

Acquisition of -Prodrop Language

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1. Universal Grammar and Language Acquisition

1.1 Introduction

Chomsky (1981) proposed Universal Grammar (UG) as a partial answer to the question of how children ultimately attain competence in first language (L1) acquisition. Assuming UG is activated in L1 acquisition, my first concern is whether UG also operates in second language (L2) acquisition and the effects of the L1 on L2 acquisition.

UG contains parameters whose values may differ from language to language. Some languages allow null subjects while other languages do not. The Prodrop Parameter (Chomsky 1981) is proposed to account for these differences. The main objective of this paper is to determine experimentally whether or not Japanese learners of English can reset the Prodrop Parameter from "+prodrop" to "-prodrop".

Additionally, I briefly deal with whether the acquisition process differs between L2 learners who receive no out-of-classroom contact with L2 and those who receive no instruction but have considerable opportunities of being exposed to English.

1.2 Logical Problem

Adult native speakers internalize linguistic rules and have unconscious knowledge which allows them to interpret or judge sentences such as (1) - (3) correctly.

- (1) a. John thinks that Bill likes him.
b. John thinks that Bill likes himself.
- (2) a. John told Mary to be back by one.
b. John promised Mary to be back by one.
- (3) He jumped into the pool with enthusiasm,
a. but she did so with temerity.
b. and so did she.
c.* and she.

The linguistic system which adults internalize is far more complex than the input children are exposed to in the process of language acquisition. In other words, there is a mismatch between primary input data and the grammar or linguistic system which children ultimately attain. This mismatch is referred to as a "projection problem" or a "logical problem", in which there are the following three main problems with input: underdetermination, degeneracy and lack of negative evidence (White, 1989).

Firstly, the primary input which children are exposed to is far less complex than the linguistic system which children ultimately acquire. In other words, input data underdetermine the acquired complex system. In compensation for underdetermination of input, it is suggested that

children are guided by innate principles which offer a priori knowledge of the linguistic system (Chomsky, 1981).

Secondly, input which children are exposed to is not always perfect. Even adult native speakers make grammatical mistakes, use wrong words, use incomplete sentences, etc. Thus, input consists of ungrammatical or imperfect sentences as well as grammatical ones. This problem with input is referred to as degeneracy. Children, being exposed to deficient input, do not know which input is grammatically correct and which is not, yet they eventually arrive at the linguistic system on the basis of degenerate input. Thus, this also suggests that children have innate internal principles which guide them in acquiring adult-like linguistic proficiency.

The third problem involves negative evidence which indicates that certain forms are not possible in a language, whereas positive evidence indicates that certain forms are possible.

The fact that children ultimately attain linguistic competences implies that they are able to distinguish ungrammatical sentence from grammatical ones. Despite the lack of negative evidence, children attain linguistic competence which can distinguish ungrammatical sentences from grammatical ones in their first language. It is therefore plausible to assume that some innate principles provide negative constraints; that is, some principles dictate what language may not do (White 1989).

Regardless of the logical problems - underdetermination, degeneracy, lack of negative evidence, and finiteness - children ultimately attain linguistic competence in a short time without making certain errors which are logically possible. How are children able to attain such competence in first language (L1) acquisition? As a partial answer to this question, Universal Grammar (UG) was proposed by Chomsky (1981). UG, being an innate system, consists of principles which function as boundary conditions on grammars. Thus, UG gives children a priori knowledge of language features and guides L1 acquisition, so that children are not misled into false hypotheses in spite of defective input. UG, therefore cannot be language specific, that is, UG does not include features of specific language such as English or Japanese but is abstract and rich enough for children to acquire any particular language under the boundary conditions.

1.3 The Logical Problem of L2 Acquisition

As stated so far, it is assumed that UG operates in L1 acquisition as a partial answer to the logical problem. In other words, UG is supposed to mediate between input which children are exposed to, and the ultimately attained linguistic system which goes far beyond input. With respect to second language (L2) acquisition, it is an issue whether there is a mismatch between input available to L2 learners and their attained system. Since successful L2 learners attain a complex system of grammar rules which are not sufficiently explained by input alone, a mismatch or logical problem seems to exist, or at least, underdetermination and degeneracy. L2 learners usually learn a language at school, so they may receive negative evidence. However, I assume there will still be an

insufficient amount of negative evidence. For example, a teacher sometimes is not aware of students' errors, or the L1 speaker does not always correct L2 learners' errors when they speak in a social situation. Therefore, I assume a lack of negative evidence still exists in L2 acquisition.

If there is a logical problem in L2 acquisition as well as in L1 acquisition, one possible answer to this is the operation of UG.

2. The Prodrop Parameter

2.1 The Prodrop Parameter

Certain principles vary somewhat from language to language in the way of their function. These differences suggest that there are certain limited options as well as invariant principles in UG. The parameterized principles are referred to as "parameters" and the different values of options are referred to as "parameter settings". One of the parameters is the Prodrop Parameter which distinguishes languages according to whether they allow null subjects or not (e.g. White 1989, Phinney, 1987): some languages such as Spanish and Italian allow null subjects while English or French do not. For example, the following sentence (1) which does not have a subject pronoun is possible in Spanish, while the equivalent interpretation is not acceptable in English.

- (1) Voy a ir a Mexico
 am going to Mexico (I am going to Mexico)

Thus, the Prodrop Parameter is assumed to have binary parameter settings as shown in (2):

- (2) Prodrop Parameter + prodrop e.g. Spanish, Italian
 - prodrop e.g. English, French

Those languages which allow null subjects are called "+prodrop" languages while the languages which require lexical subjects are called "-prodrop" languages. Studies as to the Prodrop Parameter assume that the following clusters of properties characterize "+prodrop" languages: First of all, they allow the absence of subject pronouns, as shown in (3a). While they also allow lexical pronouns once certain discourse constraints have been established (3b), pleonastic pronouns (it, there) are to be omitted as illustrated in (3c):

- (3)¹ a. Voy a ir a Mexico
 am going to Mexico (I am going to Mexico)
 b. Luigi come como una bestia

¹ Sentence (3b) is taken from Hilles (1986) and (3c) from Liceras (1989).

Luigi eats like a beast (Luigi eats like a beast)

- c. Llovio mucho ayer
rained a lot yesterday (It rained a lot yesterday)

Secondly, "+prodrop" languages can have subject verb inversion in declarative sentences, as shown in (4):

- (4) Vino el Sr. Tanaka
came Mr. Tanaka (Mr. Tanaka came)

Thirdly, a "that-trace" sequence is possible when a subject is moved out of a clause containing a complementizer "that", as in (5):

- (5) ¿Quien dijiste que vino?
Who said that came? (Who did you say came?)

With respect to the second and third properties of "+prodrop" languages, namely the free inversion of subject and verb, and "that-trace" sequence, it is disputed whether or not these properties are associated with the Prodrop Parameter (Liceras 1989, White 1989).

It is also assumed that the Prodrop Parameter is associated with languages having rich inflectional systems. Examples of Spanish and English are illustrated in (6).

- (6) "to buy"
- | | | | |
|---|----------------------|------------|---------------------------|
| a | Spanish ² | compr-o | 1 s. |
| | | compr-as | 2 s. |
| | | compr-a | 3 s. |
| | | compr-amos | 1 pl. |
| | | compr-ais | 2 pl. |
| | | compr-an | 3 pl. |
| b | English | buy | 1s / 2s / 1pl / 2pl / 3pl |
| | | buys | 3s |

In (6a), the Spanish verb "comprar" is inflected for all six numbers and persons; therefore, Spanish has a rich inflectional system, while in English (6b), only the 3rd person singular is inflected; thus, English is not as rich in the inflectional system.

With respect to rich inflectional systems of null subject languages, Jaeggli and Hyams (1988), and Jaeggli and Safir (1989) raise the question about what is the notion of "inflectional richness". In other words, they wonder whether rich agreement in person, number and tense, such as in Spanish and Italian, is a critical difference for "+prodrop" languages and "-prodrop" languages. They present counter examples such as in (7):

² In Spanish, there are certain cases where two verbal endings are identical, but Spanish allows null subjects (Jaeggli and Safir 1989).

