

**RELATIONSHIPS BETWEEN SYNTACTIC
AWARENESS AND WRITING ABILITY FOR
ADULT ESL LEARNERS**

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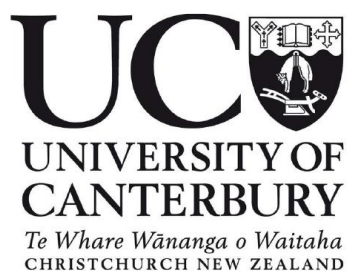
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Declaration

The material presented in this thesis is the original work of the candidate except as acknowledged in the text, and has not been previously submitted, either in part or in whole, for a degree at this or any other university.

Ping Li

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Abstract

This thesis investigated the relationship between syntactic awareness and writing in English as a Second Language (ESL) among Chinese adult learners. In order to assess this relationship, additional measures that have been identified as predictors of writing ability in children and adult writers were included in the study. These were grammatical competence, phonological awareness, orthographic awareness, morphological awareness, and vocabulary knowledge, and a second aspect of the study aimed to determine whether syntactic awareness was more predictive of adult ESL learners' writing than these other language skills. The study also considered potential differences between higher and lower proficiency adult ESL writers in terms of the relationships between these assessed language skills and writing performance.

Students from two universities in China (N = 222) participated in the study. Following adaptation, piloting and amendments, nine measures were given to these students. These were measures of syntactic awareness (a Syntactic Judgement Task and a Syntactic Word Order Task), grammatical competence, phonological and orthographic awareness (a Write the Correct Word Task), phonological awareness (a Sound Like a Word Task), orthographic awareness (a Correct Spelling Task), morphological awareness (a Correct Derivation Task and a Morphological Production Task), and vocabulary knowledge were given to the participants. The participants were also asked to write an essay based on a given topic which was scored using the Jacobs et al. (1981) ESL Composition Profile.

Correlational analyses indicated that all language skills measured in this study were associated with adult ESL learners' writing ability, with syntactic awareness correlated to a larger level than the other language skills. Regression analyses confirmed the

associations identified and suggested that syntactic awareness was the most predictive of writing performance among the variables. However, these findings also indicated that only a relatively small amount of variability in writing ability was explained by the language skills assessed in this study. Regarding the higher and lower proficiency groups, the statistical analyses showed that across the language skills tested in this study morphological awareness was a common predictor within both groups, and that phonological awareness was more predictive of writing ability in the lower proficiency group while syntactic awareness and grammatical competence were larger predictors in the higher proficiency group.

Correlational analyses were also conducted between the language skills and the sub-components of the Jacobs et al's ESL writing rubric. Syntactic awareness was correlated to language use and content sub-components to a larger level than the other sub-components suggesting its potential involvement in text production processes in writing, rather than more basic word production processes that may be more associated with phonological/orthographic processes. Based on these findings, possible explanations for the relationships were discussed and future studies focusing on potential predictors of writing ability were considered. These findings were used to present a possible theoretical explanation of writing performance among such adult second language students, and to suggest practical implications that may support the teaching of English within similar cohorts of students.

Publications/Presentations Arising from the Thesis

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CHAPTER 1 OVERVIEW

1.1 Introduction

This thesis investigates the potential relationships between syntactic awareness and the academic writing ability of adult Chinese English as a second language (ESL) learners while taking into account associations with other underlying language skills (i.e. grammar, orthographic, phonological, phonological and orthographic, morphological, and vocabulary knowledge). This first chapter concentrates on the research background of the current study and the importance of conducting this study in the Chinese context. The chapter also states the research questions explored in this study, as well as the assessment battery employed to determine the possible predictive language skills of ESL writing. It provides an introduction to the study that was carried out in order to answer the research questions.

1.2 Background of the study

To achieve effective communication, a language learner is expected to learn the four fundamental language skills of listening, speaking, reading and writing (Burns & Siegel, 2017). Writing is a learned skill that comprises sub-skills from basic letter production and word spelling (Abbott et al., 2010; Daffern et al., 2017a) to grammar, syntactic and sentence structure mastery (Crossley et al., 2016; Crossley & McNamara, 2012; Crossley & McNamara, 2014), as well as the application of cognitive strategies (Abbott et al., 2010; Berninger et al., 1994; Berninger & Winn, 2006; Flower & Hayes, 1981). Writing is a very difficult skill to acquire (Camacho & Alves, 2017; Graham & Eslami, 2020; Graham et al., 2018). It is generally regarded as being more difficult than speaking due to the complex processes involved in writing (Kellogg et al., 2013), although both are known as productive skills and used for message communication

(Widdowson, 1978). For example, in order to communicate a message effectively in the form of writing, a writer is supposed to learn handwriting/typing skills and try to avoid spelling and punctuation mistakes, which are not required for speaking. In addition, a writer is expected to develop mastery of a number of underlying linguistic facets, such as syntax, grammar, vocabulary, orthography, phonology, and morphology knowledge (Bacon, 2020; Kaplan & Grabe, 2002; Lang, 2009; Mäntylä et al., 2020; Myhill et al., 2020; Nelson & Brunetto, 2020; Olinghouse & Wilson, 2013; Perfetti & Liu, 2005; Plag et al., 1999; Siegelman et al., 2020). These linguistic characteristics help the writer with the process of writing from different aspects (Kormos, 2012; Schoonen et al., 2011).

Writing also refers to “the acts of thinking, composing, and encoding language into such text; these acts also necessarily entail discourse interactions within a socio-cultural context. Writing is text, is composing, and is social construction.” (Cumming, 1998, p. 61). The differences presented from these three aspects – text generation, composing process, and social constructivist views of writing – has provided useful inquiry in terms of writing in a second language context and has provided a basis on which to determine effective instruction implications (Kaplan & Grabe, 2002; Raimes, 1991; Silva, 2013). However, producing quality written texts in a second language can be more challenging than accomplishing the same outcome in a first language (van Weijen, 2009; Van Weijen et al., 2009; William & Kaplan, 1996). This is because a writer has to surmount the constraints of second language development, or some see them as competing demands in writing. For example, L2 writers have more difficulties with the more complex structures (Roberts & Felser, 2011) and the integration of multiple information sources (Roberts et al., 2008; Sorace & Serratrice, 2009). Writing in a second language requires an integration of both cognitive and linguistic abilities (Ferris

& Hedgcock, 2004; Maghsoudi & Haririan, 2013; Wong, 2012). A second language writer has to learn a new writing system that may differ a great deal from that of the individual's first language (Saeed, 2020; Silva, 1993) and a new set of language rules. For example, Chinese and English languages sometimes have different rules of word orders within a sentence.

Chinese sentence with the English translation below.

Wobaba weilie duo zhengqian, ye keneng zuo sanfen jianzhi gongzuo
My father in order to more make money also may do three part-time jobs

Correct order in English to give clarity of meaning.

In order to make more money, my father may also do three part-time jobs.

It can be seen from the above that there is a tendency of weight fronting in Chinese syntactic structure and, some elements (e.g., the element of adverbials) (Li, 1998) in English and Chinese languages propose the differences existing in word order of the two languages (Jin, 1998).

Acquiring a second language, and mastering its academic writing skills, can sometimes seem like an insurmountable task (Williams & Cui, 2005). Second language learners of English have been found to have difficulties in writing an essay. For example, Chinese ESL learners tend to make syntactical errors (e.g., *Because no students have applied for the job* – a sentence fragment which is a dependent clause starting with *because*) more often (Liu & Xu, 2013). These problems or difficulties may lead to a failure of effective communication and divergence from the primary topic (Phuwichit, 2004).

Furthermore, writing within an educational context is a fundamental skill that needs to be acquired by second/foreign language learners in order to complete successfully many

of the requirements of a course of study (Mehrabi, 2014; Mo, 2012). For most, educational achievement in a second/foreign language is evaluated based on the learners' written products (Pamela, 1991). Writing effectively and productively in an academic context has been considered to be of great importance in assessing students' content knowledge, in helping students become proficient writers by generating academic texts, and to obtain new knowledge through academic writing (Hirvela, 2011; Hyland, 2011; Mazgutova & Kormos, 2015). Different from general compositions, writing in an academic context entails unique thought and communication processes (Zhu, 2004) and ESL learners in academic disciplines need specialized rhetorical and linguistic conventions to serve their purposes as writers. Such differences may result from the length of a writing task and available academic vocabulary related to subject specific terminologies (Saeed, 2020). Therefore, coupled with the challenges faced by second language learners discussed in the preceding paragraph, writing for academic purposes may be a greater challenge for second/foreign language learners (Ángel et al., 2017) and they have to strive for a competent level of academic written products to achieve academic success.

Writing was neglected in the early years of second-language studies (Matsuda, 2011), probably in part because the audio-lingualism (a teaching method that emphasized speaking and listening abilities through a natural behaviour of language by mechanical repetition) was the dominant method of teaching in the mid-twentieth century. However, work on second language writing internationally has expanded over the last decades (Matsuda, 2011; Matsuda & Silva, 2005; Williams & Cui, 2005), and the position of second language writing has attained a high level of importance in second language education. It is almost impossible for English Second Language learners to achieve academic and professional success in second language learning without

competence in writing skills. As such, English Second Language learners will need to gradually develop knowledge of phonograms, spelling, vocabulary, grammar, sentence and structure to a proficient level. Research that increases our understanding of the underlying skills supporting second language writing skill will be beneficial for both theories and teaching/learning application. As suggested by Zhang (2013), second language writing has grown to be a mature field, deserving to be studied from all aspects. Zhang (2013) also argued that second language writing has become a discipline of academic and pedagogical inquiry.

Many second language writers will still be on the path to acquiring various aspects of a language when required to produce written outputs in that language. This means that developing basic language skills may determine (at least to some extent) written output quality. Research has concentrated on second language writing from various aspects (see, for example, Hedgcock, 2012; Kubota, 2013; Matsuda, 2011; Reynolds, 2010). For example, Williams and Cui (2005) elaborated that learners with lower versus higher L2 proficiency levels may apply different writing practice. This may be attributed to the different development rates of specific language skills. Additionally, Crossley and McNamara (2012) used linguistic features, such as lexical diversity, word frequency, word meaningfulness, aspect repetition and word familiarity, to predict second language writing performance. Their data demonstrated that second language writers with higher L2 proficiency produce texts with less frequent and less familiar words. Bi and Jiang (2020) investigated the relationship between syntactic complexity and writing ability through measures of length of grammatical unit, amount of subordination and coordination, and degree of phrasal sophistication, and found that syntactic complexity is significantly correlated with L2 writing scores.

Nevertheless, in spite of the importance of basic language skills in second language writing, linguistic aspects remain a challenging teaching task for most English as a Second Language (ESL) teachers. Many ESL teachers are hesitant to focus on the development of language skills in the classroom because they are principally concerned about teaching test-taking skills to cater for the students' test-driven learning styles (You, 2004a, 2004b). Well-developed language skills would facilitate learners' general writing performance while test-based strategies would be limited within a specific writing test. One possible consequence of this is that students may fail in making sense of their writing and achieving effective communication purposes. Furthermore, ignorance of linguistic skills, such as correct word order combination in particular languages, can lead to a lack of development of syntactic awareness which may lead to ESL learners producing lower quality compositions: i.e. those containing syntactic ambiguities or errors. This has been witnessed during my time working as a teacher of ESL students in China. The quality of students' written products were greatly influenced by syntactic ambiguities or errors that made written texts difficult to understand, because syntactic knowledge is an important construct in the writing rubrics (see Chapter 2 for literature review and Chapter 5 for discussion). This is consistent with Liu and Xu's (2013) findings that syntactic errors in Chinese undergraduate ESL learners' compositions have a negative correlation with the students' second language writing performance.

Syntactical errors are quite common in students' compositions (Hourani, 2008), and word order errors are one of the most noticeable errors demonstrated in students' writing outputs. Therefore, good levels of syntactic knowledge may be a vital component in the development of ESL writing proficiency. ESL learners will gradually acquire a body of linguistic data from their first exposure to English, and syntactic

categories result from processing such linguistic knowledge. With the development of essential linguistic features, including knowledge of the syntactic features of text, second language writers should benefit from effectively and efficiently expressing their ideas and arguments in producing academic writing.

1.3 Metalinguistic knowledge and the Not-So-Simple View of Writing Model

The production of written text is an intellectually demanding task. It requires the writer to translate ideas into written form through various language-specific processes. These processes of ideation and translation require a complex array of cognitive and metacognitive processes. Examples of these processes include accessing lexical knowledge, semantic coding, phonological coding, and monitoring of syntactic structures (Bain, 1991; Berninger, 1994; Levine, 1987). As argued by Berninger and Winn (2006) in their writing model, the internal functional writing system requires metalinguistic skills, including components of orthographic, phonological and morphological awareness. The Not-So-Simple View of Writing Model (Berninger & Winn, 2006) addressed the importance of the above-mentioned three metalinguistic skills (orthographic, phonological and morphological). Information about orthographic, phonological and morphological aspects of words are stored in the writers' memory for words (sometimes referred to as a lexicon or lexicons). Such information is necessary for communication in writing and hence metalinguistic skills that can use this information should support writing. For example, phonological awareness is specifically addressed in this model in terms of its significance in learning words and maintaining information actively in working memory. These processes/skills suggest that the Not-So-Simple View of Writing Model places more emphasis on orthographic, phonological and morphological awareness, particularly in terms of their prediction of variability in spelling accuracy as part of the writing system. However, it can be argued

that metalinguistic awareness also includes those skills that allow the learner/writer to focus on the structure and form of the language (Altman et al., 2018; Ramirez et al., 2014). Rather than the focus in the background of the Not-So-Simple View of Writing, it can refer to a set of multiple explicit skills (Bialystok et al., 2014; Roehr, 2008) that include phonological awareness, morphological awareness, syntactic awareness, and lexical awareness (Altman et al., 2018). As such, assessments of syntactic awareness (the focus of the research conducted as part of this thesis) can also be considered as part of metalinguistic awareness skills (see also Apel, et al., 2017; Bialystok, 1999; Brimo, et al., 2017, 2018). Research investigating the contribution of syntactic awareness to explaining writing performance would, therefore, seem worthwhile. Considering syntactic awareness as part of the metalinguistic skills covered by the Not-So-Simple View of Writing, however, remains a useful way of envisaging the potential role of syntactic awareness in writing performance. Therefore, this model will provide a basis on which to develop the current study and discuss its findings.

1.4 ESL writing in the Chinese context

In China, English as a second language plays a useful role in each aspect of life, especially for those involved in academic study. English is an obligatory part of the Entrance Examination to Universities in China. Under such circumstances, students must develop a certain level of competence in English language skills in order to gain admission to a top-ranked university. China has two divisions of English learning: English major and college English. Their English proficiency is evaluated almost exclusively by the results of the score on the Test for English Majors (TEM) and the College English Test (CET), which are two large-scale standardized English language tests administered to undergraduate students majoring in English Language and Literature and non-English majors in Chinese higher education. The CET and TEM are

two tests aiming to measure the English proficiency of Chinese undergraduate students. The TEM is administered by the National Advisory Committee for Foreign Language Teaching (NACFLT, 2000), authorized by the Department of Higher Education of the Ministry of Education in China (Jin & Fan, 2011; Liu & Huang, 2020). It is made up of TEM-4 (administered at the end of the second year) and TEM-8 (administered at the beginning of the fourth/last year). All English Majors students are required to take part in TEM and it is considered “a high-stakes testing program” (Liu & Huang, 2020, p. 3). Students who pass the TEM or CET are given a nationally recognized certificate demonstrating their English proficiency, which is important at the time when they are looking for jobs (Cheng, 2008; Jin & Fan, 2011; Liu & Huang, 2020). ESL writing proficiency is evaluated based on the score of the writing task of these tests. Therefore, in order to achieve a good result in the test, students should produce good quality written products.

Additionally, there is an increasing momentum, compared to that in the past decades, for graduates from top universities to pursue further study at overseas universities (O’Morrow, 2017). This leads to the need for more competent academic writing in order to pass international standard tests such as International English Language Testing System (IELTS) and Test of English as a Foreign Language (TOFEL). Therefore, many English second language learners are faced with the difficulty in acquiring second language writing skills.

1.5 Purpose statement

There were three primary aims of this study. One was to investigate the role of syntactic awareness in English writing of adult ESL learners. A second aim of this research project was to assess the extent to which additional factors (i.e., grammar, orthographic,

phonological, phonological and orthographic, morphological, and vocabulary knowledge) are more or less predictive of adult ESL learners' writing ability compared to syntactic ability. The third aim was to explore commonalities and differences among the potential predictors of basic linguistic skills between those with higher and lower second language English proficiency. This study therefore set out to assess the effect of the underlying language skills, and the effect of them on writing ability of ESL learners.

1.6 Sinificance of the Study

This research project provided an important opportunity to advance the understanding of relationships between underlying language skills and writing ability. There were three important areas where this study should make a contribution to the field of ESL writing. First, the study provided data on the relationship between syntactic awareness and second language writing ability. These data can be used as evidence by pedagogical practitioners' for approaches that facilitate the role of syntax in academic writing outputs. Second, the study provided evidence for language predictors of writing performance. These findings should support language teachers and learners to focus on improving those skills that predict higher levels of writing ability. This may lead to the design of language-teaching activities and practice tasks that can improve these predictive language skills. Third, the study contrasted high and low proficiency writers. This should offer important insights into the differences and commonalities between higher and lower proficiency writers in terms of the predictors of writing ability, which may advance educators' and curriculum developers' knowledge about how to address the challenges faced by lower proficiency language learners.

1.7 Research questions

1. Is syntactic awareness a predictor of second/foreign language writing ability across Chinese university students with a range of English language skills?
2. Is syntactic awareness more predictive of English writing ability among Chinese university students than other measures of basic language skills (i.e., phonological awareness, phonological & orthographic awareness, orthographic awareness, grammar knowledge and vocabulary knowledge)?
3. Do the predictors of English writing differ across Chinese university students with lower levels of English proficiency compared to those with higher levels of English proficiency?

1.8 Research design

A quantitative research design was adopted to provide empirical data for this study. The research data in this thesis are drawn from 222 university students from two universities in China (see 4.4 Data Collection Procedure for detailed information). To address the proposed research questions, 11 measures were developed and employed to investigate the potential predictors of ESL writing ability within the context of Chinese universities. These measures were piloted and amended to ensure that the test items were to assess the same construct and measures with similar characteristics were to assess something common. The data for the study were gathered in the form of a questionnaire, nine language assessments, and a written composition. Correlational analyses were undertaken to determine associations among variables applied in this study: a correlational research design best suits the aims to investigate the relationships between writing ability of adult ESL learners and their syntactic ability, as well as the relationships with other underlying language skills (i.e. grammar, orthography, phonology, orthography and phonology, morphology, and vocabulary).

1.9 Organization of the thesis

The overall structure of the thesis takes the form of five chapters, including this introductory chapter. This first chapter has provided a brief overview of the thesis, including the background of the study, ESL writing issues in the Chinese context, and purpose statement. It also presented the significance of the study, research questions as well as the measures employed.

Chapter two discusses the related literature, which is in line with the present study focusing on the relationships between basic underlying language skills and the writing ability of ESL learners. It begins by laying out the theoretical bases of the research, and looks at how they relate to second language writing researches conducted in China. It then moves to the main topic of the study, syntactic awareness and writing ability. The general definition of syntactic awareness and its two dimensions are highlighted, followed by other important language skills including grammar, orthographic awareness, phonological awareness, orthographic and phonological awareness, morphological awareness, and vocabulary knowledge. The chapter focuses on key studies that have been used to address the importance of exploring these skills among ESL learners in China.

The third chapter describes the methodology used in this study. It begins by introducing all 11 measures used in the first pilot study, including the rationale, procedures, and examples for each measure. This chapter also describes the three pilot studies conducted in New Zealand and China. Information will be provided on the participants and procedures of each pilot study, as well as how the outcomes obtained from the pilot studies are used to help improve the assessments for the main study. The final part of

this chapter presents the nine measures, with necessary amendments, that will then be used in the main study.

The fourth chapter presents the findings of the research, focusing on the three key themes that are closely related to the research questions. Correlations, multiple regressions, and differences between higher and lower proficiency learners will be reported. Internal consistency reliabilities of the nine measures employed in the main study are reported, along with the descriptive statistics for the measures. Correlational and regression analyses are then reported for the whole cohort of students. The students were then be split into two groups. Differences between these groups are then presented in terms of means and standard deviations in the performance of each measure. The results then report associations between the language skills with writing performance, and assessments of the predictors of the writing ability of the higher and lower proficiency writers.

The final chapter draws upon the entire thesis, tying up the various theoretical and empirical strands in order to discuss the significance of the findings and their possible explanations. The chapter also identifies the limitations of the research for a comprehensive understanding of the findings and, more importantly, to provide further suggestions for future studies in the context of producing quality written texts.

CHAPTER 2 LITERATURE REVIEW

2.1 Research on English writing skills in China

Since the end of the 20th century there has been research investigating what is happening when Chinese students learn to write in English (see, for example, Liu & Braine, 2005; Qin & Uccelli, 2016; Wang, 2019; You, 2010). A large volume of studies on Chinese writing in English has focused on the first language and second language transfer in writing (Huang et al., 2011; Mohan & Lo, 1985; Wang & Wen, 2002; Wu, 1993). For instance, Mohan and Lo (1985) found that transfer factors referring to the influence of the first language and developmental factors referring to learned ability in rhetorical organization development especially derived from formal education are important for the academic English writing of Chinese students. Xiangyun (2007) investigated the development of Chinese tertiary-level students' second language writing and the study revealed that memorization of words and sentence structures is an effective method for Chinese university students in acquiring and enhancing the vocabulary knowledge and fixed expressions in English that are needed in their writing. This can effectively build up the students' sense of language and reduce L1 negative transfer, e.g., rhetorical strategies such as organization of paragraphs (Mu & Carrington, 2007) in their writing output, which further improves students' overall writing proficiency. These studies referring to second language writing in terms of first and second language relationships have provided a basis of understanding ESL writing in China. Likewise, Chan (2004) provided some evidence from the interlanguage of Hong Kong Chinese English second language learners. Several error types (e.g., lack of control of the copula, incorrect placement of adverbs, failure to use the relative clause, and confusion in verb transitivity) were measured in the study. It was found that the

surface structures produced by the students were almost the same or quite similar to the standard or common sentence structure of the learners' first language. Additionally, it is also found that the effect of first language syntactic awareness was easier to happen in the compound structures of the students' English writing, which was more likely to arise among lower proficient English second language learners. This finding not only helped better understand the relationship between syntactic awareness and English writing, but also provided an effective background for second language writers with both high and low English proficiency, which is similar with the research design of the participants in this thesis.

Liu and Xu (2013) investigated syntactic errors in Chinese Undergraduate EFL Learners' Compositions. It demonstrated that syntactic errors of various categories (e.g., errors in parts of speech, in coordinating and subordinating conjunctions, in subject-verb agreement, in run-on sentences, fragments and dangling sentences, in word order, in mixed structure, in the use of articles and the use of single or plural forms) had a negative correlation with the students' second language writing performance. For example, there is an error of subordinating conjunction in this sentence:

Although Vincent van Gogh sold a few paintings during his lifetime, but he is considered one of the greatest painters of all time.

Either *although* or *but*, subordinating conjunctions, should be kept in a sentence, but not both. Liu and Xu's (2013) results related to run-on sentences, fragments and dangling sentences, and word order syntactic errors provide a reliable reference for this study which taps into syntactic awareness to investigate its relationship with writing ability of Chinese university students learning English as a second language.

There are many other studies that relate to Chinese university students' English writing from a specific perspective of vocabulary and grammar (Leki, 1991; Liu & Xu, 2013; Zhou, 2009), measurements of development in second language writing (Jiang, 2013), the role of oral participation (Wen et al., 2005; Xiangyun, 2007; Zhou, 2015) and the development of EFL writing instruction (Hu, 2007; You, 2004b; Zhang et al., 2015). However, the research to date has tended to focus on one or two particular language skills such as syntactic awareness and writing, vocabulary knowledge and writing, morphological awareness, phonological and orthographic and writing (see 2.2.4 for more details), and relatively little research controlling for a range of language factors related to ESL writing ability to investigate the specific effect of syntactic awareness in adult ESL learners. Therefore, this thesis addresses an important gap in the literature and this research should help give some key findings in this area about whether syntactic awareness is a better predictor of writing ability than other basic underlying language skills.

2.2 Syntactic awareness and English writing

The point of this thesis is to look at the influence of syntactic awareness on adult ESL learners' writing ability. This sub-section begins with the definition of syntax, followed by the relationship between syntactic awareness and language acquisition. It then gives a brief overview of the association between syntactic awareness and second language writing. Finally, a latent variable model of L2 writing quality, as one of the theoretical bases of the research, is used to argue for the importance of syntactic awareness and L2 writing ability.

2.2.1 Syntactic awareness

Krashen (1982) argues that language learning refers to a conscious process that happens when learning the syntactic rules, pronunciation and vocabulary of a language. Larsen-Freeman (1997) and De Bot (2008) hold the view that language learning should be considered as a dynamic and complex process, with the involvement of various interacting subsystems (such as syntactical, phonological, textual, etc.) changing over time. Crystal (2011) defined syntax (the adjective form is syntactic) as the inter-relationships between aspects of sentence structure and the governing regulations of organizing sentences. Syntactic awareness is a metalinguistic skill which is defined as the capability of controlling or judging word-order within the sentence context based on the application of syntactical rules (Bowey & Patel, 1988; Cain, 2007). Similarly, syntactic awareness refers to the ability ‘to reflect on and manipulate the order of words in a sentence’(Nagy et al., 2000, p. 275). Syntactic knowledge refers to one’s capability of understanding and producing various syntactic structures (the patterns or rules of formation of sentences and phrases from words) in a sentence context (Adlof & Catts, 2015; Catts et al., 2006; Cutting & Scarborough, 2006). According to Brimo et al. (2017), syntactic awareness and syntactic knowledge are two different but related constructs, both of which are involved in dealing with word order based on the application of grammatical rules. In a second language research context, syntactic complexity is generally defined as variation and sophistication of grammatical structures (Lu, 2011; Ortega, 2015; Wolfe-Quintero et al., 1998). Therefore, the terminologies of syntactic awareness, syntactic knowledge, and syntactic complexity will be used as appropriate within the thesis to describe aspects related to the processing of syntax.

Assessment of syntactic awareness has involved tasks requiring word-order correction (e.g., Cain, 2007; Gaux & Gombert, 1999; Oakhill & Cain, 2007); though many tasks that use an oral only presentation rely to a large extent on the participants' working memory (Cain, 2007; Gaux & Gombert, 1999). Students' comprehension of complex sentences has also been used to assess syntactic knowledge (e.g., Brimo & Hall-Mills, 2019). Sentences with one independent clause and at least one dependent clause, noun phrase or verb phrase are basically applied to assess syntactic knowledge and syntactic awareness (Nippold et al., 2009). Additionally, syntactic complexity at the phrase level, e.g., noun phrases and verb phrases (Biber et al., 2011; Crossley & McNamara, 2014; Kyle, 2016) and at the verb-argument construction level, e.g., a verb slot and the related arguments (Kyle & Crossley, 2017; Mostafa & Crossley, 2020) have attracted researchers' attention. Overall, different measures of syntax are applied to serve the different research purposes of word order judgement, complex sentence comprehension, and achievement of syntactic complexity, while the present research focuses on word order judgement.

In the current study, syntactic awareness and grammar knowledge are considered as two separate linguistic skills. Syntactic awareness focuses on word order (Chomsky, 2014) and it is also the first consideration of the present study while grammar is the theoretical basis of a language that includes the structure of words, phrases, clauses, sentences, and right up to the structure of the whole texts (Aarts, 2011; Chomsky, 1956).

2.2.2 Implicit and explicit processing of syntax

Implicit processing of syntax suggests that people are not consciously aware of producing and comprehending syntactical structures of phrases/sentences (Brimo &

Hall-Mills, 2019; Gaux & Gombert, 1999). Therefore, implicit syntactic processing usually develops without conscious effort and explicit training. On the other hand, explicit processing of syntax refers to situations where people are consciously aware of thinking about and applying syntactical rules of the language (Layton et al., 1998).

2.2.3 Explicit awareness of syntax and language acquisition

According to Brimo and Hall-Mills (2019), explicit syntactic knowledge, or the capability of thinking about and applying the grammatical rules of language with conscious effort and training, is one of the important skills correlated with reading comprehension and writing composition. Thus, it is likely that there is some association between syntactic skills, word recognition, reading comprehension, and writing ability. A reasonably large number of studies have looked for such relationships. These connections have been confirmed by correlations between syntactical judgement or word order tasks and reading skills (Brimo et al., 2017; Cain, 2007); by comparisons between good and poor readers in terms of factors associated with syntactic awareness (Nation & Snowling, 2000); and by syntactic features found in ESL writing samples by students with different levels of second language proficiency (Ferris, 1994). Finally, studies of syntactic awareness teaching, intervention or training (Andrews et al., 2004; Hawthorne, 2016; Kennedy & Weener, 1973) have shown that when learning has a deliberate reflection on syntactical knowledge, it has a positive impact on word processing and reading comprehension in young readers, and on the accuracy and quality of the output produced by writers.

2.2.4 Syntactic awareness and second language writing

The large volume of published studies investigating the contributions of syntactic awareness and syntactic complexity to language learning and reading comprehension

(see, for example, Berninger et al., 2008; Brimo et al., 2017; Guo, 2008; Miller, 2010; Novick et al., 2003; Rodd et al., 2010; Wong & Chen, 2012; Zimmer, 2017) suggests that syntactic awareness may be a significant metalinguistic element in reading and language development. On the other hand, in the process of producing linguistic features, syntactic knowledge plays an important role in achieving a variety and complexity of syntactic structure that facilitates language diversity. Considerable attention has been drawn to the associations between syntactic complexity and second language writing quality (Ferris, 1994; Lu, 2011; Ortega, 2003, 2015). Similarly, Sun et al. (2018) investigated the contributions of three metalinguistic components (phonological, morphological and syntactic awareness) to writing performance of Chinese-English bilingual children in Singapore, concluding that syntactic and morphological awareness contribute more than phonological awareness. Additionally, Ferris (1994) argued that appropriate use of syntactic complexity features positively correlates with ESL writing scores. Likewise, Latif (2009) asserted that syntactic knowledge has a significant effect on ESL learners' writing quality.

Research has also found that longer clauses and better quality and syntactically correct sentences are usually produced by more proficient writers (Lu, 2011; Ortega, 2003, 2015). For example, Yang et al. (2015) noted that syntactic complexity, assessed via the mean length of sentences and T-units (one independent clause and any dependent clause connected to it; Hunt, 1965, 1970), is an important predictor of second language writing quality as performed across two different writing tasks. This suggested that second language writers with higher proficiency tend to use longer sentences and T-units with syntactically correct structures throughout different writing topics. Similarly, a study conducted by Crossley and McNamara (2014) found that syntactic clausal complexity as measured via greater clauses and more verb complements is predictive

of expository writing scores. Likewise, more complex phrases, such as greater incidence of prepositional phrases, usually lead to higher rated second language essays and address the significance of phrasal expansion in academic written products (Biber et al., 2011; Kyle, 2016).

