Syntactic Variety and Writing Quality: An Investigation on EFL Students' Argumentative Writing

Yu-Shan Fan, Taipei Medical University, Taiwan

Abstract
The variety of syntactic structure of sentences has regarded as an important indicator of sentence fluency and writing proficiency. However, previous research on the relationship between syntactic variety and text quality has failed to reveal consistent patterns. Therefore, this study aims to examine the relationship of a single measure of syntactic variety with the quality of argumentative writing. It is hypothesized that syntactic complexity increases with the proficiency levels. The greater complexity of sentence used in an essay, the higher the score of the essay will be rated. A sample of 30 TWE essays written by Chinese test takers at different levels are compared to 10 by native speakers. Essays rated as Chinese 4, 5, and 6 and Native 6 represent three different levels of proficiency. The results indicate that syntactic features, such text length, number of T-units, words per T-unit, words per clauses and numbers of subordinate clauses, tend to have positive relationship with writing holistic ratings. Finally, pedagogical implications are discussed on how to integrate syntactic variety instruction with other sentence-combing exercises in a writing classroom for second language writers.

Keywords: syntactic variety, argumentative writing, EFL writers

iafor

The International Academic Forum
www.iafor.org

Introduction

Writing has been a challenging task not merely for native speakers, but also for language learners to master. Both writing researchers and instructors in second language writing field have been devoted to exploring the elements and instructional strategies that contribute to effective writing. As stated in a document about teaching of writing by the National Council of Teachers of English (NCTE), writers should be "aware of stylistic options that will produce the most desirable impression on their reader" (2004). "Stylistic options" refers to syntactic structures and varieties applied in one's text to get the message across. In addition, for many widely used writing proficiency tests, the evaluation of sentence construction is often as one indicator of a text's quality that distinguishes groups of writers at different proficiency levels. In a summative description for TWE scoring guide (ETS, 2004), an essay scored 6 "demonstrates syntactic variety and appropriate word choice" whereas an essay scored 2 shows "serious and frequent errors in sentence structure or usage."

In this study, it is hypothesized that several selected syntactic features, i.e. words per clauses, clauses per T-units, ratio of subordinating clauses to T-units, and other sentence-level features such as mean length of sentences, length of texts, represent different aspects of sentence complexity. Second, it is hypothesized that the measures of syntactic complexity are related to the quality of writing.

Literature Review

Measures of syntactic complexity

In composition research, syntactic complexity has been reported as one important variable that may influence the overall writing quality. In Beers and Nagy (2009), syntactic structure of sentences is an important component of writing fluency, and thus contributes to the flow of a text. In addition, using complex syntactic structures allows more succinct expression of complex ideas. In line with style guidebooks and ESL writing handbooks, researchers argue that the variety and the complexity of sentence structures will influence the effectiveness of the message conveyed. To be specific, a text that relies exclusively on simple and short sentence patterns is unlikely to leave readers with favorable impression. On the other hand, a text containing sentences that vary in length and style or to begin in different ways shows the writer's intention to make use of a variety of syntactic structures.

In the 1960s, several studies on second language acquisition focused on syntactic complexity and variety in order to account for the developmental changes in learners' writing. In a series of important studies by Hunt (1965, 1966, 1970), he argued that the syntactic complexity in writing revealed a positive relationship with age. In these studies Hunt used various measures of syntactic complexity, including sentence length, clause length, and ratio of subordinate clauses to all clauses. The most important contribution of these studies is that Hunt proposed a new measure—the T-unit, which is a more dependable and consistent technique of dividing writing into small units. Hunt identified T-unit as "minimal terminal syntactic unity". The explanation on T-unit he proposed is as follows:

> They [T-units] are terminable in the sense that it is grammatically acceptable to terminate each one with a capital letter at the beginning and a period or question mark at the end. They are 'minimal' in the sense that they are shortest units into which a piece of discourse can be cut without leaving any sentence fragments as residue…each is exactly one main clause plus whatever subordinate clauses are attached to that main clause (5).