- (7) a. In the case of German and Irish, not all forms in the inflectional paradigm are distinct. While Irish allows null subjects, German requires lexical subjects.³
- b. Although Chinese and Japanese allow null subjects, they do not have person-number agreement such as in Spanish. In the case of Chinese, there is no inflectional affixation at all, while, in Japanese, tense, mood, aspects, and negation agreement are present as illustrated in (8):

(8)	tabe-ru	eat - present	tabe-ta	eat - past
	tabe-nai	eat - negative	tabe-teiru	eating

Thus, Jaeggli and Hyams, and Jaeggli and Safir claim that a rich inflectional system will not be able to account for licensing null subjects, and they propose a different approach; that is, if a language has morphologically uniform inflectional paradigms, that language would allow null subjects. Morphological uniformity is defined as follows: "...a morphological paradigm is uniform if all its forms are morphologically complex or none of them are" (Jaeggli and Safir 1989, p.30). Morphologically complex means that forms of a paradigm can be morphologically divided into stem and affix. In the case of languages such as Spanish and Japanese, all forms are morphologically divisible as shown in (6a) and (8); thus, those languages allow null subjects. Whereas, in English, for example, a paradigm is mixed: some of its forms are made up of stem and affix while other forms are bare stem as shown in (6b). Consequently, English does not allow null subjects. Thus, the Null Subject (NS) Parameter would be such as in (9):

(9)	+NS...+ uniform...	All forms are morphologically complex	e.g.	Spanish Japanese
		No forms are morphologically complex	e.g.	Chinese
	-NS...- uniform...	mixed forms	e.g.	English French

³ However, German allows null expletives (Jaeggli and Hyams 1988, Jaeggli and Safir, 1989).

2.2 Properties of Japanese Prodrop

Japanese is a prodrop language since it allows null subjects the same as Spanish does. Thus, we shall consider properties of Japanese prodrop, regarding 1) null subjects, 2) no pleonastic pronouns, 3) inversion in declarative sentences and 4) that-t sequences.

Firstly, Japanese allows sentences without subjects as seen in (10) where the subjects usually will be determined by context:

- (10) a. A. Mado-o Shimemashita-ka
 window closed -Q.marker
 -obj.marker
 (Did you close the window?)
 B. Hai, shimemashita
 Yes, closed
 (Yes, I did)
- b.⁴ Kujira-wa kemono da. Sakana dewanai
 whale-topic animal is fish is not
 marker
 (A whale is a mammal. It is not a fish)
- c. John-wa Canada-e kaetta toki okaasan-ni
 -topic marker -to returned when mother -to
 aimashita
 saw
 (When John returned to Canada, he saw his mother)

In Japanese juxtaposed sentences, the second subject is normally dropped, as shown in (10b) (Mikami 1970). With respect to the adverbial subordinate clause in Japanese, Kuroda (1979) states that all the repeated subjects are to be deleted as in sentence (10c).

Secondly, regarding no pleonastic pronouns, Mikami (1970) claims that subjects are dropped in Japanese sentences which are about time, weather and distance as seen in (11).

- (11) a. A. Nan-ji desu-ka
 What-time is -Q.marker (What time is it?)
 B. Kuji desu
 9-o'clock is (It is 9 o'clock)

⁴ This sentence is taken from Mikami (1970).

- h Atsui desu
 Hot is (It is hot)
- c. Eki made aruite 15-fun kakarimasu
 Station until walk -minutes take
- (It takes 15 minutes to walk to the station)

Thirdly, as for word order, adverbs, objective case, dative case or subjects are able to change their position in Japanese sentences as shown in (12):

- (12) a. Tanaka-san-ga Yoshiko-san-ni hana-o
 Mr. Tanaka-subj. Yoshiko -to flower-obj.marker
 marker
- agemashita
 gave
- (Mr. Tanaka gave flowers to Yoshiko)
- h Yoshiko-san-ni Tanaka-san-ga hana-o agemashita.
- c. Hana-o Tanaka-san-ga Yoshiko-san-ni agemasita.

Although Japanese word order is relatively free, the verb must come at the sentence-final position (Kuno, 1973). Thus, SV inversion is not acceptable in Japanese⁵ while Spanish allows SV inversion as shown in (13):

- (13) a. *Kita Tanaka-san-ga
 came Mr. Tanaka subj-marker (Mr. Tanaka came)
- h Vino el Sr. Tanaka
 came Mr.

With respect to a "that-t" sequence, as we have seen, the following Spanish sentence (14a) is grammatical, but the equivalent English sentence (14b) is not. (Sentence (5) is repeated here as (14).)

- (14) a. ¿Quien dijiste que vino?
 Who said that came?
- b.* Who did you say that came?

Concerning interrogative questions in Japanese, since movements are not involved as in (15), "that-t" sequences do not apply:

⁵ In very colloquial conversation, SV inversion such as sentence (13a) is possible.

- (15) a. John-wa Yoshiko-san -ga kita to iimashita
 -topic -subj.came formal said
 marker marker noun⁶

(John said Yoshiko came)

- b. John -wa dare-ga kita to iimashita ka
 -topic who-subj. came formal said Q
 marker marker noun marker

(Who did John say came?)

We have seen four properties of "+prodrop" parameter so far and found that SV inversion and "that-t" sequence are not applicable to Japanese. Thus, I assume those two properties are not related to the "+prodrop" value.

3. Experimental Study

3.1 Rationale for Study and Hypotheses

This study tries to determine experimentally whether or not L2 learners can reset a parameter when the values of L1 and L2 differ. The parameter to be determined is the Prodrop Parameter for which L1 (Japanese) is "+prodrop" or "+uniform", and L2 (English) is "-prodrop" or "-uniform".

As seen in 2.2, only null subjects and no pleonastic pronouns are associated with Japanese; thus, in this paper, these two were tested. As for null subjects, juxtaposed sentences and adverbial subordinate clauses were used, since the repeated subjects are normally dropped in Japanese, while English requires subjects in these sentences.

There was another concern for this experiment. According to Jaeggli and Hyams (1988), young English speaking children start from the "+uniform" value, and when they learn and realize that English has an inflectional system which is not uniform, they will reset the parameter to "-uniform", aided by positive evidence. Therefore, concerning Japanese learners of English, I would like to examine whether Japanese learners recognize that English is a "-uniform" language, and if recognition of that will be a trigger for resetting a parameter from "+prodrop" to "-prodrop". Additionally, I would like to see whether L2 learners can reset a parameter by receiving only positive evidence, then comparing this to those with negative and positive evidence.

⁶ The term "formal noun" is adapted from Kuroda (1979).

My hypothesis is that L2 learners will transfer their L1 parameter in the early stages of acquisition, but that they will be able to reset their parameter to L2 as they progress in their L2 knowledge. Furthermore, since Japanese learners receive explicit instruction on English agreement, it will be easier for them to recognize that English is a "-uniform" language than that English requires subjects. Thus, I assume recognition of "-uniform" is not the trigger for change of their parameter setting from "+prodrop" to "-prodrop". I also hypothesize that it will take much more time for L2 learners who only get positive evidence to reset a parameter than for those who get positive and negative evidence as well, since I assume instruction will have effects on L2 acquisition.

3.2 Method

Subjects

There were 8 groups involved in this experiment: 6 experimental groups and 2 control groups.

Experimental Groups

Subjects in 5 experimental groups were from grades 9 to 12 and grade 14¹ who were studying English in Japan. They belonged to three different schools: the grade 9 students were in junior high school in Ibaragi prefecture, grade 10 to 12 students were in senior high school in Aomori prefecture, and grade 14 were university students in Aichi prefecture. They started learning English in grade 7², and had already learned the items tested, namely, 3rd person singular "s", pleonastic "it", juxtaposed sentences, and adverbial subordinate clauses ("because" and "when"). None of the subjects had ever been to foreign countries³; in other words, they had not been exposed to English out-of-the-classroom. I shall call these groups non-exposure groups.

There was one exposure group, that is, subjects in this group had been living in Montreal, Canada from one to one and half years. Since they were in grades 6 to 8, they did not learn English in Japan and entered schools in Montreal without having any prior knowledge of English grammar⁴. They went to English schools on weekdays and every Saturday they went to Japanese school to study various subjects in

¹ Grade 14 students mean 2nd level university students in Japan.

² Some students started learning English at language schools before grade 7. The language school for young children usually teaches English through songs, games, etc.

³ Several students had gone on trips but for a maximum of 7 days.

⁴ One student (grade 8) said she studied English for 6 months in Japan; however, she had not studied test items for 3rd singular "s", subordinate clauses, etc.

Japanese. Thus, they received no additional English grammar instruction but had considerable opportunities for being exposed in English.

Number of subjects and hours of studying English at school are shown in figure 1.

FIGURE 1: Number of Subjects and Hours of Studying English at School

Grade	Non-Exposure Group					Exposure Group	Jap. control Group	Eng. control Group
	9	10	11	12	14			
Number	30	34	28	33	30	6	31	20
Hours/w	4	8	8	10	1.5	-	-	-

Control Groups

There were two control groups: one consisted of English native speakers who were tested in English to obtain native speaker baseline data. The other control group was Japanese native speakers who took the equivalent test in Japanese to confirm that sentences without subjects are grammatical in Japanese. The number of subjects in control groups are also shown in figure 1.

Material

The test consisted of four sentences types: 1) juxtaposed sentences, 2) adverbial subordinate clauses, 3) expletive "it", and 4) 3rd person singular "s". Types 1 and 2 were designed to examine whether subjects know that English does not allow null subjects in these types of sentences since Japanese does allow null subjects. An example of Type 1 is:

(1) John came. Drank a glass of water.

As for type 2 sentences, the following four types are possible in Japanese adverbial clauses when the subjects are the same in the main and the subordinate clauses.

