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**Logophoric and anaphoric 'otagai' in Japanese: an acceptability study**

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## Abstract

This study revolves around the Japanese reciprocal pronoun *otagai* ‘each other’. Native Japanese speakers were asked to judge the acceptability of 48 Japanese sentences. The goal was to see if they would treat *otagai* as a logophor if it resided in the embedded possessor position of the embedded object. A comparison was made between logophoric sentences whose only possible antecedent was in the same embedded clause as *otagai*, and logophoric sentences whose only possible antecedent lay outside of the embedded clause in the position of the matrix subject. Sentences which had *otagai* in a syntactically anaphoric position in the embedded clause were added for comparison. They too had the only possible antecedent either inside the embedded clause or outside of the clause in the matrix subject position. The results show that the anaphoric sentences had a low level of acceptability in the cases where long-distance binding was necessary and a high level of acceptability when it was not. A high level of acceptability was found for the logophoric sentences which did not require long-distance binding. In the case of the logophoric sentences which did require long-distance binding, there was an even distribution between low and high levels of acceptability. It was concluded that *otagai* in the embedded possessor position of an embedded object can indeed take a long-distance antecedent if context allows for it.

Keywords: Japanese, anaphoricity, logophoricity, *otagai*, long-distance binding

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## Conventions & Abbreviations

### Glossing

The Leipzig Glossing Rules have served as the framework when it comes to glossing vocabulary in this thesis.

### Romanization

For the romanization of Japanese, this thesis utilizes the modified Hepburn system. It is different from the original Hepburn system in that it writes long vowels with double letters instead of macrons. The exception to this rule is the long *e* which is written as *ei* instead of *ee*.

### Abbreviations

1P2P	Sentence with a singular matrix subject and plural embedded subject
2P1P	Sentence with a plural matrix subject and singular embedded subject
NOM	Nominative
GEN	Genitive
ACC	Accusative
PST	Past tense
NP	Noun phrase
VP	Verb phrase
Comp	Compliment
S	Sentence
DAT	Dative
POST	Postposition
GER	Gerund
CONT	Continuous
NPST	Non-past tense
TOP	Topic
ADV	Adverb

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## 1. Introduction

This thesis is heavily based on Nakao's (2003) *Japanese Reciprocal Constructions and Binding Theory*, in which the anaphoric and logophoric elements of the Japanese reciprocal pronoun *otagai* 'each other' are reviewed. An anaphor is bound in its governing category (Chomsky, 1981). Hoji (2010:1) points out that "it is widely, /.../ assumed in the recent generative grammatical works that *otagai* in Japanese is a reciprocal anaphor corresponding to English each other". This fact renders *otagai* a local anaphor, which means that it can only take a local antecedent and is unable to break this strict locality condition. However, it has been shown that there are exceptions to this rule. Nakao (2003) shows that *otagai* can take a long-distance antecedent if it is in the embedded possessor position, which makes it a *logophor*. Observe the following example sentence.

(1) John to Mary-ga Bill-ga otagai-no kodomo-o seme-ta to omo-tta.

John and Mary-NOM Bill-NOM each.other-GEN child-ACC blame-PST that think-PST.

'John and Mary thought that Bill blamed each other's child/children.'

(Nakao 2003: 19)

In Nagata (1995a), native Japanese speakers took part in an on-line and off-line experiment, in which they were to judge the antecedent of the reflexive pronoun *jibun* 'oneself' in various anaphoric and logophoric positions. Logophors are explained to be pronouns such that "the choice of the antecedent is not determined syntactically" (Sells and Wasow 1999, cited in Nakao 2003:22). The results showed that, regardless of sentence type, the matrix subject was chosen as the antecedent of *jibun*. This did not concur with Chomsky's (1981) Binding Principle. Furthermore, in Nagata (1995b), the experiment was remade but different contextual variables were applied. The results showed that even though the target sentences were manipulated in order to try to force an anaphoric interpretation of *jibun*, a logophoric understanding of *jibun* was still applied.

Both *otagai* and *jibun* carry the ability to take on anaphoric and logophoric positions. This thesis revolved around the nature of *otagai* as opposed to Nagata's (1995a and 1995b) experiments, which dealt with *jibun*. Native Japanese speakers were to judge the acceptability

of various sentences where *otagai* resided in anaphoric and logophoric positions. There were two goals in this thesis. They are as follows:

- To test whether the anaphoric *otagai*, as explained by Nakao (2003), can only take a local antecedent by comparing the rates of acceptability between two types of sentences with the anaphoric *otagai*: sentences where the only plausible antecedent of *otagai* is the matrix subject (henceforth named 2P1P-anaphoric sentences) and sentences where the only plausible antecedent of *otagai* is the embedded subject (henceforth named 1P2P-anaphoric sentences).
- To see if there was a disparity of acceptability between two types of sentences with the logophoric *otagai*: sentences where the only plausible antecedent of *otagai* is the matrix subject (henceforth called 2P1P-logophoric sentences) and sentences where the only plausible antecedent of *otagai* is the embedded subject (henceforth called 1P2P-logophoric sentences).

The results showed that the 1P2P-anaphoric sentences had a much higher rate of acceptability than the 2P1P-anaphoric sentences. This concurs with the hypothesis of this thesis and previous research that has been made. Furthermore, the results showed that the 1P2P-logophoric sentences were deemed more acceptable than the 2P1P-logophoric sentences, which indicated a strong preference for *otagai* to take a local antecedent. However, the 2P1P-logophoric sentences had a higher level of acceptability than the 2P1P-anaphoric sentences, which seems to suggest that the logophoric *otagai* indeed can take a long-distance antecedent to a certain extent.

In Section 2, the nature of binding will be explained in order to get a clear sense of the mechanics behind the topic of this thesis. After that, the logophoric *otagai* will be described, including the exact syntactic positions in which it becomes logophoric. Lastly, the results from Nagata's experiments, which revolved around the anaphoric and logophoric *jibun*, will be analyzed and reviewed. An understanding of those experiments will help the reader to grasp the motivation behind this thesis. In section 3, the purpose and methodology of the experiment of this thesis will be explained. The results will then be provided in section 4, followed by their analysis in section 5.

## 2. Previous research

In this section, information which is relevant to the topic of *otagai* will be brought up. This information will provide the reader with a basic set of knowledge of previous research, which is related to the nature of *otagai*. Furthermore, background knowledge will help to create a clear image of the motivation behind this thesis.

### 2.1 Binding

Chomsky's (1981) Binding Theory attempts to account for the distribution of anaphors, pronominals and referential expressions including *otagai*. There are three main principles that are included in this theory. They are as follows:

- Principle A: An anaphor must have a binder in its binding domain.
- Principle B: A pronominal must not have a binder in its binding domain.
- Principle C: An R-expression must not have a binder anywhere in its binding domain.

