How Do Japanese EFL Learners Elaborate Sentences Complexly in L2 Writing? Focusing on Clause Types

Yoshito NISHIMURA  
Graduate School, Nagoya University

Yu TAMURA  
Graduate School, Nagoya University / Japan Society for the Promotion of Science

Kazuhisa HARA  
Graduate School, Nagoya University

Abstract

Syntactic complexity has traditionally been measured by “macro-perspective measures,” which provide a paucity of angles from which to examine how learners actually elaborate a sentence. Mixing up a large variety of clauses with only “the number of clauses” or “subordination ratios” could lead to overlooking desired relationships between complexity and proficiency or task manipulation and linguistic performance. The current study attempted to capture the features of writing syntactically complex sentences through “micro-perspective measures,” such as clause types (main clauses, coordinate clauses, adverbial clauses, relative clauses, complement clauses, and non-finite clauses), and differences in learner proficiency levels. Participants were 28 Japanese EFL learners. Proficiency was operationalized via argumentative essay scores. To elicit syntactic knowledge, we offered the participants a specialized task that restricted the number of sentences in describing a plot consisting of six related illustrations. The results revealed that coordinate clauses, relative clauses, and non-finite clauses are more frequently produced in elaborating syntactic structures, irrespective of the writer’s proficiency level. Our findings also indicated that non-finite clauses are a more practical expedient for proficient learners than less proficient ones. Some pedagogical implications are also discussed.

1. Introduction

Inquiries into syntactic complexity (or syntactic development) have been of considerable interest in the field of second language (L2) writing in both longitudinal and cross-sectional studies. It is widely acknowledged that an L2 learner’s ability to arrange words into phrases or phrases into clauses demonstrates his or her capacity to manipulate the syntactic knowledge of a given target language (Crossley & McNamara, 2014; Ortega, 2003). Studies that have explored syntactic complexity have primarily focused on the syntactic variation and sophistication of the
The role of syntactic complexity in L2 writing refers generally to the sophistication of syntactic structures or the range or particular structures produced by L2 learners, which have been measured using metrics of syntactic complexity such as mean length of T-units, clauses per T-unit, and amount of subordination or coordination (Norris & Ortega, 2009; Wolfe-Quintero, Inagaki, & Kim, 1998). Syntactic complexity refers generally to the sophistication of syntactic structures or the range or variety of syntactic forms (Ortega, 2003). Its measure has been used to estimate L2 proficiency, describe L2 performance, or index L2 development (Ortega, 2012). While there has been a large variety of research on syntactic complexity in L2 writing, most studies have used “macro-perspective measures,” which provide a paucity of angles from which to examine how learners write syntactically complex sentences. Examinations into the kinds of clauses or phrases learners at different proficiency levels can or cannot use in elaborating the syntactic structures of sentences are of practical importance, as such information would greatly benefit teachers and assessors wishing to fully understand the developmental stages of L2 syntactic growth.

To fill the research gap, the present study investigates how Japanese EFL learners elaborate sentences complexly in L2 writing, focusing on subordinate clause types and coordinate clauses. The rationale for selecting subordination and coordination is that complexity can be based on two ways of arranging composite systems with subsystems: either in a hierarchical manner by means of its elements’ subordinate relationships or in a coordinative manner by means of reciprocal interrelationships among the elements (Rescher, 1998).

2. Background

2.1 The Role of Syntactic Complexity in L2 Writing

According to Ortega (2012), the key reasons for measuring syntactic complexity in L2 learners’ writing are “(a) to gauge proficiency, (b) to describe performance, and (c) to benchmark development” (p. 128). First, syntactic complexity measures have primarily been used as an indicator of L2 proficiency, investigating whether syntactic complexity increases as the learner’s proficiency does. If so, the measures serve as a valid and reliable indicator of proficiency: the more syntactically complex the syntactic knowledge, the higher the proficiency. However, recent studies in the L2 writing literature have shown that more proficient learners do not always produce sentences featuring more complex syntactic structures than less proficient learners (Biber, Gray, & Poonpon, 2011; Norris & Ortega, 2009). Norris and Ortega convincingly argued that syntactic development proceeds in the following steps: (1) L2 learners at the beginning level express their ideas and the logical links and structure between them mostly through grammatical coordination (i.e., coordinate clauses); (2) L2 learners at the intermediate level begin to use more subordination than coordination; (3) L2 learners at the more advanced stages of language proficiency primarily use more nominalization at the phrasal level (i.e., grammatical metaphor). In other words, the metrics used in measuring syntactic complexity should vary depending on the learner’s proficiency level.
2.1 The Role of Syntactic Complexity in L2 Writing

Syntactic complexity refers generally to the sophistication of syntactic structures or the range or variety of syntactic forms (Ortega, 2003). Its measure has been used to estimate L2 proficiency, subordination or coordination (Norris & Ortega, 2009; Wolfe-Quintero, Inagaki, & Kim, 1998). Syntactic complexity measures as descriptors of L2 performance are primarily used in the domain of task-based research (e.g., Kuiken & Vedder, 2008). The key issues in task-based research have been concerned with the link between task manipulation and linguistic performance, investigating which hypothesis model task affects L2 performance; namely, the Limited Capacity Model (Skehan, 1998) or the Cognition Hypothesis (Robinson, 2001) can be supported in empirical data.

