In L. Gregg and E. Steinberg (Eds.), *Cognitive Processes in Writing,* 3–30. Hillsdale, NJ: Erlbaum.

Hayes, J. R. (2012a). Evidence from language bursts, revision, and transcription for translation and its relation to other writing processes. In M. Fayol, D. Alamargot, and V. W. Berninger (Eds.), *Translation of Thought to Written Text while Composing. Advancing Theory, Knowledge, Research Methods, Tools, and Applications,* 15–25. New York/London: Psychology Press.

Hayes, J. R. (2012b). Modeling and remodeling writing. *Written Communication*, *29*(July 2012), 369–388. https://doi.org/10.1177/0741088312451260

Huttenlocher, J., Haight, W., Bryk, A., Seltzer, M., and Lyons, T. (1991). Early vocabulary growth: Relation to language input and gender. *Developmental Psychology*, *27*(2), 236–248. https://doi.org/10.1037/0012-1649.27.2.236

Hyde, J. and Linn, M. C. (1988). Gender differences in verbal ability: A meta-analysis. *Psychological Bulletin*, *104*(1), 53–69. https://doi.org/10.1037/0033-2909.104.1.53

Jones, S. and Tetroe, J. (1987). Composing in a second language. In A. Matsuhashi (Ed.), *Writing in Real Time: Modelling Production Processes,* 34–57. Norwood, NJ: Ablex.

Jones, S. and Myhill, D. (2007). Discourses of difference? Examining gender differences in linguistic characteristics of writing. *Canadian Journal of Education / Revue Canadienne de l'éducation*, *30*(2), 456. https://doi.org/10.2307/20466646

Kobayashi, H. and Rinnert, C. (2013). L1/L2/L3 writing development: Longitudinal case study of a Japanese multicompetent writer. *Journal of Second Language Writing*, *22*(1), 4–33. https://doi.org/10.1016/j.jslw.2012.11.001

Kormos, J. (2012). The role of individual differences in L2 writing. *Journal of Second Language Writing*, *21*(4), 390–403. https://doi.org/10.1016/j.jslw.2012.09.003

Kroll, B. and Reid, J. (1994). Guidelines for designing writing prompts: Clarifications, caveats, and cautions. *Journal of Second Language Writing*, *3*(3), 231–255. https://doi.org/10.1016/1060-3743(94)90018-3

Leijten, M. and van Waes, L. (2013). Keystroke logging in writing research: Using inputlog to analyze and visualize writing processes. *Written Communication*, *30*, 358–392. https://doi.org/10.1177/0741088313491692

Limpo, T. and Alves, R. A. (2017). Written language bursts mediate the relationship between transcription skills and writing performance. *Written Communication*, *34*(3), 306–332. https://doi.org/10.1177/0741088317714234

Lindgren, E., Miller, S., and Sullivan, K. (2008). Development of fluency and revision in L1 and L2 writing in Swedish high school years eight and nine. *International Journal of Applied Linguistics*, *156*, 133–151. https://doi.org/10.2143/ITL.156.0.2034428

Malecki, C. K. and Jewell, J. (2003). Developmental, gender, and practical considerations in scoring curriculum-based measurement writing probes. *Psychology in the Schools*. https://doi.org/10.1002/pits.10096

Manchón, R. and Roca de Larios, J. (2007). On the temporal nature of planning in L1 and L2 composing. *Language Learning*, *57*(4), 549–593. https://doi.org/10.1111/j.1467-9922.2007.00428.x

McCutchen, D. (1996). A capacity theory of writing: Working memory in composition. *Educational Psychology Review*, 8(3), 299–325. https://doi.org/10.1007/BF01464076

McCutchen, D. (2000). Knowledge, processing, and working memory: Implications for a theory of writing. *Educational Psychologist*, 35(1), 13–23. https://doi.org/10.1207/S15326985EP3501_3

Olinghouse, N. G. (2008). Student- and instruction-level predictors of narrative writing in third-grade students. *Reading and Writing*, 21(1–2), 3–26. https://doi.org/10.1007/s11145-007-9062-1