It is reported that the average length of the T-unit correlates closely with the maturity of a learner's writing ability. In other words, the length of T-unit increases as writers mature. As a writer gradually masters sentence construction, there are two possible ways to account for the increase in T-unit length; one is to add more dependent clauses to the T-unit, and another is to lengthen the mean clauses by adding phrases and words. For instance, in Hunt's studies, twelfth grade students produced more subordinating clauses than did fourth graders. Also, noun clauses and adjective clauses nearly or more than doubled in frequency in twelve graders' written texts. With regard to T-unit expansion by increasing the number of sub-clausal elements, Hunt concluded that older writers tended to use larger numbers of modifiers of nouns, such as genitives and prepositional phrases. Hunt's studies, especially the introduction of T-unit, have allowed for description of developmental features of learners' control over syntactic features and have also fostered numerous studies afterwards. Using T-units, sentences, and clauses as measures enables researchers to have objective, normative criteria for mature writing, and to identify syntactic characteristics responding to the quality of writing (Neilsen and Piché, 1981).

Research attempts to quantify syntactic complexity have focused on various sentence-level features, such as the number of words per T-unit, the number of words per clause, and the ratio of subordinate clauses to all clauses. The analysis of the study follows Hunt's measures of syntactic complexity: 1) clauses per T-unit, 2) words per clause, and 3) words per T-unit.

Subordinate clauses per T-unit

The ratio of clauses to T-units is to measure three types of subordinate clauses, noun, adjective, and adverb clauses. Texts with a higher ratio of clauses per T-unit would have more complex sentences, or sentences that have embedding with complex relationship among ideas. On the contrary, texts with lower ratio of clauses tend to have more simple sentence structures. It is assumed that the number of clauses per T-units increases when writers become elder and more mature. However, the increase was observed gradually and no significant differences were found between high school and adult writing. This result implies that the number of clauses per T-unit may not be a distinctive feature in written language. Instead, as shown in previous studies (Scott, 2004), it is a more significant characteristic in spoken language.

Words per clause

By measuring the length of clauses (in words), it allows writers to communicate information in a more concise manner. A more mature writer is able to condense information from multiple clauses into one single clause. As Hunt (1970) pointed out, there is a significant expansion in words per clause in written produced by high school students and adults than those produced by younger students. The highly condensed

clause structure is also recognized as a characteristic of academic writing.

Words per T-unit

A number of studies on syntactic complexity used words per T-unit or number of words as a measure (Ferris, 1994; Grant & Ginther, 2000; Scott & Winsor, 2000).

Syntactic complexity, genre and writing quality

In addition to the discussion of age and its relation with syntactic complexity, it has been reported that the measures of syntactic complexity are related with the genre of the writing. In a recent study, Beers and Nagy (2009) analyzed 41 seventh and eighth graders' essays of two different genres, narrative and persuasive. The results indicate that words per clause have a positive correlation with the quality of argumentative essays, but not for narratives. Clauses per T-unit is positively correlated with quality narrative, yet negatively correlated with the quality of essays. This study also showed one of the measures of syntactic complexity that contributes to the quality is clause-internal. That is, essays that are rated highly tend to have more clause-lengthening prepositional sequences. The influence of text genre on syntactic complexity is also reported in Ravid's (2005) study. The study examines the syntactic constructions in two different genres, narrative and expository, produced by 4th graders to adulthood. The results indicate that in expository texts numbers of the measure and longer clause length (words per clause) were found. One possible explanation is that different genres have distinctive communicative goals and thus writers need to achieve the communicative purpose through using different syntactic complexity as style. It is possible that in a genre that values more details and description, like narratives, writers would construct a text consisting of longer clauses.

As reported in Crowhurst (1983), studies on syntactic complexity have fallen into two orientations. The first way is to examine the relationship between syntactic complexity and writing quality (prediction/relationship studies). Second type is to study whether instruction on syntactic complexity could affect the writing performance. Crowhurst concluded that neither T-unit length nor clause length was a good predictor of writing quality. Second, sentence-combining studies may help to improve writing quality, yet the improvement did not result in the increasing of T-unit numbers and clause length.

Syntactic complexity and pedagogical implication

Sentence combining (SC) is a methodology technique frequently used in grammar and composition instruction. It is based on the premise that all of sentences generated from Kernel sentence structures "through a process which intuitive for native speakers of a language" (Davidson, 1997, p. 49). Deep structures can be combined through the transformational process to produce more complicated structures.