For ESL students, “ambiguity is often an enormous obstacle to successful communication with native speakers of the English language, as a consequence, many misunderstandings frequently arise” (Peng, 1990, p. 1). Similarly, when writing in a second language, ambiguity is also likely to happen (Kreidler, 2002). A second language writer is more likely to produce sentences with syntactic ambiguities than a first language writer because an L2 writer has more difficulties with complex structures and integration of multiple information due to the different rules of word orders of L1 and L2 (see Chapter 1 – 1.2). From the researcher’s own experience as an ESL teacher, in writing samples produced by second language writers and speakers, readers are sometimes confused by various kinds of syntactic ambiguities or errors. For example, in the sentence ‘Shawn is our newest classmate from Toronto’, syntactic awareness is needed to judge the correct word order. The suggestion may be that there are many students from Toronto, but the most likely interpretation is that Shawn is our newest classmate and he is from Toronto. This sentence could be revised in various ways to make it clearer: a) *Shawn, our newest classmate, is from Toronto;* b) *Shawn from Toronto is our newest classmate;* c) *Our newest classmate Shawn is from Toronto;* d) *Our newest classmate is Shawn from Toronto.* The reduction of such ambiguities/errors would reduce problems of interpretation.

What is not clear is the different impacts of syntactic awareness compared to other language skills. In spite of its importance in language learning, particularly in second

language writing, the generalizability of much published research on this issue appears to be limited within one single linguistic variable, e.g., syntactic complexity and writing ability (Bi & Jiang, 2020; Kyle, 2016; Kyle & Crossley, 2017; Lu, 2011), or two variables, e.g., syntactic and lexical features in ESL writing (Ferris, 1994), or three variables, e.g., lexical sophistication, syntactic complexity, and cohesion (Kim & Crossley, 2018), and lexical, syntactic, and discourse features (Danzak, 2011). Some studies included more linguistic areas (e.g., morphology, phonology, orthography, grammar, and vocabulary) but did not address syntactic awareness (Masilamani, 2019; Saeed, 2020). Furthermore, many of these studies have focused on measuring syntactic awareness through mean length of clause, T-unit, and sentence by calculating number of words, T-units, and clauses, through number of clauses per T-unit, number of T-units per sentence, and number of coordinate phrases per clause (see Bi & Jiang, 2020; Brimo & Hall-Mills, 2019). These measures were developed from the syntactic features arisen exclusively from the written texts produced by the participants, instead of employing separate syntactic measures to assess the participants' syntactic awareness and further investigate the relationship between this particular construct with the overall writing ability.

Therefore, in order to understand the various effects of syntactic construct and a range of other language factors on second language writing ability, it is important to investigate whether syntactic awareness plays a more important role than other contrasting linguistic variables in ESL learners' writing ability. This study seeks to address this important gap by examining syntactic awareness in contrast to other basic linguistic skills (e.g., morphological awareness, phonological awareness, orthographic awareness, grammar and vocabulary) in English writing among adult ESL learners in China.

2.2.5 The Latent Variable Model for L2 Writing Quality

The Latent Variable Model for Second Language Writing Quality developed by Kim and Crossley (2018), as shown in Figure 2.1, will also be used as a theoretical basis for the present study. Syntactic awareness is one of the main elements (e.g. lexical, syntactic and cohesive features) specifically examined in this model, and it aims to account for the significance of syntactic complexity in the assessment of second language writing (Norris & Ortega, 2009; Ortega, 2015). As discussed above, research has suggested that syntactic complexity is predictive of second language writing proficiency (Crossley & McNamara, 2014; Kyle, 2016; Lu, 2011). Syntactic awareness is hypothesised as an important language skill in developing the second language writing ability of ESL adult learners. Facets of lexical (see 2.3.5 Morphology and Vocabulary for further detail) and syntactic (see 2.2 Syntactic Awareness for further detail) features are included in this thesis, while the reason for not including a measure of cohesion is that there is not an agreed measure – and those that there are assess different things and are not that well correlated (Crossley et al., 2016).

In second language writing research, syntactic complexity generally refers to the variation and sophistication of grammatical structures, or the range of the produced syntactic structures and the sophistication level of such structures (Lu, 2011). As reviewed in section 2.2.1, syntactic awareness and syntactic complexity will be used appropriately within the thesis to describe aspects related to the processing of syntax.

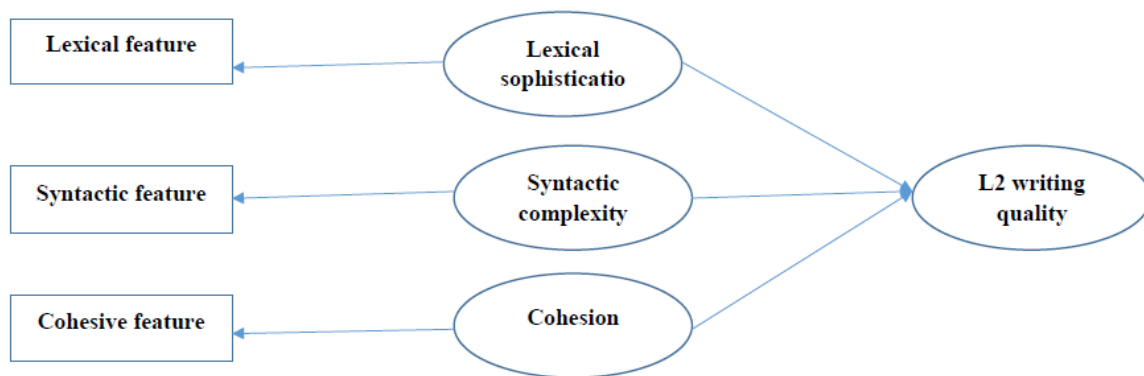


Figure 2. 1 The Latent Variable Model for L2 Writing Quality by Kim and Crossley (2018)

2.3 Other basic underlying linguistic skills

Although this study aims to investigate the influence of syntactic awareness, other underlying linguistic skills were also included in the research reported in this thesis in order to contrast their influence on L2 writing with that of syntactic awareness. After considering much of the argument and the nature of this thesis, an L1 writing model will be used as a theoretical framework for conceptualising the roles of the different language skills incorporated into this study. These skills (i.e. grammar knowledge, orthographic, phonological, morphological, and vocabulary knowledge) will then be discussed to explain their inclusion in the research.

2.3.1 The Not-So-Simple View of Writing Model

The Not-So-Simple View of Writing Model developed by Berninger and Winn (2006) is a modification of Simple Writing View Model by Berninger and Amtmann (2003), which was applied to interpret and understand the process of writing. According to the Not-So-Simple View of Writing Model, successful writing tackles four essential

component skills: transcription skills, text generation skills, self-regulatory executive functions, and working memory process.

Specifically, transcription skills tap into lower-order (Poch & Lembke, 2017) cognitive processes/skills, such as handwriting and spelling, which will require the ability to translate sounds into letter symbols. However, poor lower-order skills, such as a lack of accuracy and fluency in spelling, may affect the idea/content generation process (Abbott et al., 2010; Masilamani, 2019). The interconnection between sounds and letters considered in the transcription process argues for the importance of phonological and orthographic knowledge. Morphological knowledge is also likely to be employed for the sake of correct spelling in the translation/transcription process; e.g. with appropriate suffixes for grammatical function based on the context. As such, morphological knowledge is a basic language skill that should support both transcription and generation processes.

Text generation skills represent higher-order (Poch & Lembke, 2017) cognitive capabilities. These draw on ideation and the translation of these ideas into sentences or text/discourse-level language representations in working memory (Berninger et al., 2002). Additionally, the generation of ideas and translation ideas into sentences is a dynamic, complex and multi-dimensional process (Abbott et al., 2010; Berninger et al., 2002). Oral language skills involved in generating ideas in language form are likely to be used before the generated ideas are translated into written texts through the transcription processes (Kim & Schatschneider, 2017). Additionally, language skills, such as those involved in grammar, syntax, morphology, and vocabulary, have been found to play important roles in writing skills (Brimo et al., 2017; Kim & Schatschneider, 2017; Masilamani, 2019; Saeed, 2020). It is more likely for competent learners with advanced grammar, syntax, morphology, and vocabulary knowledge

(Coker, 2006; Crossley et al., 2019; Olinghouse & Wilson, 2013) to produce quality written texts (Masilamani, 2019).

Conscious attention, reviewing, planning, revising and strategies for regulation are included in the model as self-regulatory executive functions (Berninger & Amtmann, 2003). According to Berninger and Amtmann (2003), with the gradual maturation of a writer, the executive functions that regulate the processes transform from those provided by teachers' effective instructions or peer support, and obtained from textbooks regarding how to develop quality written outputs, to self-regulations that focus on a writer's conscious effort to achieve quality writing.

Working memory is regarded as the constraint of transcription, text generation, and self-regulations within the model. When a writer actively produces text, he/she is required to apply processes, and necessary information in his/her mind, to produce written products efficiently. A writer also needs to decide why, what, and how to write, so he/she should be able to get access to the stored concepts in the long-term memory (Swanson & Berninger, 1996), whereas reviewing and revising actions take place in the short-term memory.

“Modelling of writing has provided, and will continue to provide, a means for understanding the complexity and interconnected nature of writing” (Poch & Lembke, 2017, p. 41). Studies have suggested that the Not-So-Simple View of Writing model (Berninger & Amtmann, 2003; Berninger & Winn, 2006) can be applied across the elementary and middle school level of writing (Poch & Lembke, 2017) and it has the potential to inform our understanding of how to further develop the writing skills of adult learners (Kim & Schatschneider, 2017; Masilamani, 2019). Given such background, this model was used as one of the theoretical bases (along with

perspectives on ESL and syntactic awareness) on which the present study was developed.

The preliminary aim of the study is to focus on linguistic perspectives through an investigation of the relationship between syntactic awareness and academic writing ability of adult ESL learners. Language components such as grammatical competence, orthography, phonology, morphology, and vocabulary also represent linguistic skills needed to efficiently communicate messages in writing (Costa et al., 2018). Therefore, it is important to explore the impact of these basic language variables to ensure that any particular associations with writing abilities are connected to specific target language skills, instead of to generality of linguistic factors. As described earlier in this section, lower-order skills (e.g. handwriting and spelling) used in the transcription process require phonological and orthographical knowledge. This knowledge is usually considered fundamental and primarily associated with young learners. It is also assumed that second language learners are on the way to develop these underlying skills in their production of written texts (Masilamani, 2019) and, as pointed out by Bassetti (2017) “second languages are often learned through spoken and written input” (Bassetti, 2017, p. 1). The current study is diverting from the Not-So-Simple View of Writing Model by Berninger and Winn (2006) (see Figure 2.2 below), given that the main focus of this study is linguistic aspects which are mainly reflected in transcription and text generation processes and their relationships with writing ability, so working memory and self-regulation are not included.

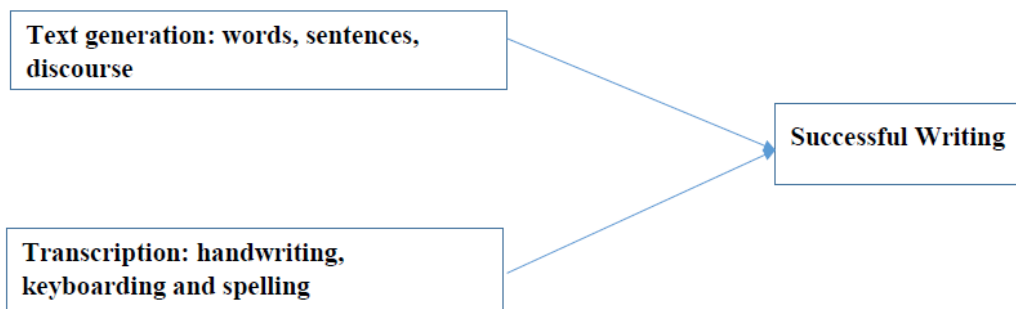


Figure 2. 2 The Not-So-Simple View of Writing Model by Berninger and Winn (2006)

2.3.2 Grammar knowledge

In order to deliver an idea or message in written or spoken forms, words need to be put together in a sentence according to the rules (grammar) that govern how words are arranged in a language (Debata, 2013; Marchman & Thal, 2005). Chomsky (1956) maintained that grammar is the theoretical basis of a language. In other words, grammar is the fundamental element that acts as the rule governing language behaviour. Based on the notion that linguistic behaviour is rule-governed (Kac, 1992), language learners need to distinguish the correct linguistic behaviour from incorrect ones. This suggests that grammatical knowledge plays an essential role in learning a language and that if knowledge of the grammatical structure of a language is not accessible, effective communication is unlikely to be achieved when listening, speaking, reading and writing (Sams, 2003; Savage et al., 2010; Sun, 2017). In agreement with Chomsky, many decades later Kreidler (2002) contended that any language can use a limited number of grammars to express an unlimited number of meanings, which further highlighted the importance of grammar in language learning.

Purpura (2013) described grammar as the structural glue and the code of language. Language learners apply this code to develop their skills for clear, meaningful, and

effective messages whether giving or receiving (Goode, 2000). Regarding the structure of grammar, Celce-Murcia (1991) suggested that grammatical structures are carefully sequenced from basic to more complex, leading to learners' successful spoken and written communications from an elementary level to a proficient level. As described in the first section of this chapter (2.3.1), writing is a complex process and a challenging skill for learners. Writers with poor grammatical knowledge are unlikely to be able to produce quality written texts. Therefore, grammatical competence is likely to play a significant role in composition writing tasks (Daffern et al., 2017b; Hillocks & Smith, 2003). An understanding of grammar should support students, including second language student learners, in employing appropriate mechanical and conventional rules to produce clearer written texts and more effective message delivery through writing (Fu, 2003; Shen, 2012). Therefore, the position taken in this thesis is that a good command of grammar knowledge of English will help the students come to the fore in the issue of second language writing.

There are those who suggest that integration of a written context might be a more beneficial approach in helping learners to develop competent grammar knowledge (Lin, 2008; Weaver, 1996). In second language learning, grammar has been considered an influential factor in determining a learners' language acquisition (Loewen et al., 2009; White, 1989) and in facilitating ESL writing (Masilamani, 2019; Wang, 2010). Grammatical competence has been found to be positively associated with second language writing (Frodesen, 2018) and a significant predictor of second language writing abilities (Lu, 2010; Schoonen et al., 2011). Regular exposure to a second language context, and appropriate communication in that second language, provides learners opportunities to master second language grammar implicitly, allowing second

language writers to employ grammar knowledge to improve writing abilities (Hinkel, 2003).

Additionally, according to Debata (2013) and Singh et al. (2017), grammar knowledge supported students in correcting mistakes and improving the quality of written texts. Others have also supported that grammatical error correction plays an important role in improving students' development of written products (Ferris, 1999; Ferris & Roberts, 2001; Ferris, 2004). Similarly, Carduner (2007) has insisted that the connection between grammar and writing should be more important if error correction was applied. Ellis (1997) suggests that acquiring grammar is one of the most challenging tasks for ESL learners (Lin et al., 2020). Ellis (1997) also pointed out that the complexity of certain second language linguistic characteristics in grammar, such as tenses and verbs, is not easy for teachers to teach because it is not feasible for the students to get a good mastery of these features through oral communication. For example, the contraction 'she's' means she was/is/has, and the pronunciation of a past and present tense verb is challenging for second language learners (e.g., *she liked it /laɪk'tɪt/. she likes it /laɪk'sɪt /.*). Incorrect use of tenses could result in a change of the written meanings and may lead to being awarded lower scores when marked by assessors (Abdullah, 2013; Vaughn, 1991).

Research in the Chinese context has demonstrated that it is challenging for ESL learners to complete academic writing tasks, especially when poor grammar knowledge influences their effective message conveying (e.g., Yang & Lyster, 2010) because they may tend to make grammatical errors in their English composition writing (Mo, 2012; Sun & Shang, 2010; Zheng & Park, 2013). Feedback on the grammatical errors and mistakes made by ESL students is the predominant aspect given by teachers (You, 2004a) in the Chinese classroom context. Therefore, grammar knowledge is always

emphasized when we learn English as a second language and English teachers usually highlight the importance of grammar acquisition at the early stage of English learning.

2.3.4 Spelling-focused linguistic skills

2.3.4.1 Orthographical knowledge

Seifart (2006) defined orthography as “the conjunction of a set of graphemes, such as the alphabet, and a set of accompanying rules regulating their use” (p. 277). Similarly, according to Coulmas (2003, p. 35), orthographies refer to writing systems that are codified in terms of a set of graphic symbols (letters/graphemes, punctuation marks, etc.), and a set of rules/conventions (e.g., orthographic, pronunciation, punctuation, capitalization, etc.). Orthography has also been defined as the standardized spelling rules and patterns of a language, which could be reduced to the grapheme-to-phoneme correspondences that exist in a certain language (Scheerer, 1986; Varnhagen et al., 1999). Although there are some inconsistencies in definitions of orthographic knowledge, its important role in literacy acquisition has been noted by many researchers (Berninger & Winn, 2006; Roman et al., 2009).

The English orthography is basically a phonographic writing system; and is typically referred to as an alphabetic writing system, having developed from the Greek alphabet via the Roman alphabet. The elements of the sound structure of the English language are the basic unit represented by the orthography. In such an alphabetic writing system, the basic set of graphemes more or less correspond to the phonemes of a language. However, within the English writing system, “the range of correspondences between phonemes and graphemes varies both in consistency and in completeness” (Katz & Frost, 1992, p. 67). In English, a single phoneme may be represented by several graphemes (e.g., /g/ - <girl>, <ghost>, <catalogue>), and a single grapheme may also

represent several phonemes (e.g., <paper> - /peɪpə/, <activity> - /æk'tɪvɪti/, <grass> - /grɑ:s/). Therefore, the contribution of orthographic processing to word recognition has been of great interest to scholars and researchers. For example, Hung and Tzeng (1981) concluded that orthographic correspondence applies to the lower-level word processing while higher-level processing is not affected by orthographic variations (Scheerer, 1986).

According to Apel (2011), orthographic knowledge is stored in one's memory and represents spoken language in written form. Apel (2010) and Wolter and Apel (2010) have used the term *mental graphemic representations (MGRs)* to refer to the stored mental representations of written words or word parts. There are two aspects of orthographic knowledge, MGRs and orthographic patterns. MGRs include specific sequences of graphemes representing written words or reflects memories of certain words: for example, complete and accurate images of written words (e.g., *dog*) and less clear or incomplete images that contain only a few letters (e.g., *sox* for *socks*). Orthographic patterns relate to an understanding of the rules governing a symbolic system: e.g., how letters can and cannot be combined, such as "jr" is not a legitimate combination in English (Apel, 2011). Both MGRs and orthographic patterns contribute to language learners' ability of spelling words correctly.

Moreover, orthographic knowledge can be divided into lexical and sub-lexical processing skills (Commissaire & Besse, 2019; Masilamani, 2019). Lexical orthographic skills, or word-specific orthographic knowledge, refer to those skills that support the processing of existing orthographic representations within the lexical items (McClelland & Rumelhart, 1981; Perfetti & Liu, 2005). Sub-lexical orthographic skills relate to the orthographic regularities of the writing system. These regularities are formed through the identification of acceptable letter patterns, most likely based on the

frequency of the use of individual or combinations of graphemes within a specific textual context (Cassar & Treiman, 1997a; Hayes et al., 2006; Pacton et al., 2005; Siegel et al., 1995). For example, ‘*tion*’ is an acceptable combination frequently used in a textual context where a noun should be applied (e.g., act - action).

Corresponding phonological and orthographic entries are attached to form a word (Apel, 2011; Nation et al., 2007), e.g., /ʃə/ is for ‘cher, ture’. When the associated information (e.g., spelling symbols/patterns of a word) is formed and saved (Tims, 2013), non-words are likely to be avoided in specific spelling, e.g., pear vs. pare; train vs. trane. Share (1999) and Tims (2013) argued that phonological recoding of novel letter strings provides opportunities for the acquisition of word-specific orthographic representations. Apart from the relationship between orthographic knowledge and phonological knowledge, orthographic awareness is additionally related to other linguistic variables such as morphology, syntax, and semantics (Roman et al., 2009; Scheerer, 1986; Seifart, 2006). For example, the word-specific images within one’s orthographic knowledge can include word parts such as prefixes and suffixes (e.g., *un-*, *-able* for *unforgettable*); the orthographic representation of syntactic units, such as phrases and sentences, are often orthographically represented with punctuation; lexical ambiguity caused by homographs may be solved by making use of syntactic (e.g., word classes) and semantic (contextual meaning) cues. The above-mentioned variables place an important and essential load on correct word spelling, successful word recognition, and effective reading comprehension, fluent vocabulary, and grammar learning (Arciuli & Monaghan, 2009; Barker et al., 1992; Conrad et al., 2013; Cunningham et al., 2001; Deacon et al., 2012).

In ESL learning, orthographic processing skills are essential in the spelling performance of Chinese ESL learners (Wang & Geva, 2003). Furthermore, limited spelling errors

have been shown to be reliable predictors of the quality of second language writing (Bestgen & Granger, 2011).

2.3.4.2 Phonological knowledge

Phonological processing involves the recognition and use of the phonological or sound structure of oral language. Such language processes can be useful when learning how to decode written language (Torgesen et al., 1994). Three kinds of phonological processing skills have been argued to be positively related to the individual development of beginning reading skills acquisition (Bishop & Adams, 1990; Read et al., 1991). These are phonological awareness, phonological memory, and phonological access to lexical storage (Anthony & Francis, 2005; Torgesen et al., 1994; Wagner & Torgesen, 1987). Anthony and Francis (2005) consider phonological awareness as highly associated with literacy.

Anthony and Francis (2005) define phonological awareness as “one's ability to recognize, discriminate, and manipulate the sounds in one's language” (p. 256). According to Allor (2002), phonological awareness, as a significant example of phonological processing, is the understanding of individual sounds or phonemes making up syllables, groups of syllables making up words, and words making up sentences. According to Anthony and Francis (2005), phonological awareness skills involve whether syllables (the sound unit that can be easily recognised in sequences of speech sounds) or smaller intrasyllabic units such as onsets (the initial consonant or consonant cluster), rimes (the remaining vowel and consonants), or phonemes (the smallest sound unit that distinguishes one word from another), are the focus of phonological acquisition. For example, in the word *slim*, *sl* is the onset, *im* is the rime, and /s/, /l/, /i/, and /m/ are the phonemes. Therefore, phonemic awareness (phonological

awareness at the phoneme level), syllable-level awareness, and onset–rime awareness, are three basic forms of phonological awareness, and are significant components in the development of phonological processing (Cisero & Royer, 1995), and may influence literacy acquisition (Anthony & Francis, 2005; Anthony & Lonigan, 2004). Additionally, phonological awareness is a precondition for understanding the association between syllables and written words (Allor, 2002). That is, a language learner, without adequate phonological awareness, is neither likely to be able to put syllables together to form words nor to divide words into their separate syllables. It is possible for learners to connect specific letters or letter clusters with their corresponding sounds as they become more sensitive to smaller parts of words as they grow older (Lonigan et al., 1998), but they may have difficulty when getting access to the relevant information to completely process a word (Allor, 2002; Anthony & Lonigan, 2004; Schatschneider et al., 1999).

Additionally, apart from the correlation between phonological awareness and reading performance (Anthony & Francis, 2005; Carroll et al., 2003; Nation & Snowling, 2004; Stahl & Murray, 1994), evidence also supports a relationship between phonological awareness and the development of writing skills. For example, Yeong et al. (2014) found that phonological processing ability was important for spelling performance among children learning English as a second language. Additionally, a study conducted by Harrison and Krol (2007), focusing on phonological processing in Chinese adult ESL learners, found that phonological awareness was a positive predictor of word-level reading, a finding consistent with results from studies on children (Gottardo et al., 2001; Lesaux & Siegel, 2003). Furthermore, the relationship between phonological processing skills and writing performance has also been found in previous studies on primary and intermediate-grade student writers (Abbott & Berninger, 1993), pre-

schoolers (Allor, 2002), and native and ESL learners in Canada (Smith, 2011). The production of the correct spelling of words is necessary for writing fluency (Ocal & Ehri, 2017), and “phoneme-grapheme associations are important during the process of written language acquisition” (Landgraf et al., 2012, p. 130). Therefore, phonological processing ability, coupled with orthographic-phonological mappings, is one of the largest predictors of spelling (Berninger et al., 1992), which directly contributed to the writing quality of second language learners (Babayigit, 2014).

2.3.5 Meaning-focused linguistic skills

2.3.5.1 Morphological knowledge

In addition to the potential impact of linguistic awareness such as phonological and orthographic awareness on learners’ reading and spelling abilities (Ehri, 2014; Wagner & Torgesen, 1987), morphological awareness has been found to be another linguistic awareness skill that can impact on processing written language. A number of studies have found an effect of morphological processing on word reading, reading comprehension, and spelling development (Apel et al., 2012; McCutchen et al., 2008; Nagy et al., 2003; Saeed, 2020; Samaraweera, 2019). Additionally, reviews of morphological awareness interventions have shown that morphological awareness instruction can improve student learners’ abilities in written language (Bowers et al., 2010; Goodwin et al., 2012). Collectively, these findings indicate that morphological awareness is a language ability that can play a role in spelling development along with phonological and orthographic awareness (e.g., Berninger et al., 2010).

Morphemes are the smallest units of meaning in a language. Morphological awareness refers to a conscious awareness of these smallest units of meaning in a language (Muse, 2005). Morphemes occur in both spoken and written language, so awareness of both

spoken and written morphemes is inevitably involved in morphological awareness, including an understanding of what written affixes (i.e., prefixes and suffixes) look like orthographically and the conventions that govern how affixes attach to base words or roots (Apel, 2014). In the process of word formation in spoken and written English, a root morpheme is independent as at least one root exists in one word and the other three morphemes are bound morphemes (e.g., affixes, inflections, and derivations) that are also meaningful units but they do not stand on their own (Arnbak & Elbro, 2000). For example, the word ‘unapproachable’ is made up of three morphemes: the root word ‘approach’, prefix ‘un-’ and suffix ‘-able’, which implies that, in order to form a word, each morpheme plays its own role and has its own meaning and functional purpose. In addition, Apel (2014) draws an extensive range of sources related to the definitions of morphological awareness and proposed that morphological awareness should include the following four aspects: “i) awareness of spoken and written forms of morphemes; ii) the meaning of affixes and the alterations in meaning and the grammatical class they bring to base words/roots; iii) the manner in which written affixes connect to base words/roots, including changes to those base words/roots; and iv) the relation between base words/roots and their inflected or derived forms” (p. 200). For example, *-ed* leads to a verb in the past tense, as in *picked*; *-or/er* can change a verb to a noun, as in *teach* to *teacher* and *invent* to *inventor*. Certain suffixes need a doubled consonant when they attach to the written root morpheme, as in *stop* to *stopped*. Some suffixes require a dropped “e” as in *dance* to *dancing*. Morphological awareness also involves an understanding of the fact that a series of words is related because they share the same root morpheme, such as *able*, *unable*, *ability*, and *enable*.

On the other hand, with regard to morphology, inflection, compounding, and derivational morphology relate to the process of word formation (Goodwin et al., 2017;

Nagy et al., 2014; Wang et al., 2009). Inflectional morphology refers to the changes for grammatical purposes without changing the part of speech or meaning (Kuo & Anderson, 2006; Sereno & Jongman, 1997) (e.g., like-likes, cherry-cherries). Compounding morphology refers to the formation of new words by putting two or more elements together (Selkirk, 1981; Zhang et al., 2014); for example, mail + box = mailbox, note + book = notebook, milk + shake = milkshake. Derivational morphology changes the word to new words through the addition of affixes to the base/root words (Kirby & Bowers, 2017; Tyler & Nagy, 1989); for example, act + ion = action, care + ful = careful, mis + treat = mistreat. Acquisition of derivational morphology knowledge usually happens at a later age of learners' language development in contrast to inflectional morphological which occurs at an early age (Mann, 2000; Singson et al., 2000).

Furthermore, Tyler and Nagy (1989) divided derivational morphology into three categories of relational knowledge (e.g., *understand* is connected to *understandable* in a certain way but *fact* is not associated with *factory*), syntactic knowledge (e.g., *satisfactory* is an adjective after deleting *-y* in *satisfy* and adding the suffix *-actory* and *satisfaction* is a noun after deleting *-y* and adding the suffix *-action*), and distributional knowledge (e.g., when *-less* is added on to a noun it becomes an adjective, as in *meaning* to *meaningless*). Therefore, understanding both relational and syntactic properties of English derivational morphemes (Koda et al., 1998), as well as English distributional knowledge, is important for written language development.

The English writing system is both alphabetic and morphological (Chomsky & Halle, 1968; Shankweiler et al., 1995). With this in mind, Kuo and Anderson (2006) argue that morphological awareness is an essential metalinguistic skill. Morphological awareness can also play a useful role in recognizing the meaning of words and forming

new words according to the known words and morphemes (Carlisle & Stone, 2003). Language learners who have obtained competent awareness of morphological composition are able to achieve a comprehensive understanding of morphemic structures of the words and further retrieve them when needed for a complete mastery of the whole meaning of the words (Karimi, 2013; Logan, 2010). As such, student learners are likely to figure out the meaning of words by deconstructing and constructing based on the morphemes (e.g., root, affixes, inflections, and derivations), which helps them to better understand the multidimensional relationship between the form and meaning of words as the English language is morphophonemic (Wysocki & Jenkins, 1987; Zhang & Koda, 2012). Basically, morphological deconstruction cannot replace vocabulary, but it can support it and maybe help with its development by providing an additional breadth of understanding of terms: ie, we now know that there are things that you cannot question, which may add to our breadth of understanding of the term ‘question’.

A broad variety of studies relating to morphological knowledge, spelling, and writing have been carried out (Deacon & Bryant, 2006; Ferreira & Humphreys, 2001; McCutchen & Stull, 2015; Nunes et al., 2006; Shapiro & Caramazza, 2009; Wilson-Fowler & Apel, 2015). They all highlight that the development of reading/writing skills and morphological awareness is closely associated. Wysocki and Jenkins (1987) pointed out that English-speaking learners’ employment of awareness of morphological information is useful in the facilitation of new word learning because the new words may be morphologically related to the words they had been previously learned. For example, a learner is more likely to figure out the meaning of *industrialize* because the suffix *ize* is related to *standardize*, a word learned previously. Given that applying morphological forms correctly in a writing task has been shown to correlate with

writing quality, written language ability would be improved if morphological awareness instructions were employed (Apel & Werfel, 2014). For example, teaching student learners meanings of a collection of various suffixes and prefixes would be contributing to the lexical diversity of a written text. Additionally, McCutchen and Stull (2015) suggested that, by employing morphological rules during sentence generation, morphological knowledge may help with both spelling and word production during writing. These findings were later supported by Silva & Martins-Reis's (2017) longitudinal study, in which primary school students with better scores on morphological awareness measures were found to perform better in measures of reading comprehension, spelling, and writing than those students with lower scores in morphological awareness. Collectively, learners with poor morphological awareness are more likely to have difficulty in reading, spelling and writing.