A crucial component of Binding Theory is the idea of *c-command* 'constituent command'.

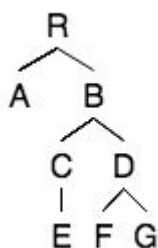
C-command is defined as follows:

- Node A c(onstituent)-commands node B if neither A nor B dominates the other and the first branching node which dominates A dominates B.

(Reinhart 1976:32, cited in Jensen 2012:130)

An understanding of c-command is required to understand the definitions of *binder* and *binding domain*. A *binder* is a NP which c-commands and refers to the same object as (i.e is co-indexed with) another NP (Chomsky 1981). A *binding domain* is "the smallest constituent containing a bound NP, its case assigner C (such as a verb or a preposition), all arguments of C (coargument domain), a subject (subject domain), a finite clause (tense domain) and an entire sentence (root domain)" (Jensen, 2012:130). The idea of c-command can be expressed and analyzed via figure 1.

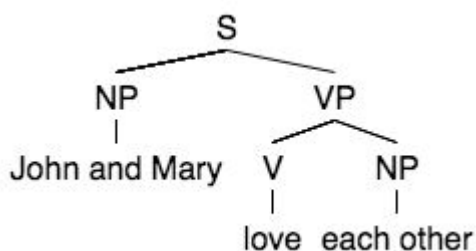




**Figure 1.** *This is an abstract construction of a syntax tree.*

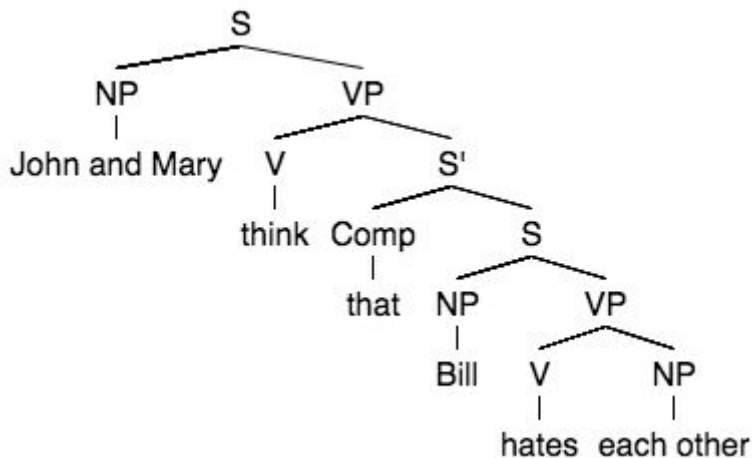
Since R is above both A and B, it dominates A and B, but does not c-command them. Since R dominates both A and B, and neither A nor B dominates the other, A c-commands B and vice versa. This also means that A c-commands all nodes that are below B. Since B dominates nodes C and D, and neither C nor D dominates the other, C c-commands D and vice versa. For the same reason that A c-commands all nodes under B, C c-commands all nodes under D. E does not c-command any node. F and G c-command each other.

We will now observe how Condition A applies in a simple sentence like ‘John and Mary love each other.’



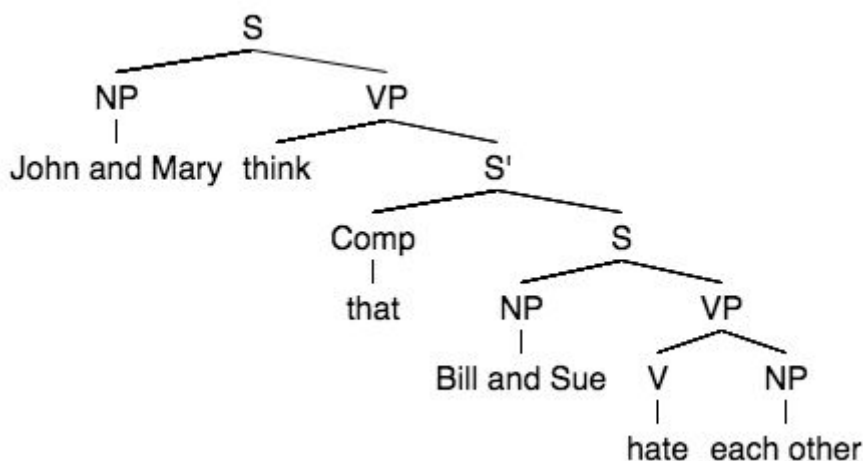
**Figure 2.** *This is a syntax tree for the sentence ‘John and Mary love each other’.*

‘Each other’ is an anaphor. According to Condition A, an anaphor must have a binder in its binding domain. ‘John and Mary’ is a NP which is co-indexed with, and c-commands, ‘each other’. Therefore, this is a grammatically well structured sentence according to Binding Theory. In Inoue Naoya, et al. (2010:295), *each other* in this sentence is a so called direct anaphor. A direct anaphor has an antecedent in the same clause in which it appears. In figure 3, we will observe why a sentence such as ‘John and Mary think that Bill hates each other’ is viewed as ungrammatical.



**Figure 3.** This shows the syntax tree for the sentence 'John and Mary think that Bill hates each other'.

In theory, one could make the case that 'John and Mary' c-commands 'each other' and that they refer to same object. However, Condition A states that the binder of an anaphor must be within the binding domain of the anaphor. A binding domain is the smallest constituent containing a NP and its case assigner. If an anaphor is meant to refer to a NP outside its binding domain, the strict locality condition is broken. The binding domain of 'each other' only contains the NP 'Bill' and the case assigner 'hates'. As the NP 'Bill' is in singular, it is not a valid antecedent of 'each other', which requires a plural antecedent by nature. This fact renders the sentence in figure 3 ungrammatical. However, that same principle is the reason why we get a valid sentence from 'John and Mary think that Bill and Sue hate each other'. Observe figure 4.



**Figure 4.** This shows the syntax tree for the sentence ‘John and Mary think that Bill and Sue hate each other.’

This sentence is grammatical but only if ‘each other’ refers to ‘Bill and Sue’, which is in the binding domain of ‘each other’. If the aim of the sentence is for ‘each other’ to refer to ‘John and Mary’, it becomes ungrammatical.

## 2.2 The anaphoric and logophoric *otagai*

The reason why *otagai* is of such interest is that it exhibits logophoric tendencies. Firstly, we will review the conditions that make *otagai* anaphoric. Nakao (2003) explains that there are certain syntactic positions of *otagai* which make it anaphoric. These are:

- *otagai* in the direct object position
- *otagai* in the indirect object position
- *otagai* in the object position of a postposition

These positions will be demonstrated in (2).

