L2 acquisition of discourse constraints on the use of Japanese pronouns

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1. Introduction

Previous studies have suggested that ambiguous null pronouns are biased to co-refer with topical subject antecedents. In Italian, for example, Belletti, Bennati & Sorace (2007) (henceforth BB&S) suggested that null subject pronouns typically co-refer with already established topic antecedents ([-topic shift]), whereas overt subject pronouns signal a change in topic ([+topic shift]). This discourse constraint on overt pronouns is not observed in non-null subject languages such as English. BB&S conducted an empirical study whose results were that the [+topic shift] requirement for overt pronouns is a residual problem for L1 English near native speakers of L2 Italian.

In order to test the applicability of findings in BB&S, this study looks at another null subject language, Japanese, and extends BB&S in three ways. First, two factors which affect the choice of antecedents of pronouns, namely topichood and subjecthood, are separated to find out which is more crucial in determining the antecedents of pronouns. Japanese has a topic marker, *–wa*, which is distinct from a nominative case marker, *–ga*. Therefore, topichood and subjecthood, which are confounded in Italian, can be separated. Second, not only the distribution of subject pronouns, but also that of object pronouns is tested. Japanese allows object drop as well as subject drop; accordingly, the distribution of null and overt pronouns in the object position, which is not discussed in BB&S, is investigated. Finally, this study considers the effects of surface word order of the antecedents. Japanese allows scrambling; as a result, whether the word order of the preceding nouns affects the antecedent preference of pronouns is investigated. The results of an off-line interpretation task and a written, elicited production task challenge BB&S, showing that (i) subjecthood, not topichood or word order, is crucial in determining the antecedents of null pronominal subjects in Japanese; and that (ii) the advanced L2 speakers had a different interpretation of null pronominal subjects, rather than overt pronominal subjects, compared to Japanese monolinguals. This suggests that a [-subject shift] requirement for null pronouns, not a [+topic shift] requirement for overt pronouns can be a residual problem in the L2 grammar.

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This paper is structured in the following way: Section 2 presents previous studies about the interpretation of pronouns in Italian and Japanese. It first presents BB&S, then presents Ueno & Kehler (2010), which investigated the antecedent preference of Japanese subject pronouns. Section 3 proposes research questions and hypotheses. Section 4 explains the experiment and presents the results. Section 5 discusses implications of the findings, and is followed by a conclusion.

2. The cross-linguistic difference in interpretation of pronouns

2.1 Interpretation of Italian pronouns

It has been pointed out that null and overt pronominal subjects have distinct preferences of antecedents in Romance null subject languages. In the Italian ambiguous sentence in (1), for example, BB&S suggests that the null subject pronoun in the embedded clause co-refers with the subject in the matrix clause (*La mamma* 'the mother'). By contrast, the overt subject pronoun (*lei* 'she') in the embedded clause co-refers with the complement in the matrix clause (*figlia* 'the daughter') or another entity in the discourse. That is, the antecedents of Italian null and overt subject pronouns show a complementary distribution.

(1) La mamma$_i$ dà un bacio alla figlia$_k$, mentre *pro*$_i$/lei$_{k/l}$ si mette il cappotto.
The mother$_i$ gives a kiss to the daughter$_k$, while she$_{k/l}$ wears the coat
The mother$_i$ kisses her daughter$_k$, while *pro*$_i$/she$_{k/l}$ is wearing her coat.
(Sorace & Filiaci, 2006, p.352)

BB&S argue that this complementary distribution of antecedents of pronouns comes from the fact that null and overt pronouns have different functions in discourse; null pronouns refer to topic (i.e. old information in the discourse) ([-topic shift]), whereas overt pronouns do not ([+topic shift]). In Italian, preverbal subjects like *La mamma* 'the mother' in (1) are topic, as follows:

> *A lexical subject in preverbal position is normally interpreted as <u>given, topic-like information</u>; typically, an overt pronominal subject of an embedded clause does not refer to the preverbal lexical subject of a superordinate clause…, whereas a null subject does (BB&S, p.660).*