2.3.5.2 Vocabulary knowledge

Vocabulary knowledge is a multidimensional construct (Wu, 2018; Wu et al., 2019). It includes aspects of both breadth and depth (Li & Kirby, 2015); both of which have been investigated in studies of reading (Reed et al., 2016) and writing (Dabbagh & Janebi Enayat, 2019). Breadth of vocabulary knowledge, also known as vocabulary size, measures the number of words known, focusing on pronunciation, spelling, and basic meaning(s) (Qian, 2002). Depth of vocabulary knowledge looks deeper into the extent of understanding a word, and considers “register, frequency, and morphological, syntactic, and collocational properties” (Qian, 2002, p. 514). These different dimensions of vocabulary knowledge may be associated with performance on English reading comprehension (Li & Kirby, 2015) and writing (Olinghouse & Wilson, 2013).

In order to acquire a word, a language learner needs to have a good mastery of the following nine facets of vocabulary knowledge: i) pronunciation; ii) spelling; iii) root, base, and stem; iv) connection between a specific form and meaning; v) concept(s) in various contexts; vi) relationships with other words; vii) grammar functional purposes; viii) collocations; and ix) frequency (e.g. Nation, 2013, p. 49; Wu, 2018, p. 4). Some researchers also refer to vocabulary as lexical sophistication, which is a construct involving both depth and breadth of lexical knowledge that a speaker, reader, and writer has stored (Meara, 1996, 2005; Read, 1988, 1998).

Vocabulary plays a significant role in writing proficiency (Kyle & Crossley, 2016). Word frequency is one of the traditional measures of lexical sophistication, such as the reference-corpus frequency of words in a text (Kyle & Crossley, 2015). High-frequency lexical items (e.g., difficulty) are generally regarded as less advanced and sophisticated than low-frequency items (e.g., strait). In addition to measures involving word frequency, vocabulary has also been assessed by measures of breadth (number of known words) and depth (how well the words are known and understood) of vocabulary (Read, 1988; Wesche & Paribakht, 1996), and the word response time (i.e., "the mean response times for a given word when it is presented in lexical decision and word naming tasks"; Kim & Crossley, 2018). In this thesis, a vocabulary measure focusing on vocabulary size was used because vocabulary breadth has been found to make a greater contribution than vocabulary depth to writing performance among the EFL 8th and 9th graders (Wu et al., 2019).

Learners' acquisition of vocabulary knowledge has been shown to influence reading comprehension directly and indirectly for both English-only students and ESL learners (Lee, 2011; Proctor et al., 2009; Reed et al., 2016; Samaraweera, 2019). Given the symbiotic association between reading and writing (Wu, 2018), it naturally follows that

the development of learners' writing proficiency should also be dependent on acquired vocabulary knowledge. Research investigating the association between vocabulary and second language writing quality suggests that more competent writers tend to store greater breadth and depth of vocabulary available to use (Kim & Crossley, 2018; Kyle & Crossley, 2016; Laufer & Nation, 1995). Less proficient second language writers also use high-frequency words more than highly proficient writers (Crossley & McNamara, 2012; Guo et al., 2013; Laufer & Nation, 1995). As for word response time, lexical decision reaction time is found to be predictive of L2 lexical proficiency (Berger et al., 2019) such that less proficient L2 learners use words that elicit shorter response times than more proficient L2 learners. These words are also likely to be regarded as sophisticated words used in writing tasks, which may be correlated with second language writing scores (Kim & Crossley, 2018).

Vocabulary, according to Kreidler (2002), is one of the two main resources (e.g., vocabulary and grammar) of a language. Schmitt and Carter (2004) hold the view that vocabulary is acquired and retrieved from available stored information when it is needed in receptive (e.g., reading and listening) and productive (e.g., writing and speaking) functions. Shamsuzzaman (2015) argues that vocabulary is an influential factor in acquiring and instructing second language writing in English, and a key predictor of ESL writing ability.

Wu (2018) investigated the contribution of vocabulary, grammar and idea generation to early writing development of young Chinese-speaking ESL learners and found that vocabulary was the largest predictor of writing ability, and that this impact of vocabulary on writing development increases with greater vocabulary knowledge. Severino and Deifell (2011) conducted a case study of a second language writer's vocabulary learning and argued for the importance of learning new words to become

proficient second language users. Lu (2010) also drew our attention to the significance of vocabulary knowledge in a study on Chinese second language learners' vocabulary knowledge and claimed that second language vocabulary knowledge significantly predicted second language learners' writing skill.

2.4 Summary

In view of all that has been mentioned so far, as the focus of the study is syntactic awareness, one may assume that syntactic awareness (e.g. the ability to make sentences in acceptable word order), may play a significant and irreplaceable role in ESL learners' writing proficiency. In order to look at the specific effect of syntactic construct on adult ESL learners' writing ability, other basic underlying linguistic skills such as orthographic and phonological knowledge (e.g. the ability to spell words correctly), morphological and vocabulary knowledge (e.g. the ability to compose words and improve and expand vocabulary for a focus of meaning), and grammar knowledge ("the ability to sequence and collocate words in a socially acceptable way" Wu, 2018, p. 114) that are fundamental to successful writing and essential in the development of ESL learners' writing ability are also important to be included to contrast with syntactic awareness.

2.5 Scoring rubrics to assess L2 writing

In terms of assessing essay writing samples, there are generally two categories of scoring rubrics used: holistic and analytic scoring rubrics. Holistic scoring is a global approach to the written text based on the assumption that writing is a single entity that is best captured by a single scale that reflects the inherent qualities of the writing (Wiseman, 2012). It is a single scale with all criteria to be included in the evaluation being considered together (e.g., organization, content, and mechanics). A rater assigns

a single score based on an overall judgement of the work. However, the overall quality of writing cannot be recognized by any objective criteria. Instead, it can only be recognized by carefully selected and very experienced raters applying their skilled impressions on high or low abilities in quality writing pieces (Hyland, 2015; Weigle, 2012; White, 1985). Some researchers have also argued that holistic scoring rubrics focus on the strengths of writing instead of the deficiencies (Cumming, 1990; Elbow, 1999; White, 1985). Additionally, holistic scoring rubrics are commonly employed when the raters need to mark a large number of written texts. Arguably, this may be because it is more practical to assign one score to a writing output by reading it once (Powills, 1979; Wiseman, 2012). However, a single score according to a holistic reading of the assessed composition might not serve the best interests of L2 writers, because “holistic scoring does not allow raters to distinguish between various aspects of writing such as control of syntax, depth of vocabulary mastery, and organizational control” (Wiseman, 2012, p. 60). While these variables may affect the writing ability assessed through the overall scores and the comparison to an analytic writing rubric is discussed in the following paragraph.

Alternatively, analytic scoring approaches allow raters to judge nominated aspects of writing and combine the assessment of these aspects of an essay for an overall score. Several domains representing different constructs of composition are included in an analytic rating rubric, providing more information about a participant’s performance than a holistic rating rubric and a relatively clear profile of the aspects of language ability that are rated via the separate domains (Wiseman, 2012). Furthermore, Knoch (2009) and Becker (2011) applied analytic rating scales and found that inter-rater reliability was sustainably higher. This is because more detailed marking descriptors of the analytic rating rubric allowed raters to be more likely to distinguish different aspects

of written outputs. For second language learners, such analytic writing rubrics may be more appropriate as different aspects of writing ability may develop differently. Some learners may be good at organizing their writing, but may be less advanced in terms of their vocabulary or syntactic accuracy. Consequently, second language learners may perform at different levels for each of the component skills involved in writing (Kroll et al., 1990). Wiseman (2012) also argued that it seemed to be advantageous to use analytic rating scales assessing second language writing ability because a more individualized profile of the L2 writers may be presented.

This study is focusing on syntactic awareness and other basic linguistic aspects to contrast with the influence of syntactic awareness on ESL writing. Therefore, in order to better identify the potential differences in L2 writing ability, an analytic scoring system was used. The system chosen was the Jacobs et al's (1981) ESL Composition Profile (see 3.2.12 in Chapter 3 for details of the rubric). Additionally, this analytic rating system was chosen because it is consistent with the TEM-4 analytic scoring rubric that the participants' writing tasks are marked as part of their university studies. The TEM-4 rubric focuses on ideas and arguments (weighting 7 out of 15 scores), language use (weighting 6 scores), and mechanics (weighting 2 scores) (Liu & Huang, 2020). The category of language use addresses the grammatical accuracy, syntactical variety, and appropriate and fluent use of language. These are similar to many of the components included in the Jacobs et al's (1981) ESL writing rubric (as discussed below).

2.6 The Present Research

As discussed, a wide variety of studies has demonstrated the potential relationships between writing quality and language skills such as orthographic awareness,

phonological awareness, morphological awareness, grammar and vocabulary knowledge. However, there has been relatively little research controlling for a range of other linguistic skills, such as grammar, vocabulary, morphological awareness, phonological and orthographic awareness, related to writing ability in order to study the specific influence of syntactic awareness in adult ESL students. In addition, many previous studies have assessed one language skill or several of them to examine the associations between writing quality and language skills (Kim & Crossley, 2018; Wu, 2018). The current study investigates higher and lower proficiency ESL students to explore whether the relationships among measured variables of syntactic awareness, grammar knowledge, morphological awareness, phonological and orthographic awareness, and vocabulary knowledge are the same for different levels of proficiency in writing. Few previous studies have considered the proficiency levels of ESL tertiary writing ability groups when discussing relationships between language skills and second language writing ability.

The present research focused on syntactic awareness and the other measures are included to contrast with the main measure. Therefore, the study employs measures of syntactic awareness to assess its relationship with writing quality. It also includes measures of the other basic language skills discussed in chapter two: orthographic awareness, phonological awareness, morphological awareness, grammar, and vocabulary skills. How these linguistic variables associate with, and predict, variability in ESL writing quality will be determined. Also, the study will examine these associations of language measures and writing ability, and predictions for two different groups of ESL learners who differ in their writing scores. This will investigate whether higher-proficiency versus lower-proficiency writers differ in their use and understanding of ESL writing processes. Lastly, with the guidance of the theoretical

base of the Not-So-Simple View of Writing Model (Berninger & Winn, 2006) and the Latent Variable Model of L2 Writing Quality (Kim & Crossley, 2018), the current study aims to develop a second language writing model based on adult ESL learners in the Chinese context.

This study is guided by three research questions (see Chapter 1 – 1.6). Significantly, this study included syntactic awareness and a collection of other basic underlying language skills to address the research gaps. Previous research assessed certain linguistic skills separately, e.g., syntactic complexity and second language writing (Crossley & McNamara, 2014; Kyle, 2016; X. Lu, 2010; Ortega, 2003, 2015); vocabulary and second language writing development (Olinghouse & Wilson, 2013; Wang, 2014; Wu et al., 2019); impact of morphological errors on ESL writing performance (El Malaki, 2020), or several language skills were investigated collectively, e.g., lexical, syntactic, and cohesive features and second language writing proficiency (Crossley & McNamara, 2012; Kim & Crossley, 2018); orthographic, phonological, morphological awareness, grammar, vocabulary, and cohesion and ESL writing quality (Masilamani, 2019; Saeed, 2020). Unlike these previous studies, this study focused on syntactic awareness and employed the majority of the linguistic skills used in previous studies to investigate the relationship between adult ESL learners' writing ability and syntactic controlling for the other language skills.

Furthermore, with respect to the theoretical bases of this study, the Not-So-Simple View of Writing Model (Berninger & Winn, 2006) addresses transcription and text generation skills, self-regulatory executive functions, and working memory process. Considering that the main focus of this study is linguistic factors and their relationships with writing ability, working memory and executive functions are not included. Therefore, the importance of the linguistic aspect is considered. Additionally, the Latent

Variable Model of L2 Writing Quality (Kim & Crossley, 2018) addresses lexical, syntactic, and cohesive features, but the cohesive feature is not considered in this thesis (see 2.2.5 for explanation).

2.7 Operational definitions

Explicit knowledge refers to conscious awareness of knowledge that is potentially able to be articulated, while **implicit knowledge** refers to intuitive awareness of knowledge that is not available for verbal report (Anderson, 2005; Hulstijn, 2005; Roehr, 2008.) An experienced learner may be able to recognize instantly that a sentence is ungrammatical even though they cannot say why it is. As suggested by Ellis, “any attempt to verbalize implicit knowledge will entail forming an explicit representation first” (Ellis, 2005, p. 150). Conscious awareness gained from instructional experience about certain language rules and applying those rules in specific tasks would be more likely explicit knowledge. When a learner has conscious awareness of why a sentence is ungrammatical and is able to correct it and demonstrate this understanding with an explanation for the ungrammaticality, explicit knowledge is evident. For example, the Syntactic Judgement Task developed by Brimo (2017), as employed in this study, is used to assess explicit syntactic knowledge. In this test, participants are required to judge the word order and/or phrase order of the given sentence and correct it to the correct version (Example item: What to wear to the party they sat discussing yesterday. Answers: Yesterday, they sat discussing what to wear to the party. OR They sat discussing what to wear to the party yesterday).

In the context of the present study, **syntactic awareness** is defined as a learner’s explicit knowledge about judging word order and/or phrase order within a sentence context (Brimo, 2018; Cain, 2007).

Grammatical knowledge in this thesis refers to an individual's knowledge of a language that includes such grammatical aspects as nouns, determiners, pronouns, verbs, propositions, conjunctions, etc. It does not include knowledge of lexis, morphology, syntax, phonology, and orthography is excluded in the grammatical judgement measure in this study.

Orthographic awareness refers to two aspects of orthographic knowledge: (i) an awareness of mental graphemic representations (MGRs), which are stored mental representations of written words or word parts; and (ii) an awareness of orthographic patterns, which relate to an understanding of the standardized spelling rules that indicate how letters go together within written words (Apel, 2010; Wolter & Apel, 2010).

Phonological awareness is defined as one's ability to recognize and discriminate the sounds within words. It includes an understanding of how individual sounds or phonemes make up syllables, and how groups of syllables can make up words (Allor, 2002; Anthony & Francis 2005).

Phono-orthographic awareness is defined as an integration of a learner's phonological awareness and orthographic awareness. In the present thesis, this relates to the grapheme-to-phoneme correspondences that exist in the English language.

Morphological awareness represents the ability to consciously focus on the relations between base words and their related inflected and derived forms (Wolter et al., 2009). Morphemes are the smallest units of meaning in a language. In the present study, morphological awareness refers to a conscious awareness of these smallest units of meaning in the English language.

In the vocabulary measure applied in this study, **vocabulary knowledge** refers to the breadth of vocabulary, also known as vocabulary size, and refers to the number of words known by an individual.

CHAPTER 3 METHODOLOGY

This chapter describes and discusses the development of the measures used in this study. The first part of the chapter gives a brief background to the work, then moves on to a detailed description of the measures employed in the first pilot study. This is followed by information on the development of the measures used in the work. This includes details of pilot work and modifications to measures performed, based on the pilot work. The final sections of the chapter provide details about the methods used in the main study performed to answer the research questions.

3.1 Procedures

A quantitative research design was employed in this study. This part briefly describes the background to the work and specifically illustrates the procedure, rationale and examples of each measure that was used in the first pilot study.

The study measures were first piloted in New Zealand to assess the presentation procedures, with a second pilot study being conducted in China in order to make sure that the measures were appropriate for the target group in the main study. All participants were invited to participate in the study on a voluntary basis. All spoke Mandarin Chinese as a first language and English as a second language. The second pilot study and the main study were conducted in two universities where an English writing course was a required part of the students' studies, and where the students were expected to produce good quality English writing to achieve their academic goal in learning English as a second language. The rationale for the researcher to choose participants from these two universities was that the researcher was familiar with the two universities, thereby providing easier access to contacts within the universities and an understanding of the English courses provided.

The first pilot study used a number of measures of English language – these are described in detail below, and table 3.1 provides an overview of the measures for reference.

Table 3. 1 Instrumentation of the 1st pilot study

Skills	Tasks	Items
Syntactic Awareness	Syntactic Judgement Task	24 Judgement items and 18 Correction items
	Syntactic Word Order Task	12 Sentence Rewriting items
Grammar	Recognizing Grammar Mistakes	12 Multiple Choice Questions
		8 Multiple Choice Questions
Morphological Awareness	Correct Derivation Task	20 Using Correct Derivation Forms
	Morphological Production Task	20 Identify and Write Correct Derivation Forms
Phonological Awareness	Sound Like a Word Task	20 Underline Sound Like an English Word
Orthographic Awareness	Correct Spelling Task	20 Underline Correct Spelling Word
	Write the Correct Word Task	20 Write Correct Word according to the made-up word items
Vocabulary	Vocabulary Task	50 Choose the Right Definition
Non-verbal Ability	Raven's Matrices	12 Choose the Correct Visual Pattern
Writing	Writing	Write a composition of at least 250 words according to the given topic

3.2 Ethical Approval

In order to conduct the study involving human participants, ethical approvals have been received from the Educational Research Human Ethic Committee (ERHEC) of the University of Canterbury, and relevant approval sought from the two universities in China. A copy of the Ethics Approval is enclosed as Appendix A. The researcher adheres to all the guidelines and regulations set by the University of Canterbury, so as to obtain ethical approval. An information sheet and a consent form had been given to the participants before the assessments occurred. Both Chinese and English versions were provided on the information sheet, consent form and questionnaire to ensure that no misunderstanding would be taking place while the participants were reading and completing them.

3.3 Measures

The syntactic judgement task and syntactic word order task used in the first pilot study were initially developed by Professor Brimo and permission to use both measures was obtained via personal communication in 2019 (see appendix B for the permission letter). The questionnaire, a grammatical judgement task, a correct spelling task, a sound like a word task, a write the correct word task, a correct derivation task and a morphological production task were developed by members of the Language and Literacy Research lab, within the College of Education, University of Canterbury, and compiled by Doctor Sadeghi. Permission to use these measures was obtained via communication in 2018. Original items, procedures and norms for the measures were used in the first pilot study. Regarding the rationale, Brimo's (2018) syntax tasks were chosen because they were designed to measure explicit syntax knowledge of older school-age children who are English native speakers, which provided a reference for

the English level of the target participants of this study, non-native English speaking adult university students. Additionally, the author gave suggestions of extending the time limit to reduce the difficulty level of the two tasks if needed, which made the application of these measures more flexible and supported the development of the final measures used in the main study. The measures compiled by Dr. Sadeghi have previously been used to assess adult ESL learners' writing (e.g., Saeed, 2020), and the target participants assessed in those previous studies were quite similar to those of the current study. Additional measures comprised a vocabulary task (Laufer & Nation, 1995) and the short form of the Raven Advanced Progressive Matrices Test (Arthur & Day, 1994). These were employed for the use of the first pilot study. Further rationale for the use of each individual measure is detailed in the following sections.

3.2.1 Background Questionnaire

A background questionnaire was used in order to elicit a descriptive profile of the participants (e.g., in terms of average age and range of ages), and to ensure that all recruited participants were Chinese-English bilingual speakers who spoke Chinese as their first language and English as their second language. This also allowed this research to make sure students had started to learn English since their primary school and they were first or second-year university students when they conducted the assessments. The questionnaire was designed in Chinese, the participants' first language, and English, the participants' second language, so as to avoid any misunderstanding of the questions.

3.2.2 Syntactic Judgement Task

Rationale

The linguistic rule system governs how words are combined into larger meaningful units, such as phrases, clauses, and sentences (Kamhi & Catts, 1999); typically, this falls under terms such as syntax or syntactic awareness (see further discussion in earlier chapters). Assessments can be employed to assess language explicit knowledge of syntax, in order to support instruction and/or to monitor learners' progress during instruction (Brimo et al., 2017; McCauley, 1996; Scott & Stokes, 1995).

Bowey and Patel (1988), Levesque et al. (2017), Cain (2007), Brimo et al. (2017), Gaux and Gombert (1999), Miller (2010) found that syntactic awareness is significantly related to reading comprehension skills. Furthermore, syntactic awareness, or explicit syntax knowledge, has been shown to be a metalinguistic skill that is positively related to writing composition (Guan et al., 2014; Tong & McBride, 2016). Given such evidence, the current study included tasks aimed at assessing the students' syntactic awareness and to allow the research to determine the relationship between writing ability and syntactic awareness within the group of students studied. The Syntactic Judgement Task developed by Brimo (2018) was used for the present study.

Procedure

The participants read 24 sentences in total. In Part I, the participants were required to judge whether the sentence was syntactically correct by circling the word 'correct' or 'incorrect' below each sentence. The task incorporated 6 correct sentences and 18 incorrect ones, and the participants were given approximately 15 seconds to judge whether each sentence was correct or not. In Part II of the measure, for those items

circled 'incorrect', the participant was required to rewrite the sentence to produce a grammatically/syntactically correct version of the sentence. When making corrections, participants were required to use all the words provided but in their correct form/order. When words needed to be added to make the sentence syntactically correct, any correct addition was acceptable. They were given 15 minutes to complete part II. Marks were given for correct answers. For both parts of the measure, 1 was given for a correct answer and 0 for an incorrect answer. The total mark for the test was 42, with a total of 24 marks for Part I, and a total of 18 marks for Part II. Two examples are presented below with the correct answers, as well as the explanation of the correct answer for ease of interpretation of the item.

Example 1

Item: I liked the picture of you on the diving board that you sent me.

Answer (Part I: Judge whether the sentence is grammatically correct or incorrect)

Correct Incorrect

Explanation of answer

This sentence is incorrect. Words are misplaced. Rearranging some words would be needed to make this sentence sound correct, as in: I liked the picture that you sent me of you on the diving board. It is more likely that you would send me a picture rather than a diving board.

Answer (Part II: Rewrite grammatically correct sentence)

I liked the picture that you sent me of you on the diving board.

Explanation of answer

“on the diving board” are misplaced. Rearranging these words would be needed to make this sentence sound correct, because it is more likely that you would send me a picture rather than a diving board.

Example 2

Item: Before you do anything impulsive.

Answer (Part I: Judge whether the sentence is grammatically correct or incorrect)

Correct Incorrect

Explanation of answer

This sentence is incorrect. It is a fragment. Words needed to be added to make the sentence sound correct, as in: Before you do anything impulsive, you should count to ten.

Answer (Part II: Rewrite grammatically correct sentence)

Before you do anything impulsive, you should count to ten.

Explanation of answer

It is a fragment. Words (any correct addition of a noun, noun and verb or verb only) needed to be added to make the sentence sound correct.

3.2.3 Syntactic Word Order Task

Rationale

Researchers have used syntactic awareness tasks, such as word-order correction tasks, for experimental purposes (Bowey & Patel, 1988; Cain, 2007; Muter et al., 2004). For example, Cain (2007) and Nation and Snowling (2000) developed a word-order correction measure by creating 12 items of simple sentences, such as “the donkey the horse races” and “the girl the kittens brushes”, which participants were to rearrange to produce the correct word order. These tasks were used with younger and older school-age children to measure their syntactic awareness in simple sentences. However, simple sentence word order tasks may lead to ceiling effects for older children and adult learners. Therefore, in order to provide information about syntactic awareness of complex syntax, such as sentences containing adverbial clauses, Brimo (2018) developed a syntactic word order task for older school-age children who are native English speakers. To allow the research to further determine the relationship between writing ability and syntactic awareness within the group of students studied, Brimo’s Syntactic Word Order Task was employed for the present study.

Procedure

The participants read 12 items in total. They were required to rearrange the words to create a grammatically correct sentence. They were aware that all the words listed needed to be included in the sentence. No additional words may be added or deleted. They wrote their sentences on the line provided. Punctuation did not count against the answers. They had approximately 1 minute to complete each item. Two examples are presented below with the possible correct answers for ease of interpretation of the item.

Example 1

Item

they because wanted they to the heat escape for the left mountains

Answers

They left for the mountains because they wanted to escape the heat

OR

Because they wanted to escape the heat, they left for the mountains.

Example 2

ditches hand-dug for water-filled transportation canals useful are.

Answer

Canals, hand-dug, water-filled ditches, are useful for transportation.

3.2.4 Grammatical Judgement Test

Rationale

English language teachers usually highlight the importance of grammar acquisition at the early stage of learning English as a second language. Furthermore, writing, as an important subfield in second language learning (Matsuda, 2011), has placed grammar knowledge as a key skill when assessing participants' writing, particularly in their academic writing products. This has led to the development of measures of grammatical understanding. Such Grammatical Judgement tasks can be used to assess second language learners' ability to generate grammatically appropriate text (Gutiérrez, 2013; Shiu et al., 2018). Given the importance that grammar has been given in second language learning contexts, such tasks are often used as an instrument or measurement to research second language learners' knowledge (Loewen, 2018). Given this potential importance, the current study included tasks aimed at assessing the students' grammatical knowledge to allow the study to investigate the relationship between writing ability and grammatical competence within the group of participants assessed.

The Grammatical Judgement Task developed by Sadeghi (2018) was used for the current purposes.

Procedure

The grammatical judgement test incorporated two parts, recognizing grammatical mistakes and sentence completion. In Part A, the participants saw a series of sentences, each of which has four underlined words or phrases. They were required to choose the underlined word or phrase that is *incorrect* – there were twelve in total. Each sentence had only ONE error, in terms of incorrect word usage or syntax. The students identified the error by marking (underlining or circling) one of the four possible answer choices. In Part B, they saw eight sentences with corresponding blanks. Among four possible answer choices that consisted of one grammatically correct answer and three grammatically incorrect answers, the participants selected the word or phrase that *correctly* completed the sentence and wrote the letter in the blank. The students were given 15 minutes to complete as many of the items as they could.

Example

Part A: Recognizing grammatical mistakes

Item: I am going to an Indian restaurant for a lunch. Will you go with me? It's not too far

A B C
away. It serve the best food, I believe.

D

Answer D

Explanation of answer

In this example, the word 'serve' is incorrect – the correct form of the word is 'serves', because a sentence has to keep the subject-verb agreement. Therefore, a correct answer in this example is to mark D.

PART B: Sentence completion

This question type presents a sentence with a blank. From four possible answer choices, you will select the one word or phrase that correctly completes the sentence.

Item: Do all the students in your class from Korea?

- | | |
|----------|---------------|
| a. comes | c. came |
| b. come | d. are coming |

Answer b

Explanation of answer

In this example, the word ‘come’ is correct. This sentence requires the basic form of a verb. Therefore, a correct answer in this example is to mark b. come.

3.2.5 Correct Spelling Task

Rationale

The orthographic choice task has been used in a number of studies of orthographic awareness (Apel, 2011; Siegel et al., 1995; Treiman, 1993; Wang et al., 2009) and Nenopoulou (2005) maintained that an orthographic choice task was necessary to test whether the participants could have direct visual/orthographic access to a word avoiding the need for translation from graphemes and phonemes. Babayiğit (2014) conducted a study to explore the role of spelling in deciding the quality of second language writing and concluded that word spelling did contributed to second language learners’ writing quality.

The correct spelling task (i.e, identifying a correctly spelled word from an incorrectly spelled word) or homophone choice task (Olson et al., 1994; Olson et al., 1985; Stanovich & West, 1989), have been used as measures of the orthographic systems (Berninger & Whitaker, 1994), and as ways to measure language learners’ orthographic knowledge (Cunningham et al., 2002; Leong et al., 2005; Zhao et al., 2017). They aim to tap into the learner’s orthographic awareness that enables students to choose the right spelling between two words that have been designed to be pronounced the same. The present study employed a task targeted measuring the students’ orthographic awareness

to determine the relationship between writing ability and orthographic awareness within the group of students studied. The Correct Spelling Task reported by Sadeghi was applied for the current study.

Procedure

A series of pairs of ‘words’ were given to the participants. In each pair, one was a real word and the other one sounded like a real word but it was spelled incorrectly. The task was to underline the correct word in each pair. Students had 1 minute to complete as many as they could among 20 pairs of words.

Example

munk monk

Answer

monk

Explanation of answer

The word is ‘monk’; ‘munk’ is an incorrect spelling. Therefore, monk should be marked as it is the correct answer.

3.2.6 Sound Like a Word Task

Rationale

The Sound Like a Word Task, or non-word lexical phonological skill task, was first developed by Baron and Strawson (1976) and Saffran and Marin (1977) prior to it being further refined and adopted by Olson et al. (1985) and Wade-Woolley (1997). Besner and Care (2003) also employed a nonword choice procedure to measure phonological awareness in a capacity-free and stimulus-driven manner (see also Kahan et al., 2011). Reading pseudowords, in a decoding process, requires one to use both their orthographic patterns and phonemic blending abilities (see Apel, 2011). Berninger and others (Abbott et al., 2010; Virginia W. Berninger et al., 2008; Berninger & Whitaker,

1994; Berninger et al., 1991) used nonsense words to measure mental graphemic knowledge. Orthographic nonwords/pseudowords have been used by Siegel et al. (1995), Cassar and Treiman (1997b), and Bowey and Muller (2005) to measure phonological recoding and rapid orthographic learning. Such measures have also been adopted by Nation et al. (2007).

In the sound like a word task, pseudohomophonemic nonwords, which did not have a lexical entry, were given to the participants who were required to produce the internal sound codes of the given nonwords. This task aimed to measure one's phonological awareness linked to orthographic knowledge because each participant was supposed to figure out the nonword which sounded like a real word. The present study included such a task to assess the participants' phonological skills and determine the possible relationship between writing ability and these phonological skills. The Sound Like a Word Task reported by Sadeghi was used for the present study.

Procedure

The task involved 20 pairs of 'made-up words'. If participants pronounced these 'made-up words' to themselves, they would find that one of each pair sounded like a real word, whereas the other could not be made to sound like a real word. Their task was to underline the made-up word in each pair that sounded like a real word. They had 1 minute to complete as many as they could among 20 pairs.

Example

nale pult

Answer

nale

Explanation of answer

The answer is 'nale' because it sounds like 'nail' whereas 'pult' does not sound like a real word. Therefore, nale is underlined/marked as correct.

3.2.7 Write the Correct Word Task

Rationale

Hatcher et al. (1994) attached great importance in the close links between orthographic knowledge and phonological knowledge, suggesting that written word and phonological processing systems might be inter-connected. A number of theorists proposed that phonemic features are involved in lexical access, suggesting that phonologically closer pseudowords will activate areas of the phonological lexicon (see, for example, Lukatela et al., 2001; Sauval et al., 2018).