- (2) (a) Ben to Takeshi-ga otagai-o home-ta.  
 Ben and Takeshi-NOM each.other-ACC praise-PST  
 ‘Ben and Takeshi praised each other.’
- (b) Ben to Takeshi-ga otagai-ni purezento-o age-ta.  
 Ben and Takeshi-NOM each.other-DAT present-ACC give-PST.  
 ‘Ben and Takeshi gave each other presents.’
- (c) Ben to Takeshi-ga otagai-ni kotona-tte-i-ru.  
 Ben and Takeshi-NOM each.other-POST differ-GER-CONT-NPST  
 ‘Ben and Takeshi differ from each other.’

As a consequence of anaphoricity, if the sentences in (2) were to be moved to an embedded clause, *otagai* would be bound to take a local antecedent in accordance with Chomsky’s Binding Principle (1981). Observe (3).

- (3) (a) \*Ben to Takeshi-wa Jiro-ga otagai-o home-ta to omo-tta.  
 Ben and Takeshi-TOP Jiro-NOM each.other-ACC praise-PST that think-PST.  
 \*‘Ben and Takeshi thought that Jiro praised each other.’

- (b) \*Ben to Takeshi-wa Jiro-ga otagai-ni purezento-wo age-ta to  
 Ben and Takeshi-TOP Jiro-NOM each.other-DAT present-ACC give-PST that  
 omo-tta.  
 think-PST  
 \*‘Ben and Takeshi thought that Jiro gave presents to each other.’

- (c) \*Ben to Takeshi-wa Jiro-ga otagai-ni kotona-tte-i-ru to  
 Ben and Takeshi-TOP Jiro-NOM each.other-POST differ-GER-CONT-NPST that  
 omo-tta.  
 think-PST  
 \*‘Ben and Takeshi thought that Jiro differs from each other.’

Nishigauchi (1992:159), on the other hand, shows that there are cases where *otagai* can be in an embedded clause, whose subject is inanimate, and take a long-distance animate antecedent. Observe (4).

- (4) John to Mary-ga kono jiken-ga otagai-o kizutsuke-ta to omo-tta.  
 John and Mary-NOM this incident-NOM each.other-ACC hurt-PST that think-PST.  
 ‘John and Mary both thought that this incident would hurt each other.’

Nishigauchi argues that *otagai* in this syntactic position is still an anaphor. It is the fact that *kono jiken* ‘this incident’ is an inanimate object which forces the conditions for *otagai* to be able to take the matrix subject as its antecedent to exist. Evaraert (2006:8) acknowledges that reciprocal long-distance binding in Japanese is possible, but calls *otagai* an anaphoric element. Nakao (2003:19) makes the statement that when *otagai* is in a possessor position, it truly becomes a logophor and can take a long-distance antecedent, even though the embedded subject is animate. Furthermore, while the sentences in (2) only take a reciprocal reading (a reciprocal reading is one where it is understood that two NP’s are both the agents and the patients of the same action), an *otagai* in the possessor position can take four different readings as explained in (5a-d).

- (5) Mary to John-ga otagai-no kodomo-o yuuenchi-ni tsure-te i-tta.  
 Mary and John-NOM each.other-GEN child-ACC park-POST bring-GER go-PST.  
 a. “Mary took John’s children to the park, and he took hers there.” (reciprocal)  
 b. “Mary took her children to the park, and John took his there.” (reflexive)

c. “Mary took her and John’s children to the park, and John took the children there.”

(collective)

d. “Mary took her children to the park and also took John’s there, and he did the same.” (distributive)

(Imani and Peters 1996: 100, cited in Nakao 2003:19)

Despite the interesting nature of this multilayered *otagai*, the logophoric, reciprocal *otagai* is of more interest in this thesis. It breaks the strict locality condition and no longer behaves like an anaphor as described by Chomsky (1981). Observe (6).

- (6) John to Mary-ga Bill-ga otagai-no kodomo-o seme-ta to omo-tta.  
 John and Mary-NOM Bill-NOM each.other-GEN child-ACC blame-PST that think-PST  
 ‘John and Mary both thought that Bill blamed their children.’

*Otagai* can take the same readings as in (5a-d) here as well. The workings behind the phenomenon of the logophoric possessor positioned *otagai* is not well researched. However, coreference resolution in Japanese is generally more difficult than in English. This is partly due to the lack of articles in Japanese (Iida, Ryuu et al. 2005:831). But the fact that the *otagai* which is observed in (6) is not purely reciprocal (it can be reflexive, collective and distributive as well) can possibly be a contributing factor as to why it can take a long-distance antecedent.

A different logophoric *otagai* is the so called *discourse otagai* (Jensen, 2012:139), which has an *exophoric* relation to its antecedent (Inoue, Naoya, et al. 2010:295). This means that the antecedent of *otagai* lies outside of the entire clause. Consequently, the antecedent must be found by using context which is retrieved from previous discourse. Jensen (2012:141) showed the following text to demonstrate.

- (7) Atashi to ano hito-wa a-wana-i to omo-tta. Ano hito-wa risoo-o  
 I and that person-TOP fit-NEG-NPST that think-PST. That person-TOP ideal-ACC  
 ue-ni ue-ni tsuku-tte-i-ru. Atashi-wa sore-ni oitsuke-na-i.  
 up-POST up-POST make-GER-CONT-NPST. I-TOP that-POST keep.up-NEG-NPST.  
 Kenka mo oo-i. Saikin, otagai-ga otagai-ni tsumeta-ku  
 Fight also many-NPST. Lately, each.other-NOM each.other-POST cold-ADV  
 na-tta.  
 become-PST.

‘He and I don’t fit, I thought. He keeps upping his expectations. I can’t keep up with that. We have a lot of fights, too. Recently, each of us have grown cold towards the other.’

Whereas the English translation requires the *each of us* and *the other* reading, the Japanese text uses *otagai* in the matrix subject position. Nakao (2003:23) refers to this kind of *otagai* as a focus logophor, due to its inability to be topicalized by the topic marker *wa*. It may still be marked by *wa* if is used to mark contrast. While the *discourse otagai* will not be researched in this thesis, its existence is interesting to bring up as it falls into the category of logophors. A part of the reason why it will not be included is because it can not fall into the 1P2P/2P1P-format which has been used in the questionnaire.

## 2.3 Nagata’s (1995) experiments

In this section, the methods and results of Nagata’s (1995) experiments will be reviewed. They have served as part of the biggest motivation for this thesis due to their relation to logophoricity and anaphoricity. However, the absolute biggest motivation for this thesis is how Nakao’s (2003) description of the *otagai* in the possessor position conflicted with the findings of Nagata’s experiments. Although Nagata researched the anaphoric *jibun* ‘oneself’ and the logophoric *jibun*, the close relationship between reciprocals and reflexives is enough to cause interest in the results.