Olive, T. (2004). Working memory in writing: Empirical evidence from the dual-task technique. *European Psychologist*, 9(1), 32–42. https://doi.org/10.1027/1016-9040.9.132

Özçalişkan, Ş., and Goldin-Meadow, S. (2010). Sex differences in language first appear in gesture. *Developmental Science*, 13(5), 752–760. https://doi.org/10.1111/j.1467-7687.2009.00933.x

Pajares, F., Miller, M. D., & Johnson, M. J. (1999). Gender differences in writing self-beliefs of elementary school students. *Journal of Educational Psychology*, 91(1), 50–61. https://doi.org/10.1037/0022-0663.91.1.50

Pajares, F. and Valiante, G. (2001a). Gender differences in writing motivation and achievement of middle school students: A function of gender orientation? *Contemporary Educational Psychology*, 26(3), 366–381. https://doi.org/10.1006/ceps.2000.1069

Pajares, F. and Valiante, G. (2001b). Gender Differences in Writing Motivation and Achievement of Middle School Students: A Function of Gender Orientation? *Contemporary Educational Psychology*. https://doi.org/10.1006/ceps.2000.1069

Reid, J. and Kroll, B. (1995). Designing and assessing effective classroom writing assignments for NES and ESL students. *Journal of Second Language Writing*. https://doi.org/10.1016/1060-3743(95)90021-7

Rinnert, C. and Kobayashi, H. (2016). Multicompetence and multilingual writing. In R. M. Manchón and P. K. Matsuda (Eds.), *The Handbook of Second and Foreign Language Writing*, 365–386. Berlin/Boston: De Gruyter Mouton. https://doi.org/10.1515/9781614511335-020

Roca de Larios, J., Manchón, R., Murphy, L., and Marín, J. (2008). The foreign language writer's strategic behaviour in the allocation of time to writing processes. *Journal of Second Language Writing*, 17(1), 30–47. https://doi.org/10.1016/j.jslw.2007.08.005

Schmidt, R. (1992). Psychological mechanism underlying second language fluency. *Studies in Second Language Acquisition*, 14, 357–385. https://doi.org/10.1017/S0272263100011189

Schoonen, R, Snellings, P, Stevenson, M,, and Von Gelderen, A. (2009). Towards a blueprint of the foreign language writer: The linguistic and cognitive demands of foreign language writing. In R. M. Manchón (Ed.), *Writing in Foreign Language Contexts: Learning, Teaching, and Research,* 77–101. UK: St Nicholas House. https://doi.org/10.21832/9781847691859-007

Schoonen, R., von Gelderen, A., de Glopper, K., Hulstijn, J., Simis, A., Snellings, P., and Stevenson, M. (2003). First language and second language writing: The role of linguistic knowledge, speed of processing, and metacognitive knowledge. *Language Learning*, *53*(1), 165–202. https://doi.org/10.1111/1467-9922.00213

Silva, T. (1993). Toward an understanding of the distinct nature of L2 writing: The ESL research and its implications. *TESOL Quarterly*, *27*(4), 657–677. https://doi.org/10.2307/3587400

Skibniewski, L. (1988). The writing processes of advanced foreign language learners in their native and foreign languages: Evidence from thinking-aloud and behavior protocols. *Studia Anglica Posnaniensia*, *21*, 177–186. https://doi.org/10.1016/j.sbspro.2011.11.214

Spelman Miller, K. (2000). Academic writers on-line: Investigating pausing in the production of text. *Language Teaching Research*, *4*(2), 123–148. https://doi.org/10.1177/136216880000400203

Spelman Miller, K., Lingren, E., and Sullivan, K. (2008). The psycholinguistic dimension in second language writing: Opportunities for research and pedagogy using computer keystroke logging. *TESOL Quarterly*, *42*(3), 433–454. https://doi.org/10.1002/j.1545-7249.2008.tb00140.x

Stevenson, M., Schoonen, R., and de Glopper, K. (2006). Revising in two languages: A multi-dimensional comparison of online writing revisions in L1 and FL. *Journal of Second Language Writing*, *15*(3), 201–233. https://doi.org/10.1016/j.jslw.2006.06.002