- (2) a. Null subject in the subordinate clause
e.g. When \emptyset went to Mexico, John met Maria.
- b. Null subject in the main clause
e.g. When John went to Mexico, \emptyset met Maria.
- c. Null subject both in the main clause and in the subordinate clause (only when subject is "I")
e.g. When \emptyset went to Mexico, \emptyset met Maria.
- d. With subjects in both clauses. (However, this type is unlikely to be produced by native Japanese speakers)
e.g. When I went to Mexico, I met Maria.

Type 3 sentences were to examine whether subjects demonstrate a knowledge that English requires the expletive "it" in sentences which are about time or weather such as in (3).

(3) It is 10 o'clock now.

Type 4 sentences were designed to determine whether subjects recognize that English is a "-uniform" language", as in (4):

- (4) a. John go to school at eight o'clock every morning.
- b. I waches television every night.

If Japanese learners recognize that the above sentences are ungrammatical and correct them to "goes" and "watch", it indicates that they know that English is "-uniform" language.

The test involved 30 test sentences, with the four types mixed together. In the case of the Japanese version, namely the literal Japanese equivalents of the English version, there were 20 sentences, since the 3rd person singular "s" is not expressed in Japanese. As stated above, the Japanese version was tested in order to confirm that sentences without subjects are grammatical in Japanese. Sentence distribution is presented in Appendix A.

Task

The subjects were asked to answer "correct", "not correct", or "not sure" on a grammaticality judgment task, and to try to correct the sentences which they thought to be incorrect. Three examples were provided.

Subjects were instructed, by written and oral instruction, that the purpose of the test was to find out how the subjects feel about certain

English sentences, and not to test their knowledge. They were also instructed not to spend too much time on each question and not to go back to former questions.

All words and structures which were used had been studied by Grade 8⁵; however, subjects were allowed to ask teachers the meaning of words if they did not know them.

3.3. Results

Results on null subjects

Results of Type 1 sentences

The results of the responses to the ungrammatical sentences with null subjects in juxtaposed sentences are shown in Table 1. Since the sentences are ungrammatical in English, a response of 'incorrect' is the expected answer. However, as can be seen in Table 1, quite a few subjects in the non-exposure groups corrected the sentences inappropriately even though they responded 'incorrect' to the ungrammatical sentences. Thus, I treated these responses separately from responses of 'incorrect' with appropriate corrections⁶. Only the latter type of response is assumed to indicate accuracy in the L2.

TABLE 1: RESPONSES TO ALL UNGRAMMATICAL SENTENCES WITH NULL SUBJECTS (Type 1)

	Non-exposure (n=155)	Exposure (n=6)	English Control Group (E.C.G.) (n=20)
TOTAL			
1. AC	184 (39.57%)	11 (61.11%)	58 (96.67%)
1. 1C	71 (15.27%)	3 (16.67%)	0
C	133 (28.60%)	3 (16.67%)	2 (3.33%)
NS	77 (16.56%)	1 (5.56%)	0

1. AC = Response of "incorrect" with appropriate correction
 1. 1C = Response of "incorrect" with inappropriate correction
 C = Response of "correct"
 NS = Response of "not sure"

Focusing on the non-exposure groups, the overall results show that only 40% of subjects are accurate in identifying the ungrammaticality of null subjects in English. As for the individual sentences (detailed data for

⁵ This information is based on the English textbook broadly used in junior high school in Japan: Ota, A. Ito, K. and Kusakabe T. (ed), 1989, New Horizon (Vols 1-3). Tokyo: Tokyo Shoseki.

⁶ Since the number of responses "incorrect" to all grammatical sentences is very low, I do not distinguish the responses "incorrect" depending on corrections.

Table 1 are given in Table 1-A in Appendix B), the accuracy of responses to sentences 3 and 9 is very low, compared to sentence 16. Since the second subject is normally dropped in Japanese juxtaposed sentences, as discussed before, I assume that poor performance is due to transfer. Additionally, the dropped subject in the second sentence is the object in the first sentence in 16, while the dropped subject in the second sentence is also the subject in the first sentence in 3 and 9. Thus, those differences might be a possible explanation for better performance for sentence 16 than for 3 and 9; that is, the non-exposure groups firstly recognize that English requires subjects for the former type of sentence.

For the purpose of investigating any differences among the non-exposure groups, their results are broken down by levels, as shown in Table 2 (detailed data are presented in Table 2-A in Appendix B).

TABLE 2: RESPONSES TO ALL UNGRAMMATICAL SENTENCES
WITH NULL SUBJECTS (Type 1), BY GRADE
(Non-exposure Groups)

TOTAL	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
1. AC	20 (22.22%)	32 (31.37%)	37 (44.05%)	36 (36.36%)	59 (65.56%)
1. 1C	16 (17.78%)	16 (15.69%)	14 (16.67%)	15 (15.15%)	10 (11.11%)
C	40 (44.44%)	37 (36.27%)	23 (27.28%)	20 (20.20%)	13 (14.44%)
NS	14 (15.56%)	17 (16.67%)	10 (11.90%)	28 (28.28%)	8 (8.89%)

Grade 14 showed better performance in detecting null subjects; however, results of other grades were very inconsistent across sentences (Table 2-A).

In particular, grade 12 performed very poorly on sentence 3, and more than half of the subjects responded 'not sure' to this sentence.

If we look at the responses to grammatical sentences in Table 3, we find that the accuracy of the non-exposure groups is nearly the same as the English Control Groups (E.C.G.) in all cases. These results could be due to a response bias to accept all sentences. However, it appears not to be the case since the non-exposure groups rejected ungrammatical sentences with null subjects, though the percentage of rejection is low, as shown in Table 1 and 2. Thus, high accuracy in identifying grammatical sentences with subjects suggests that the non-exposure groups know the grammaticality of subject pronouns.

TABLE 3: RESPONSES TO ALL GRAMMATICAL SENTENCES
WITH SUBJECTS (Type 1)

TOTAL	Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
C	402 (86.45%)	11 (61.11%)	53 (88.33%)
1*	26 (5.59%)	4 (22.22%)	5 (8.33%)
NS	37 (7.96%)	3 (16.67%)	2 (3.33%)

* Detailed data are presented in Table 3-A and 3-B in Appendix B.

Although the number of subjects in the exposure group is very small, the results are interesting: percentages of accuracy in identifying ungrammatical sentences and in identifying grammatical sentences are the same (61.11%) (Table 1 and 3). Furthermore, in the former case, the results are much better than in those of the non-exposure groups, while in the latter case, they are much worse. These results suggest that the exposure group is in the process of parameter resetting.

Results of Type 2 Sentences

The second concern is whether the experimental groups recognize the ungrammaticality of null subjects in complex sentences. The results are give in Table 4.

TABLE 4: RESPONSES TO ALL UNGRAMMATICAL SENTENCES
WITH NULL SUBJECTS (Type 2)

TOTAL	Non-exposure (n = 158)	Exposure (n = 6)	E.C.G. (n = 20)
1. AC	309 (39.87%)	20 (66.67%)	93 (93.00%)
1. 1C	76 (9.81%)	2 (6.67%)	0
C	277 (35.74%)	2 (6.67%)	7 (7.00%)
NS	113 (14.58%)	6 (20.00%)	0

* Detailed data are given in Table 4-A in Appendix B.

The non-exposure groups showed very low accuracy in identifying ungrammatical sentences with null subjects, just as they did in Type 1 sentences. When we look at the results broken down by levels, as shown in

Table 5, we see that accuracy of grade 9 was particularly low and grade 14 showed greater accuracy than other groups.

TABLE 5: RESPONSES TO ALL UNGRAMMATICAL SENTENCES WITH NULL SUBJECTS (Type 2), BY GRADE (Non-exposure Groups)

TOTAL	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
1. AC	16 (10.67%)	43 (25.29%)	58 (41.43%)	80 (48.48%)	112 (74.67%)
1. 1C	10 (6.67%)	29 (17.06%)	17 (12.14%)	14 (8.48%)	6 (4.00%)
C	95 (63.33%)	76 (44.71%)	39 (27.86%)	39 (23.64%)	28 (18.67%)
NS	29 (19.33%)	22 (12.94%)	26 (18.57%)	32 (19.39%)	4 (2.67%)

* Detailed data are presented in Table 5-A in Appendix B.

TABLE 6: RESPONSES TO ALL GRAMMATICAL SENTENCES WITH SUBJECTS (Type 2), BY GRADE (Non-exposure Groups)

TOTAL	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
C	98 (65.33%)	110 (64.71%)	90 (64.29%)	130 (78.79%)	126 (84.00%)
1	21 (14.00%)	35 (20.59%)	30 (21.43%)	11 (6.67%)	14 (9.33%)
NS	31 (20.67%)	25 (14.71%)	20 (14.29%)	24 (14.55%)	10 (6.67%)

* Detailed data are given in Table 6-A and 6-B in Appendix B.