The details of how *jibun* becomes either anaphoric or logophoric will not be discussed here as it would take up an unnecessary amount of space. If one would like to know more about this, Hirose’s (2002) “Viewpoint and the Japanese reflexive *jibun*” and Tenny’s (2006) “Evidentiality, Experiencers, and the Syntax of sentience in Japanese” are two great places to start.

### 2.3.1 First experiment

All information and example sentences in this subsection are taken from (Nagata, 1995a) unless stated otherwise. Nagata’s first experiment was conducted in two different parts. The first part was a so called “on-line” experiment. Native Japanese speakers were given a set of sentences. An equal amount of anaphoric and logophoric sentences which had one matrix

subject and one embedded subject were included in the set, as well as other non-target sentences. All target items followed the basic structure of a matrix subject followed by an embedded clause, which contained a subject, a *jibun* in the possessor position, which possessed a direct object, and a verb. Lastly, there was a matrix subject which reflected the thoughts, feelings or state of consciousness of an individual. The matrix subject and the embedded subject were always animate. The respondents were shown sentences on a screen, *bunsetsu* by *bunsetsu*. *Bunsetsus* ‘phrase’ are the smallest coherent components of sentences. This is typically found in the form of nouns or pronouns, followed by a particle. Verbs are also counted as *bunsetsus*. The respondents were then asked to identify the antecedent of the reflexive *jibun* after a specific marker appeared on the screen. The results showed that the matrix subject was chosen as the antecedent of *jibun* regardless of whether or not *jibun* was in a logophoric position.

The second part of the experiment was an “off-line” experiment. This time, the respondents were given sheets of paper with logophoric and anaphoric sentences. Here, the participants could see the sentences in their entirety and time was not a factor. Despite the fact that they were allowed to take their time with their analyses of the sentences, the matrix subject was still the preferred antecedent of *jibun*. Even when it came to the logophoric sentences, which should allow *jibun* to take both the matrix subject and the embedded subject as its antecedent, the matrix and the embedded subject were never chosen together as the proper antecedent.

These results heavily contradict Chomsky’s Binding Principle (1981). In order for his principle to be supported by this experiment, the results would have had to show that the antecedent of the anaphorically positioned *jibun* was chosen to be the embedded subject much more so than the matrix subject. Yet, this was not the case. Furthermore, the results showed that the matrix subject was chosen as the antecedent of the logophoric *jibun* in the on-line experiment a majority of the times. This in itself might not be too peculiar due to time being a factor. However, the fact that the matrix subject and the embedded subject were never written down together as possible candidates for the position of the antecedent in the off-line experiment (the matrix subject was chosen as the sole antecedent overwhelmingly more so than the embedded subject) was a very unexpected result.

### 2.3.2 Second experiment

All information and example sentences in this subsection are taken from (Nagata, 1995b) unless stated otherwise. Following the first experiment, Nagata conducted another, very similar, experiment. This time, the sentences were consciously manipulated in order to try to force a reading where the embedded subject would be deemed to be the antecedent of *jibun*. An example of a sentence with a forced, anaphoric reading can be seen in (8).

- (8) Sensei-wa seito-ga jibun-no fubenkyoo-o jikakushi-ta toki karuku unazu-ita.  
 Teacher-TOP student-NOM self-GEN idleness-ACC recognize-PST when slightly nod-PST  
 ‘The teacher slightly nodded when the student recognized his/her idleness.’

Nagata aimed to find out if one could manipulate the sentence type in such a way that the respondents’ analyses of the target sentences would make it so that the antecedent of *jibun* would be deemed to be the embedded subject more so than the matrix subject.

The experiment was conducted in an on-line fashion. Native Japanese speakers were showed sentences in the same manner as in (Nagata 1995a). These sentences had gone through scrutiny in a survey before the experiment. The survey confirmed that *jibun* was associated with the embedded subject significantly more than with the matrix subject. A marker would appear two seconds before the end of a sentence or four seconds after a sentence. The marker was the cue for the respondents to identify the antecedent of *jibun* in various sentences. Interestingly enough, the matrix subject was still chosen as the antecedent more often than the embedded subject, despite Nagata’s conscious manipulation of the sentences. An increase of nearly twenty percent units in embedded subject responses was observed when the marker was given four seconds after the sentence instead of two seconds before the end of it, as the percentage of times the embedded subject was judged to be the antecedent went up to 50,1% from 30,6%.

The result of this experiment is very peculiar. It seems to do at least one of the following four things.

- 1) Reveal a flaw in Chomsky’s (1981) Binding Principle
- 2) Show that *jibun* is not an anaphor
- 3) Reveal an inclination to relate the Japanese reflexive with a long-distance antecedent



#### 4) Show that the parsing of syntax regarding reflexives in Japanese is a slow process

The reason it could reveal a flaw in Chomsky's Binding Principle is due to the fact that even when *jibun* was in an anaphoric position, the matrix subject was chosen as its antecedent. This directly goes against Principle A. However, if it were the case that *jibun* is always a logophor, then Chomsky's Binding Principle is still valid, as *jibun* would be a logophor and Chomsky's Binding Principle would not apply to it. Yet, the most probable alternative is point 4. The reasoning behind this conclusion comes from the fact that the target items were judged in an off-line fashion before they were used in the (1995b) experiment. The results showed that the sentences with the anaphoric *jibun* were judged to be anaphoric significantly more than logophoric. This fact rebuts point 3, supports the notion that *jibun* is an anaphor and does not directly contradict Chomsky's Binding Principle. The evidence shows that coreference resolution in Japanese takes a considerable amount of time. The biggest evidence to support this claim is how the subordinate subject response accounted for 30,6% of the responses with the early marker yet it was 50,1% of the responses with the delayed marker. Still, further research is warranted. Nagata specifically mentions that more research needs to be conducted in the area of whether or not the "discrepancy between alleged knowledge of language and observed performance can be completely accounted for by merely positing performance errors or, instead, whether the obtained performance represents exactly the actual state of the speakers' knowledge". It is further pointed out that while a sentence such as (9) is not grammatical as it places the anaphoric *herself* without a possible binder in its governing category, English speakers would judge it to be much more grammatical than (10).

(9) Francine guesses that Tom trusts herself and the other managers to make good personnel decisions.

(10) Francine guesses that Tom trusts herself to make good personal decisions.

This intuitive understanding of language, albeit contradictory in relation to anaphoric binding, is perhaps the reasoning behind the respondents' answers. It is possible to argue that (9) is indeed entirely grammatical if one takes the position that what is intuitive is grammatical. If that were the case, then Chomsky's Binding Principle would indeed be threatened by Nagata's findings.

In this section, the reader has been provided with an understanding of binding, anaphoricity, logophoricity and how *otagai* relates to all three of those subjects. The aim of

this section has been to establish the necessary knowledge required to understand the structure of the experiment upon which this thesis is based.

