The Acquisition of "Subject" in to-Infinitive Clauses by Japanese Learners of English

The Acquisition of "Subject" in *to*-Infinitive Clauses by Japanese Learners of English

日本語母語話者の英語不定詞節における「主語」の習得

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Abstract

This study examined whether Japanese learners of English (JLEs) could suitably identify who the subject of the *to*-infinitive clause was. In "*Mary promised Naomi to wash the dishes*" and "*John told Ken to read this book*," the antecedents of the "subjects" of the *to*-infinitive clauses are syntactically different from each other: the first sentence is "*Mary*" and the second is "*Ken*" respectively. This complexity makes JLEs puzzled. In order to explain it linguistically, a null pronoun, PRO, was hypothesized in the theoretical linguistics.

Based on the linguistic theory, the authors established two different predictions in terms of the acquisition of subjects of the *to*-infinitive clauses by JLEs. One is that correct interpretation of PRO controlled by the object of the matrix clause (i.e., Object Control) would be easier than that of PRO controlled by the subject of the matrix clause (i.e., Subject Control) due to Minimal Distance Principle (MDP) (Rosenbaum, 1965). The other is that because of the positive L1 transfer, JLEs would not have any difference of difficulty when they interpret PRO in either Subject Control or Object Control.

Using multiple choice questionnaires with a Japanese situational context, the authors investigated 110 university JLEs' interpretation of PRO of the *to*-infinitival clauses in English. The results indicated that the JLEs showed no difficulty interpreting PRO in the *to*-infinitive clauses with Object Control and Subject Control. However, the authors also found an exception: When the matrix verb was "ask," the JLEs preferred to think that the subject of the *to*-infinitive was the objects in the matrix clause (Object Control), which meant that they tended to follow MDP.

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1. Introduction

The purpose of the study is to examine the acquisition of "subject" of to-infinitive clause: whether Japanese learners of English (JLEs) can appropriately identify who the subject of the to-infinitive clause is.[1] It may be hard for JLEs to identify the subjects of to-infinitive clauses because they are not phonetically realized.

　　Let us look at (1). When a verb in the matrix clause is, for example, "tell", "order", or "persuade", the subject of the to-infinitive clause is "Naomi", the object of the matrix clause. On the other hand, when the matrix verb is "promise" shown in (2), the subject of the to-infinitive clause is "Mary", which is the subject of the matrix clause. However, in (3), when the matrix verb is "ask", the subject of the to-infinitive can be either the matrix subject "Mary" or the matrix object "Naomi". We can have two interpretations depending on the context.

(1) Mary told /ordered /persuaded Naomi to wash the dishes.
(2) Mary promised Naomi to wash the dishes.
(3) Mary asked Naomi to see the manager.

These linguistic complexities may have JLEs fall into confusion when they interpret the English sentences with to-infinitive clauses. Thus, in this study, we will investigate whether JLEs can correctly interpret the subject of the to-infinitive clauses.

　　This paper is organized as follows. After the introduction, the authors briefly discuss linguistic backgrounds along with related previous studies in Section 2. Then, in Section 3, the experiment conducted is demonstrated. Results and discussions with pedagogical implications are shown in Section 4 and conclusion in Section 5.

2. Background
2.1 Linguistic backgrounds

In order to explain the syntactic structures of the to-infinitives, N. Chomsky (1995) hypothesized a null pronoun called PRO, which is regarded as a noun phrase without being phonetically realized but possesses a null case. In (4a), PRO is controlled by the matrix subject, "Mary". This is called Subject Control. Verb "promise" is a Subject Control verb and it is the only verb which behaves as Subject Control. PRO in the to-infinitive clause in (4b) is controlled by the matrix object "Naomi". This is a case of Object Control. Almost all the English verbs belong to Object Control verb. In the case of verb "ask" in (4c), PRO in the to-infinitive clause is controlled by either a subject noun or an object noun in the matrix clause, which depends on the context the sentence is produced. Thus, the meaning of the sentence cannot be decided by the syntactic structure. The other verb which behaves like "ask" is

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[1] This paper is based on our presentation at JASELE 2015 (The Japan Society of English Language Education 2015) held in Kumamoto Gakuen University on August 23rd, 2015.

"beg". These two verbs are verbs which behave both as Subject Control and Object Control.

