The Level of Accuracy and Grammatical Complexity in Written Texts by Chinese Students

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Abstract: The influence of the first language (L1) on the acquisition of a second language (L2) is inevitable. In addition, when L1 and L2 do not belong to the same language family, a negative influence, i.e., an interference, will occur. The current study aims to investigate the level of accuracy and grammar complexity in texts written by Chinese upper secondary school students from the perspective of language transfer. It involves an analysis of a small corpus comprising 54 texts with the use of the terminable unit (T-unit) measure. The finding shows that the Chinese writers produced a text with only a few error-free T-units largely due to the syntactical transfer from Chinese to English. With regard to grammatical complexity, subordinate clauses are frequent in the corpus but relative clauses are rare.

Keywords: Chinese; English; Writing, Language

1 Introduction

In China, both teachers and their students value the three basic skills of English language, namely, listening, reading, and writing, over speaking, which is normally excluded from school assessment. Among the three examined skills, writing is considered to be the most difficult for second language and foreign language learners (Richard and Renandya, 2002). Chinese learners of English find it a particular struggle because of the linguistic distance between their first language (L1), Chinese, and the target language or second language (L2), that is, English. Such distance can be defined through measuring the differences in, for example, lexical and morphological structures (Schepens, 2016). It can lead to a negative transfer in the form of errors or avoidance of complex grammatical structures (see Qi, 2009; Zhao, 2011; Huang, 2001). Thus, many Chinese learners often produce English texts consisting of numerous sentences that are erroneous. In addition, their texts are grammatically simple due to lack of an intuitive ability to deal with grammar when writing (Hyland, 2003).

The current study aims to the English texts written by this under-researched population by investigating how frequently they produce errors, what types of errors they tend to commit, and to what extent they are able to vary their word choices and grammatical structures. Put simply, the current study will address the following research questions:

(1) What is the frequency and distribution of the different categories of errors in English texts by average Chinese students?

(2) What is the level of grammatical complexity in English texts by average Chinese students?

From the author's personal experience as an English teacher working in a Chinese upper secondary school, he hypothesizes that there will be a large number of errors in the texts produced by the students because many students, in his experience, have reported difficulties in grasping the grammatical rules of English.

2 Related literature

2.1 The Chinese L1 interference in English writing

The fundamental theory of the psychological

aspect of contrastive analysis (CA), known as the contrastive analysis hypothesis (CAH), indicates that there is a higher chance of success in L2 acquisition or learning if the L1 and L2 are genetically related, i.e., are members of the same language family. On the other hand, if the two languages are contrastively different, for example, English and Chinese, the acquisition of the target language could be expected to be difficult. The CAH also claims that the extent to which the L1 is similar to or different from the L2 determines the degree of difficulty that the learner might experience. Since the difficulty normally takes the form of errors, the greater the difficulty is, the more errors are likely to occur (Lado, 1957, cited in Ellis, 1985). CA, however, was challenged and subsequently revised with regard to the potential to predict errors, the feasibility and necessity of making comparisons between languages, and the applicability to L2 teaching. According to Ellis (1985,), the revised CAH reveals the following:

(1) The difficulty that CA predicts might take the form of avoidance rather than errors.

(2) The interference is more likely to occur when there are some similarities between L1 and L2 rather than when they are totally different from one another. According to the CAH, the Chinese L1 is believed to exert a negative impact on the acquisition of the English L2, as the two languages do not belong to the same language family. The negative transfer could be reflected in pronunciation, vocabulary, semantics, syntax, and culture. However, the current study is concerned only with the syntactical and lexical transfer, as the former may account for the grammatical errors, and the latter may provide an explanation for the lexical errors. It is when the L2 learners encounter difficulties in applying the rules of L2, or lack sufficient knowledge about the rules of the target language that a syntactical transfer from L1 to L2 is likely to occur. Generally, the syntactical features of English differ from those of Chinese; for example, the concept of time is not achieved through the use of different tenses and verb forms, as it is in English. However, the two languages also have certain shared or similar syntactical features, e.g., the subject-verb-object structure (SVO). The similarities can also lead to certain negative transfers from Chinese to English, according to the revised CAH (Ellis, 1985).