### 3. Experiment

An experiment was conducted to see whether or not native Japanese speakers conformed to Chomsky's (1981) Binding Principle when they analyze sentences with the anaphoric *otagai*, as described by Nakao (2003). A second goal was to see if native Japanese speakers are more prone to relate the antecedent of the logophoric *otagai*, also as described by Nakao (2003), with the matrix subject or the embedded subject.

The purpose of this experiment is to try to reconcile Nagata's (1995) findings and Chomsky's (1981) Binding Principle with Nakao's (2003) syntactic description of the logophoric *otagai* and the anaphoric *otagai*.

#### 3.2 Methodology

A quantitative experiment was conducted online via google forms. It was aimed at native Japanese speakers. The test, to which a total of 27 people responded, took the form of a judgement test where the respondents were to rank the grammatical acceptability of 48 sentences on a likert scale from one to five where one corresponded to the least acceptable option, and five the most acceptable one. 32 of the sentences were filler sentences, which were added in order for the test subjects not to notice a pattern and change their answers accordingly. There were four sentences where 'otagai' was in an anaphoric position and whose matrix subject was in the singular form whereas the embedded subject was plural (1P2P-anaphoric). These sentences were grammatically correct according to the presumptions made clear in Nakao 2003. (11) is an example of such a sentence, which is taken from the stimuli.

- (11) Minato-wa Ben to Takeshi-ga otagai-ni omiyage-o age-ta toki-ni  
 Minato-TOP Ben and Takeshi-NOM each.other-DAT souvenir-ACC give-PST when-POST  
 shittoshi-ta.  
 jealous-PST  
 'Minato got jealous when Ben and Takeshi gave souvenirs to each other.'

An additional four sentences also placed ‘otagai’ in positions that would make it anaphoric but the embedded subject was singular and the matrix subject was plural (2P1P-anaphoric). These sentences were constructed in order to see if the respondents would judge them less grammatical due to the fact that the only possible antecedent in them was in the matrix subject position. This would mean that the anaphoric ‘otagai’ would have to break the *strict locality condition* (Chomsky 1981). (12) is an example of such a sentence, which is taken from the stimuli.

- (12) \*Taro to Jiro-wa Bill-ga otagai-o nagu-tta toki-ni okotta.  
 Taro and Jiro-TOP Bill-NOM each.other-ACC hit-PST when-POST angry-PST  
 \*‘Taro and Jiro got angry when Bill hit each other.’

Furthermore, eight sentences where ‘otagai’ was in a logophoric position were also constructed. Four of them had a singular matrix subject and a plural embedded subject (1P2P-logophoric). (13) is an example of such a sentence, which is taken from the stimuli.

- (13) Mary-wa Ken to Hiro-ga otagai-no koodoo-o hihanshi-te-i-ru  
 Mary-TOP Ken and Hiro-NOM each.other-GEN action-ACC criticize-GER-CONT-NPST  
 aida dama-tte-i-ta.  
 while quiet-GER-CONT-PST  
 ‘Mary was quiet while Ken and Hiro were criticizing each other’s actions.’

The other four had a plural matrix subject and a singular embedded subject (2P1P-logophoric). These were added in the judgement test to see if there was a preference for the antecedent of the logophoric ‘otagai’ to be the matrix subject, similar to how there was an inclination to relate the logophoric *jibun* with the matrix subject in Nagata (1995). (14) is an example of such a sentence, which is taken from the stimuli.

- (14) Sawako to Rika-wa shoonen-ga otagai-no oshiekata-o hihanshi-ta  
 Sawako and Rika-TOP boy-NOM each.other-GEN teaching.method-ACC criticize-PST  
 toki-ni oko-tta.  
 when-POST angry-PST.  
 ‘Sawako and Rika got angry when the boy criticized each other’s teaching methods.’

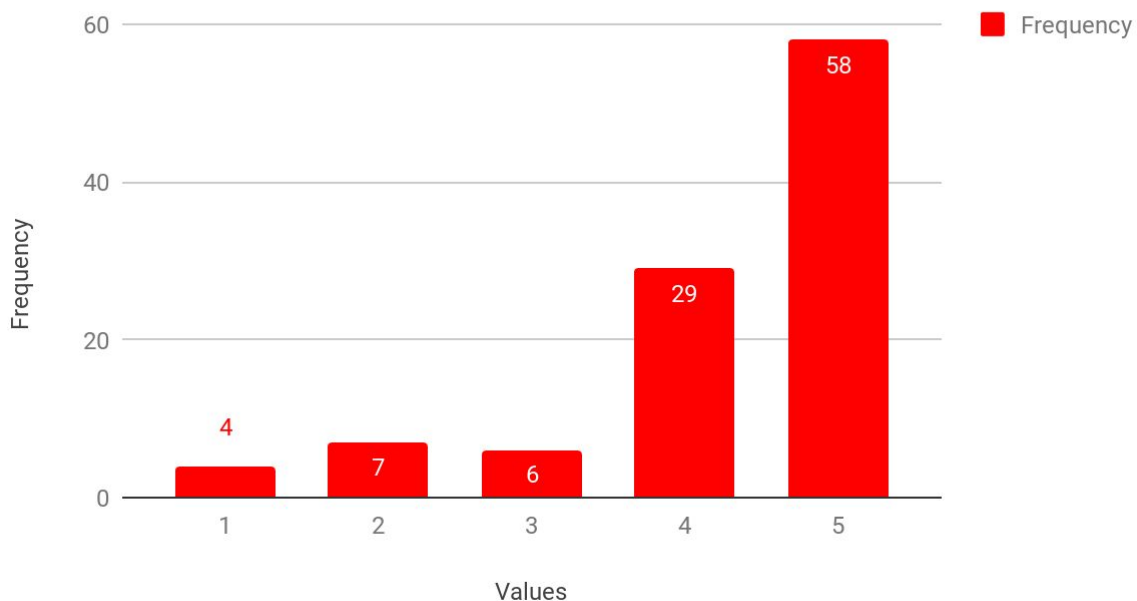
Notice how the 2P1P sentences have been manipulated to force acceptable readings. The manipulations were done intentionally as a way to try to make sure that as few contextual factors as possible would deny the possibility for *otagai* to be related with the matrix subject. In fact, all target items have been manipulated to force acceptable readings. In contrast, the

non-target items have been manipulated to create an even distribution of sentences, which correspond to the points one through five on the acceptability scale. Consequently, both ungrammatical and grammatical non-target stimuli can be found in the appendix.