BB&S conducted an empirical study to test their assumption that null and overt subject pronouns have these different discourse functions, and to test if L1 English near-native speakers of L2 Italian acquire them. They hypothesised that English near-native speakers of L2 Italian would not fully acquire the discourse constraints on overt subject pronouns because in English, overt subjects are obligatory and are not subject to discourse constraints of this kind. BB&S compared 17 L1 English near-native speakers of L2 Italian and 8 monolingual native Italian speakers as a control group in a

picture verification task, choosing antecedents of pronouns in ambiguous sentences like (1)[1]. The results are consistent with BB&S's assumption and hypothesis. The monolinguals chose the non-topical complement (e.g. 'the daughter' in (1)) as the antecedent of overt pronouns 54% of the time, while they chose it as the antecedent of null pronouns 85% of the time, as Table 1 shows. The distributions of the preferred choice of antecedents in two conditions (i.e. one for null pronouns and the other for overt pronouns) were significantly different. They also found that the near-natives were different from the monolinguals in interpreting overt pronouns. The near-natives chose the topic subjects (e.g. 'the mother' in (1)) as antecedents of overt pronouns 30% of the time, which was significantly larger than the controls (5%). This suggests that the near-natives overuse overt pronouns to refer to topical subjects. From this, BB&S concluded that the properties at the syntax-discourse interface are persistently problematic, whereas purely syntactic properties are not, in adult L2 acquisition (Interface Hypothesis in Sorace, 2005; Sorace, 2006: Sorace & Filiaci, 2006; Tsimpli & Sorace, 2006). Sorace & Filiaci (2006) suggest that this problem is caused by processing complexity at the interfaces. L2ers with insufficient processing capacity have a problem integrating multiple types of information at the interfaces. They claim that the Interface Hypothesis (henceforth IH) is applicable not only to end state second language acquisition, but also to L1 attrition, bilingual L1 acquisition, language processing, language breakdown, and diachronic change.

Table 1- Distribution of antecedents of null and overt pronominal subjects (%) (BB&S p.684-685)

antece -dents	Null pronouns		Overt pronouns	
	Control	L2er	Control	L2er
S	40	54	5	30
O	54	45	85	65
E	6	1	10	5
total	100	100	100	100

S: matrix subject, O: matrix object, E: external referent

Thus, BB&S uncovered interesting findings on the interpretation of pronouns by monolinguals and near natives L2ers. Moreover, their explanation that English speakers overuse overt pronouns in place of null pronouns because their L1 does not have this discourse constraint is plausible. Furthermore, the IH has a clear predictive power of which property can be a residual problem in L2 acquisition. Nevertheless, BB&S's analysis and findings are still debatable on theoretical and empirical grounds.

2.1.1 Theoretical disagreement

BB&S suggest that the topichood of the antecedent is crucial in deciding the interpretation of null pronouns in Italian. However, Carminati (2002) has a different view: she proposes the Position of Antecedent Hypothesis, suggesting that the syntactic position of the antecedent is crucial, as in (2).

[1] BB&S also investigated acquisition of focus by the same subjects. However, only acquisition of topic shift is relevant to the present study.

(2) Position of Antecedent Hypothesis (PAH) for Italian intra-sentential anaphora:
The null pronoun prefers the antecedent in the highest Spec IP, which is structurally prominent, whereas, the overt pronoun prefers an antecedent in a lower projection, which is structurally less prominent (Carminati, 2002).

Carminati confirmed that null pronouns have a bias toward preverbal subjects, not postverbal subjects, which BB&S assumed but did not test in their study. She conducted a self-paced reading study on 44 native Italian speakers to test if the preverbal or postverbal subjects in (3) were equally preferred antecedents for the null pronouns. She found that clauses with null pronouns were read significantly faster when the antecedent clauses contained preverbal subjects (3a), compared to when they contained postverbal subjects (3b) (mean reading time for the second clause was 1718 ms in (3a) vs. 1857 ms in (3b)).