2.1.1 The theory of language transfer

Based on the theory of language transfer, there can be numerous types of errors among Chinese learners resulting from the negative transfer of syntax. First, errors in the use of noun phrases are largely concerned with the use of articles. Chinese learners of English frequently encounter considerable difficulty in using articles properly; for example, they may use the indefinite article 'a' to modify 'apple' or omit the article altogether. This is because articles do not exist in Chinese, and there are rules to observe regarding the usage of English articles. Second, the difference in the use of verb phrases between English and Chinese leads to errors because English verb phrases often combine a verb and a preposition while Chinese verb phrases often exclude the preposition. As a result, Chinese learners of English L2 tend to omit the preposition that must follow a prepositional verb, for example the 'in' in the sentence 'participate in the school's activities'. Third, although Chinese and English share the basic SVO typology, Chinese learners of English still produce errors related to sentence structure. They frequently omit words or constituents that are unnecessary or redundant in Chinese when producing an English sentence. For example, when the predicative in Chinese is an adjective, they often unconsciously omit the copular verb (e.g., 'Jack is very honest.', which can be literally translated into the erroneous English sentence 'Jack_very honest', a sentence which is acceptable in Chinese).

In addition, as Chinese and English languages are very distant from each other, it seems impossible to find an English equivalent for each Chinese character in terms of the formality of the language use. Normally, a Chinese character, if translated literally, could correspond to several English words; for example, the character 'buy' could correspond to 'buy' or 'purchase'. But for Chinese ESL learners, it is difficult for them to know that 'purchase' is a formal word while 'buy' is a less formal word. As a result, a Chinese learner of English may say to his friend 'Let me purchase you a meal'. Furthermore, learners often translate Chinese expressions literally into English, for example, 'Good study, day up' is the literal translation of the Chinese expression 'Study well and make progress every day', which means if you study hard, you will make progress every day. The word-

for-word translation of Chinese L1 expressions is normally misunderstood by or incomprehensible to speakers of other languages. In short, these examples show a wide variety of errors that Chinese-speaking learners of English produce which are attributed to their L1 interference.

2.2 Studies on accuracy

The current study adopts the measure of the terminable unit (T-unit), which was invented by Hunt (1965), to analyze the accuracy of written texts. It was defined as one main clause plus the subordinate clauses that are attached to or embedded within it (Hunt, 1965), and it is widely used by many researchers studying language accuracy and complexity (see Scott and Tucker 1974; Larsen-Freeman and Strom, 1997; Nygaard, 2010; Homburg, 1984; Pekins and Leahy, 1980). Similarly, the T-unit has been widely used in second language studies of writing for the purpose of examining second language learners' ability to the utilize the embedding process available in the target language (Sharama, 1980). The number of error-free T-units, i.e., when a main clause, along with its subclauses, does not contain any error, is particularly related to the holistic assessment of written texts (Wolfe-Quintero et al., 1998).

Many studies utilizing the T-unit measure (see Scott and Tucker 1974; Larsen-Freeman and Strom, 1997; Nygaard, 2010; Homburg, 1984; Pekins and Leahy, 1980) are conducted on learners whose first language is close to English, such as Germans, Norwegians, and Swedes. Only a few studies in the China National Knowledge Infrastructure, the most comprehensive gateway of knowledge of academic studies in China, are concerned with Chinese learners using the T-unit measure to examine written accuracy, and even fewer are focused on Chinese upper secondary school students.

2.3 Studies on grammatical complexity

Studies in complexity tend to focus on grammatical or lexical complexity. Wolfe-Quintero et al. (1998) stated that grammatical complexity can be reflected in writing primarily through grammatical variation and sophistication. More specifically, grammatical complexity means there exist various basic and sophisticated grammatical structures in written production. Therefore, the level of grammatical complexity of a written text is not related to the quantities of production units but to how varied or

sophisticated the production units are. Studies of grammatical complexity have involved measures such as the frequency and types of subordinate clauses and the frequency with which the passive voice is used. Kameen (1979) counted the number of adverbial clauses, adjective clauses, and nominal clauses in the compositions produced by two groups of writers within a time framework. He found that these measures were not highly associated with the holistic ratings of the writers, but that 'good' writers tend to produce more clauses of each type than 'poor' writers. Drew (2010) investigated the grammatical complexity of a corpus of texts written at the end of each grade level by a group of Norwegian learners of English during their progression from the 4th to 6th grades. He found that the pupils used noun types most frequently and adjective types least commonly. In addition, the study showed that there was a marked increase in the average number per text of the three word types as the writers became more mature, that is, as they progressed from the 4th to the 6th grade.