In 1980, experimental research recommended SC practice to increase in syntactic maturity, which contributing overall writing quality. The practice first started off for elementary and junior high school learners. In Morenberg, Daiker, and Kerek (1978), they designed a 15-week instruction on first-year college students in which SC activities were made to be exclusive content of the course. After 15 weeks, the

participants in the experimental group achieved significantly higher scores than students in the control group trained in a conventional curriculum. In many ESL writing guidebooks, sentence-level exercises are recommended to learners to improve the syntactic complexity in compositions. In Oshima & Hogue's 2006) *Writing Academic Writing*, it is clearly stated that effective writers make best use of all four kinds of sentence patterns, i.e. simple, complex, compound, and compound complex, to create the variety of sentences and also to make the text flow. On the other hand, the authors suggest that the use of compound-complex sentences, which are regarded as the most difficult patterns to master, is considered an indication of more mature writing style. Hunt's studies also recommended that the maturity of writing could be fostered by integrating sentence-combining practice into curriculum materials.

The present study

Also indicated by Beers and Nagy, the previous literature explores relationships between syntactic complexity and writing quality seem to yield inconsistent results. Also, limited research has offer pedagogical implication for writing instruction. By presenting descriptive statistics, this study examines the measures of syntactic complexity with respect to level of writing proficiency to see whether different proficiency groups reveal different patterns. It is hypothesized that the measures of syntactic complexity increase with the proficiency levels. Some pedagogical implications on integrating sentence-level practice in ESL writing class will also be discussed.

Methodology

The sample

The original sample consists of 40 TWE written by Chinese test takers and 10 written by native speakers of English. Essays marked as Chinese 3, Chinese 4, Chinese 5, Chinese 6, and Native 6, 10 essay samples per group, present three different levels of writing proficiency by two different L1 backgrounds. The essay prompt requires test takers to write an argumentative essay on the issue of whether teachers should make learning enjoyable and fun for their students.

Analysis

Each sample essay was first counted its word counts and numbers of sentences using the default word count function of *Word*. Then, each sentence was analyzed and coded manually using Hunt's T-unit, followed by marking the three types of subordinate clauses. The raw data were then computed in excel, which allowed me to do descriptive statistics. Before the raw data on all syntactic variables were calculated, the highest and the lowest number of each variable for every proficiency group were eliminated. The intent of excluding the outliers from both ends for each group is to ensure that the performance within groups is more homogeneous. In addition, since the study mainly reported descriptive statistics such as mean and standard deviation, the extreme cases may have a major influence the interpretation of the results. Table 1 listed the syntactic variables that this study examined.

Table 1. Syntactic variables examined in the present study

T-unit	One main clause + any subordinate clause or nonclausal structure that is attached to or embedded in it
Clauses	Main clauses + three types of subordinating clauses, i.e. noun clause, adjective clause, and adverb clause
Words per T-unit	Mean length of T-unit; the total number of words divided by the numbers of T-unit
Words per clause	Mean length of clauses; the total number of words divided by the number of clauses
Clauses per T-unit	Subordination ratio; The number of three types of subordinating clauses (adverb, noun, and adjective clauses) divided by the number of T-unit

Results and discussion

The analysis of the 50 TWE essays revealed differences among the essays with respect to score rating. Table 2 presents the means and standard deviations of essay length in terms of average sentence numbers and mean number of words and T-units. Min and Max number for each variable are also provided.

Table 2. Mean and Standard deviation for essay lengths and T-units

Syntactic features	Group	N	Mean	SD	Min	Max
Mean number of sentences	Chinese 3	8	9.63	2.07	8	14
	Chinese 4	8	13.00	3.34	10	19
	Chinese 5	8	15.75	2.49	11	18
	Chinese 6	8	13.13	2.19	10	17
	Native 6	8	15.63	2.62	11	18
Mean number of words	Chinese 3	8	159.13	20.05	134	201
	Chinese 4	8	209.25	32.23	194	256
	Chinese 5	8	267.75	43.65	219	334
	Chinese 6	8	277.38	56.02	210	386
	Native 6	8	291.63	24.12	263	345
T-unit	Chinese 3	8	11.38	2.88	9	16
	Chinese 4	8	14.88	3.76	10	21
	Chinese 5	8	17.13	2.45	13	21
	Chinese 6	8	15.13	3.31	11	21
	Native 6	8	18.25	2.06	15	21