The second purpose of syntactic complexity measurement is to describe L2 performance. Syntactic complexity measures as descriptors of L2 performance are primarily used in the domain of task-based research (e.g., Kuiken & Vedder, 2008). The key issues in task-based research have been concerned with the link between task manipulation and linguistic performance, investigating which hypothesis model task affects L2 performance; namely, the Limited Capacity Model (Skehan, 1998) or the Cognition Hypothesis (Robinson, 2001) can be supported in empirical data.

Finally, syntactic complexity may potentially be used as an index of L2 developmental level under the assumption that the syntactic complexity of an L2 learner’s production increases with growing grammatical development. The question here is whether syntactic complexity measures can serve as a tool for benchmarking interlanguage development. Regrettably, there is little empirical evidence to support the assumption that syntactic complexity increases as linguistic developments proceeds. Ortega (2012) claimed “subsequent SLA research in this area soon shifted away from development to instead concentrate on validating the relationship between complexity and proficiency” (p. 134). As this implies, development and proficiency are distinct constructs: according to Ortega, proficiency refers to an externally motivated and subjective description of what it means to be an effective language user, whereas development refers to an internally motivated trajectory of language acquisition. Thus, although related, these constructs must be considered separately.

Taken together, syntactic complexity as a metric of linguistic performance has primarily been used to evaluate the relationships between complexity and proficiency, and to describe the linguistic performance of certain task manipulation. For whatever purpose, when measuring syntactic complexity, most researchers have been concerned with the quantification of macro-perspective structures, rather than with the complexification of a sentence. Representative measures such as the mean length of T-units, the clauses per T-unit, or the amount of subordination or coordination have overlooked the question of which kinds of clauses or phrases L2 learners are able to use in elaborating the syntactic structures of a sentence. In the following section, we will review the types of syntactic complexity measures used in previous studies and identify the issues with their use.

2.2 Syntactic Complexity Measures

In the L2 writing literature, the traditional methods of measuring syntactic complexity are tripartite: (1) length-based measures that calculate the mean length of T-units and clauses, or words before the main verbs; (2) frequency-based metrics that count clauses per T-unit or T-units per sentence; and (3) ratio-based indices that calculate by dividing words by a chosen production unit. When selecting syntactic complexity measures, most researchers have justified their choice based on the synthesis of the research. For example, Wolfe-Quintero, Inagaki, and Kim (1998) reviewed the strength of the relationships between a large variety of measures and learner proficiency, and then identified which measures performed the best based on the large-scale
cumulative evidence. They concluded that the most preferable measures were the following: the mean length of T-units, the mean length of the clauses, the clauses per T-unit, and the dependent clauses per clause. Interestingly, these measures do not focus on specific syntactic forms, although Wolfe-Quintero et al. defined syntactic complexity as a wide variety of both basic and sophisticated structures. Rather, focusing on specific grammatical forms such as clause types clarifies the relationship between complexity and proficiency. Although studies using syntactic complexity measures have made their own definition and operationalization choices, consideration into what indices intend to measure is also important. Given the definition that syntactic complexity refers generally to the sophistication of syntactic structures or the range or variety of syntactic forms (Ortega, 2003), in either purpose, perhaps, there is much to learn by focusing on specific syntactic structures that have been overlooked by previous studies.

The significance of the raw frequency of certain syntactic structures (e.g., main clauses, coordinate clauses, adverbial clauses, relative clauses, complement clauses, or non-finite clauses) has garnered little attention from researchers’ in the L2 writing literature. Not only the macro-perspective measures but also the “micro-perspective measures,” which focus on specific syntactic forms such as clause types, should be used to measure syntactic complexity and to capture the features of elaborating a sentence. Mixing up a large variety of syntactic forms with only “the number of clauses” or the “subordination ratio” is not sufficient, because the numeration of clauses has never shed light on how an L2 learner elaborates sentences complexly or on the detailed developmental stages of syntactic growth.