3 Materials and methods

3.1 Analysis of the written Texts

The written texts collected for the current study were produced by students in the third and final year from a Chinese upper secondary school (n=800). The writing task was a classroom test, the time limit of which was 30 minutes. The topic was 'Writing About Your Personal Study Habits'. The prompts were presented in Chinese and were required to be included in the written text (e.g., 'Please explain the relationship between study habits and academic performance', which was translated into English as 'illustrate the relationship between study habits and learning outcomes'). After the class, the texts were collected and were divided into nine categories based on their scores awarded by markers, and then six texts were randomly chosen from each category of the nine, constituting a corpus of 54 texts.

Hunt's (1945) T-unit was utilized to measure the accuracy and complexity of the students' writing. This measure was chosen because it can avoid the potential lack of terminal punctuation (see Hunt, 1945 & Drew, 2010). In terms of measuring the accuracy level, the number of errors in the text was counted and related to the total number of words. In addition, the number of error-free T-units and the average number of errors

per T-unit were calculated. The errors were also classified as spelling errors, grammatical errors (e.g., 'good habits is beneficial to us'), and lexical errors (e.g., 'We should work harder and then we can day up'). All these measurements using the T-unit can help address the first research question, that is, 'What is the frequency and distribution of the different categories of errors in English texts by average Chinese students.

Regarding complexity measures, the level of grammatical complexity was measured by counting the number of subordinate clauses and working out the distribution of different subordinate clauses (nominal, adverbial, and relative clauses) (Wolfe-Quintero, 1998). To measure the level of lexical complexity, the numbers of noun types, verb types, and adjective types and their tokens were calculated respectively and compared. The term type refers to the number of unique words in a text or corpus, while the term token refers to the total number of words in a text or corpus, regardless of how often they are repeated. For example, the sentence "By reading we enrich the mind, and by conversation we polish it" contains 12 tokens, but only 10 types, as "we" and "by" are repeated. The more types there are in comparison to the number of tokens, then the more varied is the vocabulary, i.e., there is greater lexical variety (Harrington, 2018). All these measurements using the T-unit can help address the second research question, that is, 'What is the level of grammatical and lexical complexity in English texts by average Chinese students?'

In short, the following measures were adopted to investigate the level of accuracy, and grammatical complexity in the corpus of texts:

Are these the nine categories you mentioned earlier? If yes, it would be better that you make it clear from the beginning rather than introducing them later with no clear indication.

    i)The total number of words in a text
    ii)The number of T-units
    iii)The average length of T-units
    iv)The number and type of errors
    v)The ratio of the overall numbers of errors to the overall number of T-units
    vi)The number and type of subordinate clauses

To ensure the reliability of the measurement, a British professor in the field of applied linguistics was requested to check the measures for a random sample of the texts.

3.2 The Writing task

The writing task was originally in Chinese as follows (the author's translation):

> An English newspaper has added a column recently based on the discussion of study habits. Please write an essay in English for the column by using your own experience
> (1) Illustrate the relationship between study habits and learning outcomes
> (2) Introduce a good study habit and propose suggestions for developing beneficial study habits.
> (3) Specify one of your problems with study and present the way for improvement
>
> Attention:
>
> 1. The words of the essay should be around 100.

4 Findings

The Chinese L1 exerted an impact on the level of accuracy and grammatical complexity of the 54 texts. The Chinese 12th graders involved in the current study produced T-units that were shorter than those produced by the 12th graders that Hunt (1965) studied. They produced fewer errors than expected but only more than a quarter of T-units are error-free, which indicates the relatively low accuracy level of the texts when compared to those written by students whose L1 is close to English (see Scott and Tucker 1974; Larsen-Freeman and Strom, 1997; Nygaard, 2010; Homburg, 1984; Pekins and Leahy, 1980). They frequently used subordinate clauses, which outnumbered those in the texts produced by Norwegian 10th graders and Dutch 10th graders (Vigrestad, 2010). However, they seldom used relative clauses, which are nonexistent in their L1.

4.1 The length of the texts and T-units in the corpus

Table 1 shows the mean length of the students' essays and T-units in the written corpus.