With respect to responses to grammatical sentences, as shown in Table 6, lower grades were also inaccurate at identifying correctness of these sentences, but higher grades showed better accuracy. These results, therefore, suggest that lower grades transfer properties of Japanese prodrop in English acquisition.

Although lower grades showed less accuracy on Type 2 grammatical sentences than Type 1 (Table 6 and Table 3-8), their corrections did not deal with subject pronouns at all: they corrected Type 2

grammatical sentences to "Yoshiko can't go to Canada because she does not have any money"(11), or "I took many pictures when I went to San Francisco"(15). Furthermore, they put an adverbial clause after a main clause, such as "I have to help her because my mother is very busy". Thus, I assume that lower grades also identify grammatical sentences with subjects.

As far as the exposure group is concerned, although data are few, they showed almost the same level of accuracy (about 60%) at identifying ungrammaticality with null subjects and grammaticality with subjects in complex sentences, as they did in Type 1. Thus, it appears that transfer occurs in the exposure group, too.

Results of Type 3 Sentences

The results of the responses to the ungrammatical sentences with no expletives are presented in Table 7.

TABLE 7: RESPONSES TO ALL UNGRAMMATICAL SENTENCES
 WITH NO EXPLETIVES (Type 3)

TOTAL	Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
1. 1A	163 (52.58%)	9 (75.00%)	39 (97.50%)
1. 1C	65 (20.97%)	0	0
C	57 (18.39%)	0	1 (2.50%)
NS	25 (8.06%)	3 (25.00%)	0

* Detailed data are presented in Tables 7-A and 7-B in Appendix B.

As for the results of the non-exposure groups, it is obvious that their accuracy at identifying ungrammaticality with no expletives in sentence 4 was significantly low compared to sentence 20. A close look at the results of sentence 4 reveals that a considerable number of subjects responded 'incorrect' with inappropriate corrections. The great majority of subjects corrected this sentence to "In June, rains a lot of in Japan" or "In June, a lot of rains in Japan", and they were not concerned with the expletive 'it'. Although accuracy was very low for sentence 4, the results broken down by each grade (Table 7-A in Appendix) indicate that there are large differences between grades 10 and 11, and between 12 and 14. Since the accuracy for sentence 20 was comparatively high and since the non-exposure groups also recognized the grammaticality of sentences with expletives as shown in Table 8, low accuracy for sentence 4 might be a special case. The Japanese translation of the verb "to rain" is "ame-ga furu" where "ame" is the subject and "furu" is the verb. Thus, I assume that they

thought sentence 4 should had included a subject and a verb; consequently, they did not recognize the ungrammaticality of 4.

TABLE 8: RESPONSES TO ALL GRAMMATICAL SENTENCES
WITH EXPLETIVES (Type 3)

TOTAL	Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
C	238 (76.77%)	9 (75.00%)	40 (100%)
1	18 (5.81%)	1 (8.33%)	0
NS	54 (17.42%)	2 (16.67%)	0

* Detailed data are provided in Table 8-A and 8-B in Appendix B.

Turning to the exposure group, we see that they performed in the same way as the non-exposure groups; i.e. their accuracy at identifying the ungrammaticality of sentence 4 is lower than of sentence 20 (Table 7), although the difference is not as large as that of the non-exposure groups. As for the results of identifying grammatical sentence with expletives, the exposure group is almost as accurate as the non-exposure group (Table 8).

To sum up the results of null subjects (Type 1 to 3 sentences), it is quite clear that subjects in the lower grades of the non-exposure groups were relatively inaccurate at identifying the ungrammatical sentences with null subjects; however, grade 14 showed greater accuracy in all cases.

As far as the exposure group is concerned, since more than 60% of the subjects recognized the ungrammaticality of null subjects in English, their accuracy was relatively good. However, we need to be cautious in drawing conclusions because the exposure groups, which had only 6 subjects, also rejected grammatical sentences for Type 1 and Type 2 with subject pronouns (Table 3 and 6-A).

Results on verb agreement

Sentences in Type 4 were included to examine if Japanese learners recognize that English is "-uniform", namely, only the 3rd person singular verb is inflected. The results of the responses to ungrammatical sentences with incorrect verb agreement are given in Table 9. As a whole, the non-exposure groups were not accurate at identifying ungrammaticality of sentences with incorrect agreement except for sentence 14 (detailed data are presented in Table 9-A in Appendix B).

TABLE 9: RESPONSES TO ALL UNGRAMMATICAL SENTENCES
WITH INCORRECT AGREEMENT (Type 4)

TOTAL	Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
1. 1A	542 (58.28%)	14 (38.89%)	119 (99.17%)
1. 1C	20 (2.15%)	0	0
C	331 (35.59%)	21 (58.33%)	1 (0.83%)
NS	37 (3.98%)	1 (2.78%)	0

TABLE 10: RESPONSES TO ALL UNGRAMMATICAL SENTENCES
WITH INCORRECT AGREEMENT (Type 4), BY GRADE
(Non-exposure Groups)

TOTAL	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
1. 1A	117 (65.00%)	131 (64.22%)	66 (39.29%)	96 (48.48%)	132 (73.33%)
1. 1C	6 (3.33%)	2 (0.98%)	5 (2.98%)	6 (3.03%)	1 (0.56%)
C	53 (29.44%)	63 (30.88%)	87 (51.79%)	87 (43.94%)	41 (22.78%)
NS	4 (2.22%)	8 (3.92%)	10 (5.95%)	9 (4.54%)	6 (3.33%)

The results broken down by each grade presented in Table 10 show high levels of inconsistency: Grades 11 and 12 did not show better performance over grades 9 and 10 in all cases. If we look closely at the results of grades 11 and 12, we see that the majority of these 2 groups treated sentences with incorrect agreement as correct. Thus, in order to see if these groups recognize the grammaticality of sentences with correct agreement, let us look at the results presented in Table 11.

TABLE 11: RESPONSES TO ALL GRAMMATICAL SENTENCES
(Type 4), BY GRADE (Non-exposure Groups)

TOTAL	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
C	91 (75.83%)	110 (80.89%)	78 (69.64%)	111 (84.09%)	99 (82.50%)
I	17 (14.17%)	17 (12.50%)	18 (16.07%)	10 (7.58%)	15 (12.50%)
NS	12 (10.00%)	9 (6.62%)	16 (14.29%)	11 (8.33%)	6 (5.00%)

* Detailed data are shown in Table 11-A and 11-B in Appendix B.

Although the results of grade 11 were not highly accurate, grade 12 as well as grade 9, 10, and 14 were over all quite accurate at identifying grammatical sentences with agreement. I have no explanation for the low accuracy of grades 11 and 12 at identifying ungrammatical sentences with incorrect agreement, compared to grades 9 and 10. Concerning sentence 27, accuracy of E.C.G. was low (Table 11-A in Appendix B). Since all English native speakers who rejected sentence 27 changed it into a question, this sentence could sound strange as a declarative sentence. Although the non-exposure groups showed almost the same accuracy as E.C.G. for sentence 27, they corrected it differently: i.e. "you teach English in a Japanese school" or "you teach English at a Japanese school".

As far as the exposure group is concerned, only 40% were accurate at identifying ungrammatical sentences with incorrect agreement (Table 9), while they recognized that sentences with correct agreement were grammatical (Table 11-A).

When we compare the results of non-exposure groups with the exposure group (even though the number in the exposure group is only 6), we see interesting results. The data is presented in Table 12.

TABLE 12: RESPONSES OF "INCORRECT" WITH APPROPRIATE CORRECTIONS (IN PERCENTAGES) TO ALL UNGRAMMATICAL SENTENCES

	Grade 9	Grade 10	Grade 11	Grade 12	Grade 14	Exposure Group
Null Subjects						
Type 1	22.22%	31.37%	44.05%	36.36%	65.56%	61.11%
Type 2	10.67%	25.29%	41.43%	48.48%	74.67%	66.67%
Type 3	40.00%	38.24%	55.36%	53.03%	78.33%	75.00%
Agreement						
Type 4	65.00%	64.22%	39.29%	48.48%	73.33%	38.89%

With respect to the results of null subjects, the exposure group was nearly as accurate as grade 14, and the results of both these groups suggest that they recognize the ungrammaticality of sentences with null subjects. In contrast to these results, the exposure group was the least accurate on Type 4 sentences out of all experimental groups. Furthermore, we see that the accuracy of grade 9 for Type 4 (65%) was not too different from grade 14 (73%), while there was more difference between grades 9 and 14 regarding the results for null subjects.

3.4. Discussion

The results of identifying ungrammatical sentences with null subjects suggest that Japanese learners transfer their L1 parameter setting, and consequently make transfer errors. Although transfer persisted for a long time, the results of the non-exposure groups showed continual better accuracy with increasing grades; resulting in the relatively high accuracy of grade 14 at identifying ungrammatical sentences with null subjects. Thus, it appears that L2 learners are able to reset their L1 parameter to the L2 after a period of transference. These results are compatible with White (1985, 1986) and also support my first hypothesis.