This connection between phonological and orthographic systems was further investigation using Sadeghi's Write the Correct Word Task. This task is different from pseudohomophone choice tasks described above, where a binary choices was required. In the Write the Correct Word task, participants cannot depend solely on phonological processing because they were required to write this real word according to the a derived pronunciation and the orthographic characteristics of a pseudoword. Therefore, this was a task designed to also assess the ability to write a word correctly, which has been considered the standard of second language writing (Babayiğit, 2014; Bestgen & Granger, 2011). Therefore, the current study applied a task aimed at assessing the students' phonological and orthographic processing skills in one task to allow the research to determine the relationship between writing ability and these underlying skills within the group of students assessed.

Procedure

The participants read 20 ‘made-up words’ in total. When the participants pronounced these words to themselves, they found that each one sounded like a real word but it was spelt incorrectly. Students were required to write this real word next to the made-up version. They had 2 minutes to complete as many of these 20 items as they could.

Example

sox

Answer

socks

Explanation of answer

This made-up word sounds like socks. Therefore, you should write ‘socks’ next to this made-up word.

3.2.8 Correct Derivation Task

Rationale

The correct derivation task, according to Goodwin et al. (2012), also known as the Extract the Base test, assessed participants’ derivational morphological awareness. Using morphological forms correctly in a writing task has shown correlations with essay quality grades, meaning that studies have investigated the associations between morphological knowledge, spelling, and writing (Apel & Werfel, 2014). Such studies have incorporated multiple-choice recognition tasks (Carlisle & Feldman, 1995; Fowler et al., 1995; Shankweiler et al., 1995; Singson et al., 2000), in which participants were required to finish a sentence by choosing the right word, and sentence completion tasks (McCutchen & Stull, 2015), which required students to produce the correct morphological change of the word to fit the sentence. The present research used a task measuring the students’ morphological awareness assessed through the derived

morphological forms and to allow the study to explore the relationship between morphological awareness and writing ability among the group of students assessed. The correct derivation task applied in this study was actually a variation of the sentence completion task, and the only difference between this Correct Derivation Task and Sentence Completion Task was that the base-form of the word was given in the sentence. This avoided participants needing to choose semantically appropriate words to complete the sentence, thereby focussing on the ability to determining the correct form of the word.

Procedure

There were 20 sentences in this task. In each sentence, the word in brackets needed to be put in its correct form. The subjects' task was to write this correct derivational or inflectional form of the word in the space next to the sentence. 3 minutes were given to complete as many of these 20 items as they could.

Examples

- a. Geography involves the study of different (country).
- b. I (start) my new school last week.

Answers

- a. countries
- b. started

Explanation of answers

The first example requires the plural of country – therefore, countries should be written. The second requires the past tense of start – therefore, started should be written.

3.2.9 Morphological Production Task

Rationale

The morphological production task enables the researcher to assess the participants' knowledge of the morphological relationship between a base word and a derived word via its internal morphological structure (Feldman, 1991). The syntactic and semantic functions of the word can thus be ignored, leaving the morphological production task to focus on knowledge of the morpheme, which is a powerful resource of learning literacy (Nunes & Bryant, 2006).

Apel and Werfel (2014), and McCutchen and Stull (2015), maintained that morphological knowledge is an important tool to help with students' written language skills. Therefore, a task measuring the students' morphological awareness was included in the current study to allow the research to further determine the relationship between writing ability and morphological awareness within the group of students assessed. The morphological production task used for the present study was reported by Sadeghi (2018).

Procedure

The participants saw rows of three words. In each row, the first two words (in bold) showed a rule for changing the first word into the second. The task was to work out this rule and apply it to the third word in the same row. Once they had done this, the student wrote the answer in the space after the third word. They had 3 minutes to finish as many of these 20 items as they could.

Examples

A	B	A	B
sing	singer	read	
man	men	boy	

Answers

reader
boys

Explanation of answer

In the first example, note the relationship between ‘sing’ and ‘singer’. It is changed from verb to noun. If applied to ‘read’, the answer will be ‘reader’ (changing to the noun form of read) – therefore, reader should be written in the space provided. In the second example, the same relationship between ‘man’ and ‘men’. It is changed from singular noun to plural noun. If applied to ‘boy’, the answer will be ‘boys’ (changing to the plural form of boy) – therefore, boys should be written.

3.2.10 Vocabulary Task

Rationale

Having a good mastery of vocabulary is one of the basic attributes for a good writer to produce good writing. Consistent with this, published studies have identified the importance of vocabulary to writing (Coxhead, 2012; Zhou, 2009). Staehr (2008) has also pointed out that vocabulary size is associated with language proficiency in listening, reading, and writing. Santos (1988) referred to the tutors’ responses to the academic writing of non-native speaking students, and argued that lexical errors were considered as the most obvious errors in writing outputs (see, also Olinghouse and Wilson, 2013). These findings provided argued for the current study to employ a task aimed at assessing the students’ vocabulary knowledge and to give the researcher

opportunity to investigate the relationship between writing ability and vocabulary within the group of participants assessed. The vocabulary task used in the present study was developed by Laufer and Nation (1995).

Procedure

A word was followed by an example of the word in use. Participants chose the meaning which most closely matched the highlighted word in the example sentence. There were 50 questions and 15 minutes was given to complete as many of the items as they could.

Example

emir: We saw the <emir>.

- a. bird with two long curved tail feathers
- b. woman who cares for other people's children in eastern countries
- c. Middle Eastern chief with power in his own land
- d. house made from blocks of ice

Answer c

Explanation of answer

In this example, a (bird with two long curved tail feathers) is a peacock; b (woman who cares for other people's children in eastern countries) is called amah; c (Middle Eastern chief with power in his own land) is 'emir'; d (house made from blocks of ice) is an igloo. Therefore, the word <emir> is the right answer. Therefore, a correct answer in this example is to mark "c".

3.2.11 Visual Patterns Task

Rationale

Nonverbal reasoning enables individuals to analyze information and solve problems without relying upon or being limited by language abilities (Raven, 2000; Wechsler & Naglieri, 2006). Many researchers have employed nonverbal reasoning in their studies measuring students' language skills (Chow, 2018; Gardner, 1993; Graham, 1989; Lam & Chen, 2018; Sarfati et al., 1997). This measure is often used as a control measure in

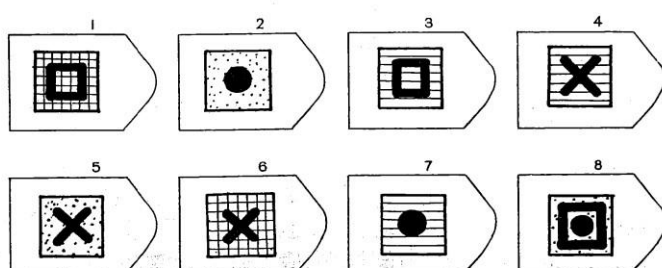
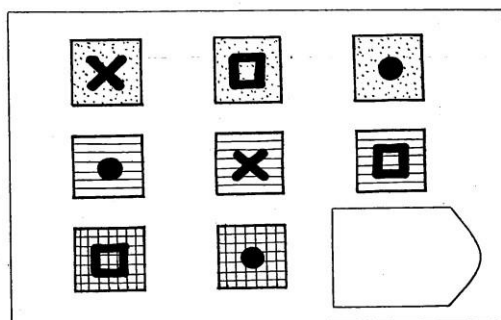
studies of language in order to avoid general ability when administering tests, or doing tasks, leading to spurious relationships between measures. In this study, the non-verbal measure will ensure that the associations between language skills and writing ability are fundamentally due to the language itself.

Raven's Progressive Matrices (Raven, 2000) is a nonverbal test typically used in educational settings. The task requires participants to analyse information and solve problems through visual/nonverbal reasoning. This task was used in order for the researcher to ensure that any effects are not solely due to general intelligence, but are specific to language. A short form of the Raven Advanced Progressive Matrices Test developed by Arthur and Day (1994) was used for the current study to avoid the overall study taking too long for participants to complete.

Procedure

Participants saw 12 patterns. Each was made up of 9 elements. However, the patterns were incomplete as the final element was missing. The task was to complete the patterns by choosing one of the 8 alternative elements below each pattern, so that the selected element completed the sequence. Participants were given 10 minutes to finish as many of these 12 items as they could.

Example



Answer 6

Explanation of answer

In this example, number 6 is the correct answer. See how this completes the sequence: the bottom row in the pattern has checked backgrounds and each of the rows in the patterns needs a cross, a square and a circle, therefore the final design must be a cross on a checked background. Hence, number 6 should be marked as the correct answer.

3.2.12 English Writing Task

Rationale

An increasing number of published studies have investigated EFL writing in China (Hu, 2007; Huang, 2009; You, 2010; Zhixue & Shaoshan, 2003). For many students, learning to write in a second language involves tasks in which the aim is to complete a composition writing task within a given time and in a single draft. This is particularly the case in situations such as entrance exams to the university, final or exit exams in the university, IELTS test, TOFEL test, TEM (Test for English Majors) 4 and 8, CET

(College English Test) 4 and 6. Students have to finish a good quality writing output with little opportunity to put into a draft, only depending on their everyday practice and their existing writing skills. Given the fact that IELTS has been a wide-recognized test for many years and that it has been increasingly popular among Chinese university students, an English writing task adapted from the IELTS test was used for the current study to allow the research to determine the relationship between writing ability and the basic language skills assessed in the present study.

Procedure

The participants were required to write an essay in English comprising approximately 250 words. Students were given 40 minutes to finish the writing task. The marking of the writing outputs was based on the ESL composition profile rubrics developed by (Jacobs, 1981). The rubric consisted of five scales:

- i. Content. Scores range from 16-13 (scores which indicate very poor writing, determined by ‘does not show knowledge of subject. non-substantive. not pertinent. Or not enough to evaluate’) to 30-27 (scores which indicate excellent to very good output suggesting ‘knowledgeable. substantive. thorough development of thesis. relevant to assigned topic’).
- ii. Organisation. Scores range from 9-7 (scores which indicate very poor writing, determined by ‘does not communicate. no organization. Or not enough to evaluate’) to 20-18 (scores which indicate excellent to very good output suggesting ‘fluent expression. ideas clearly stated/supported. succinct. well-organised. logical sequencing. cohesive’).
- iii. Vocabulary. Scores from 9-7 (scores which indicate very poor writing, determined by ‘essentially translation. little knowledge of English vocabulary,

idioms, word form. OR not enough to evaluate’) to 20-18 (scores which indicate excellent to very good output suggesting ‘sophisticated range. Effective word/idiom choice and usage. word from mastery. appropriate register’).

- iv. Language use. Scores range from 10-5 (scores which indicate very poor writing, determined by ‘virtually no mastery of sentence construction rules. dominated by errors. does not communicate. OR not enough to evaluate’) to 25-22 (scores which indicate excellent to very good output suggesting ‘effective complex constructions. few errors of arrangement, tense, number, word-order/function, articles, pronouns, prepositions’).
- v. Mechanics. Scores range from 2 (scores which indicate very poor writing, determined by ‘no mastery of conventions. dominated by errors of spelling, punctuation, capitalization, paragraphing. handwriting illegible. OR not enough to evaluate’) to 5 (scores which indicate excellent to very good output suggesting ‘demonstrates mastery of conventions. few errors of spelling, punctuation, capitalization, paragraphing’).

While the use of the assessment rubric may help to mark the compositions objectively, there is still a subjective element that involves the interpretation of the score descriptors. Hence, it is necessary to have the compositions marked by at least two assessors to achieve inter-rater reliability: when two assessors agree on the marks given based on a scale, it can be interpreted as there is a level of consistency in the way they mark the written output. The assessment of the English compositions was carried out by the researcher and another examiner who was also an experienced lecturer teaching English writing course in China for more than 15 years.

Example

Write a composition of 250 words in English within 40 minutes according to the given topic, “Every year several languages die out. Some people think that this is not important because life will be easier if there are fewer languages in the world. To what extent do you agree or disagree with this opinion?”

3.3 Pilot study

To determine that the measures would work as expected in the main study, three pilot studies had been conducted prior to the main study. The 1st pilot study was performed in New Zealand. The 2nd and 3rd pilot studies were carried out at the two universities that were to be the venues of the main study. Although testing occurred in two different country contexts, all participants were from a Chinese background and were learning English as a second/foreign language. In the 1st and 2nd pilot studies, all measures were piloted. Measures that indicate an acceptable level of internal consistency reliability in the 2nd pilot were retained in the 3rd pilot study, whereas measures with a low internal consistency level were revised to avoid floor or ceiling effects, inappropriate time limit, confusing instructions, and items with problems.

3.3.1 Pilot study 1

3.3.1.1 Measures

An initial pilot study was conducted in New Zealand to practice the administration of measures and determine if there were problems experienced by participants from a Chinese background who have been using English as an additional language. The 11 tasks used were: (i) the syntactic judgement task, (ii) the syntactic word order task, (iii) the grammatical judgement task, (iv) the correct derivation task, (v) the morphological production task, (vi) the correct spelling task, (vii) the write the correct word task, (viii)

the sound like a word task, (ix) the vocabulary task, (x) the non-verbal task and (xi) an English writing task (see 3.2 for the example of each measure).

3.3.1.2 Procedures

Eight participants participated in the first pilot study. They were Chinese students who were taking English classes at the Abacus Institute of Studies and Chinese background students studying courses in English at the University of Canterbury.

The primary aim of this research was to study the relationship between syntactic awareness and writing ability in adult Chinese students using English as an additional language. Each participant in the pilot study completed the background questionnaire, which confirmed that the pilot participants were Chinese native speakers who began to learn English as a second/foreign language in school: the target population for the current research.

A sampling of participants was based on an opportunity procedure: the researcher asked some Chinese students from the Abacus Institute of Studies, and students from China who were known to her, whether they were interested in taking part in the pilot study. Initially, ten participants were willing to participate, but one withdrew because of time availability and another did not want to write a composition after she was told about the English essay writing task. Consequently, eight participants completed the 11 assessments. From the information obtained through the questionnaires, the participants' ages ranged from 19 to 34. Three of them have been exposed to English since secondary school and five since primary school. The assessments were performed in a quiet place away from distractions. The researcher recorded the time taken to execute each task for future adjustments.

3.3.1.3 Reliability of the Measures

To assess evidence for the reliability of the measures, the data collected in the New Zealand pilot study were coded and analysed. All measures were marked based on the number of correct answers for each item: typically using 1 mark for a correct answer and 0 for an incorrect answer. The scores for each item were then entered into a statistical analysis programme (SPSS version 26) and analyses per item undertaken. Assessment of internal consistency reliability (Cronbach's Alpha) produced the following results: Syntactic Judgement Task $\alpha=.704$, Grammatical Judgement Test $\alpha=.750$, Write the Correct Word Task $\alpha=.870$, morphological Production Task $\alpha=.719$, Vocabulary Task $\alpha=.841$, English Writing Task $\alpha=.888$. These reliability values were considered acceptable and evidence of good levels of internal consistency within these measures: i.e., the items were measuring related constructs. However, the reliability analyses of the following measures were less positive: the Syntactic Word Order Task $\alpha=.519$, the Correct Spelling Task $\alpha=.572$, Sound Like a Word $\alpha=.683$, Correct Derivation Task $\alpha=.458$, Visual Pattern Task $\alpha=.675$. In order to improve the alpha scores for these measures, each item was considered by checking the impact of removing each item and calculating the alpha score for the remaining items. These calculations were used to make decisions on either deleting or revising items; for example, deleting item 2 in the Syntactic Word Order Task leads to an alpha score change from .519 to .785.

The means, standard deviations, and ranges for all measures are presented in Table 3.2. For the Correct Spelling Task, item 1, item 2, item 3, item 4, item 5, item 7, item 9, item 12, item 14, item 15, item 16, item 18, and item 20 all produced zero variance – all students got these items correct. Similarly, for the Correct Derivation Task, item 4,

item 7, item 8, item 10, item 13, item 16, item 17 and item 20 produced zero variance – again all students got these items correct. Therefore, further reliability of these measures was analysed after the second pilot in which tighter time limits were considered for these measures. It is seen from Table 2 that participants produced very good results in these two tasks.

Table 3. 2 Means, Standard Deviations and Ranges for all Measures

Skills area	Tests	Total possible score for test	Range (Min to Max)	Mean	Standard deviation	Reliability
Syntactic Awareness	Syntactic Judgement	42	15-27	20.13	5.194	.704
	Syntactic Word Order	12	1-7	3.5	2.070	.519
Grammar	Grammatical Judgement Task	20	9-18	12.13	3.441	.750
Orthographic Awareness	Correct Spelling Task	20	16-20	17.63	1.685	.572
	Write the Correct Word Task	20	1-8	4.00	2.777	.870
Morphological Awareness	Correct Derivation	20	14-20	17.00	2.000	.458
	Morphological Production	20	12-18	16.13	2.167	.719
Phonological Awareness	Sound Like a Word Task	20	8-18	12.88	3.227	.683
Vocabulary	Receptive vocabulary	50	20-42	29.63	7.328	.841
Non-verbal Ability	Ravens matrices	12	4-11	6.88	2.588	.675
Writing	Essay writing	100	70-84	76.625	6.20915	.888

3.3.1.4 Amendments of the Measures

Based on the outcome of the first pilot test, the researcher made some changes to the measures. The participants' comments and feedback were also taken into consideration for amendments references.

First of all, although both groups had a break during the test (especially the English writing task which required a good level of concentration), providing longer break times would be more appropriate since participants felt quite exhausted after they finished the 11 tasks. Secondly, a majority of participants gave the idea that some tasks might be too difficult for Chinese-first-language University students. This may lead to floor effects in the measures, which would lead to problems for the main data analyses (such considerations are one of the most important purposes for conducting pilot studies). This may be because some of the measures were originally designed for native English speakers, such as Syntactic Judgement Task and Syntactic Word Order Task, so some vocabularies (e.g., "attic" in item 10 of the Syntactic Word Oder Task) was replaced in order not to affect the participants' ability to perform appropriately in these two tests: the measure was not assessing vocabulary, so this should not influence the scores). Considering that four participants in the pilot study were not able to complete the Syntactic Judgement Task within 15 minutes, the time limit of this task was increased to 20 minutes. Additionally, some changes in terms of typos, spelling, several possible answers and instructions were necessary: for example, in item 7 of the Syntactic Word Order Task, all participants didn't produce the correct answer, because 'is' led to a failure of keeping the subject-verb agreement. Additionally, item 2 was deleted to increase the internal consistency value of the syntactic word order task. There was also a need to revise the instructions of the Syntactic Judgement and Syntactic Word Order tasks by asking whether each participant understood the given instructions

because a proficient participant (a postgraduate who has a minimum of IELTS 6.5 when enrolled as a postgraduate) produced a poor result of 3 out of 18 in rewriting grammatically correct sentences (Part II of Syntactic Judgement Task) due to misunderstanding the rule of changing the word order. This participant rewrote many incorrect sentences by adding or deleting words, which was not part of the requirement of the task. The rationale for limiting the time for the measures that had shown ceiling effects, and increasing the time for the measures that had floor effects, was to ensure variability in performance that would be indicative of fluency in the skills assessed, which is often a better indicator of adult performance than accuracy.

Given relatively large internal consistency values, the grammatical judgement task, sound like a word task, write the correct word task, morphological production task, and the essay writing task were retained without changes (see 3.2 for the example of each measure and appendices C to M for the measures). The time limit for the correct spelling task was reduced from 60 seconds to 40 seconds and from 180 seconds to 120 seconds for the correct derivation task. Furthermore, *is* in item 7 of the Syntactic Word Order Task was replaced with *are* and *attic* in item 10 was substituted by *bedroom*.

Unfortunately, Raven's Advanced Progressive Matrices (Raven, 2000) paper-based test materials were out of stock when the researcher contacted the Pearson staff and a further 4 weeks were needed for the test materials to arrive into the warehouse and another 10 business days to be shipped to New Zealand or an uncertain number of days to mainland China. Digital APM tests were available, but this would be inconsistent with the other paper-based measures in this study and Pearson does not permit photocopying or other reproduction of their test materials by any means and for any purpose. Although the Non-verbal Ability Task was supposed to be used as a control measure in this study to make sure that any effects are not solely due to nonverbal ability but are related to

language itself, many of the abilities hypothesized to be tapped by APM likely rely on learning as well (Lilienthal et al., 2013; Tamez et al., 2008; Williams & Pearlberg, 2006). Therefore, it was decided that the Non-verbal Ability Task had to be removed from the test battery.

3.3.2 Pilot Study 2

3.3.2.1 Measures

Following the amendments performed due to the 1st pilot study, a second pilot study was conducted in China. Given that the changes were working as expected, these would be retained for the main study. For the second pilot study, ten tasks: (i) the syntactic judgement task, (ii) the syntactic word order task, (iii) the grammatical judgement task, (iv) the correct derivation task, (v) the morphological production task, (vi) the correct spelling task, (vii) the write the correct word task, (viii) the sound like a word task, (ix) the vocabulary task, and (x) an English writing task, were given to the participants (see 3.3.1.4 for amendments of some measures and appendices C to M for the measures).

3.3.2.2 Procedures

This second pilot was conducted at a university in China, which was also to be one of the venues for the main study. Potential participants were first introduced to the study to see whether they were interested in taking part in this research: this was via an information sheet and consent form distributed during their self-study time. Both Chinese and English versions were provided on the information sheet, consent form and questionnaire to ensure that no misunderstanding would be taking place while the participants were reading and completing them. Students were asked to fill in the consent form and put it in the envelope provided if they were willing to be participants

of the study. The researcher was around to answer some questions if needed and collected the envelopes left on the teacher's desk. It was the students' self-study (after-class) time, so their lecturers were not in the classroom to ensure that the students did not feel that their academic performance in the course would be affected by their decisions. The specific date and time for the test were discussed with the students according to their availability. Initially, 37 participants were happy to participate in the pilot study when they were told about the English writing task, but four of them withdrew because they were only interested in writing an essay but not willing to complete the other language skills tests such as syntactic judgement task, phonological awareness task, morphological awareness task, etc. Eventually, 33 participants, who were second-year students majoring in English translation and interpretation or English literature at a university in China, and who had been learning English as a second language for a range of 6-13 years, took part in this pilot study. From the information obtained through the questionnaires, the 33 participants were aged 18-21 and every one of them was able to read newspapers in English. All 33 participants completed the ten measures.

A classroom that was quiet enough to guarantee an appropriate environment was chosen so that the participants would not be distracted during the assessments. The 33 participants conducted the test in one group during a 90-minute session for the majority of the measures and a 40-minute session for the essay writing task. The researcher supervised the whole process of testing to make sure no plagiarisms were taking place. The time for executing each task was strictly controlled and recorded.

3.3.2.3 Reliability of the Measures

Internal consistency reliability (Cronbach's Alpha) was assessed. However, these produced unacceptable levels of reliability for most measures except for the Syntactic Judgement Task $\alpha=.70$, Sound Like a Word Task $\alpha=.69$, and Writing task $\alpha=.75$. Analyses of internal consistency reliability produced the following unacceptable results: Syntactic Word Order Task $\alpha=.49$, Grammatical Judgement Task $\alpha=.08$, Correct Spelling Task $\alpha=.37$, Write the Correct Word Task $\alpha=.37$, Correct Derivation Task $\alpha=.34$, Morphological Production Task $\alpha=.27$, Vocabulary Task $\alpha=.53$. The reliability assessments for these measures were not evidence of a good level of internal consistency, i.e. the items in each measure may not be measuring related constructs. Therefore, all measures with unacceptable reliability were analysed by looking into the item-total correlations and alpha score by deleting some items.

The means, standard deviations, and ranges for all measures are presented in Table 3.3.

Table 3. 3 Means, Standard Derivations and Ranges for all Measures

Skills area	Tests	Total possible score for test	Range (Min to Max)	Mean	Standard deviation	Reliability
Syntactic Awareness	Syntactic Judgement	42	17-35	24.91	4.766	.700
	Syntactic Word Order	11	1-9	5.33	1.848	.491
Grammar	Grammatical Judgement Task	20	9-18	13.91	1.926	.075
Orthographic Awareness	Correct Spelling Task	20	13-20	17.03	1.571	.371
Orthographic & Phonological Awareness	Write the Correct Word Task	20	1-9	3.70	1.287	.367
Morphological Awareness	Correct Derivation	20	14-20	17.91	1.422	.337
	Morphological Production	20	13-19	16.27	1.587	.273
Phonological Awareness	Sound Like a Word Task	20	2-16	10.70	3.368	.689
Vocabulary	Receptive Vocabulary	50	18-36	24.06	4.069	.528
Writing	Essay Writing	100	57-78	69.92	5.710	.746

3.3.2.4 Amendments

The background of participants of the 2nd pilot study was the same as that of the participants of the main study, therefore, some measures were amended for the 3rd pilot study to ensure they would work well in the main study.

The grammatical judgement task produced a near zero score on the reliability measure. By looking into each item of the grammatical judgement task, it was found that some sentences measured two language skills. To maintain the reliability of the measure, it was decided that only one skill should be assessed in a particular measure, so some changes were made in those sentences that not only measured grammar but also measured morphology. For example, item 20, “*Neither the actors nor the producer _____ the advertisement for the movie. a. to like; b. liking; c. like; d. likes*” was changed to “*Neither the actors nor the producer _____ make the advertisement for the movie. a. are willing to; b. is willing to; c. willing to; d. willing*”. In the original sentence, both grammar knowledge and morphological awareness were needed to figure out the correct answer, whereas only grammar was assessed in the changed sentence. All items would be piloted again in the 3rd pilot study (see Appendix E for the modified Grammatical Judgement Task).

The vocabulary task also produced a lower reliability score in this 2nd pilot study than in the 1st pilot. Some vocabularies were not in the experience of Chinese background students who lived and studied in China. Items 7, 9, 13, 15, 17, 19, 27, 34, 39, 41, 45, 46, 47, 48 and 49, with negative or near-zero corrected item-total correlations, were deleted to get reasonable reliability of $\alpha=.70$, which was acceptable to be conducted in the main study.

Although items were changed to avoid the ceiling effects identified in the first pilot, there were still ceiling effects in the 2nd pilot study. Regarding the correct spelling task, item 1, item 3, item 5, item 7, item 10, item 14, item 15, and item 18 produced zero variance – all students got these items correct. Similarly, for the correct derivation task, item 4, item 5, item 6, item 7, item 9, item 10, item 13 and item 15 produced zero variance, and the same to the morphological production task, the mean score of the above three measures was close to the possible total score (correct spelling task: M=17.03, SD=1.57; correct derivation task: M=17.91, SD=1.42; morphological production task: M=16.27, SD=1.59). Therefore, items with near-zero variance and negative corrected item-total correlation were replaced by some more difficult items. For example, item 7 of the correct spelling task, *guard VS gaurd* was replaced by *weird VS wierd*. Item 8 of the correct derivation task, “*Run (quick) to catch the bus*” was replaced by “*He is a famous (piano) in China*”. Item 15 of the morphological production task, *make-made* was replaced by *hero-heroic*. The changed test would be piloted again in the 3rd pilot study (see Appendices F, I and J for the amended versions of Correct Spelling Task, Correct Derivation Task and the Morphological Production Task).

Test items in the Write the Correct Word Task were too difficult that the examinees were unable to perform well, so a floor effect occurred (Kreutzer et al., 2011). Item 2, item 4, item 5, items 12-16, items 18-19 produced zero variance since none of the students knew the correct answers. All items with near-zero or negative corrected item-total correlation, as well as zero variance, were replaced by easier ones. Changes were also based on the experience of Chinese background students, such as *farmasissed (pharmacist) – eenuf (enough)*, *rynossierus (rhinoceros) – serpriz (surprise)*, *cidneez (kidneys) – emoushn (emotion)*, etc. The whole test, with the changed items, would be

piloted again in the 3rd pilot study (see Appendix H for the modified Write the Correct Word Task).

To maintain the acceptable internal consistency value, three tasks including the syntactic judgement task, sound like a word task and the easy writing task were retained without changes. To increase the reliability value, 15 items were removed from the vocabulary task, and a task with 35 items was given to the participants for the 3rd pilot study. A considerable amount of changes were made to keep the validity and improve the reliability value of the grammatical judgement task, the correct spelling task, the correct derivation task, the morphological production task and the write the correct word task (see Appendices C to J for the modified versions of all measures).

It was further found that the marking criteria of the syntactic word order task were too strict. The previous marking instructions required rearranging the given words to create a grammatically correct sentence without any minor mistakes as articles (a, an, the). When the examinees made some mistakes except punctuation, they were given 0 point for the item. The revised marking criteria clearly stated that a point of 0.5 was given if a mistake was only due to an error in the articles in a rearranged sentence. Syntactic Word Order Task were also piloted again and marked upon the new criteria.

3.3.3 Pilot Study 3

3.3.3.1 Measures

The 3rd pilot study was performed to assess the amendments of measures in order to further ensure that the modified measures would be working well for the main study. Ten tasks: (i) the syntactic judgement task, (ii) the syntactic word order task, (iii) the grammatical judgement task, (iv) the correct derivation task, (v) the morphological production task, (vi) the correct spelling task, (vii) the write the correct word task, (viii)

the sound like a word task, (ix) the vocabulary task, and (x) an English writing task, were given to and completed by the participants (see 3.3.2.4 for the amendments of some measures and appendices C to J for the full measures).

3.3.3.2 Procedures

All measures were piloted at another university in China, which was also to be one of the venues for the main study. Potential participants were first told about the tests when they got the consent form and participant information sheet, and those who were happy to be part of the study signed and returned the consent form to the researcher. To spread the pilot assessments over potential participants, two groups of 18-21-year-old volunteers ($n = 20$), who were first and second-year university students and had been learning English as a second/foreign language for 6-12 years, were recruited. Time and venue were discussed with the students depending on their availability and available vacant classrooms. The entire assessment battery was administered during a 90-minute session and a 40-minute session. All 20 participants, ten first-year and ten second-year students completed the ten tasks, but only amended measures that did not produce acceptable reliability in the 2nd pilot study were marked and coded into SPSS.