Table 1. Mean length of student essays and T-units

Unite(*n*=54)	Mean score	Minimum	Maximum
Number of words	133.6	100	171
Number of T-units	13	8	23
T-unit Length	10.3	7.1	15.5

The average length of the 54 texts is 133.6 words, and the average number of T-units per text is 13. Thus, the T-units of the texts average at 10.3 words in length. Hunt (1965) analyzed the written texts produced by the 4th, 8th and 12th graders he chose as subjects. He found that the mean T-unit length of the texts was closely related to the grades. Specifically, the 12th graders on average produced longer T-units of 14.4 words than the 8th graders and the 4th graders, who produced T-units of 11.5 words and of 8.6 words respectively. To conclude, the Chinese learners produced shorter T-units than their western counterparts, which indicates their lower level of writing skills.

4.2 Accuracy

4.2.1 Level of accuracy

Table 2. Average number of T-units, ratio of error-free T-units and average number of errors in the texts

Unite (*n*=54)	Mean score	Minimum	Maximum
Error-free T-units	4.9	0	11
Ratio of error-free T-units	35%	-	-
Average number of errors per T-unit	0.7	-	-

Table 2 shows the error-free T-units, ratio of error-free T-units and average number of errors per T-unit in the texts.

The measure of errors per T-unit (E/T) is one of the most frequently used accuracy measures by scholars investigating the accuracy level of written texts, and it was also employed by the author for the same purpose. The average number of errors per T-unit of the 54 texts was 0.7, that is, each T-unit, whose average length was 10.3 words, contained on average 0.7 errors; this is lower than expected given the significant language distance between English and Chinese, which is normally believed to result in a high occurrence of formal written errors. However, the students' success in 'controlling' or 'reducing' errors might be largely attributable to the fact that they made every effort to avoid errors, as their written texts would be scored on grammatical correctness. Therefore, the unexpectedly low figure for errors per T-unit might be the result of the avoidance of complex structures (Ellis, 1985) and sophisticated vocabulary, which could, in turn, influence the level of accuracy of their written texts.

4.2.2 Classification of errors

Table 3 shows the classification of the errors produced by the students in question.

Table 3. C($\bar{x} \pm s$)

Unite(n=54)	Mean score	Minimum	Maximum
Number of errors	10	2	20
Grammatical errors	6.2	0	16
Lexical errors	3.1	0	7
Spelling errors	0.7	0	4

The errors identified in the present corpus were categorized into grammatical errors, lexical errors, and spelling errors. Of the three types of errors, grammar errors were the most frequent, accounting for 63 per cent of the overall number of errors. The distance between English and Chinese may account for such a high occurrence, as it is so great that there exist few shared grammatical features. In order to internalize the knowledge of English grammar that needs to be mastered, the Chinese students needto overcome the effects of their L1 grammatical knowledge on their L2, or?the students may fail to acquire the target grammatical structures despite making a significant effort. To illustrate, many grammatical errors identified in the corpus could reflect the interference of Chinese grammatical

rules. For example, prepositional verbs missed the preposition, e.g., 'Good study habits can lead good results.'

Lexical errors accounted for the second largest proportion of the errors in the corpus. Lexical errors are those that cause misunderstanding or that are regarded as Chinese-English expressions, most of which were incomprehensible to native speakers of English. The non-target-like written forms seemed to be largely attributable to the negative transfer of L1 expressions or thinking patterns (Ellis, 1985). When the learners identified that English shared a meaning with Chinese, they might have transferred the meaning as if the two languages expressed the meaning in the same way, even though they do not. For example, Good study habits help us to gain great study results, which is the direct translation of the Chinese 'Good study habits help us get good study results', which means 'good study habits can help us to achieve better performance in our studies'.

Spelling errors were the least frequent type of error. This finding was hardly surprising because the students practiced dictation of new vocabulary items on a daily basis in order to avoid spelling errors in writing.

4.3 Grammatical complexity of the texts

The study also seeks to investigate the extent to which the students are able to vary the grammatical structures in their writing assignments/tasks. Wolfe-Quintero (1998) claimed that grammatical complexity can be reflected in writing primarily through grammatical variation and sophistication. He argued that grammatical complexity means that a wide variety of both basic and sophisticated structures are available. The current study measures the level of grammatical complexity by counting the number of subordinate clauses and the distribution of the types of subordinate clauses: nominal, adverbial, and relative clauses.