2.3 Clause Types in English, Their Functions, and Developmental Perspectives

Clauses are considered to be the basic structure unit of a sentence (Townsend, 1997). Clauses comprise at least two different types in English: finite clauses and non-finite clauses. Finite clauses refer to a clause containing a verb that shows tense and agreement. These clauses can be main clauses or subordinate clauses. On the contrary, non-finite clauses contain a verb that does not show tense or agreement. Although there is debate as to whether clauses refer to both finite clauses and non-finite clauses in the L2 writing literature (Yang, Lu, & Weigle, 2015), this study will count both as clauses following the definition of linguistic theories of grammar (Givón, 2009).

Finite clauses can be main clauses, coordinate clauses, adverbial clauses, relative clauses, or complement clauses. Main clauses typically consist of a noun phrase and a verb phrase at minimum, and are sometimes followed by an object, a complement, or an adverb.

Coordinate clauses are finite clauses that connect to one or more other clauses of equal status with coordinate conjunctions (e.g., and, but, or, nor, for, so, and yet). Coordinate clauses are considered to be a basic way of elaborating a sentence (Norris & Ortega, 2009).

Adverbial clauses serve a similar function to coordinate clauses. Adverbial clauses are finite clauses that are connected to main clauses by sentences containing noun phrases and finite verbs.
with subordinate conjunctions (e.g., because, when, if, whether, before, after, and so forth). This clause is considered to be a subordinate clause type that combines a sentence with a sentence (Diessel, 2013). According to the developmental order of clauses in speaking (Vercellotti & Packer, 2016), adverbial clauses are thought to be acquired at earlier stages of L2 proficiency than other subordinate clauses.

Relative clauses are embedded into the main clause and require a subject-gap or object-gap, and, in the words of Vercellotti and Packer (2016), “they are not grammatically required and are also syntactic adjuncts” (p. 180). Kazemi (2011) claimed that embedded clause types, such as relative clauses, are harder to use than combined clause types such as coordinate clauses or adverbial clauses. Vercellotti and Packer (2016) argued that relative clauses are acquired in later stages of L2 speaking than other subordinate clauses, with the exception of complement clauses. There is, however, little research on L2 writing development concerning relative clauses.

Complement clauses are subordinate clauses that are introduced by complementizers such as that or whether. This finite clause is connected to preceding noun phrases, verb phrases, or adjectival phrases, which serve to complete the meaning of a noun or verb in a sentence. On the one hand, complement clauses are as hard to use accurately as relative clauses are in L2 speaking (Vercellotti & Packer, 2016). On the other hand, Biber et al. (2011) claimed that complement clauses are frequent in L2 speaking. Both conflicting results are derived from L2 oral production; thus, the inquiry into the use of complement clauses in L2 writing is worthwhile, and the result of a comparison with L2 speaking might be intriguing.

Non-finite clauses also play different roles in a sentence depending on their purpose. That is, non-finite clauses can be either nominal or adjectival clauses, which are considered to be embedded clauses, such as relative or complement clauses. Or, they can function as adverbial non-finite clauses, which are considered to be combined clauses, such as coordinate or adverbial clauses. Although non-finite clauses are considered to be difficult for L2 learners to use (Rimmer, 2008), Vercellotti and Packer (2016) positioned non-finite clauses after adverbial clauses in the developmental order of syntactic growth in L2 speaking. However, there is little insight into the use of non-finite clauses in L2 writing; thus, examinations into the use of non-finite clauses in L2 writing are worthwhile.

2.4 Summary and Guide to the Present Study

As mentioned above, there are many different types and functions of clauses, so that not only the macro-perspective measures but also the micro-perspective indices of measuring syntactic complexity should be used. Previous studies using macro-perspective measures have two major limitations: (1) there is no closer look at the way learners elaborate syntactic forms because of the mixing of a large variety of clauses with only the number of clauses or subordination ratio; (2) there is an oversight of the differences that elaborate syntactic structures of a sentence between proficient learners and less proficient ones. In order to overcome these limitations, this study
asked Japanese EFL learners to write syntactically complex sentences in a purposeful manner, by manipulating task conditions that restricted the number of sentences used to describe six related illustrations. This was done to capture the features of elaborating syntactic forms in terms of two perspectives: (a) clause types and (b) the differences between proficient learners and less proficient ones. By focusing on clause types in measuring syntactic complexity, the relationship between syntactic complexity and L2 proficiency can be examined. With this background in mind, the following research questions were investigated:

RQ1. What is the difference in task conditions between clause types in elaborating syntactic structures?
RQ2. Does learner proficiency level affect the clause types used in elaborating syntactic structures?