(3) a.Quando Mario ha telefonato, *pro* era ancora in ufficio.
When Mario has telephoned, *pro* was still in the office.
b. Quando ha telefonato Mario, *pro* era ancora in ufficio.
When has telephoned Mario, *pro* was still in the office. Carminati (2002, p.163)

In this way, both BB&S and Carminati suggest that null pronouns have a preference for preverbal, not postverbal, subject antecedents. However, Carminati diverges from BB&S in suggesting that this preference is primarily due to subjecthood (i.e. being in SpecIP), not topichood (i.e. being in TopP). Following Burzio (1986), she assumed that preverbal subjects are in SpecIP, while postverbal subjects are in VP complements, co-indexed with the dummy expletive in Spec IP. She claims that:

> *In intra-sentential anaphora antecedent prominence is determined by syntactic position, with the Spec IP position, the pre-verbal position of the subject, being more prominent than other positions lower in the syntactic tree (Carminati, 2002, p. vii).*

She also denies the possibility that null pronouns prefer antecedents in higher specifier positions, such as TopP, to those in SpecIP. She claims that topicalized referents can be as good antecedents as subjects, but that they do not override them, as follows:

> *For the purpose of answering our question, i.e. whether topicalized referents are more prominent than referents in the Spec IP, the tentative answer appears to be 'No'; however, both types of referent seem to be equally accessible to pro (Carminati, 2002, p.310).*

To sum up, for Carminati, the antecedent bias of null pronouns is primarily syntactic or structurally based, meaning that subjecthood is crucial in determining the antecedents. By contrast, for BB&S topichood is crucial in determining the antecedents. Thus, researchers have different views on what is crucial in antecedent choice, though they reach a consensus that Italian null pronouns prefer preverbal subject antecedents, while overt pronouns do not.

2.1.1 Empirical disagreement

As regards empirical ability, the IH is far from conclusive. On one hand, there are studies supporting the IH. For example, Tsimpli & Sorace (2006) found that the syntax-semantics interface (verb-raising in focus) was not problematic, whereas the syntax-discourse interface (overt subject pronouns in topic shift) was vulnerable in the grammar of advanced L1 Russian speakers of L2 Greek. Furthermore, Valenzuela (2006) investigated the acquisition of clitic left dislocation with topic objects by L1 English speakers of L2 Spanish. She found that near-native L2 speakers did not acquire specificity constraints on the distribution of clitic doubling, though they were sensitive to syntactic constraints, suggesting that the syntax-discourse property is a residual problem. On the other hand, however, there are studies that challenge the IH. For example, Ivanov (2010) investigated the acquisition of clitic left dislocation with topic objects by L1 English speakers of L2 Bulgarian. Though he investigated the same phenomena as Valenzuela (2006) in a different L2, he obtained opposite results. Advanced L2 speakers showed native-like performance in a context sentence evaluation task, suggesting that they successfully acquired the property – contrary to the IH. From these conflicting results, White (2011, p.587) suggests that it is misleading to assume that all phenomena at a specific interface are always (un)problematic. Thus, the IH gives an interesting account of end state grammar, but its wider applicability still needs to be tested.

2.2. Interpretation of Japanese pronouns

Ueno & Kehler (2010) investigated the effects of three factors in deciding antecedents of Japanese subject pronouns: (i) subjecthood of the antecedents, (ii) topichood of the antecedents, and (iii) grammatical aspect of the verb in the previous sentence. They conducted a written production task adapted from Rohde, Kehler & Elman (2006), which investigated the interpretation of English pronouns. In the task, 32 native Japanese speakers wrote continuations of given sentences to complete passages, as in (4). The given sentences in (4a) contained a transfer-of possession verb and two animate nouns with the same gender, one of which was 'Source' and the other 'Goal of the verb'. They varied in the grammatical aspect of the verb (perfective/imperfective) and the topic/nominative case marking of the Source noun. The informants wrote following sentences starting with three different referent nouns, a null pronoun, an overt pronoun, or a free form, respectively, as in (4b). The antecedent of each referent noun was judged by the remaining part of the sentence and categorized into 4 types: Source (*Taro* in (4a)), Goal (*Jiro* in (4a)), Theme (*a book* in (4a)), and others. There were three findings. First, null pronouns were uniformly Source-biased, irrespective of the verb aspect. Null pronouns had about 80% Source referents both under perfective and imperfective conditions. Second, overt pronouns showed sensitivity to aspect; imperfective aspect yielded more Source referents. Overt pronouns had about 45% Source referents when the given sentence was perfective, while they had about 60% Source referents when the given sentence was imperfective. Ueno & Kehler suggest that this aspectual sensitivity of overt Japanese pronouns is analogous to that of English pronouns, as in Rohde, Kehler & Elman (2006). Finally, there was no significant influence of topic marking. Topic-

marked antecedents did not significantly attract more pronominal references than non-topic-marked antecedents (i.e. nominative case-marked antecedents).