(4) a. Subject Control: "promise"

   Mary$_i$ promised Naomi$_j$ [PRO$_{i/*j}$ to wash the dishes].

   b. Object Control: e.g., "tell", "order", "persuade"

   Mary$_i$ told Naomi$_j$ [PRO$_{*i/j}$ to wash the dishes].

   c. Subject Control/ Object Control: "beg" and "ask"

   Mary$_i$ asked Naomi$_j$ [PRO$_{i/j}$ to see the manager].

As part of linguistic backgrounds to analyze the data obtained, this study will employ Minimal Distance Principle (MDP, hereafter). It was originally proposed by Rosenbaum (1965). Then, Larson (1991) revised the definition of MDP as shown in (5).

(5) Minimal Distance Principle (MDP)

   An infinitive complement of a predicate P selects as its controller the minimal c-commanding noun phrase in the functional complex of P.

<div align="right">(Larson, 1991, p.115)</div>

In other words, applied in this study, MDP claims that the closest noun phrase from the *to*-infinitive clause is regarded as the antecedent of PRO in the *to*-infinitive clause. Some researchers claim that this principle is one of the universal principles in language acquisition (e.g., C. Chomsky, 1969, 1972; Aller, 1977; Berent, 1983).

As a supporting evidence for MDP in L1 acquisition, C. Chomsky (1969) is introduced (See also C. Chomsky, 1972). The participants were 40 children whose L1 was English. Matrix verbs she used were included "promise", "tell" and "ask". The data were collected by using puppets and by asking questions each other. Her results showed that MDP was supported. That is, correct interpretation of PRO as Object Control was easier than that of PRO as Subject Control.

However, as a counter evidence against MDP in L1 acquisition, Natsopoulos & Zeromeritou (1988) conducted an experiment with children whose L1 was Greek. They claimed that their results did not support MDP. The participants more correctly interpreted PRO as Subject Control than PRO as Object Control. However, it should be noted that the test sentences they used were not English but Greek, which does not have *to*-infinitive subordinate clauses. Thus, they used tensed finite clauses instead.

If MDP is valid for an explanation of language acquisition, not only in the L1 acquisition but also in the L2 acquisition, we can assume that L2 learners will depend on MDP when they identify the subject of the *to*-infinitive clause. If language learners rely on MDP, they tend to interpret the object of the matrix clause as the subject (PRO) of the *to*-infinitive clause because the object lies in the minimal distance position from PRO.

Based on this logic, the authors will propose the following prediction, which we call

Prediction 1 from now on.

(6) Prediction 1

   If MDP operates in L2 acquisition, correct interpretation of PRO as Subject Control would
   be difficult for JLEs. However, correct interpretation of PRO as Object Control would not
   be difficult for JLEs.

Following this prediction, when JLEs interpret the sentence with the verb "ask", Subject
Control would be more difficult than Object Control.

   Although the interpretation of PRO in the *to*-infinitive clause has been examined in the L1
and L2 studies, it has not been examined in the L2 acquisition studies whose participants are
Japanese. Therefore, it is worth examining how JLEs interpret subjects of the *to*-infinitive
clauses.

2.2 L1 transfer in L2 acquisition

The authors will analyze the influence of L1 transfer for the interpretation of PRO in the *to*-
infinitive clauses from the two different perspectives; syntactic transfer and semantic
transfer. First, L1 syntactic transfer will be examined.

   In the syntactic transfer, it is claimed that *to* in English is equivalent to a subjunctive
yooni in Japanese, which is not a complementizer (Aoshima, 2001). When *yooni* is used,
Object Control is established as shown in (7).

(7) Object Control in Japanese (a subjunctive -*yooni*)

   Eri$_i$-ga　　Yoko$_j$-ni　[[PRO$_{*i/j}$ kono hon-o　yomu] yooni] itta.
   Eri-Nom　Yoko-Dat　　　this book-Acc read　to　　told.
       "Eri told Yoko to read this book."

                                                                    (Aoshima, 2001, p5)

On the other hand, a complementizer "*that*" which follows a tensed clause in English is
equivalent to complementizers -*to*/-*koto* in Japanese (Aoshima, 2001). When either -*to* or -*koto*
is a complementeizer of a subordinate clause, Subject Control is established as shown in (8).

(8) Subject Control in Japanese
   a. a complementizer -*to*

   Mary$_i$-wa　Naomi$_j$-ni　[[PRO$_{i/*j}$ osara-o　arau] to]　　yakusokusita.
   Mary-Top　Naomi-Dat　　dishes-Acc wash　Comp　promised.
       "Mary promised Naomi that she would wash the dishes."

  b. a complementizer -*koto*

   Mary$_i$-wa Naomi$_j$-ni [[PRO$_{i/*j}$ osara-o arau] koto-o] yakusokusita.