3. Methods

3.1 Participants

The participants were 30 Japanese graduate students, who were English learners and native speakers of Japanese. Two participants were eliminated from the analysis due to outliers and not following instructions. The number of remaining participants was thus 28 (11 men and 17 women). Their majors included various fields, such as language and culture, engineering, international development, international cooperation, and international communication. Their mean age was 26.29 years ($SD = 6.41$). The participants’ English proficiency levels were estimated to be in the upper intermediate range, according to their Test of English for International Communication (TOEIC) scores ($N = 26, M = 822.30, SD = 120.09$), which corresponds to the B2 level in the Common European Framework of Reference for Languages (CEFR). However, their TOEIC scores were not included in our analysis because the scores of two participants were unavailable; moreover, the TOEIC scores are not specialized for writing proficiency. Thus, the participants’ TOEIC scores were only used to grasp the average overall proficiency level.

3.2 Writing Tasks

In this study, the participants were required to perform two description tasks of six related illustrations that manipulated task conditions, and then essay writing to roughly determine each learner’s proficiency level. The task conditions were as follows: (1) describing a cartoon consisting of six ordered illustrations using six sentences and (2) describing the six related illustrations without restrictions on the number of sentences they could write. The pictures used in this study include *The Chase* and *A Surprise* from Heaton (1975). Restricting the number of sentences to describe the six related illustrations had the potential to elicit a larger variety of syntactic structures than not restricting the number of sentences, because the participants had to
condense the plotline into only six sentences. Using a dictionary, taking notes, and rewriting sentences after they were finished (i.e., when the participants finished writing one sentence and began writing the next sentence, previous sentences were not allowed to be rewritten) were not permitted. In the essay writing task, one of two prompts that they were asked to agree or disagree with were randomly assigned to the participants. These prompts were as follows: (1) It is better to have broad knowledge of many academic subjects than to specialize in one specific subject and (2) the best way to travel is in a group led by a tour guide. Each prompt was quoted from the ETS Corpus of Non-native Written English (Blanchard, Tetreault, Higgins, Cahill, & Chadorow, 2014). In the essay-writing task, taking notes and rewriting sentences after they had been completed was permitted, although the use of a dictionary was not.

Task 1 counterbalanced task 2 and prompt 1 counterbalanced prompt 2, as well. The participants had 20 minutes to complete each task and 30 minutes to write the essay. The participants’ performance on the two tasks and the essay writing was recorded by the key stroke logging software WritingMaetriX (Kusanagi, Abe, Fukuta, & Kawaguchi, 2015).

3.3 Coding

This study investigated the features of elaborating syntactic structures. In addition to subordinate clause, such as adverbal clauses, relative clauses, complement clauses, and non-finite clauses, main clauses and coordinate clauses were also included in the analysis, because complexity can be based on two ways of arranging composite systems with subsystems: either in a hierarchical manner by means of its elements’ subordinate relationships or in a coordinative manner by means of reciprocal interrelationships among the elements. (Rescher, 1998). All clause types produced in the description task were assigned to one of the clause types by the authors of this study.Clauses of 10% of the overall participants were coded by three authors. The concordance rate in the coding by the three authors was approximately 92%. When there was disagreement between the authors during the coding process, the problem was solved by discussion. When a sentence included a grammatical error, it was coded by guessing the meaning from the context. The definition of clause types and examples from the data are shown in Table 1. Syntactic structures that were not applicable to our definition of clause were also coded. For example, an independent clause with one subject and a predicate with a finite verb was coded as a coordinate predicate (e.g., *The old man stole the big suitcase and is running away*). A sentence without finite verb and a character’s dialogue enclosed in double quotes was also coded as other (e.g., “*Here, you dropped this when you got off the bus.*”). As the categories of coordinate predicate and other did not belong to our definition of clauses, they were not included in our analysis, except for descriptive statistics. By dividing the number of clauses in a sentence by the total number of sentences per participant, clause ratios for each participant were calculated. The essay-writing task was rated according to a 6-point scale (0-5, where 0 = very poor, and 5 = excellent), used to estimate the learners’ proficiency levels using the Independent Writing Rubrics.
developed by the Educational Testing Service. The interrater reliability among the three raters for the essay was good to fair ($\kappa = .69$).