(4) An example of the stimuli
a. The given sentence
Taro-wa/ga Jiro-ni hon-o watashita/watashi-te-iru tokoto-datta.
Taro-Top/Nom Jiro-to book-Acc handed/hand-Inf-Asp scene-was
'Taro handed/was handing a book to Jiro'
b. The sentence completion task
shugo-shoryaku/kare-wa/jiyu ( )
null pronoun/he-Top/free

(Ueno&Kehler, 2010, p.2058)

To summarize, Ueno & Kehler suggest that: (i) subjecthood of the antecedents is crucial, especially for null pronouns; (ii) topichood of the antecedents does not influence either pronoun; and (iii) the grammatical aspect of the verb in the previous sentence affects overt pronouns in Japanese. (i) and (ii) are surprising if we consider BB&S, which suggests that topichood is crucial in determining the antecedents of null pronouns in Italian. (i) and (ii) are more consistent with the PAH in Carminati, which suggests that subjecthood is crucial in determining the antecedents of null pronouns. Thus, Ueno & Kehler found interesting facts about Japanese subject pronouns, focusing on ambiguity resolution between sentence boundaries. Nevertheless, it gives rise to a question which the present study seeks to answer. We need to clarify if the subject antecedent preference by null subject pronouns is applicable to null object pronouns as well, because Japanese allows not only subject drop but also object drop. The present study is also different from Ueno & Kehler in investigating ambiguity resolution between clause boundaries, not sentence boundaries. This is to make a direct comparison with findings in Italian in BB&S.

3. Research question and hypotheses

The aim of this study is twofold. First, this study extends BB&S to clarify which of topichood, subjecthood or word order is crucial in determining antecedents of Japanese pronouns. Second, this study tests the applicability of the IH using a new L1-L2 combination. I have two research questions and hypotheses formulated from the findings in BB&S. These are tested in the experiment.

Research Questions:
RQ1: Which of topichood, subjecthood or word order is crucial in determining the antecedents of pronouns in the subject and object positions?
RQ2: Do advanced L1 English speakers of L2 Japanese use pronouns like Japanese monolinguals? Or do they overuse overt pronouns, just like L1 English near-natives of L2 Italian in BB&S?

Hypotheses

H1: If topichood determines the antecedent preference of null pronouns, as BB&S assumes in Italian, topic marked NPs should be chosen as antecedents, regardless of their syntactic positions (i.e. subjects/objects).

H2: If BB&S are right, advanced L1 English speakers of L2 Japanese will overuse overt pronouns, but not null pronouns.

4. The experiment

4.1. Informants

The informants were 11 L1 English speakers of L2 Japanese with an advanced level of proficiency and 14 monolingual Japanese speakers. All L2ers started their study of Japanese after puberty and had lived in Japan for more than 0.8 years (range 0.8-23, mean 9.6 years). They took an independent proficiency test adopted from Umeda (2008). The mean score on the proficiency test was 36.5 (85%, range 31- 41 (72%-95%)). The monolingual Japanese speakers were residents in Japan (aged 33-60, mean 45).

4.2. The picture verification task

4.2.1. Methodology

The first task was picture verification, adapted from BB&S, to examine the interpretation of pronouns. Each stimulus consisted of a context, the sentence, and three pictures, as (5) shows. The informants were asked to read the context and the sentence and then choose the appropriate picture(s) depicting different referents, namely, (i) the matrix subject, (ii) the matrix object, and (iii) the external referent, as in Figure 1.

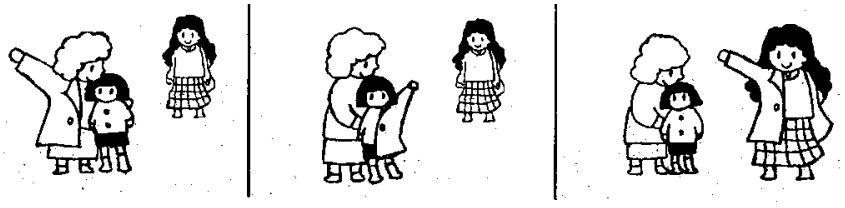
(5) Con 1-null example

Context:(given in Japanese) The mother and daughter finished their dinner at the restaurant. While putting on their coats to leave the restaurant, another customer also began to leave the restaurant.