With regard to text length and its relation with writing proficiency, Figure 1 presents a clear picture that there seems to be a tendency that the average sentence number increases with respect to groups Chinese 3, Chinese 4, and Chinese 5. The more proficient a writer is, the more sentences he/she can construct in a timed writing test. This is in line with lots of previous findings that proficient writers produce longer texts in timed writing. However, Chinese 5 revealed a different pattern in this tendency. The average numbers of sentence decreased in this group. The result

implies the mean length of sentence may not be a strong indicator that distinguishes different proficiency groups for the sample essays in this study.
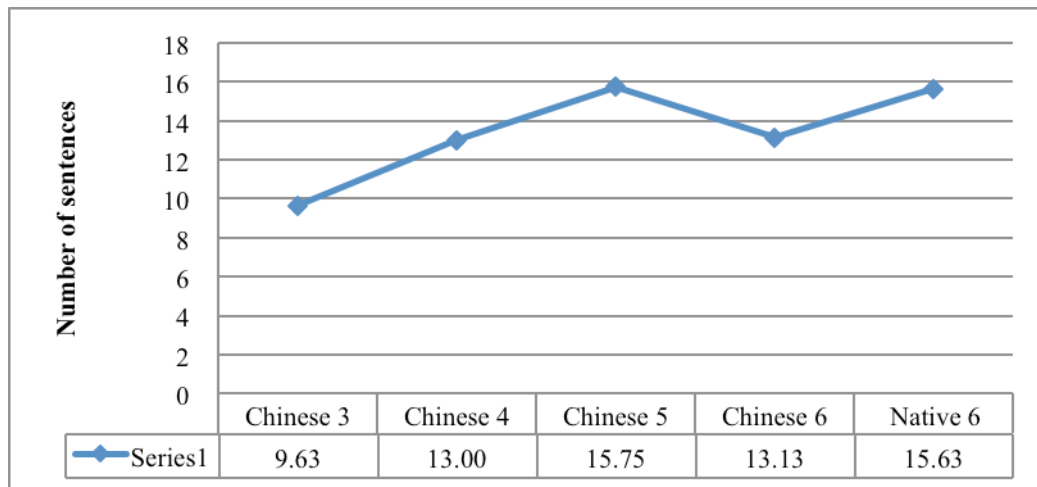

Figure 1 Mean length of text (in sentences) per proficiency group

The same with finings of mean sentence numbers, Figure 2 presents a clear increasing tendency of mean number of words as the writing proficiency gets higher. The increase is more salient from Chinese 3 and 4 while the increase becomes moderate for Chinese 5, Chinese 6 and Native 6.
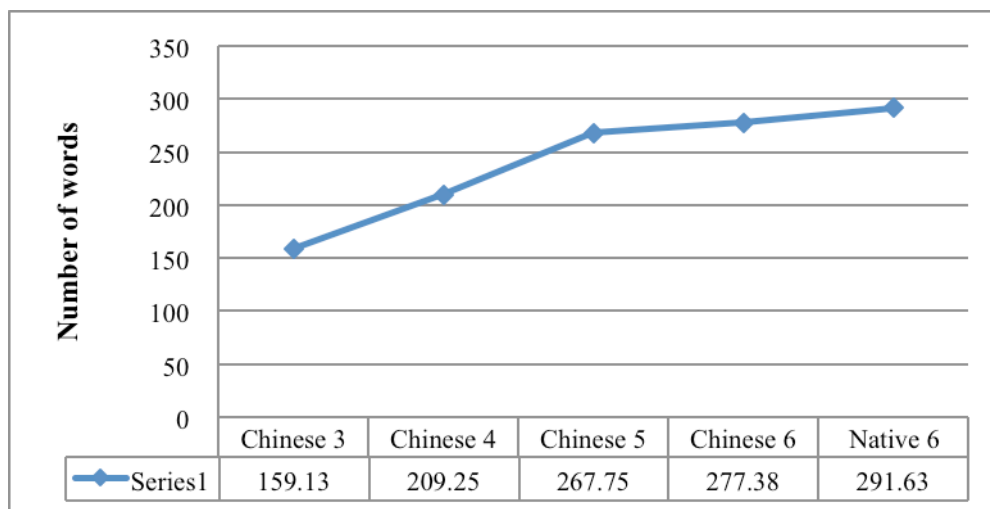

