On Exceptional *Zibun* Binding: An Experimental Approach

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1. Introduction

In past studies, it has been widely acknowledged that the Japanese anaphor *zibun* is subject-oriented, i.e., must be (locally or long-distance) bound to a subject, unless it is logophorically bound (Oshima 2004; Kameyama 1984, among others). For example, in the following example, *zibun* must be bound to the matrix subject and cannot be bound to the dative argument of the matrix clause.

(1) Taro-wa Hanako-ni [zibun-{i/*j}-ga sekkei-si-ta] ie-de
    Taro-Top Hanako-Dat self-Nom design-Past house-Loc
    at-ta.
    meet-Past
    ‘Taro met Hanako in the house that he/*she designed.’

The subjecthood condition of (non-logophoric) *zibun* binding has been challenged by several authors (Iida 1996; Momoi 1986, among others) with certain types of alleged counterevidence. There is, however, a considerable
variance among speakers as to the grammaticality judgments on sentences that involve non-subject *zibun* binding. To evaluate the validity and significance of such data, thus, it is essential to examine their acceptability in an experimentally controlled manner (see Bard et al. 1996; Asudeh and Keller 2001 for the effectiveness of experimental methodology for measurements of linguistic intuitions).

The goal of this paper is two-fold. First, the results of an experimental survey are reported, which demonstrate that two types of non-subject *zibun* binding, namely (i) binding by the causee of a lexical causative and (ii) so-called “backward” binding, are judged as (to varying degrees) grammatical by most speakers, with the acceptability comparable to that of other types of *zibun* binding which have been commonly assumed to be grammatical. Second, I discuss how the two types of non-subject binding can be incorporated to the existing theory of *zibun* binding, with minimum modification of the subjecthood condition.

2. Challenge for the Subjecthood Condition

This section clarifies certain theoretical assumptions for the present work (Section 2.1), and then illustrates two types of data that pose challenge for the subjecthood condition (Section 2.2 and 2.3).

2.1. Preliminaries

As background theory of *zibun*, I will assume the following:

(2) (i) Logophoric *zibun* must be distinguished from non-logophoric *zibun* (Kuno 1978; Kameyama 1984). Logophoric *zibun* is an instance of “shifted indexicals” (*de se* pronouns) (Schlenker 1999), and it does not have to be bound to a subject.1

(ii) Non-logophoric *zibun* must be, as a rule, bound to a subject syntactically commanding it. Non-logophoric *zibun* subsumes the reflexive and empathic uses of *zibun* (Oshima 2004).

An example of logophoric, non-subject *zibun* binding is given below:2

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1 In the present work, “logophoricity” is to be understood in its original (narrow) sense, and thus, for instance, empathic *zibun* which is long-distance bound in a relative or adverbial clause is not considered logophoric (see Oshima 2004, to appear; Culy 1997).

2 Kameyama’s judgments on the type of data shown in (3) have been questioned by several authors (Iida 1996; Mihara 1998, among others). The experimental results reveal that the acceptability of *zibun* binding by an oblique logophoric source is considerably lower than that of canonical subject binding (Section 3.2).
Logophoric binding includes binding into environments called represented speech and thought (RST; a.k.a. free indirect speech), which is also referred to as intersentential binding (Hirose 1997):

(4) (Tokiko-wa aozame-ta. ‘Tokiko turned pale.’)
Masaki-wa zibun-o okizari-ni-site-te-simat-ta-noda.
Masaki-Top self-Acc leave.behind go-end.up-Past-Emph
‘Masaki had gone leaving her behind.’

In the remainder of the paper, I will mainly discuss non-logophoric zibun, and by the term zibun I will refer to non-logophoric zibun unless otherwise noted.