   Mary-Top Naomi-Dat dishes-Acc wash Comp-Acc promised.

    "Mary promised Naomi that she would wash the dishes."

<div align="right">(Aoshima, 2001, p5)</div>

  Now, we will examine the semantic transfer from L1 concerning English and Japanese verbs. English verbs "tell", "order" and "persuade" are Object Control verbs. According to *Genius English-Japanese Dictionary,* a verb "tell" is translated into -o *iu, -o hanasu,* and -*o tsutaeru* in Japanese. A verb "order" is translated into -*o meijiru* and -*o tanomu*. A verb "persuade" is equivalent to -*o settokusuru*. Like English equivalents, all of these Japanese verbs are also used as Object Control (see (9)).

(9) An example of a Japanese sentence with *iu, hanasu, tsutaeru*

   Mary$_i$-wa Naomi$_j$-ni [[PRO$_{*i/j}$ kono-hon-o yomu] yooni] itta/hanasita/tsutaeta

   Mary-Topb Naomi-Dat this book-Acc read to told.

    "Mary told Naomi to read this book."

Now, let us go to Subject Control verb. A verb "promise" is equivalent to a Japanese verb, *yakusokusuru*. Both verbs possess the sense of commitment and an example of a Japanese sentence with *yakusokusuru* is shown in (10).

(10) An example of a Japanese sentence with *yakusokusuru*

  a. a complementizer -*to*

   Mary$_i$-wa Naomi$_j$-ni [[PRO$_{i/*j}$ osara-o arau] to] yakusokusita.

   Mary-Top Naomi-Dat dishes-Acc wash Comp promised.

    "Mary promised Naomi that she would wash the dishes."

  b. a complementizer -*koto*

   Mary$_i$-wa Naomi$_j$-ni [[PRO$_{i/*j}$ osara-o arau] koto-o] yakusokusita.

   Mary-Top Naomi-Dat dishes-Acc wash Comp-Acc promised.

    "Mary promised Naomi that she would wash the dishes."

  Concerning the exceptional English verb "ask," it possesses two senses (C. Chomsky, 1969). That is, the sense of request and the sense of question. In the sense of question, "ask" is used as Subject Control verb ((11a)). In the sense of request, it is used as Object Control verb ((11b)).

(11) Verb "ask"

    a. The sense of question: Subject Control

       e.g., Mary asked Naomi to leave.

    b. The sense of request: Object Control

       e.g., Mary asked Naomi to open the door.

In Japanese, there are two equivalents for the English verb "ask." One of them is *tazuneru* (or *kiku*). These Japanese verbs have the sense of question. They are used as Subject Control in (12a). The other equivalent for the verb "ask" is expressed in *tanomu* (or *motomeru*) in Japanese. They have the sense of request and are used as Object Control in (12b).

(12) Verb *tazuneru, tanomu* in Japanese (= "ask" in English)

    a. the sense of question: Subject Control

       Tom$_i$-wa sensei$_j$-ni [[PRO$_{i/*j}$ syukudai-o teisyutsusuru ka] to] kiita /tazuneta.

       Tom-Top his teacher-Dat   homework-ACC submit Q Comp asked.

          "Tom asked his teacher to submit the homework."

    b. the sense of request: Object Control

       Mary$_i$-ga   Naomi$_j$-ni [[PRO$_{*i/j}$ kono doa-o   akeru] yooni] tanonda / motometa.

       Mary-Nom Naomi-Dat   this door-Acc open to asked.

          "Mary asked Naomi to open this door."

To sum, the authors have discussed the followings on the influence of L1 transfer. From the point of syntax in Japanese on subordinate clauses, sentences with Subject Control and those with Object Control have different antecedents of PRO. That is, *yooni* is used with Object Control, while *-to / -koto* are used with Subject Control.

Then, from the point of semantics, the verbs used as Object Control in English are also used as Object Control in Japanese. The verbs used as Subject Control in English are also used as Subject Control in Japanese. It should be noted that the Japanese equivalent of the English verb "ask" used as Object Control have different lexical words from the Japanese equivalent of the English verb "ask" used as Subject Control.

Based on both syntactic and semantic comparisons between the two languages, Prediction 2 is proposed as presented in (13).

(13) Prediction 2

    If L1 transfer from Japanese plays an important role, JLEs will have no differential

    difficulty interpreting both PRO as Object Control and that as Subject Control.