3.3.3.3 Reliability of the measures

The correct spelling task, write the correct word task and grammatical judgement task data were collected from ten first-year university students and syntactic word order task, correct derivation task, and morphological production task data were collected from ten second-year university students. It was found that all amendments worked well in the 3rd pilot study. A less satisfactory reliability value was found for the syntactic word order task in the 2nd pilot study but this increased to a more reasonable reliability value ($\alpha = .79$) in the third pilot following revisions. Changes made for the grammatical

judgement task led to a change from a near-zero alpha value in the 2nd pilot study to a positive alpha value ($\alpha = .74$). Additionally, changes to those measures showing ceiling effects (correct spelling task, correct derivation task, and morphological production task), by replacing some easy items with difficult ones, produced more positive reliability scores: correct spelling task $\alpha = .56$, correct derivation task $\alpha = .68$ and morphological production task $\alpha = .65$. Similarly, the write the correct word task showed a floor effect in the 2nd pilot, but once some difficult items were replaced with easier ones, a more positive reliability scores was found: $\alpha = .67$. All measures except the correct spelling task worked better in the 3rd pilot study, and with the increase in the number of participants in the main study, these reliability scores should improve further. In the correct spelling task, deleting three items (item 8, item 12, and item 19) leads to a higher alpha value of .73. They were not deleted at this stage but later on the researcher may decide to delete them if a positive internal consistency reliability value would not be obtained once the data analyses for the main study had been completed. Therefore, all measures assessed in the 3rd pilot study were retained for the main study. The means, standard deviations, and ranges for all measures are presented in Table 3.4.

Table 3. 4 Means, Standard Deviations and Ranges for all Measures

Skills area	Tests	Total possible score for test	Range (Min to Max)	Mean	Standard deviation	Reliability
Syntactic Awareness	Syntactic Word Order	11	0-10	4.500	2.718	.785
Orthographic Awareness	Correct Spelling Task	20	10-18	15.20	2.530	.559
	Write the Correct Word Task	20	6-16	12.10	3.315	.666
Morphological Awareness	Correct Derivation	20	10-18	14.30	2.983	.676
	Morphological Production	20	6-17	10.90	2.998	.647
Grammar	Grammatical Judgement	20	5-17	11.8	3.706	.735

3.4 Summary

Given the evidence that all modifications of measures worked as expected, the measures used in the 3rd pilot study were retained for the use of the main study, with an exception of the Syntactic Judgement Task, which was initially designed with Part I - 24 judgement items and Part II - 18 correction items. Although the Syntactic Judgement Task produced an acceptable internal consistency value in each pilot study, only Part II - 15 correction items were retained in the main study, because, according to most

participants' feedbacks, the Syntactic Judgement Task was too overwhelming and the two forms of correction items were too confusing for them to understand, hence part I of the syntactic judgement task (see 3.2.2 for the example) was removed and three correction items of part II (see 3.2.2 for the example) were also deleted for the sake of a better understanding and avoid confusion of the syntactic judgement task. Furthermore, the 15 items were rearranged based on two types of correction (see 3.2.2 for example 1 part II and example 2 Part II), from item 1 to item 8, participants making corrections by moving the words and phrases (see 3.2.2 for example 1 Part II), while from item 9 to item 15, participants rewriting the correct version of the sentence by adding words or phrases before or after the given item (see 3.2.2 for example 2 Part II), through which the participants had a clearer idea of what was required from them (see Appendix C for the new version of Syntactic Judgement Task). Additionally, the non-verbal ability task was also removed due to the unavailability of the materials (see 3.3.1.4 for detailed rationale). The final modified version of the full measures is attached in Appendices C to J and Table 3.5 presents the assessment battery for the measures ready for use in the main study.

Table 3. 5 The assessment battery for the main study

Skills	Tasks	No of Items	Time allocation
Syntactic Awareness	Syntactic Judgement Task	15	15 minutes
	Syntactic Word Order Task	11	13 minutes
Grammatical Competence	Grammatical Judgement Task	20	10 minutes
Orthographic Awareness	Correct Spelling Task	20	60 seconds
Phonological Awareness	Sound Like a Word Task	20	60 seconds
Phonological & Orthographic Awareness	Write the Correct Word Task	20	150 seconds
Morphological Awareness	Correct Derivation Task	20	3 minutes
	Morphological Production Task	20	3 Minutes
Vocabulary	Vocabulary Task	35	10 minutes
Writing	Essay Writing Task	NA*	40 minutes

Note. The number of items is not applicable because the participants were required to write an essay based on a given topic.

CHAPTER 4 MAIN STUDY AND RESULTS

4.1 Introduction

This study applied a series of English measures developed to address the following research objectives: 1) to explore whether syntactic awareness is a predictor of English writing across students with a range of English language skills; 2) to investigate whether syntactic awareness is more predictive of English writing among Chinese university students than other measures of basic language skills including phonological awareness, morphological awareness, orthographic awareness, grammar knowledge, and vocabulary knowledge; and 3) to investigate whether the predictors of English writing differ across Chinese university students with lower levels of English proficiency compared to those with higher levels of English proficiency.

This chapter first provides the background information and characteristics of the participants involved in this study and an overview of the measures. Next data collection procedures, analyses used to address the research questions of this study, and inter-rater reliability are discussed. It then presents the findings of the research. Reliability, descriptive statistics, correlations between measures of the same construct and of a similar construct, and correlations between dependent variables and independent variables are reported in sequence. Finally, multiple regression analysis is reported to address the three research questions.

4.2 Participants

All recruited participants ($N = 222$) for the main study were university students who were studying various courses at two public universities in China. The universities were located in the southwest of China, in the two cities of Chongqing and Chengdu. These were chosen since the researcher has access to contacts within both universities. The former city/university was the researcher's birthplace and she completed her undergraduate study there. The latter city

was where the researcher got her master's degree and where the researcher worked and lived for more than ten years. Both universities have well-equipped teaching and learning environments.

Of the two universities, one specialized in foreign language studies and all students were learning various language-related subjects, such as translation and interpretation, western culture, literature and linguistics in English, French, Spanish, and other foreign languages. Participants recruited from this university were English majors who were studying English translation and interpretation, English literature, and English education. They were in their first semester of the second year of study. The other university covered a larger range of disciplines and subjects, but participants were recruited from the College of Foreign Languages. These were first-semester freshmen and first-semester sophomores. The participants were exposed to English in class with a minimum of 4-6 hours per day of full-time study with teachers as well as some assignments to complete after class. Prior to being admitted to matriculation, all participants had studied English as a second/foreign language (ESL) for 10 to 12 years and they were usually given at least 90-minutes of English lessons every day during their primary and secondary schools. Therefore, even those at the beginning of their first year of university were eligible to participate in this study based on their English learning background.

All of the participants were aged between 18 and 24 years. Both males and females were included in the study, but the participants were not required to indicate their gender on the questionnaire because it was not part of the analyses in this study. All participants spoke Chinese as their first language (L1) and English as their second/foreign language (L2), according to the responses on the background questionnaire. Responses on the questionnaire also indicated that the majority of students could read newspapers in English, and most reported that they were first exposed to English when they were 6-7 years old. The same ethical

procedures were implemented for this main study as for the pilot work (see Chapter 4 - 4.1 for details).

4.3 Measures

Measures were developed and amended through three pilot studies (see chapter 3). Participants' background information (e.g., age, language background, etc.) was collected through a questionnaire. An assessment battery consisting of 10 English subtests was employed to collect the main data for this study. This comprised a Syntactic Judgement Task, a Syntactic Word Order Task, a Grammatical Judgement Task, a Correct Spelling Task, a Sound Like a Word Task, a Write the Correct Word Task, a Correct Derivation Task, a Morphological Production Task, a Vocabulary Task, and an Essay Writing Task (see appendices C to J for such measures included in the main study). Table 4.1 presents the assessment battery for the measures used in this study.

Table 4. 1 The assessment battery

Skills	Tasks	No of Items	Time allocation
Syntactic Awareness	Syntactic Judgement Task	15	15 minutes
	Syntactic Word Order Task	11	13 minutes
Grammatical Competence	Grammatical Judgement Task	20	10 minutes
Orthographic Awareness	Correct Spelling Task	20	60 seconds
Phonological Awareness	Sound Like a Word Task	20	60 seconds
Phonological & Orthographic Awareness	Write the Correct Word Task	20	150 seconds
Morphological Awareness	Correct Derivation Task	20	3 minutes
	Morphological Production Task	20	3 Minutes
Vocabulary	Vocabulary Task	35	10 minutes
Writing	Essay Writing Task	NA*	40 minutes

Note. The number of items is not applicable because the participants were required to write an essay based on a given topic.

4.4 Data collection procedure

Before conducting the main data collection, the researcher contacted the director of the School of Foreign Languages at the university in Chengdu, China, and the director then introduced the researcher to the first and second-year lecturers from both the English department and translation department, as well as informed them of what was expected. The researcher and the lecturers discussed the students' class timetable for their availability to take the assessments and an appropriate time to introduce the research to the students. The researcher introduced the

research to the students and distributed information sheets and consent forms after their class (the lecturers were not present during the information presentation).

A total of 117 second-year students and 60 first-year students from the English department and translation department, and 24 second-year engineering students who were learning English as their second bachelor's degree, agreed to participate in this study. Time and venue availability was discussed with the 201 participants and they were divided into seven groups according to different classes. Once the time and venue had been confirmed, a detailed schedule for data collection was formulated. The proposed schedule was added to the participants' routine class timetable to ensure that they would be attending the assessment at the assigned venue as well as at the confirmed time and date. The participants were given a 90-minute session for Syntactic Judgement Task, Syntactic Word Order Task, Grammatical Judgement Task, Correct Spelling Task, Sound Like a Word Task, Write the Correct Word Task, Correct Derivation Task, Morphological Production Task, and Vocabulary Task, and a 40-minute session for essay writing task. However, all 24 second-year engineering students, who were learning English as their second bachelor's degree, were unable to take the essay writing task due to their unavailability. In addition, ten participants withdrew from the essay writing task for unknown reasons, and three others didn't write down their names on the essay writing sheet meaning that their data could not be combined with the data from the first session. This led to 164 complete data sets being collected from this university.

The same participant recruitment procedure was applied to collect data from the university in Chongqing, China. It led to 60 second-year students, majoring in English education, indicating their willingness to take part in this study. Two groups ($n=30$) completed all assessments over a four-week period, but two students withdrew prior to the English essay writing session. Hence, 58 samples were collected from the second university.

The assessments were administered in a paper-based form, and following the style of a traditional test in China. The researcher supervised the assessment sessions according to the Chinese examination setting. The order of the presentation of the tasks was the same as that of the 3rd pilot study. After collection, the 222 samples were marked dichotomously (i.e., 1= correct; 0= incorrect) or, in the case of the essay samples, based on the ESL Composition Profile developed by Jacobs et al. (1981). The latter was used by two independent raters and inter-rater reliability was analysed.

4.5 Analyses of the data

The numerical scores produced by 222 participants in the ten tasks were entered into a spreadsheet and data management and analysis were performed using SPSS 26.0. Prior to investigating the research questions, several preliminary analyses were performed to make sure that the independent variables (syntactic judgement, syntactic word order, grammar, correct spelling, sound like a word, Write the Correct Word, derivation, morphological production and vocabulary), and the dependent variable (essay writing), demonstrated acceptable psychometric properties consistent with the findings in the pilot studies.

Inter-rater reliability was determined via correlations between the essay writing scores produced by the two markers. If a correlation was relatively low (below $r = 0.5$) scores from this particular aspect of the marking were checked by both markers and discussed to identify any reasons for the discrepancy. Item reliability was calculated using Cronbach's alpha (the calculations were performed by SPSS). Any alpha scores less than .60 were investigated to identify low item-total correlations in order to determine whether to delete such items to make the scores more consistent.

4.6 Results

4.6.1 Inter-rater correlation

When two assessors agree on a scale, it can be interpreted as some levels of consistency in the way they mark the written output. Therefore, 50 (23% of the sample) out of the 222 compositions (all 222 compositions were later marked by the researcher once the inter-rater reliability had been achieved) were chosen randomly by taking one from every four pieces of writing without seeing the scripts. These 50 scripts were then marked by two assessors separately. The second marker was an experienced lecturer teaching academic English writing courses in China for more than 15 years, which ensured that she was also familiar with the background of Chinese ESL writing. Correlation between the scores awarded by the two markers for five sections was calculated: i.e., the assessments of content (30/100), organization (20/100), vocabulary (20/100), language use (25/100), and mechanics (5/100). The correlations for the total score ($r = .79$ $n = 50$, $p < .001$), content ($r = .73$ $n = 50$, $p < .001$), vocabulary ($r = .63$ $n = 50$, $p < .001$), language use ($r = .73$ $n = 50$, $p < .001$), and mechanics ($r = .60$ $n = 50$, $p < .001$) were large and positive, indicating that the two markers were relatively consistent in terms of marking. However, the organization scale produced a correlation value below .60 ($r = .39$ $n = 50$, $p < .001$). Therefore, the two markers discussed their marking of this sub-scale to identify why differences occurred. The two sets of scores for the organization section across a sample of marked essays were looked into and it was found that the second rater misinterpreted some criteria of the organization scale. She understood that organization of an essay merely referred to clear paragraphing, ignoring other important elements guided by Jacob's rubric (see 3.2.12), such as fluent expression, ideas clearly supported, logical sequencing and cohesion. Hence, the second marker remarked the compositions based on this sub-scale again. A correlation analysis was conducted again for the remarked organization scores and produced a

correlation coefficient above .60 ($r = .69$ $n = 50$, $p < .001$). These results suggest that consistency in marking can be achieved between markers with a similar background and that the results of the marking of the researcher can be replicated following the same marking principles.

4.6.2 Reliability of each measure

The Cronbach's alpha coefficient was calculated for each measure to assess their internal consistency. The Write the Correct Word Task ($\alpha = .80$) and Writing Task ($\alpha = .85$) both indicated a high degree of internal consistency. The Correct Derivation Task ($\alpha = .76$) produced an acceptable degree of internal consistency. The Syntactic Word Order Task ($\alpha = .61$), Morphological Production Task ($\alpha = .69$), and Receptive Vocabulary Task ($\alpha = .66$) all produced moderate levels of internal consistency. However, the Grammatical Judgement Task ($\alpha = .55$), Correct Spelling Task ($\alpha = .49$) and Sound Like a Word Task ($\alpha = .57$) produced unacceptable reliability values (for the current study, an acceptable level was deemed to be 0.6).

The Correct Spelling Task produced a low alpha score in the 3rd pilot study, but items were not deleted at that stage given that a larger value may have been identified in the larger sample used in the main study. Given that this was not the case, items with near-zero item-total correlations (item 4, item 11, item 12, item 13, item 16), and item 17, which produced a negative corrected item-total correlation, were deleted. This led to the alpha score changing from .490 to .602.

The Sound Like a Word Task and Grammatical Judgement Task produced higher levels of internal consistency in the pilot study. However, with the main study sample, item 2, item 4, and item 16 of the Sound Like a Word Task demonstrated near-zero item-total correlations. These were removed from the measures, leading to the alpha score changing from .570 to .604.

In contrast, the Cronbach's Alpha coefficient of the Grammatical Judgement Task did not change to a value larger than 0.6 when three items with near-zero item-total correlations were deleted. Rather than remove the whole measure, the researcher kept the grammar measure as it was with an internal consistency value of 0.55, but considered subsequent correlation analyses involving this measure to ensure that it was assessing the underlying construct. The internal consistency values of all of the final measures used in the subsequent analyses are presented in Table 4.2.

Table 4. 2 Internal consistency of all measures

Skills area	Tests	Reliability
	Syntactic Judgement	.68
Syntactic Awareness	Syntactic Word Order	.61
Grammatical Competence	Grammatical Judgement	.55
Orthographic Awareness	Correct Spelling Task	.60
Phonological Awareness	Sound Like a Word Task	.60
Phonological & Orthographic Awareness	Write the Correct Word Task	.80
	Correct Derivation	.76
Morphological Awareness	Morphological Production	.69
Vocabulary Knowledge	Receptive vocabulary	.66
Writing	Essay Writing	.85

4.6.3 Descriptive statistics

Descriptive results were generated for all variables. As can be seen from the table below, the mean score for each measure did not approach the total possible score nor the minimum score for the test, indicating no obvious evidence of ceiling or floor effects that could restrict the variability of the measures. The distribution of all measures suggested that they were not too difficult or too easy for the participants. All measures indicated variability in scores. Table 4.3 shows the means, standard deviations and ranges for all measures.

Table 4. 3 Means, Standard Derivations and Range for all measures

Skills area	Tests	Total possible score for test	Range (Min to Max)	Mean	Standard deviation
Syntactic Awareness	Syntactic Judgement	15	0-15	8.64	2.82
	Syntactic Word Order	11	0-10	4.10	2.06
Grammar	Grammatical Judgement	20	4-19	13.34	2.91
Orthographic Awareness	Correct Spelling Task	14	4-14	11.65	1.91
Phonological Awareness	Sound Like a Word Task	17	0-15	8.92	2.71
Phonological & Orthographic Awareness	Write the Correct Word Task	20	0-20	10.97	4.08
	Correct Derivation	20	1-19	13.40	3.43
Morphological Awareness	Morphological Production	20	0-19	9.88	3.14
Vocabulary	Receptive vocabulary	35	8-27	16.87	4.03
Writing	Essay Writing	100	58-93	74.78	7.85

Note. Min to Max = Minimum to Maximum

4.6.4 Correlations analyses

The correlations reported in this study were interpreted according to the suggestion that r -values between .10 and .29 equate to a small effect size, values between .30 and .49 equate to a medium effect size, and values above .50 equate to a large effect size (Cohen, 1988). First of all, the correlations among individual measures employed in this study were assessed. Correlations were then calculated among all tested language skills, which were considered as the independent variables of the assessment battery. Following this, the correlations between the seven independent variables (e.g., syntactic awareness, grammatical competence, orthographic awareness, phonological awareness, phonological & orthographic awareness, morphological awareness and vocabulary knowledge) and the writing ability measure, which was the dependent variable of this study, were analysed to investigate the relationships between English language skills and English writing ability among Chinese university students. Furthermore, the scores on the basic English language skills and the Jacobs et al. (1981) essay rubric categories of content, organization, vocabulary, language use and mechanics were calculated to investigate associations between the basic skills and the differing components of the rubric.

4.6.4.1 Correlations among individual measures applied in this study

Bivariate correlations were undertaken among all individual measures. It was hypothesised that the measures that assessing the same construct would be related and more related than measures assessing different constructs. It was demonstrated from the results that the two syntactic measures (Syntactic Judgement Task and Syntactic Word Order Task) were more correlated to each other ($r = .52$ $n = 222$, $p < .001$) than to the other measures, suggesting that these tasks were measuring a similar construct, syntactic awareness, though from different aspects potentially consistent with the type of tasks required in the two measures. The two morphology-

based measures (Correct Derivation Task and Morphological Production Task) were also more related to each other ($r = .65$ $n = 222$, $p < .001$) than to other measures, again suggesting that they were assessing a similar construct, morphological awareness: again, differences may be more to do with the type of task required in the two measures. Given that the two pairs of measures were assessing similar constructs (syntactic awareness and morphological awareness), they were combined to produce a total score of syntactic awareness, and a total score of morphological awareness. The results of the correlational analysis are set out in Table 4.4.

Table 4. 4 Correlations among individual measures applied in this study

Measures	SJT	WOT	GJT	CST	SLWT	WCWT	CDT	MPT
Syntactic Word Order Task	.52**	1						
Grammatical Judgement Task	.40**	.36**	1					
Correct Spelling Task	.18**	.22**	.19**	1				
Sound Like a Word Task	.20**	.22**	.32**	.22**	1			
Write the Correct Word Task	.34**	.43**	.40**	.40**	.36**	1		
Correct Derivation Task	.36**	.50**	.43**	.34**	.32**	.56**	1	
Morphological Production Task	.44**	.44**	.46**	.25**	.27**	.49**	.65**	1
Vocabulary Task	.31**	.37**	.35**	.42**	.29**	.43**	.36**	.34**

** Correlation is significant at the 0.01 level (2-tailed).

SJT=Syntactic Judgement Task

GJT=Grammatical Judgement Task

SLWT = Sound Like a Word Task

CDT = Correct Derivation Task

WOT = Syntactic Word Order Task

CST = Correct Spelling Task

WCWT = Write the Correct Word Task

MPT = Morphological Production Task

4.6.4.2 Correlations among independent variables in the study

Bivariate correlations were calculated among independent variables employed in the current study. It was hypothesised that a positive relationship would exist among all independent variables and variables of a similar construct would be correlated to a larger level than those of different constructs. As can be seen from the table below, the results indicated positive and significant correlations among all independent variables. There was also evidence for those variables predicted to be assessing a similar construct being correlated: i.e., (i) syntactic awareness, grammar knowledge and morphological processing were correlated, (ii) phonological and orthographic skills were correlated, (iii) vocabulary knowledge and morphology were correlated. Such significant correlations provide further evidence for the measures to be assessing the target constructs, as well as evidence that they are measuring more than random error. However, it was expected that vocabulary should be primarily associated with processing meaning, as would measures of morphology. This was not consistent in the correlations with vocabulary, which seemed as related to phonological and orthographic processing as to morphological processing. This finding was not consistent with expected relationships and hence conclusions derived from associations with vocabulary may need to be treated with caution. Furthermore, it was expected that the Grammatical Judgement Task would be more related to syntactic awareness than morphological awareness, but both grammatical knowledge and syntactic awareness were more related to morphological processing than each other. Despite this, the correlation values between the three skills were at a medium effect size and they were all significant and positive, which was consistent with expectations for such similar language skills. Table 4.5 provides the intercorrelations among the seven independent variables.

Table 4.5 Correlations among all assessed basic language skills

Skills	SA	GC	OA	PA	POA	MA
Grammatical Competence	.43**					
Orthographic Awareness	.23**	.19**				
Phonological Awareness	.24**	.32**	.22**			
Phonological & Orthographic Awareness	.43**	.40**	.40**	.36**		
Morphological Awareness	.54**	.49**	.32**	.33**	.58**	
Vocabulary Knowledge	.39**	.35**	.42**	.29**	.43**	.39**

** Correlation is significant at the 0.01 level (2-tailed).

SA=Syntactic Awareness

GC=Grammatical Competence

OA=Orthographic Awareness

PA=Phonological Awareness

POA=Phonological & Orthographic Awareness

MA=Morphological Awareness

VK=Vocabulary Knowledge

EW=Essay Writing

4.6.4.3 Correlations among the five aspects of writing rubric

A bivariate Pearson product-moment correlation was employed to explore the correlation coefficient of the scores obtained from the five aspects of writing (content, organization, vocabulary, language use, and mechanics) (Jacobs et al., 1981). Prior to undertaking the correlation analyses, descriptive statistics of the five categories of the writing were performed to get an overview of the data collected and the distribution of each variable. It can be seen from Table 4.7 that the mean score of each variable was not approaching the total possible score or to the minimum score, and that the standard deviation of each variable showed a reasonable level of variability around the mean. The exception may be argued to be the mechanics scale since it has a small range of values on the rubric. However, even here there is evidence of variability. Table 4.6 presents the descriptive statistics of the five categories of essay writing.

It was hypothesised that a positive relationship would exist between any two variables of the writing rubric. Results of the correlation indicated that all five sections (content, organization,

vocabulary, language use and mechanics) were significantly and positively related to each other. The results of the correlational analysis are set out in Table 4.7.

Table 4. 6 Descriptive statistics of the writing rubrics

Sub-components	Total Possible Score	Range (Min-Max)	Mean	Std. Deviation
Content	30.0	16-28	22.24	2.77
Organization	20.0	12-19	15.94	1.60
Vocabulary	20.0	12-18	14.73	1.61
Language Use	25.0	11-23	18.07	2.53
Mechanics	5.0	2-5	3.80	0.61

Note. Min-Max=Minimum to Maximum

Table 4. 7 Correlations of writing

	Content	Organization	Vocabulary	Language use	Writing
Content	-				.85**
Organization	.73**				.69**
Vocabulary	.75**	.67**			.80**
Language Use	.67**	.58**	.68**		.86**
Mechanics	.53**	.52**	.54**	.60**	.66**

** Correlation is significant at the 0.01 level (2-tailed).

4.6.4.4 Correlations between essay writing (dependent variable) and basic language skills (independent variables) employed in this study

Correlations between English essay writing and syntactic awareness, grammatical competence, orthographic awareness, phonological awareness, orthographic and phonological awareness,

morphological awareness, and vocabulary knowledge were conducted to investigate the hypothesised positive and significant relationship between them. The results indicated that higher scores on English essay writing were associated with higher scores on syntactic awareness ($r = .41, p < .001$), with higher scores on grammatical competence ($r = .31, p < .001$), with higher scores on orthographic awareness ($r = .22, p < .001$), with higher scores on phonological awareness ($r = .29, p < .001$), with higher scores on phonological and orthographic awareness ($r = .36, p < .001$), with higher scores on morphological awareness ($r = .38, p < .001$), with higher scores on vocabulary knowledge ($r = .22, p < .001$). All dependent variables correlated with the independent variable, the total score of the essay writing. Table 4.8 illustrates the main characteristics of the correlations between essay writing measure and basic language skills assessed in this study.

Table 4. 8 Correlations between essay writing measure and basic language skills assessed in this study

Skills	Essay Writing
Syntactic Awareness	.41**
Grammatical Competence	.31**
Orthographic Awareness	.22**
Phonological Awareness	.29**
Phonological & Orthographic Awareness	.36**
Morphological Awareness	.38**
Vocabulary Knowledge	.22**

** . Correlation is significant at the 0.01 level (2-tailed).

4.6.4.5 Correlations between basic language skills and the five aspects of writing rubric

Apart from the correlations between the independent variables and the dependent variables, further correlations were analysed between the seven basic language skills (syntactic

awareness, grammatical competence, orthographic awareness, phonological awareness, phonological & orthographic awareness, morphological awareness and vocabulary knowledge) assessed in this study and the five essay rubric categories (content, organization, vocabulary, language use and mechanics). The results indicated significant and positive relationships, in most cases, between all language skills and the five essay rubric categories but there were non-significant correlations between the scores obtained from organization of an essay and one's orthographic awareness ($r = .08$ $n = 222$), and scores of organization and one's vocabulary knowledge ($r = .10$ $n = 222$). However, the lowest level of association was found between the vocabulary measure and the vocabulary category in the essay rubric ($r = .16$ $n = 222$). Table 4.9 presents the correlations between basic language skills and the five aspects of writing rubrics.

Table 4. 9 Correlations between basic language skills and the five aspects of writing rubrics

Skills and rubric	Content	Organization	Vocabulary	Language use	Mechanics
SA	.34**	.31**	.28**	.46**	.28**
GC	.22**	.26**	.20**	.36**	.27**
OA	.20**	.08	.21**	.22**	.20**
PA	.25**	.21**	.23**	.31**	.19**
POA	.26**	.22**	.31**	.42**	.28**
MA	.26**	.34**	.30**	.40**	.33**
VK	.20**	.10	.16*	.25**	.26**

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

SA=Syntactic Awareness

GC=Grammatical Competence

OA=Orthographic Awareness

PA=Phonological Awareness

POA=Phonological & Orthographic Awareness

MA=Morphological Awareness

VK=Vocabulary Knowledge

4.6.5 Two groups of participants

In order to address the third research question (do the predictors of English writing differ across Chinese university students with lower levels of English proficiency compared to those with higher levels of English proficiency?), all participants were divided into two groups. Given such evidence that lexical knowledge is central to language proficiency (Beglari & Nation, 2013) and second language (L2) vocabulary knowledge is widely considered as a predictor of L2 learners' proficiency (Zareva et al., 2005), performance on the receptive vocabulary knowledge task was applied as one of the splitting measures. As suggested by Rucker et al. (2015), dichotomization involves splitting the measured variables at some fixed value to form two categories, which in this case can be described as "Low" and "High", with the median split being one way to divide a sample into such High versus Low groups. Hence, descriptive statistics were performed to calculate the median value of the receptive vocabulary scores and a value of 17 (Median = 17) was obtained. Those with a vocabulary score ≥ 17 were treated as a higher English proficiency group ($n = 119$), whereas those with a vocabulary score < 17 were treated as a lower English proficiency group ($n = 103$). The demographic background differences between these two groups are presented in Table 4.10.

Table 4. 10 Demographic information of higher and lower English proficiency group based on vocabulary score

Characteristic	Higher (n = 119)	Lower (n = 103)
Age (years)	n	n
< 18	3	8
18 – 21	116	95
≥ 22	0	0
Year		
First year	23	45
Second year	96	58
Primary language spoken		
Chinese	94	81
English	0	3
Both	25	19
Languages they can read and write		
Chinese	12	16
English	11	9
Both	92	74
Chinese, English and other languages	4	4
First exposed to English		
Kindergarten	10	8
Primary school	95	85
Secondary school	13	10
Approximate total number of years they having been learning English		
≥10 years	84	68
6 – 9 years	34	35

Correlations between the essay writing measure and the basic language skills were performed to explore the relationship between them. The results indicated that, for both higher and lower proficiency groups, higher scores on English essay writing were associated with higher scores on syntactic awareness, grammatical competence, phonological and orthographic awareness and morphological awareness. In contrast, scores of phonological awareness were related to

essay writing scores for the lower proficiency group but not for the higher proficiency group. Moreover, for both groups, a non-significant correlation was found between scores of essay writing and vocabulary knowledge. Table 4.11 provides the correlation results between essay writing and basic language skills in the group of lower and higher levels of English proficiency.

Table 4. 11 Correlations between essay writing and basic language skills assessed in this study (a comparison of lower-level and higher-level group) (based on vocabulary)

Skills	Essay Writing	
	Low	High
Syntactic Awareness	.33**	.41**
Grammatical Competence	.24*	.32**
Orthographic Awareness	.16	.18*
Phonological Awareness	.33**	.17
Phonological & Orthographic Awareness	.24*	.38**
Morphological Awareness	.28**	.40**
Vocabulary Knowledge	.08	.12

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

In order to further explore the difference in the correlations of basic language skills and essay writing between low and high proficiency ESL writers, all participants were also divided into two groups based on the scores of the final essay writing, as the main outcome measure of the current study. The same procedures as the vocabulary split were performed and a median value of the overall essay writing score was obtained (Median = 75). Therefore, samples with a writing score ≥ 75 , were treated as a higher proficiency group of ESL writers ($n = 113$), whereas samples with a writing score < 75 were treated as a lower proficiency group of ESL writers ($n = 109$). The demographic background differences between these two groups are indicated in Table 4.12.

Table 4. 12 Demographic information of higher and lower proficiency ESL writers based on writing score

Characteristic	Higher (n = 113)	Lower (n = 109)
Age (years)	n	n
< 18	5	6
18 – 21	108	103
≥ 22		
Year		
First year	31	38
Second year	82	71
Primary language spoken		
Chinese	96	80
English	1	2
Both	16	27
Languages they can read and write		
Chinese	18	10
English	6	14
Both	85	81
Chinese, English and other languages	4	4
First exposed to English		
Kindergarten	13	92
Primary school	88	5
Secondary school	12	11
Approximate total number of years they having been learning English		
≥10 years	78	74
6 – 9 years	35	34

Again, bivariate correlations were calculated between the essay writing measure and the basic language skills. For both higher and lower proficiency groups of ESL writers, higher English essay writing scores were significantly correlated with higher scores on the grammatical competence and morphological awareness measures. Performance on syntactic awareness, phonological and orthographic awareness and vocabulary knowledge was positively and significantly correlated with essay writing ability for the higher proficiency writers but not for

the lower proficiency writers. For the lower proficiency writers, phonological awareness was positively and significantly related to essay writing scores but not for the higher proficiency writers. Both groups produced a non-significant correlation between essay writing and orthographic awareness. Table 4.13 provides the correlation results between essay writing and basic language skills in the group of lower and higher proficiency ESL writers.