2.2. Lexical Causatives

In the literature, it has been widely assumed that the causee argument of a morphological causative can be a binder of zibun, while that of a lexical causative cannot (Shibatani 1976; Kameyama 1984; Manning et al. 1999, among others).3

(5) (a): morphological causative, (b): lexical causative
   a. Taro-wa Hanako-o zibun-no zitensya-ni nor-ase-ta.
      Taro-Top Hanako-Acc self-Gen bicycle-Dat get.on-Caus-Past
      ‘Taro made Hanako ride on his/her bicycle.’
   b. Taro-wa Hanako-o zibun-no zitensya-ni nose-ta.
      Taro-Top Hanako-Acc self-Gen bicycle-Dat put-Past
      ‘Taro put Hanako on his/*her bicycle.’

(6) (a): morphological causative, (b): lexical causative
   a. Taro-wa kodomo-ni zibun-no huku-o
      Taro-Top child-Dat self-Gen clothes-Acc
      put.on(tr.)-Caus-Past
      ‘Taro made the child, put on his/*her clothes.’
b. Taro-wa kodomo-ni zibun,-no huku-o kise-ta.
   Taro-Top child-Dat self-Gen clothes-Acc put.on(dtr.)-Past
   ‘Taro put his clothes on the child.’

This contrast has been attributed to the biclausality of morphological causatives and the monoclausality of lexical causatives. The causee argument of a morphological causative is the subject of the embedded clause, and thus is a possible zibun binder; by contrast, a lexical causative is monoclausal, and thus its only subject (= the only possible zibun binder) is the nominative argument. According to some authors, however, the contrast between morphological and lexical causatives with regard to zibun binding is not clear-cut. Iida (1996: 211-3), for example, claims that the causee of a lexical causative can be the binder of zibun, especially with appropriate contextual information (see also Momoi 1986; Kitagawa 1981).

In Section 3, the results of an experimental survey will be demonstrated, which prove that zibun binding by the causee of a lexical causative is judged as acceptable by many speakers. In Section 4, I will discuss what makes this type of binding possible.

2.3. Backward Binding

Another type of non-subject zibun binding is so-called backward binding (or backward reflexivization), which is exemplified below (Inoue 1976; Ue 1982; Momoi 1986; Iida 1996).

   ‘The pupil who he trained brought reputation to Prof. Yamada.’

b. Zibun,-no desi-ga Yamada-kyoozyu-ni meisei-o self-Gen pupil-Nom Prof. Yamada-Dat reputation-Acc motarasi-ta. bring-Past
   ‘His pupil brought reputation to Prof. Yamada.’

What is peculiar about zibun binding in (7) is that the binder is a non-subject and the bindee (zibun) occurs within the co-argument subject of the binder; I will take this as the defining property of backward binding. Note that the term backward binding is somewhat misleading, as it sounds as if it
is defined in terms of linear order; I will keep using this term, however, for the lack of a better alternative.\(^4\)

To account for such data, Momoi proposes that the binding condition of \textit{zibun} must refer to the semantic role hierarchy; i.e., NPs that carry one of the highest roles in the hierarchy (i.e., Experiencer, Agent, etc.) are always good candidates for the antecedent of \textit{zibun}, but in the absence of a higher role, an NP that bears a relatively lower role (Goal, etc.) may bind \textit{zibun} (see also Uda 1994). One difficulty of semantic role-based analyses along the lines of Momoi (1986) is that they make different predictions depending on which version of the theory of semantic roles one adopts (e.g. whether Recipient and Goal are distinct or not, which of Goal or Theme is ranked higher, whether the oblique argument of ‘receive’ assigned Agent or Source); in other words, they have a risk of tailoring otherwise unmotivated theoretical assumptions to meet the empirical data (see Iida 1996: 68-72 for similar criticism). In Section 4, I will pursue an alternative, more syntax-oriented way to account for backward binding, yet leaving open the possibility of the semantic role-based approach.

Whether we adopt the syntax- or semantics-based approach, the following two factors that affect the acceptability of backward binding must be taken into consideration: (i) the presence of a potential subject binder, and (ii) the “agentivity” of the antecedent. These points will be illustrated in Section 3 with experimental data, and further discussed in Section 4.