Following this assumption, correct identification of antecedent of PRO in the sentence with Object Control and with Subject Control are both easy for JLEs.

Thus, based on the analyses the authors discussed, two predictions; Prediction 1 presented in (6) and Prediction 2 presented in (13), have been established in order to examine JLEs' interpretation of PRO in the *to*-infinitive clause. Now, the authors will clarify which prediction is more valid than the other and trying to explain JLEs' acquisition process of PRO.

3. Experiment

3.1 Participants

Participants in the experiment were 110 first-year university students whose L1 was Japanese. The average score of their TOEIC was about 400.

3.2 Materials and procedures

All the participants were expected to complete a context-based judgment task consisted of 13 questions with 15 distractors. Ten out of the 13 questions were questions of who was the antecedent of PRO in the *to*-infinitive clauses. The remaining 3 questions were the questions about Japanese sentences with *yooni*. They were asked who the antecedent of PRO was in these sentences.

Ten question sentences were divided into three categories as summarized in Table 1: (i) the sentences with the verb "promise" as Subject Control, (ii) the verbs "tell", "order", and "persuade" as Object Control, and the verb "ask" both as Subject Control and as Object Control. In each category except the verb "ask" as Object Control, there were 3 stimulus sentences. On the other hand, there were 4 stimulus sentences for the verb "ask": 3 were subject-oriented and 1 was object-oriented sentences.

Table 1. *Ten question sentences used in the experiment: English to-infinitive structures*

The matrix verbs	Structure	Tokens
"promise"	Subject Control	3
"tell", "order", persuade"	Object Control	3
"ask"	Subject Control	3
	Object Control	1

An example of the test items is demonstrated in (14). The test items consisted of a context sentence in Japanese and a test sentence in English. The participants were asked to read a context sentence written in Japanese, which provided the information of the situation to understand the test sentence, and then they read a test sentence written in English. After that, they were asked to judge who the agent of the *to*-infinitive clause was in Japanese by choosing an answer from the three answer choices. All the participants completed the whole task within 25 minutes even though no time limitation was provided.

(14) An Example of the test items (Subject Control: "promise")

   a. Context sentence

      MaryとNaomiはルームメイトで、今一緒に夕ご飯を食べています。

   b. Test sentence

     ① Mary promised Naomi to wash the dishes today.

     ②（質問）誰が今日 wash the dishes することになりそうですか？

       （答え）【A：Mary, B：Naomi, C：MaryでもNaomiでもない別の人】

Four participants were eliminated because their distractor scores did not exceed 80%. Subsequently, 106 participants became real participants. All the answers were tabulated by giving one point to the correct answer and zero to the incorrect ones.

4. Results and Discussions

4.1 Object Control and Subject Control

The overall results in the experiment are shown in Table 2. The maximum score of each category was 3. The percentages of correct interpretations of PRO as Object Control and Subject Control were 81.45% and 80.50% respectively. The correct interpretation of PRO in Japanese sentences with *yooni* was 93.40%.

Table 2. *Results of the experiment* (n=106)

Category	Mean	SD	%
Object Control ("tell". "order". "persuade")	2.44	0.72	81.45
Subject Control ("promise")	2.42	1.12	80.50
Japanese *yooni*	2.80	0.40	93.40

Note: *The maximum score of each category was 3.0.*

Let us focus on the mean scores of Object Control and Subject Control. In Figure 1, the results of a one-way repeated measures ANOVA among three categories (i.e., Object Control, Subject Control and Japanese *yooni*) indicated highly significant differences between these categories (F (2, 317) =7.455, p =.003, η^2 = 0.07). However, multiple comparisons based on the Bonferroni showed that no significant difference was observed between Object Control and Subject Control (p = .84, r = .02).
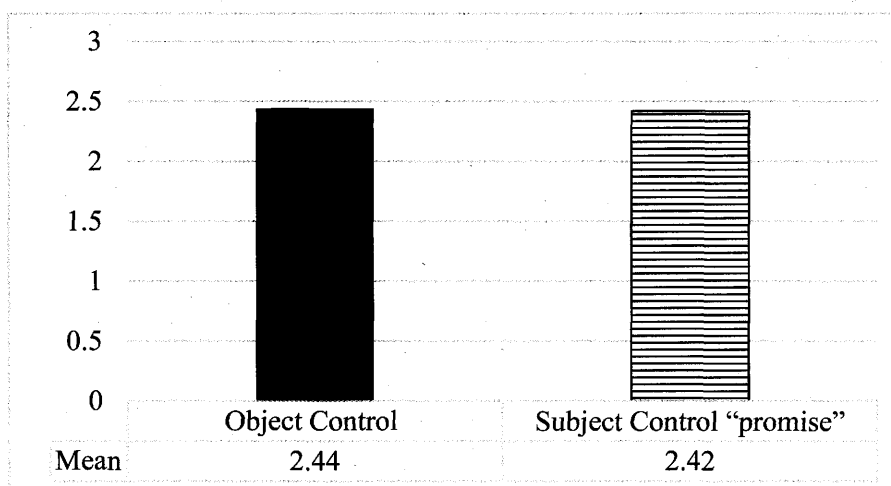
Figure 1. Mean Scores of Object Control, Subject Control "promise"