Table 4. Subordinate clauses in the texts

Unite(n=54)	Mean score	Minimum	Maximum
Number per text	7.6	4	15
Nominal	5.5	2	13
Adverbial	1.6	0	5
Relative	0.5	0	3

The average number of subordinate clauses in the analyzed texts was 7.6, and the average number of T-units was 10.3, which means the T-units contained on average 0.6 subordinate clauses. The average number of subordinate clauses per T-unit for the texts (0.6) analyzed by the current author compared favorably with that in the corpora of texts produced by Norwegian 10th graders (0.48) and Dutch 10th graders (0.48) (Vigrestad, 2010). However, it should be noted that the Norwegian and Dutch 10th graders may have produced more subordinate clauses per T-unit than the Chinese learners in question when they progressed to the 12th grade, since a number of empirical studies (see Drew, 2010) have shown that there exists a linear relationship between the increasing frequency of subordinate clauses and the progression through school levels. Furthermore, Norwegian and Dutch learners are assumed to acquire the English language more smoothly and rapidly than their Chinese counterparts due to the fact that the Norwegian and Dutch languages come from the same language family as English, which could facilitate the

acquisition in EFL writing.

It is noticeable that relative clauses accounted for only 6 per cent of the total number of subordinate clauses, while nominal clauses made up 72 per cent, followed by adverbial clauses with 21 per cent. The distribution of subordinate clauses in this corpus is consistent with that of the corpora analyzed by other researchers, for example, Drew (2010) and Vigrestad (2006), but the occurrence of relative clauses is extremely low in the 54 texts. One interpretation of this could be due to the fact relative clauses do not exist in the Chinese language, while other types of subordinate clauses do. Therefore, the students were less likely to use relative clauses in English writing as a result of avoidance (Ellis, 1994: 304). these writers might have not fully acquired the knowledge of English relative clauses and thus may have deliberately avoided using the clauses in order not to produce errors that would result in the loss of marks. The students were, however, expected to produce English-like relative clauses, which are often regarded as an indicator of the maturity of writers

because many researchers (e.g., Hunt, 1966) reported that learners are likely to produce more relative clauses as they progress through the levels of school. Thus, this might explain the reason for fewer use of relative clauses in their texts. Another explanation for the scarcity of relative clauses could be that relative clauses are the least frequent of the three subordinate clause types among native speakers as well (Drew, 1998).

5 Conclusion

This study has analyzed the accuracy and complexity in written English in a group of of Chinese upper secondary students. The subject for the thesis was of great interest to the author, who had been an English teacher in a Chinese upper-secondary school. The study aimed to find out the frequency and distribution of the different categories of errors produced by the students, and the level of grammatical in their texts.

The 54 analyzed written texts were produced by 54 student writers under an exam condition. The essay topic was 'personal study habits' and the minimum length requirement was 100 words. One of the aims was to measure the distribution and frequency of grammatical, lexical and spelling errors. The methods applied included counting the T-units and the mistakes in each text to work out the ratio of error-free T-units to T-units. It also included counting the three categories of mistakes to work out the ratio of the categories to each other. Another aim was to measure the distribution and frequency of nominal, adverbial and relative clauses. The method employed was to identify and count three categories of subordinate clauses (nominal, adverbial and relative) and work out the ratio of the categories to each other. The result of the distribution of the three categories of errors was as expected. The grammatical errors were most frequent. This was probably because English grammar is difficult for Chinese-speaking learners to learn due to the differences in structures and because the students were unable to apply the consciously learned, although not acquired, grammatical rules in a timed exam. In contrast, the spelling errors were the least frequent. This might be largely due to the fact that the students practiced dictation of new vocabulary items almost every day and had got accustomed to memorizing learning materials because

of the Chinese tradition of studying ancient prose, which requires learning by rote.

The Chinese students also produced more subordinate clauses than the author expected based on his experience as an English teacher. The students might have been instructed to use subordinate clauses to impress the markers to get higher scores. The result showed that nominal clauses were most common, which was consistent with the finding of the studies conducted by other researchers (e.g. Drew, 2010). What was surprising was the rarity of relative clauses, which accounted for 6 per cent of subordinate clauses in the collected texts, although relative clauses had been reported as the least frequent types of subordinate clauses by other researchers (e.g. Vigrestad, 2006). This extremely low occurrence of relative clauses might be largely because relative clauses do not exist in Chinese and partly because the students tried to avoid using relative clauses in order to not run the risk of committing mistakes.

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