### Table 1

**The Definition of Clause Types in this Study and Examples from the Data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main</td>
<td>Consisting of a noun phrase and a verb phrase at minimum</td>
<td><em>There is a small fence next to the trees.</em></td>
</tr>
<tr>
<td>Coordinate</td>
<td>Connected to one or more other clauses of equal status by coordinate conjunctions</td>
<td><em>The man looks relieved and the boy is laughing.</em></td>
</tr>
<tr>
<td>Adverbial</td>
<td>Connected to main clauses by sentences containing a noun phrase and finite verbs with subordinate conjunctions</td>
<td><em>As the boy looked back with a big picture, the old man talked to him.</em></td>
</tr>
<tr>
<td>Relative</td>
<td>Embedded into the main clause and requiring a subject-gap or object-gap</td>
<td><em>A stranger stole the box that belonged to them.</em></td>
</tr>
<tr>
<td>Complement</td>
<td>Subordinate clauses that have a complementizer connector</td>
<td><em>The man noticed that his belongings had been stolen.</em></td>
</tr>
<tr>
<td>Non-finite</td>
<td>Subordinate clauses that are not marked for agreement and tense (e.g., infinitives, gerunds, and participles)</td>
<td><em>He got scared and tried to run away from the man.</em></td>
</tr>
</tbody>
</table>

### 3.4 Analysis

In order to investigate how L2 learners write syntactically complex sentences and whether writing proficiency influences the way learners elaborate single sentences, we conducted a series of linear mixed-effects (LME) analyses with crossed random effects of the participants for each clause. The response variable was the frequency of each clause type calculated by dividing the number of sentences into the number of each clause measured. We included three explanatory variables in the model. First, since our focus was on whether restricting the number of sentences in the picture description task affected the production of different types of subordinate clauses, the task condition (restricted or non-restricted) was entered into the model as a categorical variable, the coding of which was done by contrast coding, as recommended by Linck and Cunnings (2015). Second, essay scores of individual participants were also included in the model to see whether different tendencies of producing subordinate clauses according to learner writing proficiency were observed. The essay scores were centered on the group mean to avoid the multicollinearity issue. Third, the interaction term between the task condition and writing proficiency was added. The model, which included both the random slope and random intercept of the participants, had convergence issues, and therefore, all the models reported in the next section only include the...
random intercepts of the participants. The analysis was completed using R3.3.0 (R Core Team, 2016) and lme4 package (Bates, Maechler, Boker, & Walker, 2016).

4. Results

Table 2 summarizes the descriptive statistics of the frequency of each type of clauses, and Figure 1 graphically represents the frequency of the clauses targeted in this study. In the non-restricted condition, the participants were likely to produce more sentences than in the restricted condition, which indicates that the participants split the necessary information into independent clauses rather than using subordination. Looking at the type of clauses, coordinate predicates and adverbial clauses did not increase in the restricted condition, whereas the frequency of coordinate clauses, relative clauses, and non-finite clauses increased.

Table 2
Descriptive Statistics of the Clauses and Other Types Measured in Each Condition

<table>
<thead>
<tr>
<th>Condition</th>
<th>Measures</th>
<th>M</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Skew</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restricted</td>
<td>Coordinate clause</td>
<td>0.52</td>
<td>0.42</td>
<td>0</td>
<td>1.67</td>
<td>0.91</td>
<td>-0.06</td>
</tr>
<tr>
<td></td>
<td>Coordinate predicate</td>
<td>0.22</td>
<td>0.18</td>
<td>0</td>
<td>0.67</td>
<td>0.36</td>
<td>-0.63</td>
</tr>
<tr>
<td></td>
<td>Adverbial</td>
<td>0.23</td>
<td>0.2</td>
<td>0</td>
<td>0.67</td>
<td>0.62</td>
<td>-0.57</td>
</tr>
<tr>
<td></td>
<td>Relative</td>
<td>0.24</td>
<td>0.15</td>
<td>0</td>
<td>0.5</td>
<td>-0.26</td>
<td>-0.92</td>
</tr>
<tr>
<td></td>
<td>Complement</td>
<td>0.21</td>
<td>0.29</td>
<td>0</td>
<td>1.17</td>
<td>1.63</td>
<td>2.38</td>
</tr>
<tr>
<td></td>
<td>Non-finite</td>
<td>0.64</td>
<td>0.38</td>
<td>0</td>
<td>1.5</td>
<td>0.4</td>
<td>-0.78</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>0.02</td>
<td>0.05</td>
<td>0</td>
<td>0.17</td>
<td>2.41</td>
<td>3.93</td>
</tr>
<tr>
<td>Non-restricted</td>
<td>Main clause</td>
<td>0.99</td>
<td>0.03</td>
<td>0.83</td>
<td>1</td>
<td>-4.74</td>
<td>21.21</td>
</tr>
<tr>
<td></td>
<td>Coordinate clause</td>
<td>0.26</td>
<td>0.19</td>
<td>0</td>
<td>0.67</td>
<td>0.61</td>
<td>-0.75</td>
</tr>
<tr>
<td></td>
<td>Coordinate predicate</td>
<td>0.21</td>
<td>0.15</td>
<td>0</td>
<td>0.5</td>
<td>0.23</td>
<td>-1.15</td>
</tr>
<tr>
<td></td>
<td>Adverbial</td>
<td>0.19</td>
<td>0.14</td>
<td>0</td>
<td>0.5</td>
<td>0.43</td>
<td>-0.75</td>
</tr>
<tr>
<td></td>
<td>Relative</td>
<td>0.12</td>
<td>0.1</td>
<td>0</td>
<td>0.33</td>
<td>0.55</td>
<td>-0.65</td>
</tr>
<tr>
<td></td>
<td>Complement</td>
<td>0.14</td>
<td>0.11</td>
<td>0</td>
<td>0.4</td>
<td>0.56</td>
<td>-0.51</td>
</tr>
<tr>
<td></td>
<td>Non-finite</td>
<td>0.4</td>
<td>0.26</td>
<td>0</td>
<td>0.92</td>
<td>0.33</td>
<td>-1.24</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>0.03</td>
<td>0.07</td>
<td>0</td>
<td>0.28</td>
<td>2.15</td>
<td>4.68</td>
</tr>
<tr>
<td></td>
<td>Number of sentences</td>
<td>11.96</td>
<td>4.93</td>
<td>6</td>
<td>25</td>
<td>1.46</td>
<td>1.16</td>
</tr>
</tbody>
</table>