Figure 2. Mean length of text (in words) per proficiency group

Figure 3 presents the mean number of T-units per proficiency groups. There is a tendency of increasing on the number of T-units in higher rated essays. Yet, Chinese 6 revealed a different tendency of decreasing in the number of T-units. The finding is in consistent with the average number of sentences.
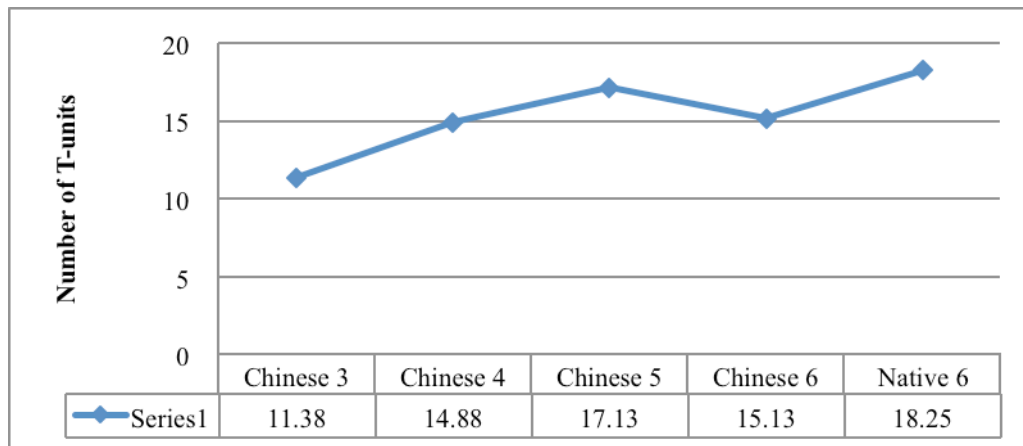
Figure 3. Mean numbers of T-units

	Chinese 3	Chinese 4	Chinese 5	Chinese 6	Native 6
Series1	11.38	14.88	17.13	15.13	18.25

Figure 4 presents results of the mean number of words per T-units, words per clause, and clauses per T-unit. As seen in the line graph, the words per T-unit and words per clause revealed a similar pattern; that is, the numbers of these two measures go up for Chinese 4, 5, and 6. Based on previous literature, this finding suggests that with the increasing of proficiency level, the syntactic features get more complex; more words are used in each T-unit and clause. This also means that when writers become more mature and proficient, they compress more ideas into a syntactic unit. On the other hand, Chinese 3 and Native 6 did not follow the trend. Chinese 3 are found more words per T-unit and per clause than Chinese 4 or Chinese 5 while Native 6 used slightly less numbers of these two measures. It is likely that by quantifying syntactic complexity, it can merely be used to describe the tendency of some proficiency groups. The measures of syntactic complexity alone, however, may not describe the quality of writing. In this case, it is likely that Chinese 3 has a lot of longer but weak T-unit and clauses, which adversely influenced information clarity. On the other hand, Native 6 has much shorter, yet concise T-unit and clauses that attribute to better writing quality. It is also likely that language accuracy might play a more important role than syntactic complexity in a writing test. Thus, essays of higher scores are those composed of simple and clear syntactic structures with no grammatical errors.