Table 4. 13 Correlations between essay writing measure and basic language skills assessed in this study (lower-level and higher-level group) (based on writing)

Skills	Essay Writing	
	Low	High
Syntactic Awareness	.16	.31**
Grammatical Competence	.23*	.34**
Orthographic Awareness	.12	.16
Phonological Awareness	.30**	.14
Phonological & Orthographic Awareness	.15	.24**
Morphological Awareness	.28**	.34**
Vocabulary Knowledge	.08	.26**

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

4.6.6 Regression Analysis

Regression analysis is used when independent variables are correlated with one another as well as with the dependent variable (Coakes & Steed, 2009). Based on the previous correlation results, all basic languages skills assessed in this study, treated as Independent Variables (IV), were associated with the essay writing measure (see section 4.6.4.4), treated as Dependent Variable (DV). Therefore, multiple regression analyses were conducted to further investigate the relationships between writing performance and the basic language skills measures, and to determine the amount of variability in the essay writing measure (DV) contributed by the seven

Independent Variables. Multicollinearity was calculated to investigate the predictive power of language skills assessed to writing ability.

Two regression models were employed, simultaneous regression and stepwise regression. In the first model of simultaneous multiple regression analyses, all language skills (IV) entered the regression equation at once. The rationale for applying the first model was to examine the relationship between the whole set of predictors (IV) and the essay writing score (DV). The rationale for the second model of stepwise multiple regression was to identify which independent variables were the best predictors of writing ability in English as a foreign/second language among Chinese university students.

As can be seen in Table 4.14, the simultaneous multiple regression analysis indicated that about 25% of the variability in the essay writing measure could be predicted from the whole set of language skills measures ($R^2 = .25$, $P < .001$). Two variables that significantly explained variability in Chinese ESL adult learners' L2 writing were syntactic awareness and phonological awareness.

The stepwise multiple regression analysis led to three predictors being entered into the regression equation. Syntactic awareness was entered first, predicting 17% of the variability in the essay writing measure ($R^2 = .17$, $P < .001$), followed by phonological & orthographic awareness, adding 4% of the variability predicted (two-measure model, $R^2 = .21$, $P = .001$), and finally phonological awareness, which added another 2% of variability (three-measure model, $R^2 = .23$ $n = 222$, $P = .014$). Although phonological and orthographic awareness was nonsignificant according to the overall multiple regression, it entered the stepwise regression as the second predictor. The significant positive relationship indicated that when the participants' knowledge of syntactic awareness, phonological and orthographic awareness and

phonological awareness increased, better performance in ESL writing would be likely to increase also.

Table 4. 14 Results of regression analysis on total writing scores

Variables	Regression statistics		Standardised coefficients		Collinearity statistics	
	R ²	Sig. R ²	Beta	Sig. Beta	Tolerance score	VIF score
Total variability explained	.25	F=9.904 <i>p</i> < .001				
Syntactic Awareness			.254	t=3.414 p=.001	.640	1.562
Grammatical Competence			.068	t=.943 p=.346	.680	1.470
Orthographic Awareness			.061	t=.885 p=.377	.755	1.324
Phonological Awareness			.140	t=2.117 p=.035	.812	1.232
Phonological Orthographic Awareness			.115	t=1.455 p=.147	.561	1.782
Morphological Awareness			.095	t=1.148 p=.252	.518	1.931
Vocabulary Knowledge			-.053	t=-.730 p=.466	.676	1.480

Note: none of Collinearity statistics suggest a problem with multicollinearity (i.e., tolerance scores are all greater than 0.5 and VIF scores are all less than 2)

The same simultaneous regression and stepwise regression analyses were conducted to explore the predictors of English writing for Chinese adult ESL learners with lower proficiency ESL writers compared to higher proficiency ESL writers. Given that the essay writing measure was the main outcome variable in this study, higher versus lower scoring groups were employed based on the scores from the essay writing task.

For the group of lower proficiency writers, the findings from the simultaneous regression analysis model (see Table 4.15) indicated that about 14% of the variability in the essay writing measure could be predicted from the whole set of language skills measures ($R^2 = .14$ $n = 109$, $p = .028$). Two variables that significantly explained variability in Chinese ESL adult learners' L2 writing were phonological awareness and morphological awareness.

Moreover, the same two variables entered the stepwise regression analysis model, phonological awareness first, predicting 9% of the variability in the essay writing measure ($R^2 = .09$ $n = 109$, $P = .002$), then morphological awareness, adding 4% to the variability predicted (two-measure model, $R^2 = .13$ $n = 109$, $P = .001$). The significant positive relationships suggest that when the participants' knowledge of phonological awareness and morphological awareness increased, the probability of better performance in ESL writing increased accordingly. However, syntactic awareness, grammatical competence, orthographic awareness, phonological and orthographic awareness and vocabulary knowledge were not significant predictors.

Table 4. 15 Results of regression analysis on total writing scores (lower group based on writing)

Variables	Regression statistics		Standardised coefficients		Collinearity statistics	
	R ²	Sig. R ²	Beta	Sig. Beta	Tolerance score	VIF score
Total variability explained	.141	F=2.369 p = .028				
Syntactic Awareness			-.020	t=-.173 p=.863	.626	1.596
Grammatical Competence			.089	t=.785 p=.434	.654	1.528
Orthographic Awareness			.051	t=.488 p=.626	.782	1.279
Phonological Awareness			.235	t=2.320 p=.022	.826	1.211
Phonological Orthographic Awareness			-.051	t=-.432 p=.667	.620	1.612
Morphological Awareness			.217	t=1.698 p=.093	.521	1.918
Vocabulary Knowledge			-.062	t=-.587 p=.558	.753	1.328

Note: none of Collinearity statistics suggest a problem with multicollinearity (i.e., tolerance scores are all greater than 0.5 and VIF scores are all less than 2)

For the group of higher proficiency ESL writers, the findings from the simultaneous regression analysis (see Table 4.16) indicated that about 18% of the variability in the essay writing measure was predicted by all language skills ($R^2 = .18$ $n = 113$, $p = .003$), with syntactic awareness, grammatical competence and morphological awareness showing larger beta values, but no individual standardised coefficients beta score came out significant, probably because several measures added a little bit of explanation. Therefore, to further look into the predictors to see which may be the best combination, stepwise regression was conducted again. There were two predictors entering the stepwise regression model, with morphological awareness first followed by grammatical competence. Morphological awareness predicted about 12% of the variability in the essay writing measure ($R^2 = .12$ $n = 113$, $p < .001$) and grammatical competence added an additional 4% of the predicting variability in the essay writing measure ($R^2 = .16$ $n = 113$, $p < .001$). The positive relationships suggested that when the participants' knowledge of syntactic awareness, morphological awareness and grammatical competence increased, the probability of better performance in ESL writing increased accordingly. However, orthographic awareness, phonological awareness, phonological and orthographic awareness and vocabulary knowledge were not significant predictors of writing ability.

Table 4. 16 Results of regression analysis on total writing scores (higher group based on writing)

Variables	Regression statistics		Standardised coefficients		Collinearity statistics	
	R ²	Sig. R ²	Beta	Sig. Beta	Tolerance score	VIF score
Total variability explained	.181	F=3.320 p = .003				
Syntactic Awareness			.152	t=1.443 p=.152	.707	1.415
Grammatical Competence			.195	t=1.876 p=.063	.719	1.390
Orthographic Awareness			.008	t=.078 p=.938	.742	1.347
Phonological Awareness			-.009	t=-.094 p=.925	.831	1.204
Phonological Orthographic Awareness			-.007	t=-.063 p=.950	.582	1.719
Morphological Awareness			.167	t=1.406 p=.163	.551	1.815
Vocabulary Knowledge			.044	t=-.391 p=.697	.605	1.653

Note: none of Collinearity statistics suggest a problem with multicollinearity (i.e., tolerance scores are all greater than 0.5 and VIF scores are all less than 2)

The regression analyses findings indicate that the basic English language skills employed in this study do not contribute much to the writing ability of English as a second/foreign language among Chinese university students. However, the results do suggest that syntactic awareness, phonological and orthographic awareness and phonological awareness are significant predictors of writing ability in terms of the whole sample set. Additionally, morphological awareness was a common predictor of variance in English writing ability across lower and higher proficiency ESL writers; although phonological awareness was a predictor of English writing ability for lower proficiency ESL writers, syntactic awareness and grammatical competence were predictors for higher proficiency ESL writers.

CHAPTER 5 DISCUSSION

5.1 Introduction

The current chapter summarises the research outcomes and conclusions of this study, followed by a discussion of the possible reasons for the findings in the light of the theoretical background, linking the results reported in this study to the findings suggested in the previously existing literature. The theoretical and pedagogical implications of this study are then explored. The discussion finishes with a cautionary note acknowledging the limitations of the study and suggestions for future research.

5.2 Summary of the findings

An initial objective of the study was to identify the predictors of adult ESL learners' writing (i.e., to answer the first research question 'Is syntactic awareness a predictor of second/foreign language writing ability across Chinese university students with a range of English language skills?' and the second research question 'Is syntactic awareness more predictive of English writing ability among Chinese university students than other measures of basic language skills? i.e., phonological awareness, phonological and orthographic awareness, orthographic awareness, grammatical knowledge and vocabulary knowledge'). The findings indicated that all basic language skills were positively and significantly associated with adult ESL learners' writing which was assessed using Jacobs et al. (1981) rubric, suggesting that all variables have an influence on the writing score. Syntactic awareness, morphological awareness, and phonological and orthographic awareness demonstrated higher correlations with writing than grammatical knowledge, orthographic awareness, phonological awareness, and vocabulary knowledge. When all these language skills variables were included in the regression analyses, both syntactic awareness and phonological awareness, together

with phonological and orthographic awareness, were found to be significant predictors of variability in total writing scores, although the variability explained by the combination of measures used was not very high. Therefore, in answer to the first research question, syntactic awareness was found to be a predictor of adult ESL learners' writing, and, in answer to the second research question, it was more predictive of variability in writing scores for the whole Chinese background cohort than the other measures of basic linguistic processing included in the study. However, a caveat to these conclusions is that the level of variability in writing performance predicted by syntactic awareness and these other measures seems to be relatively small, suggesting that other measures may need to be considered in future research to determine additional predictors of writing skills among students similar to those included in the current study.

The research also considered whether there were any differences between higher and lower proficiency ESL writers (in order to answer research question three 'Do the predictors of English writing differ across Chinese university students with lower levels of English proficiency compared to those with higher levels of English proficiency?'). Participants were split into two groups based on the writing scores. For the higher proficiency group, significant and positive associations were found between syntactic awareness, grammatical knowledge, phonological and orthographic awareness, morphological awareness, vocabulary and adult ESL learners' writing performance. For the lower proficiency group, significant and positive correlations were found between grammatical knowledge, phonological awareness, morphological awareness, and writing adult ESL learners' writing performance. In the regression analyses for the higher proficiency writers, two variables entered the stepwise regression model, with morphological awareness first and grammatical knowledge second. For the lower

proficiency ESL writers, significant and positive correlations were found between grammatical knowledge, phonological awareness, morphological awareness, and adult ESL learners' writing performance. The regression analyses identified phonological awareness and morphological awareness as significant predictors of variability in writing ability within this lower proficiency group. Therefore, the answer to the third question was that the predictors of English writing were different across adult ESL learners with lower and higher levels of English proficiency.

The theoretical and practical implications of these findings will be discussed in the following sub-sections.

5.3 Theoretical implications

As discussed in the literature review chapter, this study chose a first language writing model, the Not-So-Simple View of Writing Model developed by Berninger and Winn (2006), and a second language writing model, the Latent Variable Model for L2 Writing Quality developed by Kim and Crossley (2018), as theoretical frameworks to investigate some of the linguistic skills required to support the development of second language writing among Chinese adult ESL learners in mainland China. Before discussing the implications of the findings for these sorts of language/writing models, it is worth considering the writing measure used in the present study. Students' writing samples were marked based on the Jacobs et al. (1981) rubric (see Chapter 3.2.1.2 for the rubric). The rationale for choosing this rubric was discussed in Chapter 2, but the way such writing rubrics assess written outputs needs to be considered when interpreting results.

5.3.1 Essay writing rubrics

As discussed, essay writing, as the main outcome measure of this study, was marked employing the Jacobs et al. (1981) rubric. The result of the present study revealed that syntactic awareness was more correlated with writing ability and it was found that syntactic awareness was the largest predictor of adult ESL learners' writing performance. However, using another writing rubric might have led to different results. For example, a study by Kim and Crossley (2018) used a holistic rating rubric, TOFEL iBT, and considered the relationships between L2 writing quality and vocabulary-related aspect, syntactic-related aspect and cohesive features. The findings of their study showed that lexical sophistication is more important than syntactic complexity and cohesion in assessing L2 writing quality, suggesting that vocabulary instead of syntactic awareness is the best predictor of ESL learners' writing ability. Given such evidence that using different rubrics may make a difference to conclusions, the results obtained from the current study may need to be confined to the rubric (Jacobs et al., 1981) used in this study, and to those contexts where the rubric is used in research or practice.

Additionally, Jacob et al.'s (1981) ESL Composition Profile counts these main traits (e.g., content, organization, vocabulary, language use, and mechanics), fitting each trait into a proficiency scale, and a breakdown of each trait into subtraits. Taking into account the language measures used in this study, it might be expected that the organization sub-component would be the aspect most related to syntactic awareness. Similarly, the language use sub-component may be expected to be associated with syntactic awareness, but the vocabulary sub-component of the rubric should be related to the vocabulary measure and the mechanics sub-component to the grammar measure. The correlations between the basic language skills assessed in this study and the five

subscales of the writing rubrics demonstrated that the sub-component of language use showed the largest relationship with syntactic awareness compared to the other sub-components of the rubric. Several of the descriptors in the language use sub-component are consistent with syntactic awareness. For example, 'effective complex constructions and word order' would be expected to be aspects of syntactic awareness, and consistent with the syntactic measures focusing on syntactic correction and word order. This would be consistent with views about syntactic skill as the main metalinguistic aspect in judging the language use in a composition (González et al., 2001; Huang, 2009).

Gaps in language use during the production of a written text may also differentiate ESL writers. For example, writers who acquire more competent explicit syntactic knowledge may be able to achieve effective complex text constructions without spending too much time and effort, thus allowing more time and effort to be allocated toward knowledgeable, substantive content and succinct organization. Consequently, they are more likely to produce better quality compositions. This would be consistent with Sakyi's (2000) findings indicating that the range and sophistication of syntax significantly affected the overall writing scores awarded by raters. Furthermore, errors in language use are considered as another important rating criterion in ESL compositions (Huang, 2009; Mendelsohn & Cumming, 1987). It is argued that poor linguistic control may have a more negative effect on the writing scores of given topics in contrast to compositions responding to specific texts (e.g., summary writing based on the given text) because ESL raters chose effective use of language (e.g., grammar) more frequently as the most influential element to fail essays on given topics (McDaniel, 1985; Weigle et al., 2003). In the present study, all language skills assessed in this study were found to be correlated with the language use subscale to a larger level than the other four subscales of content, organization, vocabulary, and mechanics. This may be

consistent with the language use subscale assessing a range of writing features that are reliant on these basic language skills.

Additionally, a relatively higher relationship was found between the organization subscale and syntactic awareness. The organization criteria refer to ‘fluency, ideas support, organization, succinctness, sequencing, and cohesion’. Among these descriptors, ideas support and succinctness are expected to be related to syntactic awareness because using syntactic devices such as correct word and/or phrase order of cause-effect relationships, conditional clauses, special conjunctions, attributive adjectives, and appositive relationships, and prepositional phrases is facilitative in supporting ideas and achieving succinct expression of ideas. Mendelsohn and Cumming (1987) argued that “concern for the logical organization of information” has long been an important criterion in ESL teaching and that ESL instruction generally includes the standard of overall organization that figures prominently in most rating rubrics assessing the writing abilities of ESL learners. Syntactic awareness may support the organization of an essay in the following way. Beers and Nagy (2009) studied the relationship between syntax and writing ability of English-speaking students and the findings supported the view suggested by the current correlational data that syntactic awareness may help with the fluent expression of a more complex relationship among ideas, leading the ideas to be supported clearly. The Syntactic Judgement and Word Order Tasks in this study also measured students’ ability to produce the above-mentioned syntactic devices. One example is the causal relationship expressed in a sentence (e.g., to rewrite the fragment, *Because no students have applied for the job*, an effect clause – *they have to postpone the interview* - is required to make the subordinate clause syntactically correct and fluent). Another example is the appositive relationship (nouns or noun phrases that follow or come after a noun and give more information about it) expressed in a sentence

(e.g., In the Syntactic Judgement Task, to rewrite the sentence *Bill toured Oklahoma with herbal cures and powerful oils the great supporter of mankind*, if the participants are able to figure out where *the great supporter of mankind* should be put in this sentence, a fluent expression of a more complex relationship among ideas would be achieved. As in the correct version *Bill, the greatest supporter of mankind, toured Oklahoma with herbal cures and powerful oils, the greatest supporter of mankind* is an appositive of the subject *Bill*). The expression of the appositive relationship, as measured in some items of the Syntactic Judgement Task, is also supportive of the idea that “syntax may facilitate the expression of complex ideas more succinctly” (Tong & McBride, 2016, p. 1267). In addition to this, applying effective syntactic structures may assist writers to use conjunctions to compress several ideas into a single clause (e.g., To rearrange the randomly arranged words *as the presentation is soon refreshments will be over served as*, the conjunction *as soon as* is the centre of figuring out the correct word order of the sentence: *The refreshments will be served as soon as the presentation is over*).

Interestingly, the organization sub-component was as correlated with morphological awareness as syntactic awareness, and these correlations were larger than those with any of the other language skills examined. Such a finding may be consistent with Northey et al.’s (2016) study which suggested that increased knowledge of morphological awareness supported the improvement of the organization of a composition by effectively using transition words and phrases, such as sentence-initial transition words (e.g., *additionally*), to signal the move from one thought to the next. Such skills with lexical morphology in terms of word-level choices, when used well, can improve text-level organization in suggesting the movement of ideas through a text. Another possible explanation may be that some morphologically constructed words,

such as ‘firstly’, ‘secondly’ and ‘finally’, may help with logical sequencing, which can help writers to better organise the text, or to make the ideas more clearly stated/supported. These sorts of linguistic tools may also support word ordering or sentence ordering, which may be partly associated with aspects assessed by the syntactic awareness measures. However, further studies taking these variables into account will need to be undertaken. One possible way could be thinking of a writing assessment rubric that focuses only on those aspects that might be leading to the relationship between morphology and/or syntactic awareness. For example, using an adapted version of the WIAT – III scoring guide (Pearson, 2010) to assess how many morphological transition terms such as *secondly*, *finally*, *additionally*, etc. are used. A list of 207 unique transition words and phrases is available and identified in this scoring guide, and many are affixed derivations such as *thirdly*, *finally*, and *additionally*. Probably only morphological derivations could be kept to see if this is related to the rubric scores and scores on morphology/syntactic measures and if they explain the same variability.

The vocabulary subscale in the writing rubrics was expected to be more correlated with the vocabulary measure. However, the lowest level of association was found between these measures. There are several possible explanations for this unanticipated result. One possible explanation may be related to the difference between the vocabulary measure and the vocabulary scale in the writing rubric: they may not be assessing the same aspect of vocabulary knowledge. The vocabulary test (Beglar & Nation, 2007) was measuring the size of the participant’s vocabulary while the vocabulary scale of the writing rubric focused on both the size and depth of vocabulary. As described by Jacobs et al. (1981), a high score on the vocabulary sub-component would be given for a text that shows a sophisticated range of words used, effective word/idiom choice and

usage, word form mastery, and appropriate register use (this refers to the level of formality in terms of a specific vocabulary used in writing, for example, some words are appropriate in an informal text message to a friend but not in academic writing). Across the marking criteria of the vocabulary section, the sophisticated range of vocabulary, for example, does refer to the size of vocabulary, which may have led to the significant correlation between the vocabulary test scores and the vocabulary sub-component of the rubric. In contrast, other aspects such as word form mastery evaluate both size and depth of vocabulary. This difference between the constructs assessed by the two measures may have accounted for the comparatively low level of correlation between the vocabulary test and vocabulary sub-component of the writing rubric. Nevertheless, more significant and positive associations between Chinese 8th and 9th ESL students were found between the students' vocabulary breadth and vocabulary depth (Wu, 2018; Wu et al., 2019) and similar findings were suggested in studies targeting adult ESL learners from various contexts (Nurweni & Read, 1999). (Another possible explanation in terms of the order of presentation of the language measures is discussed later in section 5.3.5, when the vocabulary measure itself is discussed further.) Future studies, which include measures of both breadth and depth of participants' vocabulary knowledge, may be useful (see section 5.5 for more details of suggestions for future work).

The highest level of correlation for the mechanics subscale of the writing rubrics was with morphological awareness, which was inconsistent with the expectation that mechanics and grammar should be more related. This may be due to the ability to avoid spelling errors. The first criterion of the mechanics subscale of the writing rubric is spelling. Although this explanation may have predicted a larger correlation with morphological awareness, phonological and orthographic awareness measures. As

suggested by Masilamani (2019), knowledge of complex morphological patterns may help the writers to form spelling rules. Further research considering the different aspects of the mechanic sub-component may be useful. These would take into account variables such as spelling errors, handwriting, punctuation, capitalization, paragraphing. It may then be that different underlying language skills are related to these different aspects of the mechanics sub-component.

The content sub-component assessed ‘knowledge of subject, thesis development, topic relevance, original or factual support’. An ESL composition that is knowledgeable, substantive, relevant to the assigned topic, and has a thorough development of the topic should be considered as being excellent to very good. Although none of these descriptors seemed to be associated with syntactic awareness, this metalinguistic skill showed the largest correlations with the content sub-component. Although surprising based on the descriptors, this finding may be consistent with previous research finding that syntactic awareness predicted EL1 and ESL learners’ writing quality based on text content and structure (Harrison et al., 2016). According to Harrison et al, content and structure scores were assessed based on the evaluation of the text organization, and the organization score was based on such constructs as sentence structure and the use of linking expressions. Then a possible interpretation might be that Harrison et al. specifically focused on content and structure that placed a larger emphasis on sentence structure in the scoring criteria. Also rules of syntactic awareness, assessed via Syntax Construction Test in Harrison et al.’s study and via Syntactic Judgement and Word Order Tasks in the current study, may support writers to produce better quality sentence structures (e.g., to rewrite the sentence *Developed severe stage fright she suddenly having been chosen for the lead role*, awareness of syntactic rules was activated to provide the correct version with a better quality structure – *Having been chosen for the*

lead role, she suddenly developed severe stage fright), which may help with the development of the written content. However, the sub-component of content is an aspect of writing upon which further research may need to focus (see section 5.6 for more details of suggestions for future work).

5.3.2 Syntactic awareness and ESL writing

The current thesis finding in answer to the first research question indicated that syntactic awareness was a significant predictor of adult ESL learners' writing ability. It suggested that the learners' ability to reorder the syntactically incorrect sentences and the randomly arranged words to create sentences with appropriate word orders should have a positive effect on their writing performance. Clearly, the correct word order of sentences in an essay is a very important aspect of good writing. It reduces the chance to make syntactic errors (e.g., syntactically ambiguous sentences). For example, in the Syntactic Judgement Task, The sentence, *There are books on the shelf that must be distributed* is ambiguous because what must be distributed might be books or the shelf. Moving the word order of, *on the shelf*, to the beginning of this sentence can help with a correct version, *On the shelf there are books that must be distributed*. Another example is, *I liked the picture of you on the diving board that you sent me*. This sentence is also ambiguous because *that you sent me* could refer to *the diving board* or *the picture*. Reformulating the order of words leads to an unambiguous version of this sentence *I liked the picture that you sent me of you on the diving board*. Given these examples, the findings observed in this study are supported by previous research into the relationship between syntactic errors and writing performance. Liu and Xu (2013), as discussed in Chapter 2 - 2.1, worked with undergraduate ESL learners in China and found that the students' writing quality was affected by syntactic errors (e.g., word order errors, ambiguities). Additionally, this result is also consistent with the study by Connor (1990)

who found that syntactic factors obtained via features of prepositions, specific conjuncts, and passives were significant predictors of writing ability among native English speaking learners. It is supportive of the current finding because where these linguistic features considered in Connor's study should be placed in a sentence is also included in the syntactic judgement and word order measures used in the present study. For example, to reformulate the sentence, *He supervised with an interest in music the work of millions of singers*, by moving the order of words, the preposition phrase, *with an interest in music*, can be moved to the beginning of the sentence, then a correct version can be, *With an interest in music, he supervised the work of millions of singers*; to rearrange the randomly arranged words, *that about novel I from the borrowed library is the American war the*, the position of the conjunct *that* is important, then a correct version can be, *The novel that I borrowed from the library is about the American war*; to rearrange the randomly arranged words, *boss soon as money the job was as finished the her some gave*, the correct word order of the passive, *the job was finished*, is important to come to the correct version, *The boss gave her some money as soon as the job was finished*. A range of findings (see the literature review chapter), including those in the present data, support the view that syntactic awareness is a significant predictor in ESL learners' writing. These data are also consistent with the Latent Variables model of L2 writing quality introduced as one of the theoretical bases in the literature review chapter. However, the current findings extend these past perspectives by suggesting that syntactic awareness was more predictive than a range of other basic language skills. This may be specific to the Chinese adult ESL learners' writing, which was the focus of the current work, but argues for its influence to be considered further in future research.

According to the Not-So-Simple View of Writing Model, one of the theoretical bases introduced in the literature review, text generation skills are treated as higher-order skills (Poch & Lembke, 2017). The relationships between syntactic awareness and text generation process, and second language writing quality may be due to several aspects. First, syntactic awareness can support adult ESL learners to produce syntactically mature sentences and also helps produce a variety of linguistic features. As such, syntactic awareness may support adult ESL learners' ability to stretch their language repertoire and achieve greater diversity and sophistication in the language use of a composition (Lu, 2011). Second, an awareness of syntactic rules may help writers to focus on producing clearer ideas in a text. For example, in the Syntactic Judgement Task, the sentence, *Where I was born the house is red*, is not clear because the house could be either the house where the author was born or the house in the area where the author was born. By moving the order of the words, a correct version can be, *The house where I was born is red/The red house is where I was born*. This may be particularly useful for ESL writers' who need more time and effort to focus on idea generation. As introduced in the literature review chapter, writing is a process of translating the author's ideas into written speech and the writing process is constrained by multidimensional lower and higher linguistic and cognitive skills (Berninger et al., 1991). The automaticity of applying syntactic skills to construct sentences during writing (e.g., effective use of conjunctions, cause-effect relationships, and appositives without too much effort would facilitate a writer's linguistic control) should support the production of clear/concise sentences and free cognitive resources for the purpose of other higher-level processes such as translating, planning, and review (Hayes & Flower, 1980). These explanations may also be related to the argumentative genre assessed in the essay writing task. In a study examining Chinese secondary-school ESL learners'

writing performance (Qin & Uccelli, 2016), argumentative essays showed more complex syntactic features than narrative essays. Likewise, Brimo and Hall-Mills (2019) found that adolescents of native English speakers produced a higher percentage of syntactic complex sentences and a higher clausal density in the persuasive genre than in the expository genre. Therefore, further studies contrasting different predictors across different types of texts in future studies would be recommended. It may be that syntactic awareness is one of the better predictors of certain types of writing (e.g., argumentative essays), but not other types of writing (e.g., expository and narrative essays).

Additionally, syntactic awareness was significantly associated with the general writing performance of the higher proficiency ESL writers but not with the lower proficiency group. Ferris (1994) also contrasted the syntactic features of ESL writing by students and found that higher proficiency ESL writers employed more targeted syntactic features than lower proficiency ESL writers, and that writers with higher levels of ESL proficiency used some syntactic tools more frequently than the lower proficiency students. Bardovi-Harlig and Bofman (1989) and Bardovi-Harlig (1990) argued that more advanced learners would show a greater tendency to use more syntactic devices in achieving syntactic complexity in writing. The syntactic devices are as assessed in the Syntactic Judgement and Word Order Tasks, e.g., causal relationship sentences, use of specific conjuncts and appositives (see 5.3.1 for example). Although these also represent grammatical features, word order is the main focus of the syntactic tasks. In contrast, the reason why syntactic awareness was not significantly correlated with the lower proficiency writers may be because lower proficiency learners are at a stage that higher-order cognitive skills may have not been well developed. While syntactic

awareness is hypothesized as a higher-order component based on the Not-So-Simple Writing Model.

The different relationships in terms of syntactic awareness and writing ability between the higher and lower proficiency groups can be seen clearly in Figure 5.1. The two groups are fairly arbitrary. The writing score split produces flat lines at the split – this flat line makes the regression line flat too. What it suggests is the low level of explanation provided by syntactic awareness. Within both higher and lower writing ability groups, there are those who are good and those who are scored poorly on the syntactic awareness scale – just slightly better in the higher group and slightly at a lower level in the lower group. This may suggest that the split of this group of participants based on the overall essay writing scores is not that useful in terms of explaining the relationship between syntactic awareness and writing ability in higher and lower proficiency adult ESL learners, therefore, a different way of splitting groups in the future might be more important.