As shown in Figure 2, we have categorized the participants according to the total number of correct answers for both Subject Control and Object Control. About 60% of the JLEs correctly answered all the 3 questions for Object Control, and 75% of them for Subject Control as well.
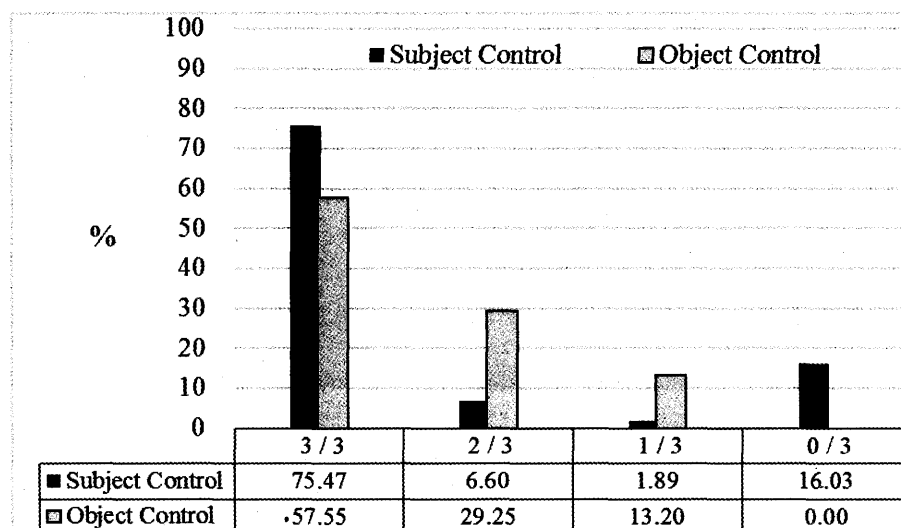

	3 / 3	2 / 3	1 / 3	0 / 3
■ Subject Control	75.47	6.60	1.89	16.03
□ Object Control	.57.55	29.25	13.20	0.00

Figure 2. The percentages of participants according to the total number of correct answers for both Subject Control, "promise" and Object Control, "tell". "order". "persuade" (*n*=106)

Therefore, our results have supported Prediction 2. That is, the JLEs have no difficulty interpreting PRO in the *to*-infinitive clause with Object Control and Subject Control. We would like to conclude that this is due to the strong influence of L1 transfer.

4.2 Results of the verb "ask"

Now let us look at and discuss the results of verb "ask". As shown in Table 3, in addition to Mean and SD, the percentages of the participants who interpreted PRO as either the matrix subject or matrix object are presented. For the subject-oriented questions, about 60% ~ 68% of the participants chose the matrix object as the antecedent of PRO. For the object-oriented questions, 83% of the participants chose the matrix object.

Table 3. *Results of the experiment, verb "ask" (n=106)*

Category	Mean	SD	Subject (%)	Object (%)
Subject Control *ask* 1	0.34	0.48	33.96	66.04
Subject Control *ask* 2	0.32	0.47	32.08	67.92
Subject Control *ask* 3	0.40	0.49	39.62	60.38
Object Control *ask*	0.83	0.38	16.98	83.01

Note: The maximum score of each category was 1.0.