Okaasan-**wa** musume-ni ***pro*** kooto-o kiru tokini kisu-o sita.

mother-Top daughter-Dat pro coat-Acc put on when kiss-Acc did

'The mother(Topic) kissed the daughter when pro put on the coat.'



(i) *pro*=matrix subject (ii) *pro*=matrix object (iii) pro=external referent

Figure 1 (adapted from Sorace & Filiaci with modifications)

There were 8 conditions: 4 for pronominal subjects (Con 1-4) and 4 for pronominal objects (Con 5-8). Con 1-4 were different from each other in topic marking and word order in the matrix clause. In Con 1, the subject was topic marked as in (5), while in Con 2, the object was topic marked, as in (6). In Con 3 and 4, neither the subject nor the object was topic marked. In Con 3, the object followed the subject (a basic word order), whereas the object preceded the subject by scrambling in Con 4. Each condition was divided into 2 sub-groups depending on pronoun type (i.e. null or overt). Each sub-group contained 4 stimuli (i.e. 2 each for masculine/feminine referents). The stimuli (n=64) and distracters (n=32) were randomized.

(6) Con 2-null/overt

Musume-ni-**wa** okaasan-ga [***pro*/kanozyo-ga** kooto-o kiru tokini] kisu-wo sita.
daughter-Dat-Top mother-Nom [pro/she-Nom coat-Acc put on when] kiss-Acc did
'The mother kissed the daughter (Topic) when pro/she put on the coat.'

4.2.2. Results (Subject pronouns)

Table 2 shows the distribution of antecedent choices in 4 conditions in which embedded subjects were null pronouns[2]. There are two interesting findings we can glean from this. First, the controls always preferred matrix subject antecedents, regardless of topic marking (Con 1-null vs. Con 2-null) and word order (Con 3-null vs. Con 4-null). In all conditions, the distribution among the three choices was significant, but there was no significant difference among the 4 null conditions. This suggests Japanese null subject always prefer subject pronouns as antecedents, irrespective of their topic marking or word order. In other words, subjecthood is more crucial than topichood or word order in determining the antecedents of null subject pronouns. Second, the L2ers chose matrix subjects and objects to the same extent when the matrix subject precedes the matrix object (Con 1-null and Con 3-null). As a result, there was a significant difference in the antecedent choice between the controls and the L2ers in Con 3-null ($\chi^2(2, N=111)=9.95$ $p=.007<.05$). The differences between the controls and the L2ers in other conditions, including Con1-null, were not statistically significant (e.g. $\chi^2(2, N=102)=5.56$ $p=.062>.05$ in Con 1-null).

Table 2 Distribution of antecedents of null pronominal subjects (%)

antece-dents	Con 1-null (topic-S)		Con 2-null (topic-O)		Con 3-null* (non-topic-SO)		Con 4-null (non-topic-OS)	
	Control	L2er	Control	L2er	Control	L2er	Control	L2er
S[3]	72	49	68	65	73	45	66	58
O	24	43	27	31	21	48	30	38
E	4	8	5	4	6	7	4	4
total	100	100	100	100	100	100	100	100

[2] One out of the four stimuli for subject pronouns was eliminated from analysis because the informants categorically chose object antecedents. As a result, each condition from Con 1-4-null/overt consisted of 3 stimuli.
[3] S:matrix subject, O:matrix object, E:external referent, *$p<.05$

Table 3 shows the distribution of antecedent choices in 4 conditions in which embedded subjects were overt pronouns. There are two findings. First, the controls chose matrix subjects and objects to the same extent. This suggests that overt subject pronouns do not have a strong antecedent bias. Though the controls appear to have slightly preferred antecedents immediately preceding the overt pronouns, this preference was not statistically significant. Second, the L2ers generally preferred object antecedents to subject antecedents, irrespective of topic marking and word order. Though they might seem to have a different strategy in determining the antecedent from the controls, the difference between the controls and the L2ers was not statistically significant in any of the 4 conditions.