3. Experiment
This section reports the results and key findings of an experimental survey of the acceptability of non-subject \textit{zibun} binding.

3.1. Design
To identify the acceptability of the types of non-subject \textit{zibun} binding discussed above, I conducted a questionnaire-based experiment with 44 native speakers of Japanese (\textbf{Experiment A}). 10 subjects had experience in linguistics, and the other 34 were naive to linguistic theory.

The subjects were asked to evaluate the acceptability of stimuli sentences (with specification of coreference) by assigning them numerical scores from 1 to 5 (1 = “(the intended interpretation is) impossible”, 2 = “possible, but nearly impossible”, 3 = “possible, but considerably difficult”, 4 = “possible, but slightly difficult”, and 5 = “fully acceptable and natural”), which are assumed to form an interval scale. The questionnaire included the following sets of experimental sentences, as well as 17 fillers; in the ex-

\(^4\) The effect of linear order on backward binding will be discussed in Section 4.2.
periment, each sentence was transcribed in the standard Japanese orthography, and included a single pair of coreference markers:

(9) [CSB]: canonical subject binding ((1) on the i interpretation)  
[MPC](a,b): binding by the causee of a morphological causative ((5a) and (6a) on the j interpretation)  
[LXC](a,b): binding by the causee of a lexical causative ((5b) and (6b) on the j interpretation)  
[BWB]: backward binding  
[BWB-NPSB-AG](a,b): backward binding without a potential subject binder/with an agentive (i.e. recipient) antecedent ((7a), (7b))  
[BWB-PSB-AG]: backward binding with a potential subject binder/with an agentive antecedent ((10) below)  
[BWB-NPSB-NA]: backward binding without a potential subject binder/with a non-agentive (i.e. patient) antecedent ((11) below)  
[LOGOBL]: logophoric binding by an oblique source ((3))  
[NSB]: non-subject binding that satisfies neither of the MSC, BWB, or LOGOBL conditions ((1) on the j interpretation)

(10) Zibun-i-o takaku hyooka-site-i-ru desi-ga  
self-Acc highly evaluate-Asp-Pres pupil-Nom  
Yamada-kyoozyu-ni meisei-o motarasi-ta.  
Prof. Yamada-Dat reputation-Acc bring-Past  
‘The pupil who thinks highly of him, brought reputation to Prof. Yamada,’

self-Nom train-Past pupil-Nom Prof. Yamada-Acc criticize-Past  
‘The pupil who he, trained criticized Prof. Yamada.’

3.2. Results and Findings
The mean scores and standard deviations of the stimuli sentences are summarized in the following table.
The results show that both binding by the causee of a lexical causative and backward binding were judged as at least marginally acceptable (i.e. ≥ 2) by most speakers. The mean score (MS) of LXC was slightly lower than that of MPC, but significantly higher than that of NSC (p < 0.01 determined by the Wilcoxon signed rank test with Holm’s correction) and slightly higher than LOGOBL (which was reported to be grammatical by Kameyama 1984).

Backward binding without a potential binder and with an agentive antecedent (BWB-NPSB-AG) was judged highly acceptable (comparable to MPC), especially when zibun appears in a relative clause modifying the subject, rather than directly modifies the subject as a possessive. The acceptability decreased when there is a potential subject binder (BWB-PSB-AG) or the antecedent is non-agentive (BWB-NPSB-NA).

4. Discussion and Proposals

4.1. Lexical Causatives and Coercion

The results of Experiment A revealed that the causee of a lexical causative is a possible zibun binder for many speakers, despite the fact that it has not been considered a subject in the standard syntactic analysis.

To account for the (degraded or marginal) acceptability of LXC, I propose that a lexical causative can be coercedly interpreted as having two “subjects”, yet having a monoclausal syntactic structure. Such a solution is possible within syntactic frameworks like HPSG and LFG, where the subject-ood is defined in a syntax-semantics interface component (i.e. ARG-ST...
list in HPSG, *f*-structure in LFG; cf. Asudeh and Keller 2001). In the HPSG framework, for example, a subject is defined as the first member of an ARG-ST list; the marginal acceptability of LXC can be formally captured by a coercion rule that assigns a nested ARG-ST list like (13a) (which is similar or identical to that of the corresponding morphological causative) to a lexical causative, which canonically has a simplex ARG-ST like (13b) (see Manning et al. 1999).