Note. The number of clauses measured were divided by the number of sentences in each condition.
The results of the LME analyses confirmed the results displayed in Table 2 and Figure 1. For coordinate clauses, there was a main effect of the task condition (Estimate = -0.257, SE = 0.079, $t = -3.261, p = .003$), though we find neither a main effect of writing proficiency (Estimate = -0.022, SE = 0.046, $t = -0.482, p = .634$) nor an interaction between the condition and proficiency (Estimate = 0.645, SE = 0.074, $t = 8.68, p = .393$). No main effects and no interaction were found on the use of adverbial clauses (for the main effect of the condition; Estimate = -0.038, SE = 0.045, $t = -0.843, p = .403$, for the main effect of proficiency; Estimate = 0.028, SE = 0.043, $t = 0.669, p = .376$, or for the interaction between the two; Estimate = 0.029, SE = 0.043, $t = 0.669, p = .376$). Similarly, neither the main effects of both the condition or proficiency nor the interaction were found on the use of complements (condition; Estimate = -0.070, SE = 0.056, $t = -1.253, p = .221$, proficiency; Estimate = 0.042, SE = 0.028, $t = 1.497, p = .146$, interaction; Estimate = -0.014, SE = 0.052, $t = -0.259, p = .798$). As for relative clauses, there was a main effect of the condition (Estimate = -0.120, SE = 0.029, $t = -4.123, p < .001$), but again, no main effect of proficiency (Estimate = 0.016, SE = 0.018, $t = 0.900, p = .376$), and an interaction between the two explanatory variables (Estimate = -0.026, SE = 0.027, $t = -0.956, p = .348$) was found. Lastly, there was a main effect of the condition (Estimate = -0.239, SE = 0.067, $t = -3.560, p = .001$) and the writing proficiency (Estimate = 0.010, SE = 0.046, $t = 2.069, p = .049$) on non-finite clauses. The five panels in Figure 2 graphically summarize the results of the LMEs.

Figure 1. Box plots representing the frequency of each clause measured per sentence. Grey box plots and white box plots indicate the frequency in the non-restricted condition and restricted condition respectively. Dots represent each participant.

Figure 2. Interaction plot of the five clause types. The black lines represent the restricted condition and the grey lines represent the non-restricted condition. The grey areas are 95% CI.
Figure 1. Box plots representing the frequency of each clause measured per sentence. Grey box plots and white box plots indicate the frequency in the non-restricted condition and restricted condition respectively. Dots represent each participant.

The results of the LME analyses confirmed the results displayed in Table 2 and Figure 1. For coordinate clauses, there was a main effect of the task condition (Estimate = -0.257, SE = 0.079, t = -3.261, p = .003), though we find neither a main effect of writing proficiency (Estimate = -0.022, SE = 0.046, t = -0.482, p = .634) nor an interaction between the condition and proficiency (Estimate = 0.645, SE = 0.074, t = 0.868, p = .393). No main effects and no interaction were found on the use of adverbial clauses (for the main effect of the condition; Estimate = -0.038, SE = 0.045, t = -0.843, p = .403, for the main effect of proficiency; Estimate = 0.028, SE = 0.213, t = 1.291, p = .202, or for the interaction between the two; Estimate = 0.029, SE = 0.043, t = 0.669, p = .507). Similarly, neither the main effects of both the condition or proficiency nor the interaction were found on the use of complements (condition; Estimate = -0.070, SE = 0.056, t = -1.253, p = .221, proficiency; Estimate = 0.042, SE = 0.028, t = 1.497, p = .146, interaction; Estimate = -0.014, SE = 0.052, t = -0.259, p = .798). As for relative clauses, there was a main effect of the condition (Estimate = -0.120, SE = 0.029, t = -4.123, p < .001), but again, no main effect of proficiency (Estimate = 0.016, SE = 0.018, t = 0.900, p = .376), and an interaction between the two explanatory variables (Estimate = -0.026, SE = 0.027, t = -0.956, p = .348) was found. Lastly, there was a main effect of the condition (Estimate = -0.239, SE = 0.067, t = -3.560, p = .001) and the writing proficiency (Estimate = 0.010, SE = 0.046, t = 2.069, p = .049) on non-finite clauses. The five panels in Figure 2 graphically summarize the results of the LMEs.