Table 3 Distribution of antecedents of overt pronominal subjects (%)

antece-dents	Con 1-overt (topic-S)		Con 2-overt (topic-O)		Con 3-overt (non-topic-SO)		Con 4-overt (non-topic-OS)	
	Control	L2er	Control	L2er	Control	L2er	Control	L2er
S	37	29	48	30	40	28	46	37
O	49	53	41	56	45	56	39	45
E	14	18	11	14	15	16	15	18
total	100	100	100	100	100	100	100	100

4.2.3. Results (Object pronouns)

Table 4 and 5 show the distribution of antecedents of null and overt object pronouns. There are two findings. First, the controls accepted subject and object antecedent nearly to the same extent. Though they appear to slightly prefer subjects to objects in 5 out of the 8 conditions (Con 5/7/8-null and Con 5/8-overt), this preference was not statistically significant. This suggests that object pronouns do not have an antecedent bias. Second, the L2ers also accepted subject and object antecedent to the same extent. Though they chose antecedents immediately preceding the pronouns in 5 out of the 8 conditions (Con 5/6/7/8-null and Con 6/8-overt), this was not statistically significant. As a result, there was no significant difference between the L2ers and the controls.

Table 4 Distribution of antecedents of null pronominal objects (%)

antece-dents	Con 5-null (topic-S)		Con 6-null (topic-O)		Con 7-null (non-topic-SO)		Con 8-null (non-topic-OS)	
	Con	L2er	Con	L2er	Con	L2er	Con	L2er
S	51	40	44	46	49	39	55	47
O	41	46	46	43	41	46	36	38
E	8	14	10	11	10	15	9	15
total	100	100	100	100	100	100	100	100

Table 5 Distribution of antecedents of overt pronominal objects (%)

antece-dents	Con 5-overt (topic-S)		Con 6-overt (topic-O)		Con 7-overt (non-topic-SO)		Con 8-overt (non-topic-OS)	
	Con	L2er	Con	L2er	Con	L2er	Con	L2er
S	49	44	42	52	46	46	53	53
O	41	44	46	41	46	45	40	41
E	10	12	12	7	8	9	7	6
total	100	100	100	100	100	100	100	100

To summarize, there were three findings in the interpretation task.

1. Subjecthood is more crucial than topichood or word order in determining antecedents of null subject pronouns.
2. Neither overt subject pronouns nor null or overt object pronouns show an antecedent preference.
3. The L2ers did not show a subject preference in the case of null pronominal subjects, unlike the controls, in Con 3-null.

4.3. The written production task

4.3.1. Methodology

The second task was a written elicited production task, adapted from Serratrice (2009) with a number of modifications. There were 8 conditions, 4 for pronominal subjects and 4 for pronominal objects, varying by the combination of the given picture and the sentence, as Table 5 shows.

Table 6 Conditions and stimuli types

Condition	pictures		sentences			
	Type	Person involved in the embedded action	Type (e.g.)	topic marking	word order	Positions of Pronouns
Con 1-S	P1	Subject	S1 (9)	matrix subject	SO	Embedded Subject
Con 1-O	P2	Object				
Con 2-S	P1	Subject	S2	matrix object	OS	
Con 2-O	P2	Object				
Con 3-S	P3	Subject	S3	matrix subject	SO	Embedded Object
Con 3-O	P4	Object				
Con 4-S	P3	Subject	S4	matrix object	OS	
Con 4-O	P4	Object				

There were 4 types of pictures: two (P1 and P2) for embedded subject pronouns and two (P3 and P4) for embedded object pronouns. In P1, a topic subject was simultaneously doing two actions: (i) a transitive action which affected a human object (e.g. greeting somebody) and (ii) an action which did not (e.g. watering flowers) (see Figure 2). This was to elicit an embedded null pronominal subject referring to the matrix topic subject ([-topic shift] contexts). By contrast, in P2 the topic subject was only doing the first action and the human object was doing the other action. This was to elicit an embedded overt pronominal subject referring to the matrix non-topic object ([+topic shift] contexts). P3 and P4 were object equivalents to P1 and P2.

In each sentence the matrix clause was given, whereas the embedded clause was in brackets and its elements were only partially given, as shown in (7). In the embedded clause, no subject/object was given and only a base verb form (and an inanimate verb complement when necessary), followed by a conjunction, was given to control the structure. As a result, the informants were required to produce the appropriate embedded subject/object to refer to the matrix subject/object on their own. There were 4 types of sentences: two (S1 and S2) for embedded subjects and two (S3 and S4) for embedded

objects. S1 and S2 were exactly the same except for the place of topic marking. Matrix subjects were topic-marked in S1, whereas matrix objects were topic-marked in S2. All 4 types shared the same matrix clause and each type consisted of 4 different sentences with even numbers of male and female subjects. The stimuli (n=32) and distracters (n=16) were randomized.