Thorson, H. (2000). Using the computer to compare foreign and native language writing processes: A statistical and case study approach. *Modern Language Journal*, *84*(2), 155–170. https://doi.org/10.1111/0026-7902.00059

Troia, G. A., Harbaugh, A. G., Shankland, R. K., Wolbers, K. A., and Lawrence, A. M. (2013). Relationships between writing motivation, writing activity, and writing performance: Effects of grade, sex, and ability. *Reading and Writing*, *26*(1), 17–44. https://doi.org/10.1007/s11145-012-9379-2

Troia, G., Harbaugh, A., Shankland, R., Wolbers, K., and Lawrence, A. (2013). Relationships between writing motivation, writing activity, and writing performance: Effects of grade, sex, and ability. *Reading and Writing*, *26*(1), 17–44. https://doi.org/10.1007/s11145-012-9379-2

van Waes, L., Leijten, M., and van Weijen, D. (2009). Keystroke logging in writing research: Observing writing process with inputlog. *German as a Foreign Language*, *2*(3), 41–64. https://doi.org/10.1016/j.jslw.2009.06.003

Victori, M. (1999). An analysis of writing knowledge in EFL composing: A case study of two effective and two less effective writers. *System*, *27*, 537–555. https://doi.org/10.1016/S0346-251X(99)00049-4

Wang, L. (2003). Switching to first language among writers with differing second-language proficiency. *Journal of Second Language Writing*, *12*(4), 347–375. https://doi.org/10.1016/j.jslw.2003.08.003

Weisberg, Y. J., DeYoung, C. G., and Hirsh, J. B. (2011). Gender differences in peronality acoss the ten aspects of the big five. *Frontiers in Psychology*, *2*(178), 1–11. https://doi.org/10.3389/fpsyg.2011.00178

Whalen, K. and Menard, N. (1995). L1 and L2 writers strategic and linguis-
     tic knowledge: A model of multiple-level discourse processing. *Language
     Learning*, *45*, 381–418. https://doi.org/10.1111/j.1467-1770.1995.tb00447.x
Zamel, V. (1982). Writing: The process of discovering meaning. *TESOL
     Quarterly*, *16*(2), 195–209. https://doi.org/10.2307/3586792
Zamel, V. (1983). The composing processes of advanced ESL students: Six case
     studies. *TESOL Quarterly*, *17*(2), 165–187. https://doi.org/10.2307/3586647
Zhang, M., Bennett, R. E., Deane, P., and Rijn, P. W. (2019). Are there gender dif-
     ferences in how students write their essays? An analysis of writing processes.
     Educational Measurement: Issues and Practice, 1–13.
     https://doi.org/10.1111/emip.12249
Zimmerman, R. (2000). L2 writing: Subprocesses, a model of formulating and
     emprical findings. *Learning and Instruction*, *10*(1), 73–99.
     https://doi.org/10.1016/S0959-4752(99)00019-5

Appendix A

Writing Topics

Topic one: Write an article to Rustaq Round-up Newsletter about your
opinion on this topic. Do you agree or disagree with the following state-
ment? Administrative staff at Rustaq College are always helpful and offer
efficient customer services. Support your opinion with example and details.

حول رأيك في هذا الموضوع. هل توافق أو لا توافق على العباره (Rustaq Round-up
Newsletter) اكتب مقال موجهة الى التالية: الطاقم الإداري في كلية الرستاق دائما متعاون ويقدم
خدمات فعالة. ادعم رأيك بالأمثلة التوضيحية والتفاصيل.

Topic two: Write an article to Rustaq Round-up Newsletter about your
opinion on this topic. Do you agree or disagree with the following state-
ment? Co-education is the cause of low academic achievement for many
students. Support your opinion with examples and details.

حول رأيك في هذا الموضوع. هل توافق أو لا توافق على العباره (Rustaq Round-up
Newsletter) حول رأيك في هذا الموضوع. هل توافق أو لا توافق على العباره التالية: التعليم
المختلط هو سبب تدني المستوى التحصيلي لدى الكثير من الطلاب. ادعم رأيك بالأمثلة التوضيحية
والتفاصيل.