#### 4. Results

In this section, the results of the questionnaire will be provided. The means of all four conditions (1P2P-Anaphoric, 2P1P-Anaphoric, 1P2P-Logophoric and 2P1P-Logophoric) have been calculated. The frequency of answers has also been calculated and plotted on column charts. The values on the frequency bars correspond to the number of times each value was chosen for the type of sentences each diagram represents. The sum of the values of the frequency bars equals 104, which is the product of the number of respondents times the amount of sentences per condition (4).

##### 1P2P-anaphoric sentences

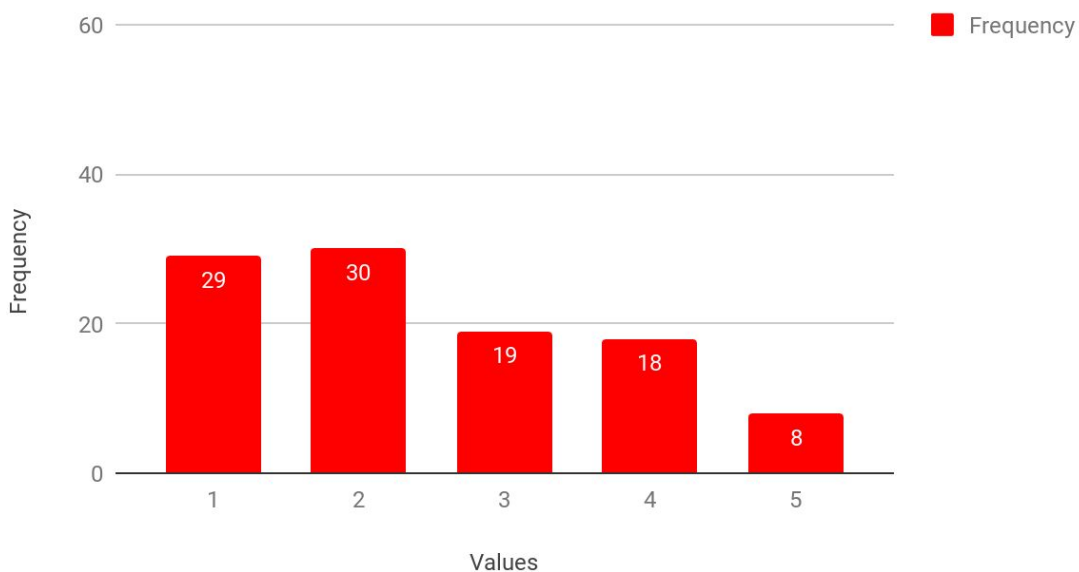


**Figure 5.** *The x-axis represents the values 1-5 on the likert scale. The number on the columns represent the amount of times each value was chosen in total.*

Figure 5 represents the data collected from the 1P2P-anaphoric sentences. The mean of the sum of all value equals 4,25. A quick glance at the table reveals that there was an extremely high level of acceptability of 1P2P-anaphoric sentences. The higher values of ‘4’ or

‘5’ were chosen roughly 83,6% of the time.

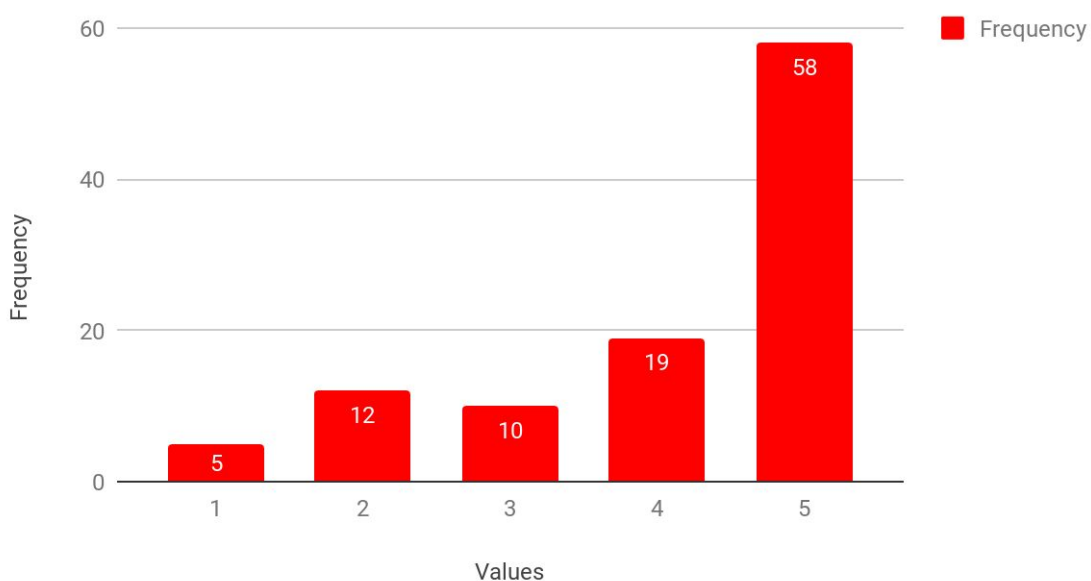
### 2P1P-anaphoric sentences



**Figure 6.**

Figure 6 represents the anaphoric sentences which were in the format of 2P1P. Its mean value is 2,48. In contrast to the 1P2P-anaphoric sentences, the answers indicate a strong leniency towards the lower values. The values ‘1’ or ‘2’ were chosen around 56,7% of the time, unlike the the values ‘4’ and ‘5’ which only gathered 25% of the answers.

### 1P2P-logophoric sentences



**Figure 7.**

Figure 7 shows the chart of the logophoric sentences which had the structure of 1P2P. Similar to the anaphoric 1P2P diagram, there is a strong leniency towards the higher values of '4' and '5', which were chosen 74% of the time. The sum of its mean (4,09) is close to that of the mean of the 1P2P-anaphoric sentences (4,25).