Figure 2. Interaction plot of the five clause types. The black lines represent the restricted condition and the grey lines represent the non-restricted condition. The grey areas are 95% CI.

5. Discussion

To summarize the results of this study, the participants produced more coordinate clauses, relative clauses, and non-finite clauses when they were required to include the same amount of information in a restricted number of sentences. Among these three types of clauses, only non-finite clauses demonstrated the significant main effect of writing proficiency, suggesting that the participants who were proficient in writing tended to utilize non-finite clauses in the description task irrespective of the task condition, compared to the less proficient learners. However, it should be noted that, as can be seen in Figure 3, the amount of non-finite clauses produced was greater than any other type of clause; therefore, the fact that we found the main effect of writing proficiency on the frequency of use of non-finite clauses does not mean that less proficient learners did not use non-finite clauses as a means of elaborating sentences.
5.1 Clause Types, Task Conditions, and Learner Proficiency

Our research questions were concerned with (1) the differences in manipulating task conditions between clause types in writing syntactically complex sentences and (2) the differences in proficiency between clause types in elaborating syntactic structures. In the restricted condition, the participants used coordinate clauses to pack information into a limited number of sentences. A plausible explanation of this is that coordinate clauses provide a way to elaborate a sentence (Norris & Ortega, 2009). Coordinate clauses have a feature that combines a sentence with another sentence having equal status. When connecting between sentences with a subject and a finite verb in order to pack information into a sentence, coordinate clauses are considered to be easier to produce compared to subordinate clauses. On the other hand, the fact that no proficiency effects on coordinate clauses were found suggests that coordinate clauses are useful in writing syntactically complex sentences irrespective of learner proficiency. In addition, using adverbial clauses as well as coordinate clauses are useful ways of increasing the amount of information in a sentence, because adverbial clauses have a similar status as coordinate clauses in terms of connecting a sentence with a subject and a finite clause to main clause (Diessel, 2013). Interestingly, no task and proficiency effects on adverbial clauses were found. This result suggests that when combining a sentence with a subject and a finite verb, coordinate conjunctions are easier to use than subordinate conjunctions, regardless of learner proficiency and task restriction.

Unlike coordinate clauses and adverbial clauses, relative clauses are embedded into the main clause and require a subject-gap or object-gap. As relative clauses are difficult syntactic structures to acquire and use accurately (Pienemann, 1998), a significant difference in learner proficiency between the ratio of relative clauses in production was expected; however, surprisingly, no such difference was found, which means that irrespective of learner proficiency, relative clauses are easy to use as a way of elaborating syntactic structures. Although relative clauses have been considered difficult to use correctly by previous studies (e.g., Kormos & Trebits, 2012), relative clauses are apparently easier to use than adverbial clauses and complement clauses if one needs to condense information into one sentence. Of course, in evaluating this, keep in mind that the overall, general proficiency level of the participants in this study was upper intermediate.
Similar to relative clauses, complement clauses are also embedded clause types that are introduced by complementizers; however, in this study, it was not the case that complement clauses were utilized in writing syntactically complex sentences. The plausible explanation for this is that, as complement clauses are a salient way to convey information about the speaker’s point of view in L2 speaking contexts (Biber, Gray, & Staples, 2016), using these clause types might be considered to be ineffective in increasing the amount of information in a sentence in L2 writing.

Both effects of proficiency and task were only found on non-finite clauses. As non-finite clauses do not require verb tense or agreement, unlike other subordinate clauses and coordinate clauses, they are useful in elaborating syntactic structures easily. In fact, the ratio of non-finite clauses was greater than any other subordinate clauses and coordinate clauses. Therefore, non-finite clauses are considered to be a practical expedient in increasing the amount of information in a sentence, namely elaborating syntactic structures. It is, of course, possible that the results are considered to be derived from task essentialness, where task in itself requires to elicit certain syntactic forms, so one should be careful in construing the results.