Concerning the claim of Hilles (1986) that the presence of expletives is the trigger for parameter resetting from "+prodrop" to "-prodrop", the results of this paper seem to support her claim. However, a closer look at the results of sentences with no expletives reveals that non-exposure groups performed very differently depending on the sentences: their accuracy at recognizing ungrammatical sentences with no expletives is significantly poor for one sentence and considerably good for the other, even for lower grades. Thus, it is not clear to me whether expletives trigger parameter resetting or not.

The test of subject-verb agreement, used to examine whether Japanese learners recognize that English is "-uniform", showed highly inconsistent results. Firstly, grades 9 and 10 were more accurate than grades 11 and 12 at identifying ungrammatical sentences with incorrect agreement. Secondly, compared to the results of null subjects, grades 9 and 10 performed much better on sentences of incorrect agreement, while grades 11, 12 and 14 did not show greatly different results on both test types, as shown in Table 12. In contrast to these results from the non-exposure groups, the exposure groups performed very poorly for these sentences while they are comparatively accurate for sentences with subjects. Thus, it appears that subject-verb agreement is independent of the properties of the Prodrop Parameter, i.e. is not one of the clusters of properties associated with this parameter. Furthermore, the results discussed so far are not compatible with the claims of Jaeggli and Hyams (1987), either. In other words, the predictions of the morphological uniformity hypothesis are incorrect. Subjects in lower grades appear to treat English as a pro-drop language, even though they also know that it is not "+uniform".

As far as grades 9 and 10 are concerned, their results for sentences with incorrect agreement are not consistent with Phinney's statement, namely, 3rd person 's' is very difficult to learn (Phinney 1987). Since

Japanese does not have subject-verb agreement as English does, Japanese learners of English receive explicit instruction about that at grade 7. Therefore, 3rd person 's' could be easy to learn, so that grades 9 and 10 showed considerable accuracy on agreement. As for better accuracy of grades 9 and 10 compared with grades 11 and 12 in identifying ungrammatical sentences with incorrect agreement, I have no explanation. As far as grade 10 is concerned, they have just taken entrance examinations for senior high school⁷. Thus, they may have retained some grammar knowledge, and consequently showed better accuracy.

Despite the fact that subjects in the exposure group did not know any English at all until they came to Montreal, and that they had not been exposed to English for an extended time (between 8 to 18 months only), their accuracy at identifying ungrammatical sentences with null subjects is close to that for grade 14. Thus, these results do not support the third hypothesis, namely, that it will take much more time for the exposure group to reset a parameter than for the non-exposure groups who get positive and negative evidence. However, I assume that poor accuracy shown in sentences with incorrect agreement is due to lack of instruction. It appears to take time for L2 learners to learn those properties (which their own L1 does not have) without explicit instruction. Thus, I assume instruction still has an effect on L2 acquisition.

4. Conclusion

The results obtained in this experimental study have revealed a number of implications for the Prodrop Parameter and L2 acquisition.

Firstly, the results presented in this paper indicate that L2 learners carry over their L1 parameter setting, and consequently they make transfer errors, especially at lower levels of proficiency. In the case of learners who are not exposed to the L2 outside of the classroom, transference persists for a long period of time; however, L2 learners are able to reset their L1 parameter setting to L2 as they progress in their L2 knowledge. Thus, this study provides further support for the hypothesis that UG is available via the L1. As far as the non-exposure groups are concerned, it might be argued that instruction is responsible for parameter resetting. However, the exposure group, with only six subjects, showed comparatively high accuracy at identifying ungrammatical sentences with null subjects even without instruction, suggesting that instruction is sufficient but not necessary for parameter resetting in this case.

Secondly, with respect to subject-verb agreement, highly inconsistent results in this study suggest that 3rd person singular 's' is not

⁷ They took the entrance examination in February and the test in this paper was done in May.

associated with the Prodrop Parameter, and that the acquisition of the present tense is not the trigger for parameter resetting in L2 acquisition. Although the results in this study are incompatible with Jaeggli and Hyams (1988), further exploration is advised in which L2 learners of different "+uniform" languages are tested.

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APPENDIX A: TEST SENTENCES

TYPE 1: JUXTAPOSED SENTENCES

- (3) John came. Drank a glass of water.
- (9) We went to the park. Played baseball.
- (16) I saw the movie last night. Was very interesting.
- (19) My brother is a college student. I sometimes play basketball with him.
- (24) Lucy and Mary are good friends of mine. I see them every day.
- (29) Mike went to Kyoto last year. He saw many temples there.

TYPE 2: ADVERBIAL SUBORDINATE CLAUSES

- (2) When went to Japan, Mary met Taro.
- (5) Her eyes were red because was crying.
- (7) When Ken came to the table, he saw a small box on his chair.
- (10) Mike lived in Kyoto when was a little boy.
- (11) Yoshiko cannot go to Canada because she does not have any money.
- (15) I took many pictures when I was in San Francisco.
- (18) Because my mother is very busy, I have to help her.
- (21) Saw kangaroos when I went to Australia.
- (26) When you go to a bookstore, you can buy a Japanese dictionary.
- (28) Because I was sick, could not do homework yesterday.

TYPE 3: EXPLETIVE "IT"

- (4) In June, rains a lot in Japan.
- (13) It is very hot outside.
- (20) Is ten o'clock now.
- (23) It was still dark when I got up at five o'clock.

TYPE 4: 3rd PERSON SINGULAR "S"

- (1) Mike speaks Japanese very well.
- (6) My mother have some beautiful pictures.
- (8) They like baseball very much.
- (12) Mr. and Mrs. Okada plays tennis every Sunday.
- (14) I eats Japanese food every day.
- (17) John go to school at eight o'clock every morning.
- (22) We watches television every night.
- (25) Yumi works for an American bank in Tokyo.
- (27) You teach English at a Japanese school.
- (30) Yumi and Ken often comes to my house.

* The sentence numbers correspond to the numbers appeared in the test.

APPENDIX B: RESULTS

TABLE 1-A: RESPONSES TO UNGRAMMATICAL SENTENCES WITH NULL SUBJECTS (Type 1)

Sentences		Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
3	1. 1AC	33 (21.29%)	4 (66.67%)	19 (95.00%)
	1. 1C	12 (7.74%)	1 (16.67%)	0
	C	60 (38.71%)	0	1 (5.00%)
	NS	50 (32.26%)	1 (16.67%)	0
9	1. AC	54 (34.84%)	2 (33.33%)	19 (95.00%)
	1. 1C	39 (25.16%)	2 (33.33%)	0
	C	48 (30.97%)	2 (33.33%)	1 (5.00%)
	NS	14 (9.03%)	0	0
16	1. AC	97 (62.58%)	5 (83.33%)	20 (100%)
	1. 1C	20 (12.90%)	0	0
	C	25 (16.13%)	1 (16.67%)	0
	NS	13 (8.39%)	0	0
TOTAL				
	1. AC	184 (39.57%)	11 (61.11%)	58 (96.67%)
	1. 1C	71 (15.27%)	3 (16.67%)	0
	C	133 (28.60%)	3 (16.67%)	2 (3.33%)
	NS	77 (16.56%)	1 (5.56%)	0

NOTES:

1. E.C.G. = English Control Group
2. 1. AC = Response of "incorrect" with appropriate correction
1. 1C = Response of "incorrect" with inappropriate correction
C = Response of "correct"
NS = Response of "not sure"
3. Percentages have been rounded off to the second decimal place.

TABLE 2-A: RESPONSES TO UNGRAMMATICAL SENTENCES
WITH NULL SUBJECTS (Type 1), BY GRADE
(Non-Exposure Groups)

Sentences		Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
3	1. AC	2 (6.67%)	7 (20.59%)	8 (28.57%)	1 (3.03%)	15 (50.00%)
	1. 1C	1 (3.33%)	3 (8.82%)	2 (7.14%)	2 (6.06%)	4 (13.33%)
	C	17 (56.67%)	13 (38.24%)	12 (42.86%)	12 (36.36%)	6 (20.00%)
	NS	10 (33.33%)	11 (32.35%)	6 (21.43%)	18 (54.55%)	5 (16.67%)
9	1. AC	2 (6.67%)	11 (32.35%)	8 (28.57%)	14 (42.42%)	19 (63.33%)
	1. 1C	12 (40.00%)	5 (14.71%)	8 (28.57%)	10 (30.30%)	4 (13.33%)
	C	13 (43.33%)	16 (47.06%)	9 (32.14%)	5 (15.15%)	5 (16.67%)
	NS	3 (10.00%)	2 (5.88%)	3 (10.71%)	4 (12.12%)	2 (6.67%)
16	1. AC	16 (53.33%)	14 (41.18%)	21 (75.00%)	21 (63.64%)	25 (83.33%)
	1. 1C	3 (10.00%)	8 (23.53%)	4 (14.29%)	3 (9.09%)	2 (6.67%)
	C	10 (33.33%)	8 (23.53%)	2 (7.14%)	3 (9.09%)	2 (6.67%)
	NS	1 (3.33%)	4 (11.76%)	1 (3.57%)	6 (18.18%)	1 (3.33%)
TOTAL						
	1. AC	20 (22.22%)	32 (31.37%)	37 (44.05%)	36 (36.36%)	59 (65.56%)
	1. 1C	16 (17.78%)	16 (15.69%)	14 (16.67%)	15 (15.15%)	10 (11.11%)
	C	40 (44.44%)	37 (36.27%)	23 (27.38%)	20 (20.20%)	13 (14.44%)
	NS	14 (15.56%)	17 (16.67%)	10 (11.90%)	28 (28.28%)	8 (8.89%)