(13)  a. Argument structure of *noraseru* ‘cause X to get on Y’ and *nos-eru*

   in (5b) (for those speakers who accept the j interpretation)  
   \[\text{ARG-ST} < \text{NP[NOM]}, \text{NP[ACC]}, < \text{PRO}, \text{NP[DAT]} > > \]

   b. Canonical argument structure of *noseru* ‘put X on Y’

   \[\text{ARG-ST} < \text{NP[NOM]}, \text{NP[ACC]}, \text{NP[DAT]} > \]

4.2. A Revised Subjecthood Condition

To accommodate backward binding exemplified by BWB-NPSB-AG, I propose to revise the subjecthood condition as follows:

(14) **Revised subjecthood condition**: (Non-logophoric) *zibun* must be bound to a subject syntactically commanding it *if there is any*; when there is no potential subject binder, it can be bound to a non-subject antecedent in an argument position of the same clause or a clause dominating it.

This “weakened” version of the subjecthood condition is somewhat reminiscent of Principle A proposed by Pollard and Sag (1992) (“A locally o-commanded anaphor must be o-bound”), which allows an (English) anaphor to be bound by a non-local antecedent when there is no local possible antecedent. The common idea of the revised subjecthood condition and Pollard and Sag’s Principle A can be put as: “when an anaphor cannot be bound by a canonical binder (i.e. a local antecedent for English anaphors/a subject antecedent for *zibun*), it can be bound by a non-canonical binder”. Note that the revised subjecthood condition still makes correct predictions as to the (nearly categorical) acceptability of CSB and (nearly categorical) unacceptability of NSB.

There remain, however, two questions yet to be addressed. First, why is a sentence like (10) (BWB-PSB-AG), which involves backward binding with a potential binder, at least marginally acceptable to many speakers, despite the fact that it does not satisfy (even) the revised subjecthood condition?
Second, why does the acceptability of backward binding decrease with an antecedent with low agentivity (e.g. patient) while it increases with an antecedent with high agentivity (e.g. recipient)?

To account for the contrast between NSB (nearly categorically unacceptable), and BWB-PSB-AG (marginally acceptable), I submit the following hypothesis:

(15) **Linear order effect**: The effect of a potential subject binder is highly significant when it linearly precedes *zibun*, but relatively mild when it follows *zibun*.

To examine this hypothesis, I conducted a follow-up experiment with 36 speakers (Experiment B; 8 subjects had experience in linguistics) that included the following experimental sentences:

   Prof. Suzuki-Top self-Nom train-Past pupil-Nom
   Yamada-kyoozyu,-o hihan-su-ru] bamen-ni dekuwasi-ta.
   Prof. Yamada-Acc criticize-Pres scene-Dat come.across-Past
   ‘Prof. Suzuki witnessed the scene where the pupil he trained criticized Prof. Yamada.’

b. [[Zibun,-ga sodate-ta] desi-ga Yamada-kyoozyu,-o
   self,Nom train-Past pupil-Top Prof. Yamada-Acc
   criticize-Pres scene-Dat Prof.Suzuki-Top come.across-Past

Both (16a) and (16b) involve a potential subject binder (i.e. *Suzuki-kyoozyu*), but they differ with respect to word order; Hypothesis (15) predicts that (16b) would be judged more acceptable than (16a), and that both (16a) and (16b) would be judged less acceptable than (11), repeated below as (17).

(17) Zibun,-ga sodate-ta desi-ga Yamada-kyoozyu,-o hihan-si-ta.
   self-Nom train-Past pupil-Nom Prof. Yamada-Acc criticize-Past
   ‘The pupil who he trained criticized Prof. Yamada.’