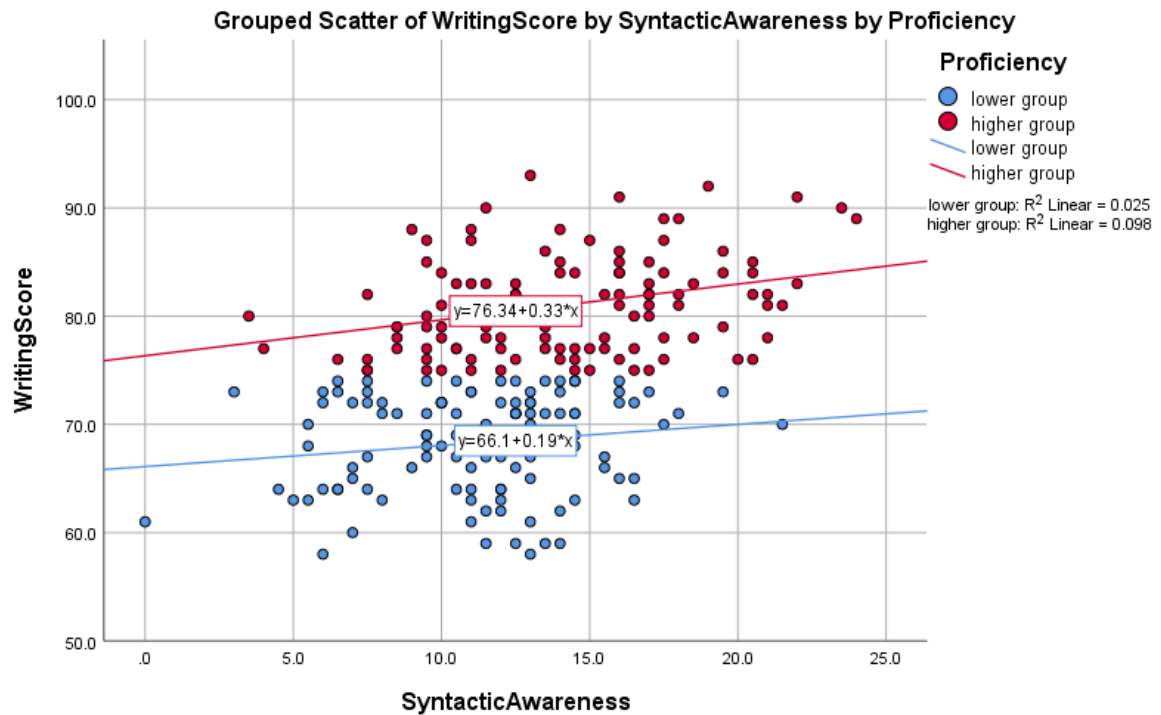


Figure 5. 1 Scatter plot of syntactic awareness and writing score for the higher and lower proficiency groups

5.3.3 Syntactic awareness and other higher-order language skills

According to the Not-So-Simple View of Writing Model, text generation skills represent higher-order cognitive abilities (Poch & Lembke, 2017). As introduced in the model section in the literature review chapter, the current findings that syntax, grammar, and morphology skills were significantly correlated with overall writing scores may be due to their collective importance in the text generation process, or their contribution to higher-order cognitive abilities. That these three areas have a common link is supported by the higher level of correlations between syntactic awareness, morphological awareness and grammatical knowledge. It is also supported by the larger beta values of these three variables in the multiple regression analysis for the higher group when the whole cohort was split into a higher and lower proficiency group. The relatively good interrelationship between syntactic awareness and morphological

awareness may attribute to the syntactic context provided in the correct derivation task. For example, to produce the correct derivational form of the word *introduce* according to the given context *He began with a brief (introduce)*, adjective + noun should provide an awareness of a proper syntactic rule, which would lead to learners' better understanding of the correct morphological form of the words added affixes. Therefore, the correct form should be *introduction*. It may be also due to the morphological construct applied when deciding the correct word order in completing the syntactic judgement and word order tasks. Although the syntactic measures used in the present study were not about morphological components of words, the correct word order measured in the syntactic tasks was positively influenced by the morphological components of words. For example, in order to rearrange the randomly arranged words *in drawer the was microphone placed the repaired left*, students' morphological knowledge of how to compose the words was activated to help them to combine the words, specifically, to put the word *repair* with a suffix *ed* before the noun *microphone*, and to put the word *place* with a suffix *ed* after the be verb *is*. Therefore, a correct rearranged sentence can be, *The repaired microphone was placed in the left drawer*. These explanations are compatible with the linguistic structure of the morphosyntactic English word (Dixon & Aikhenvald, 2003; Haspelmath, 2011; Juilland & Roceric, 1972; Krámský, 1969; Spencer, 2005; Sugioka, 2018).

The current study assessed syntactic awareness via a measure looking at the students' ability to recognize correct word order. The composition of words (i.e. morphological construct) was measured via a separate variable to allow the study to focus on the specific effects of word-order syntactic awareness on writing outputs. However, the correlations between the syntactic measure and the morphology support the view that they were assessing something similar. The interrelations between morphology and

syntax are also in agreement with the findings of Kim et al. (2015) and Northey et al. (2016), showing a positive relationship between syntactic knowledge and morphological awareness. Kim et al. (2015) used a Does it Fit task asking the students to select one of the four words in completing a sentence using a non-word with an existing derivational suffix to measure morphological awareness. They also used a Sentence Structure task asking the students to select one of the three sentences that were composed of the same words but with different word orders to measure syntactic awareness. Because of the high correlation between the two variables, they named these tasks morpho-syntactic tasks. These measures were assessed via a multiple-choice procedure and to investigate their effects on reading comprehension while the way testing syntactic and morphological awareness measures in the present study was to write the correct answer and the purpose was to investigate their effects on writing performance. Nevertheless, the interrelationships between these two language skills were highlighted because of the intertwined connections between the ability to deduce the meaning of morphologically complex words based on morphological awareness and the understanding of how different classified words are combined to form effective sentences and how different classified words are marked with various morphemes (Geva & Farnia, 2012). These abilities and understandings jointly contribute to successful reading and writing in English.

Syntactic awareness was also more correlated with grammatical knowledge. This finding adds to the body of evidence showing that learners who have a higher level of understanding of syntactic structures have been reported to be more sensitive to grammatical violations than those who have a lower level of syntactic awareness understanding (Isakson & Miller, 1976; Stothard & Hulme, 1992). It also corroborates Nation and Snowling's (2000) findings which showed that students have more

difficulty in reordering sentences in the syntactic word order tasks when there is a greater number of grammatically correct alternative forms within the sentences, indicating that grammatical knowledge encompasses proficient syntactic awareness (e.g., Nation & Snowling, 2000). Some factors may explain the relatively good correlation between grammar and syntax. A possible explanation might be related to the procedure of the syntactic judgement and word order tasks (see Chapter 3 sections 3.2.2 and 3.2.3 for the example), which were developed as rewriting syntactically correct sentences. Good knowledge of grammatical rules and conventions might be required to put words together for phrase formation and then for the production of efficient sentences (Brown, 2016). Students working on correct syntactical sentences of English need a good knowledge of grammar in order not to produce a sentence with syntactic ambiguity when it is typical of written standard English. Another possible explanation for this is that the variation in syntactic word order reflects a single underlying option in the grammar (Pintzuk, 2014; Ravshanovna, 2020). It also seems possible that this result is due to the grammatical judgement task that was designed as multiple choices according to the given sentences. In Part A of the Grammatical Judgement task, students were required to choose the incorrect word or phrase among the four underlined words. For example, in order to work out the incorrect word in the sentence, *The city doesn't need no more taxes; everyone pays too much already,* students' awareness of word order sorting was activated in terms of the correct order of, *not any more*, or the correct order of negative words in a sentence. Specifically, students can choose *no* as the incorrect answer since there is a *doesn't* before the verb *need* and the word *no* should be changed to *any*, or they can choose *doesn't* as the incorrect answer because there is a negative word *no* after the verb *need* and the word *doesn't* can be changed to *does*.

Although the three language skills related to higher-order cognitive abilities in the writing process were showing larger interrelations and also significantly associated with overall writing scores, the stepwise regression findings showed that grammatical knowledge and morphological awareness were not significant predictors of adult learners' ESL writing ability when treated in the whole cohort. Syntactic awareness was the only higher-order skill variable that entered into the regression equation, suggesting that syntactic awareness was a dominant explainer of adult ESL learners' writing ability. This may be because grammatical knowledge and morphological awareness were explaining the same variability as syntactic awareness. Chinese adult ESL writers still need grammatical knowledge and morphological knowledge, but the type of understanding that supports writing is that which grammatical knowledge and morphological knowledge has in common with syntactic skills area. For instance, first and second-person pronouns, the pronoun *it*, contractions, nominalizations, prepositions, specific conjuncts, and agentless passives, as important grammatical constructs that play important roles in the achievement of writing products, are also considered typical aspects of multi-dimensional syntactic features by Connor and Biber (1988), and these aspects were also referred to in the measures of syntactic awareness when making corrections of word and/or phrase orders and deciding the correct orders of words and phrases. For example, item 10 of the Syntactic Judgement Task: *Painted and signed by the author*. The participants could treat this as an agentless passive, and add the main sentence after it to rewrite the syntactically correct version of the sentence as required. Hence, a possible answer could be *Painted and signed by the author, this picture was priceless*. On the other hand, subject-verb agreement, past tense, and adjective comparatives, as common grammatical constructs that support successful written outputs, also invite morphological awareness of derivational and productive

pattern or affix when performing the grammatical judgement task, e.g., when figuring out that ‘less’ people should be incorrect because ‘less’ was supposed to be ‘fewer’. Furthermore, morphological skills have in common with syntactic skills in supporting writing (see 5.3.2 for explanation).

However, in addition to what has been explained in sub-section 5.3.2 in terms of the possible reasons why the current findings found syntactic awareness most predicting ESL writing ability, this was probably associated with the language use scale of the writing rubric. The language use scale was primarily developed to assess grammatical knowledge but it may have put more importance on syntactic complex construction and word order as syntactic awareness measures were correlated with the language use section to a larger level than grammatical judgement measure.

Moreover, morphological awareness was a common predictor of the overall essay writing scores of higher and lower proficiency Chinese adult ESL learners, suggesting that morphological awareness may play a significant role in second language writing regardless of the learners’ writing proficiency. This finding suggested the effect of morphological awareness on the writing abilities of higher and lower proficiency Chinese adult ESL learners. As discussed in the literature review section in terms of the Not - So - Simple View of Writing Model, morphological knowledge is a basic language skill that should support both transcription (lower-order cognitive ability) and text generation (higher-order cognitive ability) processes. Hence, morphological awareness should be considered a metalinguistic skill related to both higher-order and lower-order cognitive skills. This result may be explained by the fact that written English is a morpho-phonemic language (Apel & Werfel, 2014; Ping & Liow, 2011; Venezky, 2011), and morphological awareness is needed to produce a meaningful word by connecting the form and meaning of a word (Masilamani, 2019). The common

relationship between morphological awareness and writing development in higher and lower proficiency adult ESL learners is possibly due to the processing of the form and meaning of a word. As suggested by Saeed (2020) that the awareness of how to process meanings from the meaning of different units (e.g., affixes and roots versus concepts, phrase, sentences, and paragraphs) may also explain the association between morphological awareness and the development of ESL learners' writing ability. ESL writers with lower proficiency may have low levels of morphological awareness. They would perform poorer in connecting affixes and roots in written English. They may also inappropriately produce concepts, phrases, sentences, and paragraphs in the writing process. However, morphological awareness is still needed in their writing performance, although not as important as the largest predictor of lower groups' writing performance (see 5.3.4 for discussion on phonological awareness). In contrast, morphological awareness was showing the largest predictive power in explaining the variability of higher proficiency ESL learners' writing ability. This suggested that learners with higher proficiency would depend more on morphological awareness in terms of writing. Although few studies have looked into the relationships between metalinguistic skills and higher and lower proficiency writers, the effects of morphological awareness on writing observed in this study mirror those of the previous studies (e.g., Apel & Werfel, 2014; Northey, 2017; Northey et al., 2016; Saeed, 2020; Wilson-Fowler & Apel, 2015) that have examined the direct or indirect effects of morphological awareness on English writing by native English-speaking children and college students and ESL adults learners. In the study by Apel and Werfel (2014), Implicit Awareness Tasks used were similar to the Correct Derivation task used in the present study, which provided evidence supporting the role of morphological awareness in word recognition and spelling and further contributes to written language skills of school-age children. The

finding of the relationship between morphological awareness and writing ability is also supported by the influence of morphological awareness on literacy skills as suggested in a study by Wilson-Fowler and Apel (2015) who found that morphological awareness is a strong predictor of college students' spelling abilities. This further explains the finding found in the present data that morphological awareness is important in the writing performance of higher and lower proficiency writers in terms of its important role in word recognition and spelling.

5.3.4 Lower-order language skills

According to the Not-So-Simple View of Writing Model, transcription skills represent lower-order cognitive abilities (Poch & Lembke, 2017). As introduced in the model section in the literature review chapter, phonological awareness and orthographic awareness were important elements in the development of transcription skills. It was suggested in the current findings that phonological and orthographic awareness was significantly correlated with overall writing scores because of their collective importance in the transcription process.

A measure mapping onto both participants' phonological and orthographic awareness was used in this study and it was found that not only was it significantly associated with other independent variables as well as with adult ESL learners' writing, but also positively predicted writing ability. The observed correlation might be explained in this way. In order to write the real word according to the made-up words which sound like a real word but spelled incorrectly (e.g., sox, eggzostid, emoushn), students need to activate their phonological awareness to pronounce these words (e.g., /sɒks/, /ɪg'zɔːstɪd/, /ɪ'məʊ.ʃən/) first and then work out the correct spelling based on the awareness of orthographic rules (e.g., x - /ks/ - ks - socks, ggz - /g'z/ - x - exhausted, shn - /ʃən/ -

tion - emotion). This is also supported by Ehri's (1992) theory of word learning. According to this theory, word learning entails the combination and activation of various word identities (e.g., orthography, phonology). A combination of phonological and orthographic awareness, namely graphemes and phonemes, occurs when the written form of the lexis needs to be completed. These connections bond phonological and orthographic awareness to lexical spelling and meaning, enhancing the words' memorability through written words and pronunciation (Sadoski & Paivio, 2013), enabling learners to produce words at an automaticity level when writing an essay.

Phonological awareness was also found to be a small but significant predictor of ESL learners' writing performance. According to the correlation analysis, phonological awareness was significantly and positively correlated with essay writing measure. Phonological awareness has been identified to be correlated with English spelling (Adams, 1994; Council, 1998; Zhao et al., 2017). Producing correct spellings of words helps with writing fluency (Ocal & Ehri, 2017) and phonological awareness and orthographic awareness were correlated to a larger level than with other language skills because the way how a word is pronounced helps in acquiring how to write it (Saeed, 2020). When writing in English, sound units (e.g. graphemes, phonemes, syllables, and morphemes) are read or pronounced to oneself first and corresponding spelling units are then matched to produce a specific word. Therefore, phonology plays a role in helping students to acquire how to spell words and how to compose words.

However, according to the results presented in this study, across all language skills assessed, orthographic awareness demonstrated relatively small correlations with the adult ESL learners' writing performance. Orthographic awareness has been found to explain variability in word-level skills, such as spelling and pseudo-word recognition (Sadeghi et al., 2014), especially in young children. It may be assumed that

orthographic awareness can only influence the overall quality of adult ESL learners' writing output when it is considered together with phonological awareness in terms of their collective effects on certain aspects of writing (maybe basic word production as discussed earlier in this section). However, the writing rubric used in this study placed a little emphasis on spelling and handwriting. These were assessed via the mechanics subscale, which was given scores out of five in a rubric that produced total scores out of 100. If orthographic awareness supported those aspects of writing assessed by the mechanics subscale, then its lack of influence on the overall writing score may not be surprising. Although, this explanation does not help us understand why the orthographic awareness measure showed only a small correlation with the mechanics scale itself. In future investigations, it might be possible to account for equal proportions of scores of each sub-scale (e.g., as did by Masilamani, 2019; Wu et al., 2019), in order to avoid possible reflection of unweighted marks on the interpretation of results.

In terms of the findings related to phonological awareness, Harrison et al. (2016) argued that phonological awareness was the strongest predictor of the variance in word-level spelling, and Jongejan et al. (2007) have argued that phonological awareness was significantly predictive of grade 3-4 ESL children's spelling. Phonological awareness has also been found to be a significant predictor of Chinese children learning to read English as a second language (Chow et al., 2005). These findings may suggest that lower proficiency writers are at their early phase of ESL learning, meaning that their performance would parallel that of the younger first language students. In the Chinese context, the pronunciation of words is the very first step of English language acquisition, which may mean that the lower proficiency students are more dependent on

phonological processing than other language skills, such as grammar and syntax, which are yet to be fully developed.

Phonological awareness showed a significant correlation with the overall essay writing abilities of the lower proficiency ESL participants, whereas there was no significant relationship between phonological awareness and higher proficiency learners' writing performance. However, the observed discrepancy between the two groups doesn't mean that the other language skills showing a lower size of correlation were not important in the development of the writing ability of learners at a higher or lower level of ESL proficiency, but these skills may not have been activated or used when producing a written text. The reason why there was a non-significant association between phonological awareness and the writing ability of the higher proficiency writers might attribute to the possibility that the higher group of writers may not be mapping onto the phonological awareness in their composition writing process. Alternatively, phonological and orthographic awareness may be stimulated simultaneously to make a correct spelling, which is consistent with the cognitive processing of skill learning proposed by Ackerman (see Ackerman, 1987; Ackerman, 1993; Kanfer & Ackerman, 1989). Higher proficiency writers who possess a high level of automatization of skill components require little information processing or cognition (e.g., phonological processing) when performing some language tasks (e.g., essay writing), leading to the occurrence of individual differences in task performance (e.g., higher and lower proficiency learners respond differently in terms of the importance of phonological processing in completing essay writing tasks). Moreover, it can be specifically connected to second language learning that when "the individual has achieved a very high level of skill", the targeted aspects (e.g., aspect of phonological awareness) of performance "become autonomous" (Segalowitz, 1997, p. 94). This means higher

proficiency ESL learners may be able to perform certain aspects (e.g. word recognition and pronunciation) of the language task (e.g. essay writing) implicitly.

However, given that the correlation is at a small to medium size and small variabilities in writing ability of both groups are explained by the assessed language skills, it may be the case therefore that there might be some other variables differentiating good and poor writers. For example, metadiscourse feature (e.g., addressing organization and content) may be an important variable in judging good and poor ESL essays (Intaraprawat & Steffensen, 1995), and transcription skill might be the best variable to differentiate good and poor writers (Berninger et al., 1994). Additionally, language learning beliefs held by higher and lower proficiency ESL learners caused discrepancies between the two groups (Huang & Tsai, 2003), leading to higher and lower quality levels in their writing performances. Last but not the least, the number of English writing lessons might be an influential factor as well, especially for those students who plan to be in pursuit of further study at home and abroad. ESL learners may decide to attend extra courses outside of the university classroom and receive academic English writing instructions to live up to the expectations of the required English tests. These possible variables suggest that it may be necessary for classroom teachers to take these into account in terms of developing appropriate teaching materials and teaching approaches. The number of teaching hours should also be increased at a tertiary level to allow educators more time to teach the students essential skills of improving writing ability, and teachers teaching different aspects of English should collaborate with each other when preparing for the teaching curriculum. Moreover, it is of paramount importance that teachers who teach ESL students are provided frequent discussions about what ESL writing outputs can be considered competent and incompetent, and what progress can reasonably be expected from lower and advanced ESL student

writers in terms of their writing performance within a foreseeable period of time (Sweedler-Brown, 1993). Moreover, academic writing courses taken by students are another possible element in causing the discrepancy given that, in a study conducted across 103 students in four universities in China, only half the students indicated that they had taken courses that they perceived were beneficial to their writing abilities (Cumming et al., 2018).

5.3.5 Vocabulary measure and ESL writing

Vocabulary was significantly associated with the overall writing scores assessed by the rubric developed by Jacobs et al. (1981), suggesting that vocabulary knowledge did play a role in the development of writing performance, which is consistent with the previous findings (Chang-cheng, 2006; Guanghui & Qiufang, 1999). However, it is surprising to note that in all seven language skills assessed in the present study, vocabulary showed the smallest correlations, and the multiple regression analysis indicated that vocabulary was not a significant predictor of writing performance. This does not fit with the Not-So-Simple View of Writing Model or the Latent Variable Model of L2 Writing Quality. According to the Not-So-Simple View of Writing Model, vocabulary is one of the high-order language skills that support the text generation process. The Latent Variable Model of L2 Writing Quality suggested that lexical sophistication is a significant predictor of L2 writing quality. Therefore, this result of the current study does not support previous research that affirmed that vocabulary knowledge is a predictor of ESL writing quality (Astika, 1993; Harrison et al., 2016; Leki & Carson, 1994; Masilamani, 2019; Schoonen et al., 2011; Wang, 2014). It is also inconsistent with some studies conducted in the Chinese ESL context that argued a bigger contribution made by vocabulary to English writing performance than English grammar (Wu, 2018) and morphological awareness (Wu et al., 2019). The two studies

(Wu, 2018; Wu et al., 2019) measured both breadth and depth of vocabulary, whereas the current study focused only on the size dimension of vocabulary knowledge. The issue of breadth and depth of vocabulary as it relates to the current study was discussed earlier in this chapter (see 5.3.1).

A further possible explanation might be that the vocabulary measure was the last one in the 10-measure booklet that the participants completed. Although rest intervals were given during the assessment, the participants may still have attempted to complete the last test faster than their usual rate of completion of such tasks. Additionally, in the current study, the way to assess students' vocabulary (to choose the meaning that most closely matches the highlighted words in the example sentence) was not the same as the usual practice when the Chinese students were tested their vocabulary knowledge. The usual practice in their English tests was to choose the correct word from four different forms of a word or four words with different meanings. This lack of familiarity may have also confused some participants, and led to an atypical performance.

It seems possible that this result is also due to the vocabulary strategy used by the students. Chinese ESL learners may acquire some special vocabulary strategies taught by their teachers. For instance, some teachers teach the students to store some infrequent vocabularies in their memory and specifically use them at the beginning and the end of their compositions and repetitively use these words to try to fit with different writing tasks. Students do so because they are told that examiners tend to instinctively be impressed by the unusual words used in the first and last paragraph of an essay, especially when a large number of essays need to be marked. Consequently, students are able to apply certain underlying vocabulary strategies to achieve writing tasks, but they don't have comprehensive knowledge about the vocabularies which include the meanings and appropriateness in different contexts. However, ESL learners from other

contexts may not be taught certain vocabulary strategies as the Chinese ESL learners have been done.

Another interesting finding was that there was a significant correlation between vocabulary knowledge and the overall writing performance of the higher proficiency group, but a non-significant correlation between the same variables for the lower proficiency group. There are similarities between the results found in this study and those explored by McNamara et al. (2010) who argued that compositions assessed to be of higher quality were more likely to employ a diversity of words. Similarly, Zhai's (2016) study on Chinese EFL learners' indicated that learners with higher writing ability were able to use a greater range of words than learners with lower writing ability. This further confirms an earlier finding of Laufer and Nation (1995) who suggested that less proficient learners tended to use more frequent words and showed a tendency towards using the less sophisticated vocabulary. That is because a richer vocabulary is likely to be a characteristic of a better ESL writer, with gaps in vocabulary knowledge tending to widen over time although they are generally negligible among lower proficiency language learners (Wu, 2018). Furthermore, as discussed in 5.3.1, the vocabulary measure employed in this study was breadth focused, because the vocabulary measure was chosen based on the researcher's experience with the Chinese ESL learners who usually consider increasing English vocabulary size as a preliminary approach to acquire English vocabulary knowledge. While the vocabulary sub-component of the writing rubric is more depth focused, and the breadth-depth correlation tends to be stronger among ESL learners with higher proficiency (Nurweni & Read, 1999; Wu et al., 2019).

To sum up, the different relationship in terms of vocabulary and writing ability between higher and lower proficiency ESL writers is supported by previous studies as discussed

in the preceding paragraph. However, further study is needed regarding the unexpected finding in the whole cohort indicated by vocabulary and ESL writing performance revealed in the present data, because, as discussed in the literature review chapter and earlier in this sub-section, the previous researches have witnessed a noticeable number of publications on the positive effect of vocabulary knowledge on academic writing in native English and ESL (Grobe, 1981; Leki & Carson, 1994; Llach, 2007; Morris & Cobb, 2004; Olinghouse & Wilson, 2013; Saville - Troike, 1984; Wong, 2012). Further research considering the above possible explanations is discussed later (see section 5.5 for details of suggestions for future work).

5.3.6 The adapted writing model

As discussed in Chapter 1 and Chapter 2, writing involves a range of multidimensional linguistic and cognitive skills that affect writers' writing performance. Although quite a few L1 and L2 writing models have been proposed by scholars and researchers, this study chose the Not-So-Simple View of Writing Model developed by Berninger and Winn (2006) and the Latent Variable Model for L2 Writing Quality developed by Kim and Crossley (2018) as theoretical frameworks to investigate the metalinguistic and language skills required in the development of second language writing and particularly address the relationship between syntactic awareness and writing ability among Chinese adult ESL learners in mainland China. Figure 5.2 presents an adapted L2 writing model from Berninger and Winn (2006) and Kim and Crossley (2018).

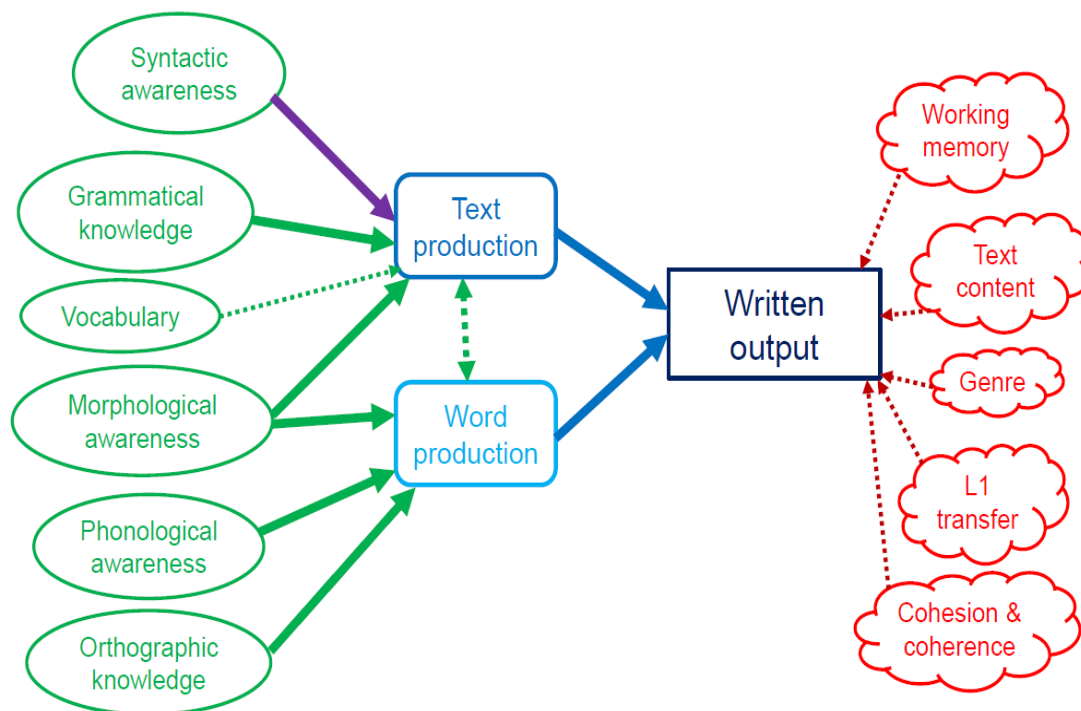


Figure 5. 2 An adapted L2 writing model from Berninger and Winn (2006) and Kim and Crossley (2018)

According to Berninger and Winn’s not-so-simple view of writing (2006), transcription, text generation processes, and higher-order executive processes (e.g., planning, reviewing) all compete for limited working memory resources during writing. By such an account and by such findings suggested in the present data, increased fluency of text generation (resulting from increased syntactic skill, morphological awareness, and grammatical knowledge) and transcription (resulting from increased phonological and orthographic, and morphological skills) could lead to improved writing because of specific aspects of the language generated (e.g., effective word order awareness resulting in more varied or sophisticated syntactic structures, awareness of morphology, phonology and orthography resulting in more precise word choice and accurate spelling). Besides, Berninger and Swanson (1994) also documented that both transcription and text generation skills contributed significantly to composition quality

across the intermediate and junior high school years. Consistent with this view, the current study suggested a similar finding across the adult ESL writers. Moreover, syntactic awareness may facilitate the production of ideas more clearly and effectively and may help to support the process of revision during writing, so writers could obtain increased ability to attend to higher-level goals, such as planning and revising, as a result of increased available working memory resources (see also McCutchen, 2000; Northey et al., 2016).

The findings also provide an expansion of prior models offering a picture of the respective roles of syntactic awareness, morphological awareness, grammatical knowledge, phonological awareness, and orthographic awareness in the writing ability of adult ESL learners, with syntactic awareness more predictive (the purple arrow indicates its stronger predictive power in adult ESL learners' writing ability).

Although the relationship between vocabulary and adult ESL learners' writing ability does not fit either the not-so-simple writing model or the latent variable model for L2 writing ability, vocabulary is still kept in this adapted model given its important role in writing performance emphasized in many previous studies (Masilamani, 2019; Wu, 2018; Wu et al., 2019). A dotted arrow between vocabulary and text production presents the unexpected finding in this study.

Given that the correlation results in this study are at a small to medium size and small variabilities in writing ability of adult ESL learners are explained by the assessed language skills, there might be some other important variables that might explain further variability in writing quality (see 5.5 for details about future suggestions), such as working memory (based on its important role implied in the not-so-simple view of writing model), text content (based on its large weight in the currently used writing rubric), the genre of composition (based on the different structures and emphasis found

in compositions of different genres), L2 transfer (based on the effect on L2 writing established in previous findings), cohesion and coherence (based on the importance in the latent variable model for L2 writing ability and in most essay rubrics). The possible correlations which might be suggested by these variables and written output are indicated by red dotted arrows in the figure.

5.4 Educational implications

In addition to the theoretical implications, the findings from the current study also have implications for developing and improving educational practice. An initial objective of the study was to identify the predictors of the writing ability of adult ESL learners in a Chinese context. These might then be used to support the research, teaching and learning of English second language writing in China. Differences did exist in terms of the predictors of lower and higher proficiency adult ESL learners' writing ability, which provided further evidence for developing pedagogical approaches regarding adult ESL writers with different proficiencies. Although the data were collected targeting English-major university students, the implications obtained and suggested from these findings can be applied to researchers, teachers, curriculum developers, ESL learners targeting other participants in China.

This study is one of the first to control a range of basic language skills (e.g., grammatical knowledge, phonological awareness, orthographic awareness, morphological awareness, and vocabulary) so as to measure the effect of syntactic construct on adult ESL learners' writing ability. Hence, this study provides more accurate estimates of relationships among syntactic awareness, grammatical knowledge, phonological awareness, orthographic awareness, morphological awareness, vocabulary, and writing ability than previous correlational studies with adults or

children. As such, the findings hold particular implications for the assessment of writing-related skills. For adult ESL learners in the Chinese context, these above language skills related to writing abilities should not be assessed in isolation in researching second language writing performance. Instead, all of these language skills should be assessed to get a comprehensive evaluation of their knowledge.