Let us consider further the unique status of non-finite clauses. These constructions can be either nominal or adjectival (which can both be classified as embedded, such as relative or complement clauses), or adverbial (which can be classified as a combined clause, such as coordinate clauses). Based on Kazemi’s (2011) claim that the combined clause type is easier to produce than the embedded clause type, a higher ratio of adverbial non-finite clauses should have been produced than nominal and adjectival non-finite clauses; however, this was not the case. Interestingly, in post hoc analyses, the nominal non-finite clause frequently used as an object of a finite verb had the highest ratio of the non-finite clauses in both conditions (56.8% of the overall non-finite clause ratio in the restricted condition; 47.1% in the non-restricted condition). A possible explanation for this might be that as nominal non-finite clauses are the only dependent clauses that could be required for grammaticality that serves as grammatical subjects or direct objects (Vercellotti & Packer, 2016), nominal non-finite clauses are easier to use than other non-finite clauses as well as other subordinate clauses.

5.2 Pedagogical Implications

Like the present study, investigating how Japanese EFL learners elaborate syntactic forms in a sentence through focusing on clause types would lead to a better understand of the specific differences of clause usage. In order to link this line of research to pedagogical implications for teachers and assessors, it is also important to investigate how a specific task is likely to elicit certain syntactic structures. If we can reveal the complex relationships between how learners in diverse proficiency groups elaborate sentences and how various tasks elicit different types of clauses, it would help us to further our understanding of L2 writing, from both research and practice perspectives.
5.3 Limitations and Recommendations for Future Studies

There are several limitations to the current study. First, the number of clauses produced by the participants was moderate. Particularly, the number of adverbial clauses, complement clauses, and relative clauses produced was small. The number of clauses was originally count data, so that the present study should have treated the number of clauses as count data, not as ratio data. As there is a weak relationship between the number of sentences (or clauses) and the number of subordinate clauses, generalized linear methods such as the Poisson or negative binomial distribution cannot be applied to our data. Second, this study focused on subordinate clauses in description tasks. The relationship between the production trend of subordinate clauses in a description task or another task such as a narrative task, argumentative task, or expository task remained unsettled. Given task essentialness, where task in itself required eliciting certain syntactic forms, when replicating this study the results might differ from the present study. Third, because the overall average proficiency levels of the participants in this study was confined to the range of upper intermediate alone, a wider proficiency range such as novice or advanced will be required. Furthermore, writings of native speakers of English identical to the learners’ will also be necessary as base data. Thus, the comparison of features in writing syntactically complex sentences between native and non-native learners could reveal intriguing features of the texts. Finally, the psychological orientation of how the participants achieved the necessary conditions for various task was not accounted for in this study, thus leaving the matter of whether the participants attempted to artistically describe cartoons or technically describe plots, which can affect clause production, unresolved.

6. Concluding Remarks

The present study investigated how L2 learners actually elaborate sentences complexly in writing, focusing on specific syntactic structures. The results indicated that coordinate clauses, relative clauses, and non-finite clauses are practical expedients in writing syntactically complex sentences; moreover, proficient learners have the tendency to utilize non-finite clauses to increase the amount of information in a sentence. Although the present study has several limitations that should be kept in mind, the results shed new light on how L2 learners actually write syntactically complex sentences in terms of the micro-perspective indices that have attracted little attention from researchers in previous studies. Thus, it can be said that this study’s findings make a significant contribution to the literature in this regard.

Notes

1 A t-unit is composed of one main clause plus the dependent clauses (Hunt, 1965).
A t-unit is composed of one main clause plus the dependent clauses (Hunt, 1965). Significant contribution to the literature in this regard. Thus, it can be said that this study's findings make a complex sentences in terms of the micro-perspective indices that have attracted little attention should be kept in mind, the results shed new light on how L2 learners actually write syntactically. The present study investigated how L2 learners actually elaborate sentences complexly in L2 writing, focusing on specific syntactic structures. The results indicated that coordinate clauses, relative clauses, and non-finite clauses produced was small. The number of clauses was originally count data, so that there is a weak relationship between the number of sentences (or clauses) and the number of adverbs not complement clauses (e.g., Eventually the boy could understand why the man chased, and said thanks to him), the frequency of the indirect questions was extremely low (n = 6). Hence, the indirect questions were not included in our analysis.

References

Hunt, K. W. (1965). Grammatical structures written at three grade levels. NCTE research report, no. 3. Champaign, IL: National Council of Teachers of English

2 Although indirect questions used as the direct object of a finite verb were coded as relative adverbs not complement clauses (e.g., Eventually the boy could understand why the man chased, and said thanks to him), the frequency of the indirect questions was extremely low (n = 6). Therefore, the indirect questions were not included in our analysis.