TABLE 3-A: RESPONSES TO GRAMMATICAL SENTENCES
(Type 1)

Sentences		Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
19	C	132 (85.16%)	3 (50.00%)	16 (80.00%)
	I	12 (7.74%)	2 (33.33%)	2 (10.00%)
	NS	11 (7.10%)	1 (16.67%)	2 (10.00%)
24	C	127 (81.94%)	4 (66.67%)	19 (95.00%)
	I	10 (6.45%)	1 (16.67%)	1 (5.00%)
	NS	18 (11.61%)	1 (16.67%)	0
29	C	143 (92.26%)	4 (66.67%)	18 (90.00%)
	I	4 (2.58%)	1 (16.67%)	2 (10.00%)
	NS	8 (5.16%)	1 (16.67%)	0
TOTAL				
	C	402 (86.45%)	11 (61.11%)	53 (88.33%)
	I	26 (5.59%)	4 (22.22%)	5 (8.33%)
	NS	37 (7.96%)	3 (16.67%)	2 (3.33%)

TABLE 3-B: RESPONSES TO GRAMMATICAL SENTENCES
(Type 1), BY GRADE (Non-exposure Groups)

Sentences	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
19 C	25 (83.33%)	28 (82.35%)	23 (82.14%)	29 (87.88%)	27 (90.00%)
1	2 (6.67%)	3 (8.82%)	4 (14.29%)	1 (3.03%)	2 (6.67%)
NS	3 (10.00%)	3 (8.82%)	1 (3.57%)	3 (9.09%)	1 (3.33%)
24 C	26 (86.67%)	25 (73.53%)	26 (92.86%)	24 (72.72%)	26 (86.67%)
1	3 (10.00%)	0	1 (3.57%)	3 (9.09%)	3 (10.00%)
NS	1 (3.33%)	9 (26.47%)	1 (3.57%)	6 (18.18%)	1 (3.33%)
29 C	27 (90.00%)	29 (85.29%)	25 (89.29%)	32 (96.97%)	30 (100%)
1	2 (6.67%)	0	1 (3.57%)	1 (3.03%)	0
NS	1 (3.33%)	5 (14.71%)	2 (7.14%)	0	0
TOTAL					
C	78 (86.67%)	82 (80.40%)	74 (88.10%)	85 (85.86%)	83 (92.22%)
1	7 (7.78%)	3 (2.94%)	6 (7.14%)	5 (5.05%)	5 (5.56%)
NS	5 (5.56%)	17 (16.67%)	4 (4.76%)	9 (9.09%)	2 (2.22%)

TABLE 4-A: RESPONSES TO UNGRAMMATICAL SENTENCES
WITH NULL SUBJECTS (Type 2)

Sentences		Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
2	1. AC	70 (45.16%)	4 (66.67%)	20 (100%)
	1. 1C	27 (17.42%)	1 (16.67%)	0
	C	30 (19.35%)	0	0
	NS	28 (18.06%)	1 (16.67%)	0
5	1. AC	60 (38.71%)	5 (83.33%)	19 (95.00%)
	1. 1C	16 (10.32%)	0	0
	C	64 (41.29%)	0	1 (5.00%)
	NS	15 (9.68%)	1 (16.67%)	0
10	1. AC	62 (40.00%)	4 (66.67%)	16 (80.00%)
	1. 1C	10 (6.45%)	0	0
	C	66 (42.58%)	0	4 (20.00%)
	NS	17 (10.97%)	2 (33.33%)	0
21	1. AC	67 (43.22%)	4 (66.67%)	20 (100%)
	1. 1C	7 (4.52%)	0	0
	C	52 (33.55%)	1 (16.67%)	0
	NS	29 (18.71%)	1 (16.67%)	0
28	1. AC	50 (32.26%)	3 (50.00%)	18 (90.00%)
	1. 1C	16 (10.32%)	1 (16.67%)	0
	C	65 (41.94%)	1 (16.67%)	2 (10.00%)
	NS	24 (15.48%)	1 (16.67%)	0
TOTAL				
	1. AC	309 (39.87%)	20 (66.67%)	93 (93.00%)
	1. 1C	76 (9.81%)	2 (6.67%)	0
	C	277 (35.74%)	2 (6.67%)	7 (7.00%)
	NS	113 (14.58%)	6 (20.00%)	0

TABLE 5-A: RESPONSES TO UNGRAMMATICAL SENTENCES WITH
NULL SUBJECTS (Type 2), BY GRADE
(Non-exposure Groups)

Sentences	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
2 1. AC	3 (10.00%)	12 (35.29%)	12 (42.86%)	18 (54.55%)	25 (83.33%)
1. 1C	5 (16.67%)	8 (23.53%)	6 (21.43%)	6 (18.18%)	2 (6.67%)
C	13 (43.33%)	7 (20.59%)	5 (17.86%)	3 (9.09%)	2 (6.67%)
NS	9 (30.00%)	7 (20.59%)	5 (17.86%)	6 (18.18%)	1 (3.33%)
5 1. AC	8 (26.67%)	7 (20.59%)	12 (42.86%)	10 (30.30%)	23 (76.67%)
1. 1C	1 (3.33%)	7 (20.59%)	2 (7.14%)	3 (9.09%)	3 (10.00%)
C	18 (60.00%)	16 (47.06%)	12 (42.86%)	14 (42.42%)	4 (13.33%)
NS	3 (10.00%)	4 (11.76%)	2 (7.14%)	6 (18.18%)	0
10 1. AC	2 (6.67%)	8 (23.53%)	11 (39.29%)	20 (60.61%)	21 (70.00%)
1. 1C	0	3 (8.82%)	3 (10.71%)	3 (9.09%)	1 (3.33%)
C	21 (70.00%)	21 (61.76%)	11 (39.29%)	6 (18.18%)	7 (23.33%)
NS	7 (23.33%)	2 (5.88%)	3 (10.71%)	4 (12.12%)	1 (3.33%)
21 1. AC	1 (3.33%)	10 (29.41%)	13 (46.43%)	17 (51.52%)	26 (86.67%)
1. 1C	1 (3.33%)	2 (5.88%)	2 (7.14%)	2 (6.06%)	0
C	20 (66.67%)	17 (50.00%)	5 (17.86%)	7 (21.21%)	3 (10.00%)
NS	8 (26.67%)	5 (14.71%)	8 (28.57%)	7 (21.21%)	1 (3.33%)
28 1. AC	2 (6.67%)	6 (17.65%)	10 (35.71%)	15 (45.45%)	17 (56.67%)
1. 1C	3 (10.00%)	9 (26.47%)	4 (14.29%)	0	0
C	23 (76.67%)	15 (44.12%)	6 (21.43%)	9 (27.27%)	12 (40.00%)
NS	2 (6.67%)	4 (11.76%)	8 (28.57%)	9 (27.27%)	1 (3.33%)
TOTAL					
1. AC	16 (10.67%)	43 (25.29%)	58 (41.43%)	80 (48.48%)	112 (74.67%)
1. 1C	10 (6.67%)	29 (17.06%)	17 (12.14%)	14 (8.48%)	6 (4.00%)
C	95 (63.33%)	76 (44.71%)	39 (27.86%)	39 (23.64%)	28 (18.67%)
NS	29 (19.33%)	22 (12.94%)	26 (18.57%)	32 (19.39%)	4 (2.67%)

TABLE 6-A: RESPONSES TO GRAMMATICAL SENTENCES
(Type 2)

Sentences		Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
7	C	112 (72.26%)	3 (50.00%)	19 (95.00%)
	I	12 (7.74%)	1 (16.67%)	1 (5.00%)
	NS	31 (20.00%)	2 (33.33%)	0
11	C	117 (75.48%)	4 (66.67%)	19 (95.00%)
	I	20 (12.90%)	1 (16.67%)	1 (5.00%)
	NS	18 (11.61%)	1 (16.67%)	0
15	C	121 (78.06%)	4 (66.67%)	19 (95.00%)
	I	20 (12.90%)	0	1 (5.00%)
	NS	14 (9.03%)	2 (33.33%)	0
18	C	100 (64.52%)	3 (50.00%)	16 (80.00%)
	I	37 (23.87%)	3 (50.00%)	4 (20.00%)
	NS	18 (11.61%)	0	0
26	C	104 (67.10%)	5 (83.33%)	17 (85.00%)
	I	22 (14.19%)	0	3 (15.00%)
	NS	29 (18.71%)	1 (16.67%)	0
TOTAL	C	554 (71.48%)	19 (63.33%)	90 (90.00%)
	I	111 (14.32%)	5 (16.67%)	10 (10.00%)
	NS	110 (14.19%)	6 (20.00%)	0