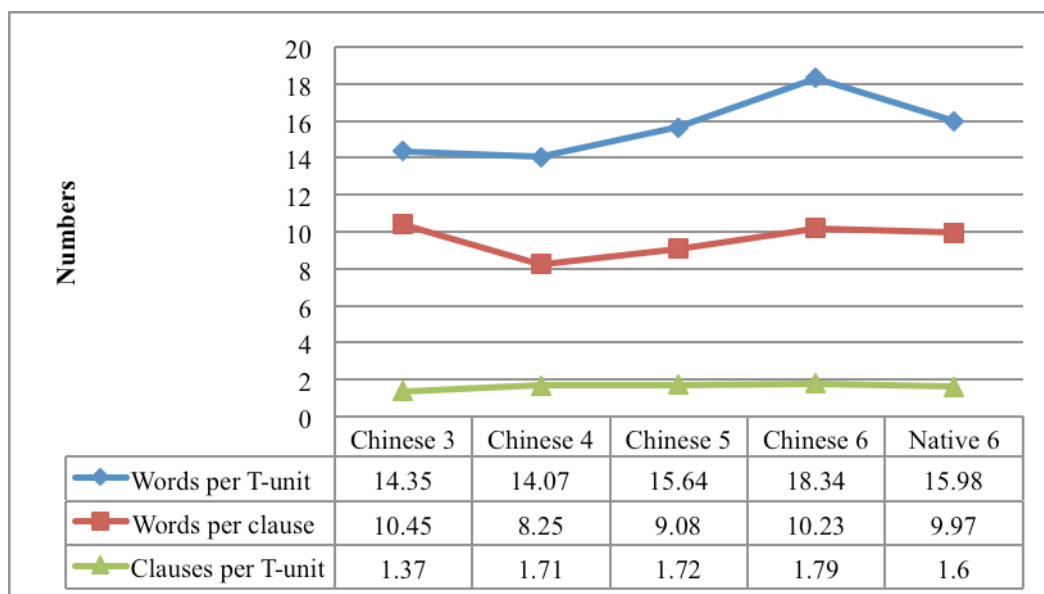|	Chinese 3	Chinese 4	Chinese 5	Chinese 6	Native 6
Words per T-unit	14.35	14.07	15.64	18.34	15.98
Words per clause	10.45	8.25	9.08	10.23	9.97
Clauses per T-unit	1.37	1.71	1.72	1.79	1.6

Figure 4. Measures of syntactic complexity per proficiency group

Figure 5 presents the mean numbers of three types of subordinate clauses per proficiency groups. In general, the number of subordinate clauses increases in higher scored essays. Chinese 3 used fewer subordinate clauses compared to other proficiency groups while the increase is moderate in Chinese 5, Chinese 6 and Native 6. With a close examination of the types of subordinate clauses, it is interesting to note that three types of subordinate clauses are equally used by Native 6s. This may suggest that within this group, the test takers could manipulate any type of the subordinate clauses equally well. It may also imply that this group displays more varieties of sentence patterns. Among the three types, the use of adjective clauses tends to have a positive relationship with the proficiency of the groups. Native 6 used most adjective clauses compared to the other groups. In regard with the functions of three types of subordinate clauses, adjective clauses are used to modify nouns and pronouns and used to add detail to sentences. It is likely that higher proficient writers will be able to compress more information into one T-unit by using adjective clauses.
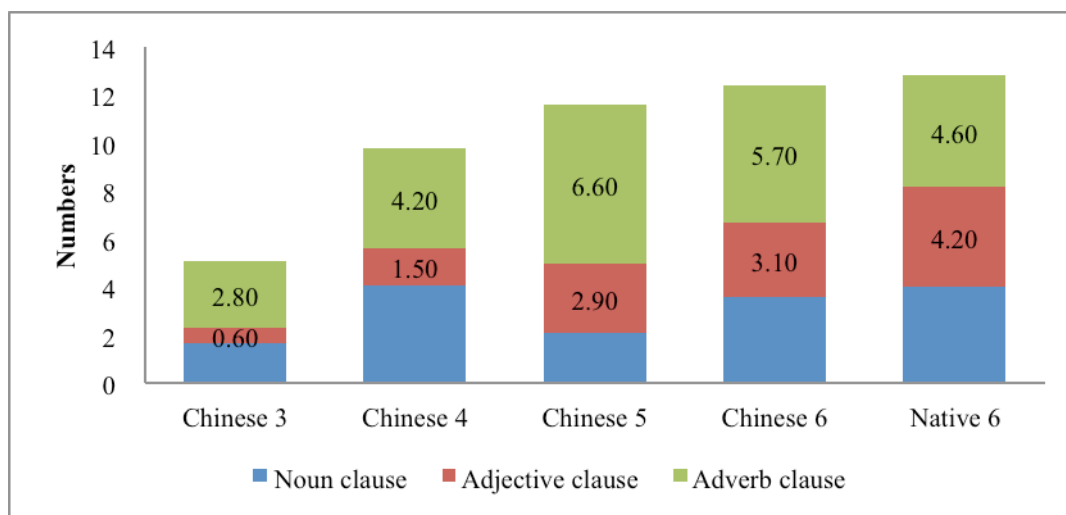