### 2P1P-logophoric sentences

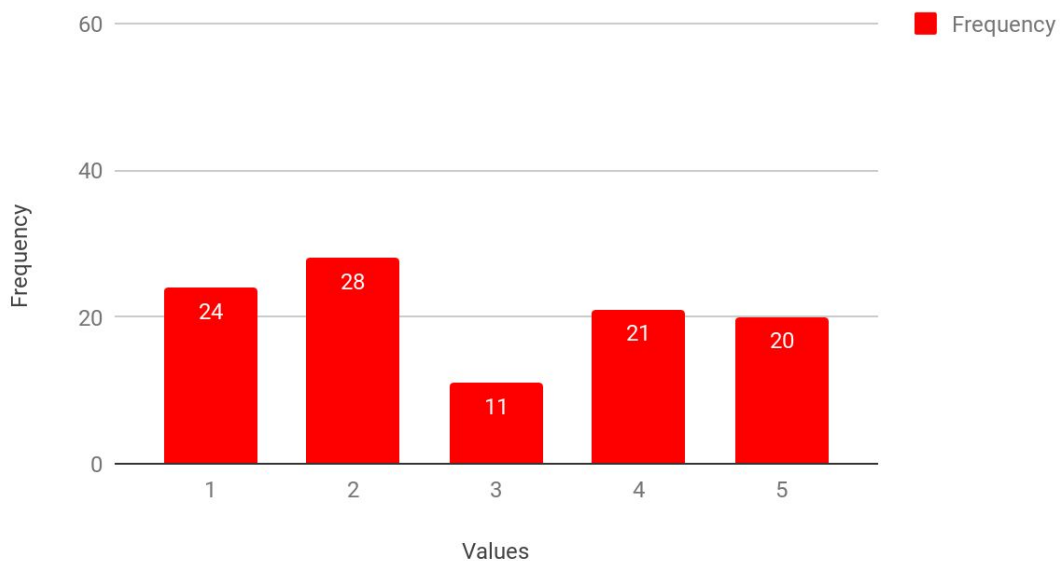
**Figure 8.**

Figure 8 represents the final condition, 2P1P-logophoric sentences. Unlike the previous types of sentences, there is an almost equal distribution between the lower values of '1' and '2' versus the higher values of '4' and '5'. The values '1' or '2' were chosen exactly 50% of the time. The higher values '4' or '5' represent 39,5% of the frequency of values. That is a difference of 10,5 percent units.

The bipolar nature of the answers of figure 8 raises the question of whence such a result stems. It could be the items themselves that were flawed. Perhaps certain items received mostly low values and some mostly high values. It is also possible that certain participants gave consistently low values and others gave consistently high values. The data reveals that no sentence of the four 2P1P-logophoric sentences received a particularly lower score than the other. However, it was showed that people were consistent in their answers. The average value of 2P1P-logophoric sentences from people who gave either '4' or '5' as their answer

during their first encounter with 2P1P-logophoric answers was 3,9 (14 people). Contrastively, the average value for the participants who gave either '1' or '2' as their answer when they encountered the first 2P1P-logophoric sentence was 1,77 (11 people).

## 5. Discussion

In this section the results from the experiment will be analyzed and discussed. The possible impact the results could have on *otagai* as a logophor will be brought up. Furthermore, possible errors and factors that have played a part in this essay will be reviewed.

The results from the 1P2P-anaphoric sentences concur both with Nakao's description of the anaphoric *otagai* and Chomsky's binding principle. The indisputable, sharp leniency towards high levels of acceptability points to the fact that native Japanese speakers treat this type of *otagai* as an anaphor. This conclusion is supported by the results of the 2P1P-anaphoric sentences, which were consciously manipulated in order to try to force the reader to allow long-distance binding. Still, the diagram of the 2P1P-anaphoric sentences indicates low levels of acceptability. Native Japanese speakers must intuitively find that 2P1P-anaphoric sentences sound ungrammatical.

The results show that close to no difference in acceptability is found between 1P2P-anaphoric sentences and 1P2P-logophoric sentences. '5' was predominately chosen as the value which corresponded to the grammaticality of the sentences in both cases. In fact, for both types of sentences, '5' was chosen 58 times, which amounts to almost 56% of the entire amount of responses. This result was expected because logophors are not restricted to either the matrix subject, the embedded subject nor even an antecedent in the same clause in which they appear. Therefore, if the logophoric *otagai* appears in sentences which force readings where the matrix subject is its antecedent, it would be naturally expected for native Japanese speakers to interpret the sentence according to the forced readings.

Lastly, the results of the 2P1P-logophoric sentences will be discussed. In comparison with the other results, these ones stood out. All other types of sentences were either heavily negatively or positively skewed, whereas the answers of the 2P1P-logophoric sentences were evenly distributed. It is interesting to note that it is not an even distribution between all five possible values, rather it is an even distribution between the values '1' to '2', chosen 50% of the time, and '4' to '5', chosen approximately 39,5% of the time. '3' was only chosen 11

times, which roughly equals a mere 10,5% of all the answers. This fact shows a clearcut dichotomy between the lower values and the higher ones. What this seems to suggest is that, unlike how anaphoric sentences are analyzed, some other factor or factors than syntax play a critical role in coreference analyzation of Japanese 2P1P-structured sentences with *otagai* in the possessor position of the embedded object. If Nakao's (2003) findings concerning the logophoric *otagai* are accepted as viable descriptions, the notable difference in the results between the 2P1P-anaphoric sentences and the 2P1P-logophoric sentences may be explained by logophoricity. As the antecedents of logophors are not determined syntactically (Sells and Wasow 1999), rather contextually, one can assume that the respondents' individual theoretical knowledge of long-distance binding played a big role in whether or not the 2P1P-logophoric sentences were deemed grammatical or not. This insight allows for the justification of why the outcome of their results was of such bipolar nature. If respondent X had theoretical knowledge of the conditions that allow long-distance binding, and felt that the context justified it, then a high value would be chosen. If respondent Y either lacked the theoretical knowledge or felt that the context did not justify long-distance binding, then a low value would be chosen, as the sentence would then be analyzed syntactically due to the fact that *otagai* would not be interpreted as a logophor, rather as an anaphor. Furthermore, it may be argued that the 'natural' setting of coreference analyzation in Japanese is to view reciprocal pronouns as anaphors. As the syntactic positions which make *otagai* anaphoric far outnumber the ones which make it logophoric, which thereby makes the occurrence of sentences with a logophoric *otagai* rarer and harder to analyze, a native Japanese speaker without a linguistic background might have trouble to truly know the machinations behind logophoricity and anaphoricity. Instead, they might analyze such sentences individually, interpret the context, and 'feel' if the sentence is right.

## 5.1 Review of errors

Possible errors that have been committed in this survey will now be discussed. It may be considered a flaw that all the target sentences were different sentences, not the same sentences whose structure had only been changed to conform to the 1P2P/2P1P format. Had this method been performed, it might have had been more easy to justify the conclusions that have been made in this thesis. On the other hand, were that method chosen, it might have had



a negative effect on the experiment. The respondents may as well have had started to recognize the sentences and change their strategy accordingly. The possibility of such a reaction serves as the justification for the use of dissimilar sentences. Another conceivable error in this survey is the possibility that the target sentences may sound unnatural. While the supervisor of this thesis, Shinichiro Ishihara, corrected the initial sentences on their grammaticality, the possibility remains that native Japanese speakers who do not have a background in linguistics may deem sentences less acceptable because they do not occur in day to day dialogue. Finally, the modest number of respondents counts as a flaw. There are only responses from 27 people, which is too small of a number to represent an entire demographic. It is not certain that if the pool of respondents were bigger, the answers would remain the same. To truly corroborate the findings of this thesis, several other similar experiments would have to be conducted, preferably on a larger scale.