TABLE 6-B: RESPONSES TO GRAMMATICAL SENTENCES
(Type 2), BY GRADE (Non-exposure Groups)

Sentences	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
7 C	21 (70.00%)	19 (55.88%)	23 (82.14%)	24 (72.72%)	25 (83.33%)
I	0	6 (17.65%)	2 (7.14%)	2 (6.06%)	2 (6.67%)
NS	9 (30.00%)	9 (26.47%)	3 (10.71%)	7 (21.21%)	3 (10.00%)
22 C	18 (60.00%)	26 (76.47%)	21 (75.00%)	26 (78.79%)	26 (86.67%)
I	10 (33.33%)	3 (8.82%)	3 (10.71%)	2 (6.06%)	2 (6.67%)
NS	2 (6.67%)	5 (14.71%)	4 (14.29%)	5 (15.15%)	2 (6.67%)
15 C	24 (80.00%)	26 (76.47%)	15 (53.57%)	29 (87.88%)	27 (90.00%)
I	1 (3.33%)	7 (20.59%)	9 (32.14%)	1 (3.03%)	2 (6.67%)
NS	5 (16.67%)	1 (2.94%)	4 (14.29%)	3 (9.09%)	1 (3.33%)
18 C	17 (56.67%)	20 (58.82%)	12 (42.86%)	27 (81.82%)	24 (80.00%)
I	10 (33.33%)	10 (29.41%)	10 (35.71%)	4 (12.12%)	3 (10.00%)
NS	3 (10.00%)	4 (11.76%)	6 (21.43%)	2 (6.06%)	3 (10.00%)
26 C	18 (60.00%)	19 (55.88%)	19 (67.86%)	24 (72.72%)	24 (80.00%)
I	0	9 (26.47%)	6 (21.43%)	2 (6.06%)	5 (16.67%)
NS	12 (40.00%)	6 (17.65%)	3 (10.71%)	7 (21.21%)	1 (3.33%)
TOTAL					
C	98 (65.33%)	110 (64.71%)	90 (64.29%)	130 (78.79%)	126 (84.00%)
I	21 (14.00%)	35 (20.59%)	30 (21.43%)	11 (6.67%)	14 (9.33%)
NS	31 (20.67%)	25 (14.71%)	20 (14.29%)	24 (14.55%)	10 (6.67%)

TABLE 7-A: RESPONSES TO UNGRAMMATICAL SENTENCES
WITH NO EXPLETIVES (Type 3)

Sentences		Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
4	1. AC	38 (24.52%)	4 (66.67%)	20 (100%)
	1. 1C	51 (32.90%)	0	0
	C	46 (29.68%)	0	0
	NS	20 (12.90%)	2 (33.33%)	0
20	1. AC	125 (80.65%)	5 (83.33%)	19 (95.00%)
	1. 1C	14 (9.03%)	0	0
	C	11 (7.10%)	0	1 (5.00%)
	NS	5 (3.23%)	1 (16.67%)	0
TOTAL				
	1. 1A	163 (52.58%)	9 (75.00%)	39 (97.50%)
	1. 1C	65 (20.97%)	0	0
	C	57 (18.39%)	0	1 (2.50%)
	NS	25 (8.06%)	3 (25.00%)	0

TABLE 7-B: RESPONSES TO UNGRAMMATICAL SENTENCES
WITH NO EXPLETIVES (Type 3), BY GRADE
(Non-exposure Groups)

Sentences		Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
4	1. AC	1 (3.33%)	1 (2.94%)	6 (21.43%)	10 (30.30%)	20 (66.67%)
	1. 1C	9 (30.00%)	17 (50.00%)	11 (39.29%)	10 (30.30%)	4 (13.33%)
	C	17 (56.67%)	12 (35.29%)	7 (25.00%)	8 (24.24%)	2 (6.67%)
	NS	3 (10.00%)	4 (11.76%)	4 (14.29%)	5 (15.15%)	4 (13.33%)
20	1. AC	23 (76.67%)	25 (73.53%)	25 (89.29%)	25 (75.76%)	27 (90.00%)
	1. 1C	4 (13.33%)	4 (11.76%)	0	4 (12.12%)	2 (6.67%)
	C	3 (10.00%)	3 (8.82%)	2 (7.14%)	2 (6.06%)	1 (3.33%)
	NS	0	2 (5.88%)	1 (3.57%)	2 (6.06%)	0
TOTAL						
	1. AC	24 (40.00%)	26 (38.24%)	31 (55.36%)	35 (53.03%)	47 (78.33%)
	1. 1C	13 (21.67%)	21 (30.88%)	11 (19.64%)	14 (21.21%)	6 (10.00%)
	C	20 (33.33%)	15 (22.06%)	9 (16.07%)	10 (15.15%)	3 (5.00%)
	NS	3 (5.00%)	6 (8.82%)	5 (8.93%)	7 (10.61%)	4 (6.67%)

**TABLE 8-A: RESPONSES TO GRAMMATICAL SENTENCES
WITH EXPLETIVES (Type 3)**

Sentences		Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
13	C	105 (67.75%)	5 (83.33%)	20 (100%)
	I	13 (8.39%)	0	0
	NS	37 (23.87%)	1 (16.67%)	0
23	C	133 (85.81%)	4 (66.67%)	20 (100%)
	I	5 (3.23%)	1 (16.67%)	0
	NS	17 (10.97%)	1 (16.67%)	0
TOTAL	C	238 (76.77%)	9 (75.00%)	40 (100%)
	I	18 (5.81%)	1 (8.33%)	0
	NS	54 (17.42%)	2 (16.67%)	0

**TABLE 8-B: RESPONSES TO GRAMMATICAL SENTENCES
(Type 3), BY GRADE (Non-exposure Groups)**

Sentences		Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
13	C	22 (73.33%)	28 (82.35%)	16 (57.14%)	16 (48.48%)	23 (76.67%)
	I	0	3 (8.82%)	4 (14.29%)	3 (9.09%)	3 (10.00%)
	NS	8 (26.67%)	3 (8.82%)	8 (28.57%)	14 (42.42%)	4 (13.33%)
23	C	21 (70.00%)	30 (88.24%)	23 (82.14%)	29 (87.88%)	30 (100%)
	I	1 (3.33%)	1 (2.94%)	2 (7.14%)	1 (3.03%)	0
	NS	8 (26.67%)	3 (8.82%)	3 (10.71%)	3 (9.09%)	0
TOTAL	C	43 (71.67%)	58 (85.29%)	39 (69.64%)	45 (68.18%)	53 (88.33%)
	I	1 (1.67%)	4 (5.88%)	6 (10.71%)	4 (6.06%)	3 (5.00%)
	NS	16 (26.67%)	6 (8.82%)	11 (19.64%)	17 (25.76%)	4 (6.67%)

TABLE 9-A: RESPONSES TO UNGRAMMATICAL SENTENCES WITH
INCORRECT AGREEMENT (Type 4)

Sentences		Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
6	1. AC	91 (58.71%)	1 (16.67%)	20 (100%)
	1. 1C	4 (2.58%)	0	0
	C	57 (36.77%)	4 (66.67%)	0
	NS	3 (1.94%)	1 (16.67%)	0
12	1. AC	76 (49.03%)	1 (16.67%)	20 (100%)
	1. 1C	6 (3.87%)	0	0
	C	69 (44.52%)	5 (83.33%)	0
	NS	4 (2.58%)	0	0
14	1. AC	129 (83.23%)	4 (66.67%)	20 (100%)
	1. 1C	3 (1.94%)	0	0
	C	15 (9.68%)	2 (33.33%)	0
	NS	8 (5.16%)	0	0
17	1. AC	69 (44.52%)	2 (33.33%)	20 (100%)
	1. 1C	1 (0.65%)	0	0
	C	83 (53.55%)	4 (66.67%)	0
	NS	2 (1.29%)	0	0
22	1. AC	93 (60.00%)	4 (66.67%)	20 (100%)
	1. 1C	4 (2.58%)	0	0
	C	49 (31.61%)	2 (33.33%)	0
	NS	9 (5.80%)	0	0
30	1. AC	84 (54.19%)	2 (33.33%)	19 (95.00%)
	1. 1C	2 (1.29%)	0	0
	C	58 (37.42%)	4 (66.67%)	1 (5.00%)
	NS	11 (7.10%)	0	0
TOTAL				
	1. AC	542 (58.28%)	14 (38.89%)	119 (99.17%)
	1. 1C	20 (2.15%)	0	0
	C	331 (35.59%)	21 (58.33%)	1 (0.83%)
	NS	37 (3.98%)	1 (2.78%)	0