The relevant part of the results of Experiment B is shown below (note the change in the number of subjects).

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5 The questionnaire for Experiment B contained 8 experimental sentences ((1-i), (1-j), (16a), (16b), (17), (19a), (19b-i), (19b-j)) and 11 fillers.
These results bear out the effect of linear order between *zibun* and the potential subject binder. While the acceptability difference between (17) and (16a) is significant ($p < 0.01$), the difference between (17) and (16b) is rather small.\(^7\)

Next, let us address the effect of agentivity of the antecedent. A possible source of this effect is the “coerced subject” status of the antecedent (note that the verb *motarasu* ‘bring’ can be semantically paraphrased as ‘cause to have’). That is, although in backward binding the subjecthood of the antecedent is not a necessary requirement, it still serves as a factor to improve the acceptability. I do not assume, however, that “backward subject binding” can be assimilated to ordinary (forward) subject binding, as only the former is highly sensitive to the effect of a potential subject binder. In (19), for example, the acceptability of backward *zibun* binding is considerably degraded with a potential subject binder, despite the fact that the antecedent (*Yamada-kyoozyu*) is the causee of a morphological causative (and hence is a subject without coercion).

   ‘The pupil he trained is embarrassing Prof. Yamada.’

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\(^6\) The effect of a potential binder in (16a) is not as strong as in (1). The interference of a potential binder appears to be most prominently felt when it is a clause-mate of the intended binder.

\(^7\) Hypothesis (15) also predicts that the following sentence is more acceptable than (1-j):

(i) Hanako-ni-wa [zibun-ga sekkei-si-ta] ie-de Taro-ga at-ta.
Hanako-Dat-Top self-Nom design-Past house-Loc Taro-Nom meet-Past
‘Taro met Hanako in the house that she designed.’

Unfortunately, I have no experimental data at hand about the relative acceptability of (i) and (1-j); my own judgments, however, conform to the prediction.
b. Suzuki-kyoozyu,-wa [[zibun,~/~/ ga sodate-ta] desi-ga
Prof. Suzuki-Top self-Nom train-Past pupil-Nom
Yamada-kyoozyu,-o komar-ase-te-i-ru] bamen-ni
Prof. Yamada-Acc be.annoyed-Caus-Asp-Pres scene-Dat
dekuwasi-ta.
come.across-Past
‘Prof. Suzuki, witnessed the scene where the pupil he trained
was embarrassing Prof. Yamada.’

(20) (part of the results of Experiment B; 36 subjects)

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<th></th>
<th>MS</th>
<th>SD</th>
<th>1</th>
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<th>≥ 3</th>
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<td>(19a)</td>
<td>2.75</td>
<td>1.36</td>
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<td>26 (72%)</td>
<td>22 (61%)</td>
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<tr>
<td>(19b) (i)</td>
<td>4.78</td>
<td>0.59</td>
<td>0 (0%)</td>
<td>36 (100%)</td>
<td>35 (97%)</td>
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<tr>
<td>(19b) (j)</td>
<td>1.89</td>
<td>0.92</td>
<td>16 (44%)</td>
<td>20 (56%)</td>
<td>11 (31%)</td>
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5. Summary
In this paper, I examined two types of non-subject zibun binding. With experimental data, I demonstrated that (i) zibun binding by the causee of a lexical causative, which has been assumed to be ungrammatical in the syntactic literature, is acceptable to many speakers, and (ii) so-called backward binding is highly acceptable, while the acceptability decreases either (a) if the agentivity of the antecedent is low, or (b) if there is a potential subject binder. To accommodate these two types of non-subject binding into the existing theory of zibun, I proposed that the causee of a lexical causative can be interpreted as a (predicationally defined) subject by coercion, and that the subjecthood condition must be slightly revised so that non-subject binding is licensed when there is no potential subject binder. I also pointed out that the effect of a potential binder is relatively mild when it linearly follows zibun.

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