Figure 3 showed the percentages of the participants categorized by the total number of correct answers in the sentences with subject-oriented "ask". About 45% of the participants selected the matrix object as the antecedent of PRO for all the 3 questions.
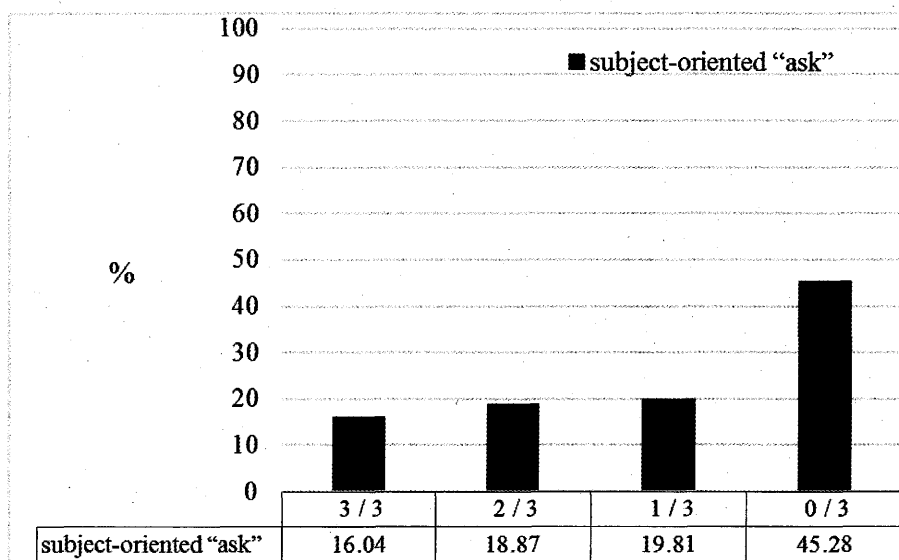

subject-oriented "ask"	3 / 3	2 / 3	1 / 3	0 / 3
	16.04	18.87	19.81	45.28

Figure 3. The percentages of participants according to the total number of correct answers in the sentences with subject-oriented, "ask" (*n* =106)

Therefore, in the case of verb "ask", JLEs tend to prefer to select the matrix object as the antecedent of PRO. That is, they prefer to regard the sentence with the matrix verb "ask" as Object Control because they follow MDP. It appears to be the result of L1 transfer. In the case of Japanese equivalents of verb "ask", both Subject Control and Object Control can be

established. That is, one of the Japanese equivalents of verb "ask", "*tazuneru*" (or "*kiku*"), takes -*to* or -*koto* and thus, Subject Control is established. The other Japanese equivalent of verb "ask", "*tanomu*" (or "*motomeru*"), takes -*yooni* and thus, Object Control is established. Therefore, in the case of verb "ask", when two noun phrases of the matrix clause; the matrix subject and the matrix object, can become the possible antecedents of PRO, as same as the Japanese equivalents of verb "ask", JLEs prefer to select the object as the antecedent of PRO by following MDP.

On the contrary, in the case of verb "promise", which takes only Subject Control, the preference of selecting the matrix object as the antecedent of PRO is not observed due to L1 transfer. That is, verb "*yakusokusuru*", Japanese equivalent of verb "promise", can only take -*to* or -*koto*, but not *yooni*. Thus, only Subject Control is established when the matrix verb is "*yakusokusuru*".

In order to interpret the antecedent of PRO with the matrix verb "ask" correctly, depending on the context, JLEs need to interpret the meaning of the sentences with the verb "ask". That is, Japanese equivalent verbs "*tazuneru*" (or "*kiku*") for "ask" in English is used as Subject Control, while the Japanese equivalent verbs "*tanomu*" (or "*motomeru*") for "ask" in English is used as Object Control.

From these findings, we would like to suggest that teachers of English need to recognize the following two points. First, they do not explicitly have to teach subjects of *to*-infinitive clauses because it is easy for JLEs to correctly interpret who the person is. Second, teachers should know that JLEs have difficulty interpreting the subject of the *to*-infinitive clauses when the matrix verb is "ask". Therefore, they need to instruct that when the sentence has the *to*-infinitive subordinate clause with the verb "ask", it has two different meanings.

5. Conclusion

This study has attempted to examine the acquisition of "subject" of a *to*-infinitive clause by JLEs. The authors would like to repeat the following findings. First, it is not difficult for JLEs to interpret the subject of the *to*-infinitive clauses due to syntactically and semantically positive transfer from L1 Japanese. Second, in the case of "ask", which allows both Subject Control and Object Control, JLEs tend to prefer to choose the matrix object as the subject of the *to*-infinitive clause. When two choices are possible, JLEs tend to choose the minimal distance noun following MDP.

Finally, we would like to refer to our future study. We have found some JLEs who did not correctly interpret all the questions of "promise," which is the only Subject Control verb. We would like to examine why they did not transfer the L1 properties. Also, we would like to test junior high school and senior high school students in order to observe the initial state of PRO interpretation of the *to*-infinitive clauses.

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