TABLE 10-A: RESPONSES TO UNGRAMMATICAL SENTENCES WITH
INCORRECT AGREEMENT (Type 4), BY GRADE
(Non-exposure Groups)

Sentences	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
6 1. AC	24 (80.00%)	19 (55.88%)	12 (42.86%)	18 (54.55%)	18 (60.00%)
1. 1C	0	0	2 (7.14%)	1 (3.03%)	1 (3.33%)
C	6 (20.00%)	15 (44.12%)	14 (50.00%)	14 (42.42%)	8 (26.67%)
NS	0	0	0	0	3 (10.00%)
12 1. AC	16 (53.33%)	21 (61.76%)	7 (25.00%)	9 (27.27%)	23 (76.67%)
1. 1C	3 (10.00%)	1 (2.94%)	1 (3.57%)	1 (3.03%)	0
C	10 (33.33%)	11 (32.35%)	20 (71.43%)	21 (63.64%)	7 (23.33%)
NS	1 (3.33%)	1 (2.94%)	0	2 (6.06%)	0
14 1. AC	24 (80.00%)	32 (94.12%)	18 (64.29%)	27 (81.82%)	28 (93.33%)
1. 1C	1 (3.33%)	1 (2.94%)	1 (3.57%)	0	0
C	5 (16.67%)	0	6 (21.43%)	2 (6.06%)	2 (6.67%)
NS	0	1 (2.94%)	3 (10.71%)	4 (12.12%)	0
17 1. AC	12 (40.00%)	17 (50.00%)	10 (35.71%)	16 (48.48%)	14 (46.67%)
1. 1C	0	0	0	1 (3.03%)	0
C	18 (60.00%)	17 (50.00%)	17 (60.71%)	16 (48.48%)	15 (50.00%)
NS	0	0	1 (3.57%)	0	1 (3.33%)
22 1. AC	20 (66.67%)	22 (64.71%)	10 (35.71%)	16 (48.48%)	25 (83.33%)
1. 1C	1 (3.33%)	0	0	3 (9.09%)	0
C	7 (23.33%)	9 (26.47%)	16 (57.14%)	13 (39.39%)	4 (13.33%)
NS	2 (6.67%)	3 (8.82%)	2 (7.14%)	1 (3.03%)	1 (3.33%)
30 1. AC	21 (70.00%)	20 (58.82%)	9 (32.14%)	10 (30.30%)	24 (80.00%)
1. 1C	1 (3.33%)	0	1 (3.57%)	0	0
C	7 (23.33%)	11 (32.35%)	14 (50.00%)	21 (63.64%)	5 (16.67%)
NS	1 (3.33%)	3 (8.82%)	4 (14.29%)	2 (6.06%)	1 (3.33%)
TOTAL					
1. 1A	117 (65.00%)	131 (64.22%)	66 (39.29%)	96 (48.48%)	132 (73.33%)
1. 1C	6 (3.33%)	2 (0.98%)	5 (2.98%)	6 (3.03%)	1 (0.56%)
C	53 (29.44%)	63 (30.88%)	87 (51.79%)	87 (43.94%)	41 (22.78%)
NS	4 (2.22%)	8 (3.92%)	10 (5.95%)	9 (4.54%)	6 (3.33%)

TABLE 11-A: RESPONSES TO GRAMMATICAL SENTENCES
WITH CORRECT AGREEMENT (Type 4)

Sentences		Non-exposure (n = 155)	Exposure (n = 6)	E.C.G. (n = 20)
1	C	151 (97.42%)	6 (100%)	19 (95.00%)
	I	4 (2.58%)	0	1 (5.00%)
	NS	0	0	0
8	C	137 (88.39%)	6 (100%)	19 (95.00%)
	I	13 (8.39%)	0	1 (5.00%)
	NS	5 (3.23%)	0	0
25	C	106 (68.39%)	3 (50.00%)	19 (95.00%)
	I	19 (12.26%)	2 (33.33%)	1 (5.00%)
	NS	30 (19.35%)	1 (16.67%)	0
27	C	95 (61.29%)	5 (83.33%)	12 (60.00%)
	I	41 (26.45%)	1 (16.67%)	6 (30.00%)
	NS	19 (12.26%)	0	2 (10.00%)
TOTAL	C	489 (78.87%)	20 (83.33%)	69 (86.25%)
	I	77 (12.42%)	3 (12.50%)	9 (11.25%)
	NS	54 (8.71%)	1 (4.17%)	2 (2.50%)

TABLE 11-B: RESPONSES TO GRAMMATICAL SENTENCES
(Type 4), BY GRADE (Non-exposure Groups)

Sentences	Grade 9 (n = 30)	Grade 10 (n = 34)	Grade 11 (n = 28)	Grade 12 (n = 33)	Grade 14 (n = 30)
1 C	28 (93.33%)	34 (100%)	27 (96.43%)	33 (100%)	29 (96.67%)
I	2 (6.67%)	0	1 (3.57%)	0	1 (3.33%)
NS	0	0	0	0	0
8 C	25 (83.33%)	32 (94.12%)	22 (78.57%)	29 (87.88%)	29 (96.67%)
I	3 (10.00%)	2 (5.88%)	4 (14.29%)	3 (9.09%)	1 (3.33%)
NS	2 (6.67%)	0	2 (7.14%)	1 (3.03%)	0
25 C	22 (73.33%)	23 (67.65%)	12 (42.86%)	27 (81.82%)	22 (73.33%)
I	3 (10.00%)	6 (17.65%)	5 (17.86%)	1 (3.03%)	4 (13.33%)
NS	5 (16.67%)	5 (14.71%)	11 (39.29%)	5 (15.15%)	4 (13.33%)
27 C	16 (53.33%)	21 (61.76%)	17 (60.71%)	22 (66.67%)	19 (63.33%)
I	9 (30.00%)	9 (26.47%)	8 (28.57%)	6 (18.18%)	9 (30.00%)
NS	5 (16.67%)	4 (11.76%)	3 (10.71%)	5 (15.15%)	2 (6.67%)
TOTAL					
C	91 (75.83%)	110 (80.89%)	78 (69.64%)	111 (84.09%)	99 (82.50%)
I	17 (14.17%)	17 (12.50%)	18 (16.07%)	10 (7.58%)	15 (12.50%)
NS	12 (10.00%)	9 (6.62%)	16 (14.29%)	11 (8.33%)	6 (5.00%)

TABLE 13: RESPONSES TO JAPANESE SENTENCES BY A
JAPANESE CONTROL GROUP (n =31)

TYPE 1

[Null Subject]			[Non Null Subject]		
3	C	21 (67.74%)	19	C	29 (93.55%)
	I	7 (22.58%)		I	2 (6.45%)
	NS	3 (9.68%)		NS	0
9	C	20 (64.52%)	24	C	29 (93.55%)
	I	11 (35.48%)		I	1 (3.23%)
	NS	0		NS	1 (3.23%)
16	C	27 (87.10%)	29	C	30 (96.77%)
	I	4 (12.90%)		I	1 (3.23%)
	NS	0		NS	0
<hr/>			<hr/>		
TOTAL			TOTAL		
	C	68 (73.12%)		C	88 (94.62%)
	I	22 (23.66%)		I	4 (4.30%)
	NS	3 (3.23%)		NS	1 (1.08%)

NOTES:

1. All Japanese sentences tested are grammatical, although some sentences are unlikely to be produced by native speakers.
2. Sentences numbers appearing here are arranged to correspond to the English versions.

TYPE 2

[Null Subjects]

[Non Null Subjects]

2 C 28 (90.32%)
 I 2 (6.45%)
 NS 1 (3.23%)

7 C 28 (90.32%)
 I 2 (6.45%)
 NS 1 (3.23%)

5 C 27 (87.10%)
 I 4 (12.90%)
 NS 0

11 C 30 (96.77%)
 I 1 (3.23%)
 NS 0

10 C 30 (96.77%)
 I 1 (3.23%)
 NS 0

15 C 24 (77.42%)
 I 7 (22.58%)
 NS 0

21 C 31 (100%)
 I 0
 NS 0

18 C 30 (96.77%)
 I 1 (3.23%)
 NS 0

28 C 28 (90.32%)
 I 3 (9.68%)
 NS 0

26 C 25 (80.65%)
 I 3 (9.68%)
 NS 3 (9.68%)

TOTAL

C 144 (92.90%)
I 10 (6.45%)
NS 1 (0.65%)

TOTAL

C 137 (88.39%)
I 14 (9.03%)
NS 4 (2.58%)

TYPE 3

[NO EXPLETIVES]

3	C	31 (100%)
	I	0
	NS	0

9	C	31 (100%)
	I	0
	NS	0

14	C	31 (100%)
	I	0
	NS	0

20	C	31 (100%)
	I	0
	NS	0

TOTAL

	C	124 (100%)
	I	0
	NS	0