Figure 5. Mean number of three types of subordinate clauses per proficiency group

In addition to reporting the mean number of subordinate clauses, another important reason accounting for less use of subordinate clauses for Chinese 3 and Chinese 4 is due to the problematic clause constructions. Chinese 3 essays were found 9.09% ungrammatical subordinate clause usage and Chinese 4 found 11.54%. The error ratio is calculated from the numbers of incorrect sentence patterns divided by total number of T-units within the group. Since T-unit is applicable to mature syntactic structure, in the present study, sentence fragments were excluded from the data. In Chinese 3, problematic T-units resulted in syntactically or semantically ungrammatical are as follows.

e.g.1 *"for example, math, chemistry physics."* (C302)
e.g.2 *"Rather than those strict teacher."* (C310)
e.g. 3 *"In the other way, are also know that enjoyable and fun can make us awake from tiring."* (C308)

As can be seen in the examples, the incomplete syntactic structure may contribute to lower ratings. More error examples in the data samples seem to imply that the writers at this level may benefit explicit instruction on English kernel sentences that enables

them to construct basic syntactic patterns before writing more complex structures.

It is noteworthy that Chinese 4 revealed a different syntactic fragment types than did Chinese 3. It is observed that Chinese 4 test takers tended to make longer sentence structures, yet failed to attach subordinate clauses to main clauses as illustrated in the following examples. This type of syntactic problem may leave an impression to the readers that the information is not fully completed. In the sample data, some of main clauses came right after the fragmental subordinate clauses, while some were left incomplete.

> e.g. 4 "*As a teacher, no matter you are a physical teacher, a art teacher, a science teacher or a math teacher.*" (C405)
> e.g. 5 "*If the students find the learning interesting.*" (C410)
> e.g. 6 "*If a teacher simply follows the context of the book, without making any effort to improve the lesson.*" (C402)

Unlike Chinese 3, Chinese 4 writers may need instruction on what constitute complex sentence patterns and it is possible that this group of writers may benefit from sentence combing exercises.

Conclusions and Implications

The study is to explore the relationship of various measures of syntactic complexity with rated timed essays by three groups of Chinese writers and one group of native writers at different proficiency levels. It is hypothesized that the measures of syntactic complexity increase with the proficiency levels. Thus, by analyzing 40 rated TWE essay samples, this study is to examine whether the measures of syntactic complexity can be used as predictor of writing proficiency.

The results of the study show that groups of writers at different writing proficiency seem to display different patterns in terms of syntactic complexity. Some measures of syntactic measures seem to have positive relationships with the writing proficiency. Higher rated essays are found to be longer in length; that is, more sentences, words, and T-units are produced per text than in lower rated essays. The three measures, however, are found to be more salient in Chinese 3, 4, and 5, and Native 6, while Chinese 6 revealed a different pattern than the other groups.

With regard to words per T-unit and words per clause, the results indicate that the number of these two syntactic measures increase with the proficiency for Chinese 4, 5, and 6. This is in line with the hypothesis that the more proficient a writer is, the more syntactic measures are used in his/her writing, and thus the more syntactic complexity is featured for the writing. However, it is also noted that the measures are not applicable to two groups, the lowest rated essays (Chinese 3) and the highest rated essays (Native 6). It is argued that the measures of syntactic complexity might be objective or normative criteria, yet the measures may not be sensitive to the effectiveness of information. In the case of Chinese 3 and Native 6, it is likely that the lowest rated essays are found to have more, yet less effective units, while highest rated essays less, but more effective ones. In terms of types of subordinate clauses, it is found that there more proficient writers write more subordinate clauses than do low proficiency writers.