(7) Con 1-S example

Onnanoko$_i$-**wa** sensei$_j$-ni [(_____) tokini] aisatu-o sita

mizu yaru

girl$_i$-Top teacher$_j$-Dat [(water give) when] greeting-Acc did

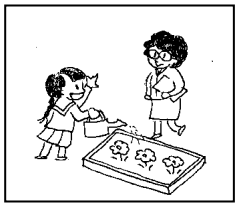


Figure 2

Target answer: (***pro$_i$*** mizu-o yatteiru)

pro$_i$ water-Acc doing

'pro is watering'

The target meaning of the whole sentence: 'The girl$_i$ (Topic) greeted the teacher$_j$ when she$_i$ was watering (flowers)'

4.3.2. Results

Table 7 shows the distribution of embedded subjects. There are two findings. First, over 80% of the time the controls produced null subject pronouns to refer to the matrix subjects, irrespective of topic marking (Con 1-S, Con 2-S). In these conditions, they produced overt NPs 13-14% of the time and overt pronouns 2-5 % of the time. By contrast, over 60% of the time the controls produced overt NPs and overt pronouns to refer to matrix objects, irrespective of topic marking (61% in Con 1-O, 66% in Con 2-O). These results suggest that null subject pronouns were mainly used to refer to matrix subjects, whereas overt NPs and overt pronouns were mainly used to refer to matrix objects. The reason why the informants produced more overt NPs than overt pronouns to refer to matrix objects (e.g. the controls produced overt NPs and overt pronouns 45% and 16% respectively in Con 1-O) can be attributed to the fact that overt pronouns are mostly used in formal written occasions. Second, the L2ers also produced null pronouns to refer to matrix subjects, while they produced overt NPs and overt pronouns to refer to matrix objects. Accordingly, there was no significant statistical difference between the controls and the L2ers.

Table 7 Distribution of embedded subjects (%)

Condition / productions	Con 1-S (topic-S)		Con 1-O (topic-S)		Con 2-S (topic-O)		Con 2-O (topic-O)	
	Con	L2er	Con	L2er	Con	L2er	Con	L2er
Overt NPs[3]	14	11	45	48	13	9	54	48
Overt pronouns	2	2	16	20	5	2	12	16
Null pronouns	84	87	39	32	82	89	34	36
total	100	100	100	100	100	100	100	100

Table 8 presents the distribution of embedded objects. There are two findings. First, the controls produced null and overt expressions to nearly the same extent in Con 3-S (overt NPs and overt pronouns 48% vs. Null pronouns 52%) and in Con 3-O (overt NPs and overt pronouns 57% vs. Null pronouns 43%). This suggests that object null and overt pronouns do not show an antecedent bias. Second, the L2ers produced overt expressions and null pronouns to nearly the same extent in all conditions. There was no significant difference between the controls and the L2ers in distribution of overt expressions and null pronouns. The L2ers generally produced more overt pronouns (11-30%) than the controls (7-13%), presumably because of L1 transfer. Though pronouns are commonly used in English, they are rather limited to formal occasions in Japanese.

Table 8 Distribution of embedded objects (%)

Condition / productions	Con 3-S (topic-S)		Con 3-O (topic-S)		Con 4-S (topic-O)		Con 4-O (topic-O)	
	Con	L2er	Con	L2er	Con	L2er	Con	L2er
Overt NPs	41	34	48	43	54	27	48	43
Overt pronouns	7	18	9	11	7	30	13	14
Null pronouns	52	48	43	46	39	43	39	43
total	100	100	100	100	100	100	100	100

To summarize, there were three findings in the elicited production task:

1. Subjecthood is more crucial than topichood in determining antecedents of null subject pronouns.
2. Neither overt subject pronouns nor null and overt object pronouns shows an antecedent preference.
3. The pattern of producing null pronouns and overt expressions was similar in the L2ers and the controls.

[3] Overt NPs include repeating the nouns in the matrix clause and using reflexives *self*.