## 6. Conclusion

To conclude this study, the two points in the introduction which demonstrated its main goals will be referred:

- To test whether the anaphoric *otagai*, as explained by Nakao (2003), can only take a local antecedent by comparing the rates of acceptability between two types of sentences with the anaphoric *otagai*: sentences where the only plausible antecedent of *otagai* is the matrix subject (henceforth named 2P1P-anaphoric sentences) and sentences where the only plausible antecedent of *otagai* is the embedded subject (henceforth named 1P2P-anaphoric sentences).
- To see if there was a disparity of acceptability between two types of sentences with the logophoric *otagai*: sentences where the only plausible antecedent of *otagai* is the matrix subject (henceforth called 2P1P-logophoric sentences) and sentences where the only plausible antecedent of *otagai* is the embedded subject (henceforth called 1P2P-logophoric sentences).

For point 1, one can confidently conclude that the anaphoric *otagai* which Nakao (2003) describes can only take a local antecedent. The heavily positively skewed results for

2P1P-anaphoric sentences serve as evidence for this claim. The conclusion is further corroborated by the sharply negatively skewed results for 1P2P-anaphoric sentences. The results also coincide with Chomsky's (1981) Binding Principle.

As for point 2, there is no debate to be had regarding whether or not there was a disparity between the acceptability of the two different types of logophoric sentences. The 1P2P-logophoric received almost identical levels of acceptability as the 1P2P-anaphoric sentences. However, if one were to compare the results of the 2P1P-sentences, the anaphoric sentences had extremely low levels of acceptability whereas the logophoric sentences were evenly distributed. The explanation offered in this thesis as to why the 1P2P sentences were similar in levels of acceptability, and not the 2P1P sentences, is that *otagai*, as described by Nakao (2003), becomes logophoric while in a possessor position. This insight, coupled with Chomsky's Binding Principle, explains why 2P1P-anaphoric sentences had such a low level of acceptability. The syntactic positions of the 2P1P-anaphoric sentences did indeed make *otagai* anaphoric. It is argued in this study that the respondents treated it as such when they judged the acceptability of those sentences and acted according to Chomsky's Binding Principles. Contrastively, it is argued that at least a considerable amount of the respondents viewed the occurrences of *otagai* in the 2P1P-logophoric sentences as logophors. This reasoning explains the even distribution of the answers.

I propose two main factors which may have caused the respondents to choose low acceptability values for the 2P1P-logophoric sentences:

- The context in the sentences were not deemed to be strong enough to justify long-distance binding.
- Some native Japanese speakers do not possess theoretical knowledge of the conditions that allow long-distance binding in Japanese.

In conclusion, this thesis agrees with Nakao's descriptions of the anaphoric and logophoric *otagai*, and finds them compatible with Chomsky's Binding Principle. The evidence which is presented by the results is deemed as viable enough to support these claims. Similar results are expected, were this experiment to be conducted again. If the variable of whether or not the participants possess theoretical knowledge of long-distance binding were to be included in the survey, it would show that those who possess it would

consistently choose high values for 2P1P-logophoric sentences. In contrast, those who do not possess it would consistently choose low values.

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## 8. Appendix

These are the items which were used in the survey. While they have been put in separate categories, the number before them represents the order in which they were displayed.

### Judgement questions

#### 1P2P-Anaphoric

- 4.けんはゆりとあかりがお互いを知ればよいと思っていた。
- 22.みなとはベンとたけしがお互いにお土産をあげた時に嫉妬した。
- 28.さわこはひろしとけんがお互いを攻めた時に後ろめたい気持ちになった。
- 43.りかはロバートとみなとがどうしてお互いを許せたのか理解できなかった。

#### 2P1P-Anaphoric

- 6.けんとロバートは先生がお互いを攻めた時に何と言えいいかわからなかった。
- 12.太郎とじろはビルがお互いを殴った時に怒った。
- 37.たけしとけんはお母さんがお互いと遊ばせた時に喜んだ。
- 48.日向と誠は先生がお互いに何が起こったか聞いた時に何も言わなかった。

#### 1P2P-Logophoric

- 16.ジョンはひろとロバートがお互いの状況を説明した後「どうすればいいかなあ」と言っていた。
- 25.メアリーはけんとひろがお互いの行動を批判している間黙っていた。
- 34.ひろはりかとみなとがお互いの子供を叱った時に黙ったまま本を読み続けた。
- 46.けんはたけしとメアリーがお互いの大好物について話している間スマホをいじっていた。

#### 2P1P-Logophoric

- 9.メアリーとスーはたけしがお互いのプロジェクトを褒めたのに不満だった。

19. さわことりかは少年がお互いの教え方を批判した時に怒った。
31. スミズとゆうこはジョンがお互いの子供を攻めた時に驚いた。
40. ジョンとメアリーはりかがなぜお互いの問題を気にしないのかわからなかった。

### Filler sentences

1. これが先生からくれた物で私の宝物です。
2. ここではタバコを吸ってはいけません。
3. 電車に乗り遅れば彼女を待たせちゃう。
5. 寝るとゴロゴロするのが好きだ。
7. 九時になれば家を出かけようと思います。
8. 両親が喧嘩している間に私は黙っていて本を読みました。
10. りかとのゆりはどこに行ってもさわこを見つけませんでした。
11. 九時になるとパーティーに行くかもしれない。
13. あの二人は彼は好きだった歌は好きだった。
14. 僕は先生に僕のプレゼンテーションを褒められてよかった。
15. 子供だった時ナルトを見るのが好きだった。
17. 彼は友達が自分を叩いたので、泣き始めた。
18. テーブルの上である物が何ですか。
20. お母さんが子供を寝かそうとしたが子供は寝かせなかった。
21. あなたはパーティーに行きたいか。
23. 俺はロバートと申します。
24. 私が彼だとしたら何と言いたいの。
26. この映画は先生に見てほしいです。
27. 友達に残りのご飯を食べられてもらった。
29. いつも学校に行ったら途中でメロンパンを買います。
30. これは何と言いますかなあ。
32. 一言も言わなくて私をじっと見ていた。
33. 春になると花が咲きます。
35. 彼は私が殺したい。
36. 私の頼みを聞いてくれた先生が息子にもっと難しい宿題をやってくれました。
38. 名前は何ですか。

- 39.彼は寒い時に仕事に車で通います。
- 41.勉強せぬ学生はする学生ほどいい成績が取れない。
- 42.お名前は何?
- 44.あのメガネをしている人は先生そうだよね。
- 45.パーティーはしたいですか。
- 47.彼は寒かったのでお茶を飲むことにしました。
- 48.日向と誠は先生がお互いに何が起こったか聞いた時に何も言わなかった。