Among three types of clauses, adjective clauses are found to have positive relationship with proficiency. The mean number of adjective clauses increases when the proficiency gets higher. This finding suggests that high proficiency writers produce T-units that contain more detail by using adjective clauses. Another interesting finding is that Native 6 display equal means for three types of subordinate clauses, which may be that writers at this group have good command of the subordinate clauses. With a close examination of the clauses used, problematic subordinate clause uses were marked in Chinese 3 and 4 essays. The error types are related to the proficiency. Subordinate clauses errors made by Chinese 3 indicate that this group encounters difficulty in composing simple structures because most of the errors impede the understanding of messages. To this group, explicit instruction on basic English sentence structure may be necessary and helpful. In Chinese 4 essays, errors are found more frequently as sentence fragments. It is obvious that writers in this group may benefit from instruction on how to construct complex sentence, in which subordinate clauses have to be attached to main clauses to form a grammatical sentence. Sentence-combining could be effective exercise for this group.

Although the findings on measures provide insights on syntactic complexity, this study is limited in several ways. Firstly, the number of sample size for each proficiency group is very small. Only 10 essay samples for each group limit the generalizability of the study. In addition, even if the outliers at both ends for each group are excluded from the descriptive statistics, based on the standard deviations, it is admitted that the variation among individuals within a proficiency group is relatively high. Finally, since only one rater is responsible for the data analysis, it is likely that the result of the analysis may be subjective.

References

Beers, S. F., & Nagy, W.E. (2009). Syntactic complexity as a predicator of adolescent writing quality: Which measures? Which genre? *Read Write, 22*, 185-200.

Crowhurst, M. (1983). Syntactic complexity and writing quality: A review. *Canadian Journals of Education, 8*(1), 1-16.

Davidson, D. M. (1977). Sentence combining in an ESL writing program. *Journal of Basic Writing, 1*(3), 49-62.

Ferris, D. R. (1994). Lexical and syntactic features of ESL writing by students at different levels of L2 proficiency. *TESOL Quarterly, 28*(2), 414-420.

Grant, L., & Ginther, A. (2000). Using computer-tagged linguistic features to describe L2 writing differences. *Journal of Second Language Writing, 9*(2), 123-145.

Hunt, K. W. (1965) Grammatical structures written at three grade levels (Research Report No. 3). Campaign, IL: National Council of Teachers of English.

Hunt, K. W. (1966). Sentence structures used by superior students in grade four and twelve and by superior adults. Tallahassee: Florida State University.

Hunt, K. W. (1970). Syntactic maturity in school children and adults. *Monographs of the Society for Research in Child Development, 35* (1, Serial No. 134).

Morenberg, M., Daiker, D., and Kerek, D. (1978). Sentence combining at the college level: An experimental study. *Research in the Teaching of English, 12*(3), 245-256.

Neilsen, L., & Piché, G. L. (1981). The influence of headed nominal complexity and lexical choice on teachers' evaluation of writing. *Research in Teaching of English, 15*(1), 65-78.

NCTE beliefs about the teaching of writing (2004). Urbana, IL: National Council of Teachers of English. Retrieved on May 1, 2011, from http://www.ncte.org/governance/writing

Oshima, A., & Hogue, A. (2006). *Writing academic English* (4th ed.). Menlo Park, CA: Addison-Wesley.

Ravid, D. D. (2005). Emergence of linguistic complexity in later language development: Evidence from expository text construction. In D. D. Ravid & H. B.

Shyldkrot (Eds.), P*erspectives on language and language development: Essays in honor of Ruth A. Berman* (pp.337-356). London: Kluwer Academic Publishers.

Scott, C. M. (2004). Syntactic contributions to literacy learning. In C. A. Stone, E. R. Silliman, B. J. Ehren, & K. Apel (Eds.), *Handbook of language and literacy: Development and disorders* (pp. 340-362). New York: The Guilford Press.

TWE Scoring Guide (2004). Retrieved on June 13, 2017, from
https://www.ets.org/Media/Tests/TOEFL/pdf/Writing_Rubrics.pdf

Scott, C. M., & Winsor, J. (2000). General language performance measures in spoken
and written narrative and expository discourse of school-age children with language
learning disabilities. *Journal of Speech, Language, and Hearing Research, 43*,
324-339.

Contact email: yushanfan@tmu.edu.tw