5. Discussion

5.1. H1 was not supported

H1 was not supported in either the interpretation task or the production task. In these tasks, subjecthood of the antecedents was crucial in determining antecedents of null subject pronouns. By contrast, there was no significant effect of topichood or the surface word order of the antecedents in determining antecedents of null subject pronouns. This is consistent with Ueno & Kehler and Carminatti, not with BB&S. By contrast, other pronouns—namely overt subject pronouns and null/overt object pronouns—did not show clear preference, unlike null subject pronouns.

5.2. H2 was not supported

H2 was not supported. In the interpretation task, the advanced L2ers encountered problems in determining the antecedents of null subject pronouns, not overt pronouns. The L2ers did not prefer matrix subjects as antecedents of null subject pronouns as strong as the controls. This means that L2ers tend to underuse matrix subjects as antecedents of null subject pronouns. By contrast, the L2ers did not have a problem with other pronouns (i.e. overt subject pronouns and null/overt object pronouns). This is different from BB&S, which suggests that L2ers do not acquire discourse constraint on overt subject pronouns and overuse them.

There are two puzzling findings in this study. The first one is why the L2ers had different preferences from the controls in Con 3-null in the picture verification task. In this condition, neither matrix subjects nor objects were topic marked, and the embedded pronouns were null subjects. One possible explanation is that the L2ers recognized Japanese null subject pronouns as equivalents to English (overt) subject pronouns, and transfer their antecedent preference. In order to clarify this possibility, I conducted a follow-up study in which 10 native English speakers who were not subjects in the present study took an English version of the picture verification task. The native English speakers answered the reference of the embedded English pronouns in (8) by choosing the same pictures as those in the Japanese picture verification task (e.g. Figure 1 in 4.2.1.). The results in Table 9 suggests that English subject pronouns do not have as strong subject bias as Japanese null pronouns. Therefore, it can be speculated that the L2ers in the present study may have transferred their L1 preference in place of L2.

(8) An example of the English picture verification task

a. Embedded subject pronouns

Context: The mother and daughter finished their dinner at the restaurant. While putting on their coats to leave the restaurant, another customer also began to leave the restaurant.

The test sentence: 'The mother kissed the daughter when she put on the coat.'

b. Embedded object pronouns

Context: The mother and the daughter were waiting for the father in a cafe. The waitress was working near them.

The test sentence: 'The mother kissed the daughter when the father was looking for her.'

Table 9: Distribution of antecedents in the English picture verification task (%)

antece-dents	Antecedents of overt subject pronouns	Antecedents of overt object pronouns
S	42	47
O	44	39
E	14	14
total	100	100

Another puzzling result in the present study is why the L2ers were different from the controls only in the picture verification task, and not in the written production task. If the L2ers had fully acquired the use of Japanese pronouns as they demonstrated in the written production task, they should have had the same interpretation as the controls in the picture verification task too. The order of the two tasks should not have affected this contradictory result because about half of the informants first took the picture verification task, and the remaining half first took the written production task. One explanation could be task effect, that is, the picture verification task was more demanding than the written production task for the L2ers. In the picture verification task, the informants were required to carefully read the context and the ambiguous sentence, and then to observe three pictures, considering the possibility of three options (i.e. subject antecedents, object antecedents, and external referents). By contrast, in the written production task, the informants did not have to read a written paragraph; in addition, they needed to consider only two options (i.e. subject antecedents and object antecedents).

6. Conclusion

In this study, I presented empirical evidence to demonstrate that BB&S's findings on L2 Italian are not applicable to L2 Japanese. First, I presented data showing that subjecthood, rather than topichood or word order, is crucial in determining the antecedents of null subject pronouns in Japanese. The results of both the interpretation task and the written production task suggest that the prominence of topic antecedents, which BB&S assume in Italian, is absent in L1 and L2 Japanese. This result is consistent with the findings about Japanese subject pronouns in Ueno & Kehler (2010). Second, I presented data confirming that advanced L1 English speakers of L2 Japanese do not have a problem with the [+topic shift] requirement for overt pronouns. Instead, they experience problems with the [-subject shift] requirement for null pronouns. This challenges the IH view, suggesting that the syntax-discourse requirement for overt pronouns can be acquired in L2 Japanese. These findings support White (2011), showing that not all the properties on the external interface are necessarily problematic in L2 acquisition.

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