Given the indication that syntactic awareness was the largest predictor of adult ESL learners' writing ability assessed in this study, this study has also supported the importance of syntactic awareness in the development of writing abilities. Given that previous research related to the effectiveness of explicit second language training/instruction has demonstrated "that focused second language instruction results in large target-oriented gains, that explicit types of instruction are more effective than implicit types, and that the effectiveness of second language instruction is durable" (Ellis, 2002, p. 145), it may be that the teaching of syntactic skills would be beneficial for Chinese ESL students' academic English writing. In some relative research to date, syntactic awareness is considered an important element for improving writing skills. For example, Northey et al. (2016) explored the contribution of morpho-syntax to children's essay writing skills and found that condensing syntax via morphologically manipulating words in a sentence-combining task was predictive of the quality of the students' essay writing at the word, sentence, and text level. However, syntactic awareness was not assessed separately from morphological awareness and the effect was caused by morphological awareness or syntactic awareness is confusing. The findings from the present study suggest that syntactic awareness is more predictive of adult writing ability than other skills assessed in this study. The findings of the present study also provide an instructional direction for adult ESL learners' writing intervention because intervention focusing on language tasks in terms of syntactic complexity and

the important training effect on syntactic features to improve L1 learners' (Saddler & Graham, 2005) and ESL learners' (Lu, 2011) writing quality has been proved effective. Hence, I argue that to make explicit syntactic knowledge instruction aim at improving writing ability more effective, syntactic-oriented intervention should be expanded to include syntactic tasks such as rewriting dangling sentences and fragments (e.g., to rewrite the fragment *If you bring your guitar to the picnic*. A correct answer can be *If you bring your guitar to the picnic, you can play your new song*) and rearranging randomly arranged words into syntactically correct sentences with correct word orders (e.g., *the for which you obvious have searching been answers are*. A correct answer can be, *The answers which you have been searching for are obvious*). Moreover, considering the interrelations between syntactic awareness and morphological awareness, morpho-syntactic intervention activities should also be applied to improve students' morpho-syntactic production and then contribute to essay writing skills. In this case, sentence combination activities addressing morphological and syntactic awareness (e.g., *The children slept under the sky. The sky looked like ink. Their sleep was deep*. A correct response to this combination task might be *The children slept deeply under the inky sky*) would be effective teaching and learning activities in and out of class.

Furthermore, it is suggested that educators and curriculum developers should incorporate syntactic awareness, morphological awareness, and grammatical knowledge activities into the curriculum and class activities of the university classroom context. A special recommendation goes to syntactic awareness that it should be part of the second language writing curriculum because of its stronger predictive role than other language skills assessed in this study, just as Ortega (2015) suggested that the value of syntactic development for second language writers is undeniable. Additionally,

as the genre of the essay-writing task assessed in this study is argumentative, these empirically tested measures may also have implications for the teaching of argumentative writing. The results of the present study suggest that it may be advisable to emphasize explicit syntactic knowledge tasks in the teaching of argumentative/persuasive writing, as Qin and Uccelli (2016) suggested that argumentative essays showed more complex syntactic features than narratives.

Moreover, it is important for ESL teachers and researchers to carefully choose writing rubrics when rating compositions and to make sure that the marking descriptors in the rubric are well instructed in teaching activities and are assessed correspondingly in the research. Additionally, some professional development for ESL teachers on using the explicit criteria and perhaps include levels within each criteria could be recommended. The findings suggested that syntactic awareness was the largest predictor of learners' writing ability. As explained in the previous section, it might be related to the subscales of the writing rubric assessed by certain descriptors.

Furthermore, teaching activities mapping onto morphological awareness, phonological and orthographic awareness, and syntactic awareness would help students to perform better in terms of mechanics based on the associations found in the present study. For example, incorporating error-correction activities addressing mastery of conventions, errors of spelling, punctuation, capitalization, and paragraphing into morphological, phonological and orthographic, and syntactic awareness tasks. Sample sentences with the above errors can be selected from the students' written output and peer reviews (e.g., students ask questions, offer explanations, give suggestions, restate what their peers have written, correct mistakes) is also recommended as Mendonca and Johnson (1994) suggested that ESL students overall found peer reviews useful and to include peer reviews in second language writing instruction is important.

However, given that the language skills demonstrate small- to medium-sized correlations with content, organization, vocabulary, language use, and mechanics of the essay rubrics, additional skills, for example, as discussed previously in the present section, may need to be pursued by teachers and curriculum developers for the sake of better-assessing learners' writing abilities and improving their academic writing abilities.

Knowledge of predictive language skills may aid ESL learners with the development of certain aspects of English essay writing, and it is also possible to assist students with lower and higher levels of English proficiency to improve their writing abilities from different language skills aspects. It was suggested that L2 writers' language proficiency could influence L2 writing (El-Dakhs, 2020), it is therefore important for English language teachers to place close attention to learners' language proficiency.

These findings from the current study suggest that morphological awareness is a common predictor of writing ability even though their writing proficiency differs, which is consistent with the findings of El Malaki's (2020) study. It may be therefore effective if ESL teachers can help students with higher and lower writing proficiency improve their writing abilities through facilitating morphology knowledge via language activities in class. Apart from morphological awareness, phonological awareness was found to be a predictor of lower proficiency writers' writing abilities but not applicable to higher proficiency writers, as discussed in section 5.3.2 that lower proficiency writers may depend more on phonological awareness in their writing process, it may be the case therefore that these variations provide teachers and curriculum designers with possibilities of supporting phonological awareness teaching activities to especially improve the writing ability of lower proficiency writers who would later recognize that they may benefit a lot from these specifically performed language skills. As such,

exposure to English phonological awareness might be implemented as remedial lessons of the tertiary courses, especially for poor ESL writers.

The assessment instruments used in this study were developed to investigate the ESL learners' writing ability. Such tools might also be useful for additional studies. For example, in China, they could be used to test secondary ESL learners in high schools or college English (non-English major) learners at colleges and private language institutions, but the ability levels of these measures should be adjusted based on the students' language proficiency.

5.5 Limitations and suggestions

Although the findings indicated the existing associations between assessed language skills and the writing ability of ESL learners, the amounts of variability explained in the overall writing abilities was low. The findings do not mean that the language skills assessed are unimportant since any significant predictor should be considered; however, it suggests that there is still a lot to investigate about those factors that are predictive of the writing ability.

The generalisability of the results obtained from this study is subject to certain limitations that may help better understand the findings of the current study and provide references for future studies targeting ESL/EFL writing context in terms of second language theories and practices. A limitation of this study lies in the fact that the sample was regionally representative but may not be representative of those who were receiving tertiary education in other cities in China or elsewhere in the world. For example, those contexts where students may have been exposed to English at a different age or had more chances to be exposed in an English-speaking environment, or have

had rich English print available. Therefore, future studies may consider recruiting participants from other cities in China with different English learning backgrounds.

A limitation of this study might be related to the reliability of some measures. Three pilot studies were conducted prior to the main study to ensure that the modified measures would be working well in the main study, but internal consistency of certain measures (e.g. grammatical judgement task) between the 1st and 2nd pilot test with the same items of some measures differ a lot. This may be due to the different strategies participants used to answer the questions. For the group that produced more consistency, they may use the same strategy to answer the questions, and for the group that produced less consistency, they may use different strategies to answer the questions. Given the unexpected results of the 2nd pilot study in terms of the reliability of certain measures, some items were amended for the sake of acceptable internal consistency of all measures in the main study. The amended measures worked well in the 3rd pilot study, nevertheless, some measures still produced moderate levels of internal consistency (e.g. Syntactic Word Order Task $\alpha = .61$, Morphological Production Task $\alpha = .69$, and Receptive Vocabulary Task $\alpha = .66$), or unacceptable levels of reliability (e.g. Grammatical Judgement Task $\alpha = .55$, Correct Spelling Task $\alpha = .49$, and Sound Like a Word Task $\alpha = .57$). Although the researcher was very careful about the data used to analyse and answer the research questions, for example, items with near-zero item-total correlations and negative corrected item-total correlations were deleted to lead to the alpha score changing to a higher level, some items in certain measures still need revisions when developing future measures. For example, in item 9 of the first part of the Grammatical Judgement Task: *Less people stood in line for concert, even though there were more tickets available*, the mistake *less* (the correct answer should be *fewer*) may be either grammatical or lexical, depending on students'

different ways of responding; similarly, in item 18 of the second part of the Grammatical Judgement Task: *How many times **have I told you not to do that?*** The correct answer may be either lexical, syntactic or grammatical. In future studies, measures should be developed to assess only one language skill in a particular measure. For instance, the above-mentioned items which were applied to assess grammatical knowledge but turned out to be assessing lexical and/or syntactic aspects either would be deleted or carefully revised (e.g. item 9 - ***less** people stood in line for concert, even though there were more tickets available* will be changed to *fewer people stood in line for concert, even though there **was** more tickets available*. In this case, the mistake '**less** people' is substituted with the mistake '*there **was** more tickets*', ensuring that grammatical knowledge is the only language skill assessed in this item. Similarly, regarding item 18 – *how many times **have/did/do/has** I told you not to do that?* it can be designed and revised to be choosing the correct answer from '*have/did/do/has*', again to ensure that grammatical knowledge is the only language skill tested).

Another limitation of the current investigation was the exclusion of measures of the students' first language, and hence the lack of assessment of first language transfer, an effect that has been widely elaborated in the previous studies (Mohan & Lo, 1985; Qin & Uccelli, 2016; Wang, 2003; Wang et al., 2005) might be an important aspect to investigate. Such first language findings suggest the need to assess students' native literacy, educational experience, and writing system as important influential factors in developing academic written texts in English. For example, González et al. (2001) claimed that Chinese ESL learners may consider using the cultural rhetoric patterns of their first language, which might lead to the presence of rhetorical functions of written Chinese discourse, instead of the appropriate use of English syntax and structure. Wu (1992) suggests that first language transfer may lead to problems associated with some

instructional factors; for example, if the focus of language instruction is placed primarily on syntax and grammar. Future research including the role of first language transfer as one aspect of the assessment battery would be worthwhile, to evaluate and compare the different relationships with other language skills in predicting ESL writing ability from the perspective of syntactic awareness and grammatical knowledge.

A limitation to this study also needs to be acknowledged in terms of the argumentative genre of the employed essay writing task. Compositions of different genres may lead to different loads (Weigle et al., 2003) and different structures (Ghazanfari et al., 2011). For example, Ferris (1994) discovered that in argumentative writing, raters usually assign higher scores to written texts in which rhetorical features were more applied. However, instead of rhetorical features, the writing rubrics (Jacobs et al., 1981) used in the current study placed the largest weight on content which is considered as the most important element in rating expository essays (Mendelsohn & Cumming, 1987). In expository essays, writers are required to accumulate facts and information, and then organize them logically and successfully. Personal opinions, thoughts, and feelings should be excluded from this type of essay. In argumentative essays, writers need to set an argument and counter-argument via the application of a wide range of rhetorical features to help convince readers of a certain point of view. In this type of essay, personal opinions and thoughts are persuasively articulated via relevant evidence to back the specific argument. Therefore, future research contrasting different genres of essays, coupled with corresponding emphasis on certain sub features (e.g., rhetorical features for argumentative essays, content for expository essays) in the methods of assessing writing performance in order to better interpret students' writing output and the factors that influence such output.

It is unfortunate that the study did not include a measure assessing the text content, which, as described in the previous paragraph, was assigned the largest weight in the currently used rubrics. And in the Chinese teaching and learning context, content of text often plays an important role in ESL learners' writing quality (Huang, 2009), and teachers tend to consider written texts that are knowledgeable, substantive, relevant to the assigned topic, and successfully demonstrate a thorough development of thesis competent to be excellent. It is recommended that future research should be undertaken in the area of the type of writing output required. For example, a written output with specific content is required of writing in English for academic purposes, enabling students to produce writing that satisfies the expectations of the particular academic discourse community and better catering for the academic writing needs of ESL students in tertiary education (Hu, 2007).

The current study is limited by the lack of a language placement test to differentiate the higher and lower proficiency of ESL learners. The two groups with higher and lower levels of writing ability were divided according to the overall scores of the essay writing task, which was marked via the analytic rating criterion, Jacobs et al.' ESL composition profile (1981). However, Izadpanah et al. (2014) argued that lower proficiency learners' writing ability might be under-estimated by analytic rating because the holistic rating rubric (TOFEL iBT rating system) and analytic rating rubric (Jacobs writing rubric) revealed no significant relationship between low groups defined by the two rating rubrics while the correlation between the scores found in the high group was significant. Hence, further trials should assess the impact of language proficiency and the impact of different rating criteria, to further explore the difference of predictors of higher and lower proficiency writers. This may be achieved by applying an appropriate language placement test to judge ESL language proficiency and then employing different rating

criteria to score the written texts produced by two groups of learners respectively, which may yield different but interesting results as well.

Another important limitation is that this study was unable to assess and analyse the effect of cohesion and coherence. Cohesion deals with the more obvious language forms and generally refers to grammatical cohesion and lexical cohesion (Halliday & Hasan, 2014) and coherence is “an essential practical construct in describing the quality of written discourse” (Richards et al., 1990, p. 104). Measures including the two features might lead to a better and more reasonable assessment of the five subscales of the writing rubrics since cohesion is an important component in the organization subscale of the Jacobs et al. (1981) composition profile. The relationship between coherence and ESL writing ability has been studied previously (Connor, 1984; Lee, 2002; Liu & Braine, 2005; Masilamani, 2019; Saeed, 2020; Yang & Sun, 2012). Liu and Braine (2005) argued that cohesion and coherence are important for writers to produce a text and for readers to comprehend a written text. Yang and Sun (2012) suggested that, regardless of the language proficiency levels of ESL learners, using cohesive devices (e.g., conjunction, reference, ellipsis, and substitution) correctly has a significant and positive association with the quality of their written texts. However, these studies either addressed the predictors of cohesion and coherence or investigated them as predictors of writing ability without taking into account other linguistic variables. Therefore, future experimental investigations are needed to estimate the role of cohesion and coherence, along with other language skills and rubric subscales measures, in predicting and supporting second language writing ability.

One source of weakness in this study was that the vocabulary test used in the current study assessed the size/breadth of learners’ vocabulary, not the depth of vocabulary. Considering that the two dimensions of vocabulary are intertwined with each other

(Schmitt & Meara, 1997), future investigation of depth and breadth of vocabulary is recommended. For example, Read's (1993) Word Associate Test (WAT) might show that depth of vocabulary has a larger correlation with writing ability. Alternatively, including measures of both depth and breadth of vocabulary may produce different associations with higher and lower proficiency ESL writers.

Next studies may include other ways to analyse adult ESL Learners' writing samples to investigate how these other ways of analysing writing might relate to the metalinguistic and linguistic skills measured. In the Chinese context, English compositions with more words have long been believed to be indicating ESL learners' higher English proficiency, while compositions with fewer words are usually considered to be related to less proficient writers. Chinese ESL teachers always encourage students to write as many words as possible when teaching writing skills in class (Nie, 2014). The close relationships between the number of words written and morphological awareness and orthographic awareness have been evidenced in the adult ESL context in other countries (e.g. Masilamani, 2019). Given this background, it is useful to further analyse the writing sample in terms of the number of words written to investigate its relationships with ESL learners' English metalinguistic skills such as morphological awareness and orthographic awareness in the Chinese adult ESL context. Additionally, the complex nature involved in ESL writing requires more than one metalinguistic skill in order to produce a quality ESL writing output. Especially spelling and grammar errors made in the essays are typical elements when scoring the compositions written by Chinese ESL learners (Liu, 2015; Sun & Shang, 2010). Therefore, analyses targeting relationships between spelling errors produced in the essay writing samples and the morphological awareness, orthographic awareness, phonological awareness, and phono-orthographic awareness will be of great

significance for Chinese ESL teachers and learners. Similarly, it is also important to investigate the relationship between grammar errors and phono-orthographic awareness, morphological awareness, and syntactic awareness. If better phono-orthographic awareness is related to fewer spelling errors, then teaching the link between phonology and orthography (e.g. grapheme-phoneme correspondence) should produce better spelling results than teaching the two separately. If better morphological awareness is related to fewer grammar errors, then instructions about skills of morphological rules (e.g., affixes, inflections, and derivations) should produce better grammatical results than teaching phono-orthographic awareness and syntactic awareness.

5.6 Conclusion

The purpose of the current study was to investigate the specific influence of syntactic awareness in the writing ability of adult ESL learners by controlling for a range of other language skills (e.g., grammar, orthography, phonology, morphology, and vocabulary) and determine the predictors of the writing ability of ESL learners via an investigation into the role of these underlying language skills and how these may support adult ESL learners' writing ability, as well as the difference between higher and lower proficiency writers. The findings to emerge from this study suggest that syntactic awareness is significantly related to adult ESL learners' writing ability and it is more predictive than other language skills. It was also shown that morphological awareness was found to be a common predictor of writing ability across both groups of higher and lower proficiency ESL learners. However, phonological awareness supports the lower-level writers more while higher-level ones tend to be supported more by syntactic awareness and grammatical knowledge. Although the study has gone some way towards enhancing our understanding of the relationship

between language skills and ESL writing, the results produced from the regression analysis suggested that the level of variability explained in ESL learners' writing ability was not very high. Further research will be needed to investigate additional underlying skills and individual abilities that support ESL learners to become competent writers.

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Appendix A



HUMAN ETHICS COMMITTEE

Secretary, Rebecca Robinson
Telephone: +64 03 380 4588, Extn 94588
Email: human-ethics@canterbury.ac.nz

Ref: 2019/11/ERHEC

2 April 2019

Ping Li
College of Education, Health and Human Development
UNIVERSITY OF CANTERBURY

Dear Ping

Thank you for providing the revised documents in support of your application to the Educational Research Human Ethics Committee. I am very pleased to inform you that your research proposal "Relationships Between Chinese University Students' English Writing and Syntactic Awareness" has been granted ethical approval.

Please note that this approval is subject to the incorporation of the amendments you have provided in your emails of 11th and 29th March 2019.

Should circumstances relevant to this current application change you are required to reapply for ethical approval.

If you have any questions regarding this approval, please let me know.

We wish you well for your research.

Yours sincerely

PP

Dr Patrick Shepherd
Chair
Educational Research Human Ethics Committee

Please note that ethical approval relates only to the ethical elements of the relationship between the researcher, research participants and other stakeholders. The granting of approval by the Educational Research Human Ethics Committee should not be interpreted as comment on the methodology, legality, value or any other matters relating to this research.

F E S

Appendix B

From: Brimo, Danielle Danielle.brimo@tcu.edu

Sent: Tuesday, 19 March 2019 4:21 AM

To: Ping Li ping.li@pg.canterbury.ac.nz

Cc: APEL, KENNETH KENNEPEL@mailbox.sc.edu

Subject: Re: support

Good morning Lily,

Thank you for your interest in the tasks that I created. I will share the tasks with you; however, I want to provide you with some information.

The tasks underwent validation using Item Response Theory analyses. Attached is the unpublished manuscript. At this time, the paper is unpublished because reviewers pointed out that I did not assess the students' syntactic awareness with a validated assessment (concurrent validity). However, as you will read in the paper, the tasks have been validated for construct validity.

Here are some other anecdotal thoughts. The word-order task is somewhat dependent on vocabulary knowledge. The judgement task is based on explicit knowledge of sentences in written language (not utterances in spoken language). I mention this because the students have to judge the fragment sentences as incorrect and in spoken language, fragment sentences are acceptable.

With all that being said, if you use the tasks, I would greatly appreciate feedback and information about the tasks. I would highly suggest giving a validated assessment like the Comprehensive Assessment of Spoken Language-2 (CASL-2) grammatical judgment subtest. This will help to get the paper published.

Thanks again for your interest and please stay in touch,

Danielle



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From: Ping Li [mailto: ping.li@pg.canterbury.ac.nz](mailto:ping.li@pg.canterbury.ac.nz)

Sent: Wednesday, March 13, 2019 10:25 PM

To: Brimo, Danielle Danielle.brimo@tcu.edu

Subject: support

Dear Professor Brimo,

I am Lily from China. I am studying for my PhD at University of Canterbury in New Zealand. My research area is syntactic awareness and L2 writing ability (L1 Chinese and L2 English). I read your thesis and your instruments. I would like to request you to grant me permission to use your instruments (Syntactic Judgement and Correction Task & Syntactic Word Order Task for measuring Syntactic Awareness; Listening Comprehension subtest for measuring Syntactic Knowledge) in my research. If you could give me the permission to use your instruments, it would be very helpful for my study.

I look forward to a favourable response.

Thank you very much.

Kind regards,

Lily

PhD Candidate

University of Canterbury

New Zealand

TEST 1

Syntactic Judgement Task

**DO NOT TURN PAGE
UNTIL TOLD TO**

Syntactic Judgment Task

Instructions

Rewrite the grammatically correct version of the sentence on the line provided below each sentence. There are 15 items and you have 15 minutes to complete as many as you can.

From item 1 to item 8, you need to make corrections. When making corrections, you must use **all** the words provided; **no** words can be deleted from or added to the sentence. Points will not be taken away for punctuation (commas or periods).

Example:

I liked the picture of you on the diving board that you sent me.

Example 1 Answer:

I liked the picture that you sent me of you on the diving board.

1. Where I was born the house is red.

2. Brenda managed to build all her experiences into one cheerful world a shy woman to which her sort belongs.

3. He supervised with an interest in music the work of millions of singers.

4. Developed severe stage fright she suddenly having been chosen for the lead role.

5. Jill bought a town house the reporter.

6. What to wear to the party they sat discussing yesterday.

7. Bill toured Oklahoma with herbal cures and powerful oils the great supporter of mankind.

8. There are books on the shelf that must be distributed.

From item 9 to item 15, you need to rewrite the grammatically correct version of the sentence on the line provided below each sentence. When rewriting the sentences, you must **keep** all the words provided and **do not** make any changes on the existing words; words can be added before or after the sentence. Points will not be taken away for punctuation (commas or periods).

Example:

Before you do anything impulsive.

Example 2 Answer:

Before you do anything impulsive, you should count to ten.

9. Standing on the deck beside the captain.

10. Painted and signed by the author.

11. Because no students have applied for the job.

12. If you bring your guitar to the picnic.

13. Near the corner on the north side of the street.

14. Lamps that burned oil.

15. Playing tennis in the hot sun.

TEST 2

Syntactic Word Order Task

**DO NOT TURN PAGE
UNTIL TOLD TO**

Instructions

You will see 15 items of randomly arranged words. Your task is to rearrange the words to create a grammatically correct sentence. Write your sentence on the line provided below the sentence. Punctuation will not count against you. You have 15 minutes to complete as many as you can.

Example 1:

they because wanted they to the heat escape for the left mountains

Example 1 Answer:

They left for the mountains because they wanted to escape the heat.

Because they wanted to escape the heat, they left for the mountains.

Example 2:

ditches hand-dug for water-filled transportation canals useful are

Example 2 Answer:

Canals, hand-dug, water-filled ditches, are useful for transportation.

1. in drawer the was microphone placed the repaired left

2. noise strict the a did not librarian allow woman any

3. marathon a promising Daniel is athlete a candidate for good the

4. as the presentation is soon refreshments will be over served as

5. that about novel I from the borrowed library is the American war
the

6. the for which you obvious have searching been answers are

7. boss soon as money the job was as finished the her some gave

8. my the sister the standing girl on is seven years old bench

9. car in the wedding we our mother's found dress

10. children perfectly watching while the we were behaved them

11. were welcome we that we not very guessed

1. Though honoured with the title Athlete of the Century, he will always be
 A B
remembered as the footballer.
 C D
2. A lack in vitamin D, which comes from fortified milk or sunshine, can decrease the
 A B C
body's ability to absorb calcium.
 D
3. There are many people who wish they have started learning earlier.
 A B C D
4. If your are interested in pleasing customers, don't make them wait for service.
 A B C D
5. It seems like a good idea, so all the details what need to be sorted out will be
 A B C
 discussed in the coming meeting.
 D
6. The city doesn't need no more taxes; everyone pays too much already.
 A B C D
7. In contrast to its soft body and muscular feet, some mollusks have hard shells.
 A B C D
8. Although they have the advantage to being able to carry out their duties, they face
 A B C
some problems.
 D
9. Less people stood in line for the concert, even though there were more tickets
 A B C D
 available.
10. Of the three girls that recently joined the basketball team, Frieda is the tallest.
 A B C D

Part B: Answer the questions below. Select the *correct* answer to fill in the blank.

11. The company _____ waste into the river for years and it planned to continue doing so.

- A. has been dumped
- B. could be dumped
- C. had dumped
- D. might be dumped

12. After the female emperor penguin lays a single egg, she gives them to her mate, _____ holds it in a fold of skin near his feet for a two-month incubation period.

- A. he
- B. who
- C. which
- D. while

13. In 1868, newspapers were filled with the accounts of men _____ claimed to have become rich overnight in California's gold fields.

- A. whom
- B. that
- C. which
- D. who

14. . Sarah would have made sure Steven was here _____ were coming too.

- A. when she had known
- B. if he has known you
- C. if she had known you
- D. if she knew

15. Jackson Pollock, the twentieth-century American painter, was concerned _____ the connection between the unconscious and artistic creativity.

- A. with
- B. in
- C. of
- D. for

16. _____ different food from all over the world in London.

- A. There is a lot of
- B. There are loads of
- C. There is many
- D. There is a lots of

17. Since his release from jail in 1990, Nelson Mandela has emerged as the _____ spokesman for South Africa's anti-apartheid movement.

- A. more prominent
- B. more prominently
- C. most prominent
- D. most prominently

18. . How many times _____ not to do that?

- A. haven't I told you
- B. have I told
- C. I told you
- D. have I told you

19. Neither the actors nor the producer _____ make the advertisement for the movie.

- A. are willing to
- B. willing to
- C. is willing to
- D. willing

20. "What's up with him?" "Oh, _____ mood about something."

- A. he's in angry
- B. he's in a bad
- C. he had a bad
- D. he has a angry

TEST 4

Correct Spelling Task

**DO NOT TURN PAGE
UNTIL TOLD TO**

Instructions

You will see a series of pairs of 'words'. One of each pair is a real word and the other sounds like a real word but it is spelt incorrectly. Your task is to underline the correct word in each pair. There are 20 pairs and you have 40 seconds to complete as many as you can."

Example

munk monk

Answer

munk monk

Reason:

The word is 'monk'; 'munk' is an incorrect spelling. Therefore, monk should be marked as it is the correct answer.

1. court	cort
2. benefit	benifit
3. source	sorce
4. foreign	foriegn
5. symble	symbol
6. pursuit	pursute
7. weird	wierd
8. conscious	conciuous
9. relevent	relevant
10.demenstrate	demonstrate
11.separate	seperate
12.peice	piece
13.granit	granite
14.appriciate	appreciate
15.convenient	convinient
16.poultry	poltrey
17.pronunciation	pronounciation
18.vacume	vacuum
19.experience	expierence
20.detour	detoor

TEST 5

Sounds Like a Word Task

**DO NOT TURN PAGE
UNTIL TOLD TO**

Instructions

You will see a series of pairs of 'made-up words'. If you pronounce these to yourself, you will find that one of each pair sounds like a real word but it is spelt incorrectly, whereas the other cannot be made to sound like a real word. Your task is to underline the made-up word in each pair that sounds like a real word. There are 20 pairs and you have 1 minute to complete as many as you can.

Example

nale pult

Answer

nale pult

Reason:

The answer is 'nale' because it sounds like 'nail' whereas 'pult' does not sound like a real word. Therefore, nale is underlined/marked as correct.

1. warg	dore
2. dert	jint
3. bern	glev
4. gruss	katch
5. maif	neet
6. groe	swad
7. chove	furst
8. peech	bleme
9. sed	wef
10. poar	hign
11. sworf	skert
12. toab	onor
13. calch	reeth
14. orlthoe	hausage
15. inbigerted	sellestiall
16. insashabul	polonelist
17. rynosserus	bemonthaty
18. amrahili	misselani
19. fongue	dyarea
20. ensiklopedya	delikeratie

TEST 6

Write the Correct Word Task

**DO NOT TURN PAGE
UNTIL TOLD TO**

Instructions

You will see 20 ‘made-up words’. If you pronounce these to yourself, you will find that each one sounds like a real word but it is spelt incorrectly. Your task is to write this real word next to the made-up word. You have 2 minutes to complete as many of these 20 items as you can.”

Example

SOX

Answer

sox ‘*socks*’

Reason:

'sox' sounds like the word 'socks' – therefore write SOCKS as the answer.

alau

sekend

breef

eeshu

prity

garenti

eenuf

stricked

olthou

eggzostid

eezee

serpriz

kontinyu

emoushn

konvinians

temaro

tekneekl

biskit

konfrant

lejislayshun

TEST 7

Correct Derivation Task

**DO NOT TURN PAGE
UNTIL TOLD TO**

Instructions

You will see 20 sentences. In each sentence the word in brackets needs to be put in its correct form. Your task is to write this correct form of the word next in the space next to the sentence. You have 3 minutes to complete as many of these 20 items as you can.

Examples

Geography involves the study of different (country) .

I (start) my new school last week.

Answer

Geography involves the study of different (country) . *countries*

I (start) my new school last week. *started*

Reason:

The first example requires the plural of country – the second requires the past tense of start.

- Tim couldn't control his (sad). 1.
- I usually go (swim) in the sea every Friday . 2.....
- China has some (volcano) . 3.
- He began with a brief (introduce). 4.
- Instead of taking a bus to school, Lucy always (walk). 5.
- You must make your own (decide). 6.
- My grandpa is full of (wise). 7.
- He is a famous (piano) in China. 8.
- Last week, the painting was (steal). 9.
- He used a ruler to measure the table's (long). 10.
- A person who plays the piano is a (music). 11.
- Today the rain is (heavy) than yesterday . 12.
- A person who performs tricks is called (magic). 13.
- How many (play) are there in a football team? 14.
- The teacher has a lot of (know). 15.
- Drinking hot water is good for the (complex). 16.
- The loud sound was caused by (explode). 17.
- She moved here to study the (geo) of the area. 18.
- At the end of the letter John needed his (sign). 19.
- This is a (type) spelling mistake in English. 20.

TEST 8

Morphological Production Task

**DO NOT TURN PAGE
UNTIL TOLD TO**

Instructions

You will see rows of three words. In each row, the first two (in bold) show a rule for changing the first word into the second. Your task is to work out this rule and apply it to the third word in the row. Once you have done this write the answer in the space after the third word. You have 3 minutes to complete as many of these 20 items as you can.

Examples

A	B	A	B
sing	singer	read	
man	men	boy	

Answers

A	B	A	B
sing	singer	read	<i>reader</i>
man	men	boy	<i>boys</i>

A	B	A	B
book	books	chief	1
looked	look	woke	2
work	worker	swim	3
talk	talked	mean	4
see	saw	shine	5
happy	happiness	wide	6
wish	wished	rise	7
cried	cry	rode	8
help	helpful	approach	9
sing	song	live	10
nerve	nervous	space	11
teacher	taught	writer	12
comes	came	throws	13
cats	cat	mice	14
illness	ill	hero	15
drinks	drank	eats	16
drive	driver	invent	17
anger	angry	mystery	18
act	actor	type	19
well	wellness	captive	20