Acquisition of two domains of knowledge of demonstratives by L1 English speakers of L2 Japanese

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Abstract: This paper reports on an empirical study, extending the work done by Okuma (2017). Okuma investigated acquisition of Japanese demonstratives by 26 first language (L1) English speakers of second language (L2) Japanese and found a delay of discourse-related knowledge of demonstratives in L2 grammar. To improve the statistical reliability of Okuma, the present study presents data which added 10 more L2 speakers to Okuma's experiments and reanalyzed them. The results still support Okuma, suggesting a disparity between the discourse-related knowledge and the syntax/semantics-related knowledge of demonstratives by L2 speakers.

1. Introduction

This paper investigates the acquisition of two domains of knowledge of Japanese demonstratives, one relates to discourse, and the other relates to syntax or semantics. The former is required when demonstratives are used as referential expressions in discourse, and the other is required when demonstratives are used as bound variables in sentences. Okuma (2017) examined L1 English speakers of L2 Japanese's understanding of the two types of knowledge and found a delay of discourse-related knowledge. However, Okuma tested only 26 L2 speakers (henceforth L2ers) in the experiment, and, as a result, its statistical reliability is question-

able. In order to improve the statistical reliability, the present study added 10 more L2ers to Okuma's experiments and reanalyzed the results. Section 2 explains the two domains of knowledge of Japanese demonstratives, referring to Mikami (1970) and Kratzer (1998), which were not included in Okuma. Section 3 reports on the two experiments that were adopted from Okuma. Section 4 presents the results and discusses why a delay of discourse-related knowledge is found, following the work of Reinhart (2006). This paper ends with a conclusion.

2. Japanese demonstratives

Japanese has three series of demonstratives, which begin with *ko*-, *so*- and *a*-, as in (1). When they are deictic[1], their use is determined by the degree of proximity between the referent and the speaker. *Ko*- is used to refer to an object or a person that is close to the speaker (i.e., proximal, e.g., *kore* 'this one', *koitu* 'this guy'). In contrast, *so*- and *a*- are used when an object or a person is far from the speaker. *So*- is used when the referent is close to the listener rather than the speaker (i.e., medial, e.g., *sore* 'that one', *soitu* 'that guy'). *A*- is used when the referent is far from both the speaker and the listener (i.e., distal, e.g., *are* 'that one there', *aitu* 'that guy there') (Kuno 1973, Shibatani 1990, Noguchi 1997). Thus, Japanese makes a three-way distinction among demonstratives for spatial deixis.

(1) Japanese demonstratives

ko-series (proximal)	*so*-series (medial)	*a*-series (distal)
kore 'this one'	*sore* 'that one'	*are* 'that one there'
koitu 'this guy'	*soitu* 'that guy'	*aitu* 'that guy there'
kono '(of) this'	*sono* '(of) that'	*ano* '(of) that over there'
koko 'here'	*soko* 'there'	*asoko* 'over there'
kotira 'this way'	*sotira* 'that way'	*atira* 'that way over there'

koo 'in this way' *soo* 'in that way' *aa* 'in that way'

(Kuno 1973, with modifications)

In contrast, English has two adjectival deictics, *this* and *that,* and distinguishes them in terms of proximity; near or far. When the referent is near the speaker, *this* is used (proximal). When the referent is far from the speaker, *that* is used (distal) (Halliday and Hasan, 1976).

2.1 Anaphoric use in discourse

In addition to the deictic use as demonstratives which we have seen in the previous section, the medial and distal series can be used anaphorically[2]. The medial, *so*-series, is used when the referent is not known either to the speaker or listener. By contrast, the distal, *a*-series, is used when the referent is known both to the speaker and listener by experience (Kuno 1973, Hoji 1991). In the example (2 a), the speaker uses *sono hito* 'that man' to refer to Mr. Yamada because the speaker believes that the listener does not know Mr. Yamada. By contrast, in (2 b), the speaker uses *ano hito* 'that man', not *sono hito,* because the speaker knows that the listener have already met Mr. Yamada.

(2) a. Kinoo Yamada-san to yuu hitoni aimasita. *Sono* (**ano*) *hito* miti ni
yesterday Yamada-Mr that call person-to meet-Pst that person road by
mayotte komatteitanode, tasukete agemasita.
lose have-Pst difficulty since help-give-Pst
'Yesterday, I met a man by the name of Yamada. Since he lost his way and was having difficulties, I helped him.'

b. Kinoo Yamada-san ni aimasita. *Ano* (**sono*) *hito* itumo genki desu yone.
yesterday Yamada-Mr to meet-Pst that person always high spirit is isn't he
'Yesterday, I met Mr Yamada. That man is always in high spirits, isn't he?'

Mikami (1970) suggests that *ano* plays a crucial role in indicating that the speaker and the listener have common experience about the referent. In (2b), for example, *ano* is used because both the speaker and the listener have knowing and meeting with Mr. Yamada in common. He further argues that this property of 'common experience' of *ano* is also found when it is deictically used, as we observed in (1). When *ano* is used deictically, it refers to a thing that is far from both the speaker and the listener. In other words, the speaker and the listener share the experience of having a referent in the distance. In contrast, *sono* indicates that the speaker and the listener do not share the experience. When *sono* is deictically used, the referent is close to the listener, but not to the speaker. When *sono* is anaphorically used, as in (2), either the speaker or the listener is not familiar with the referent.

To summarize, either *sono* or *ano* followed by a noun, *hito* 'person,' is anaphorically used like a pronoun in discourse, depending on the familiarity of the referent. Note that judgements on familiarity of referents relate to knowledge of utterance context rather than knowledge of syntax or semantics. In other words, the referent of *sono hito* or *ano hito* is contextually provided. Therefore, the anaphoric use of *sono* and *ano* in discourse differs from the typical human computational system, such as syntactic/semantic operations, which will be explained in 2.2.

In contrast to the Japanese demonstratives, *sono* and *ano*, the English demonstratives, this (proximal) and that (distal) do not distinguish the familiarity of referents.

2.2 Use as bound variables

It has been pointed out that *so*-series can act as variables bound by quantified antecedents (Hoji 1991, 1995, Nishigauchi 1990, Noguchi 1997). The data in (3) adapted from Noguchi (1997) present examples in which *so*-series work as vari-

ables bound by non-human quantificational antecedents. *Sono* 'that' can be construed as a variable in (3a), while *kono* 'this' and *ano* 'that' cannot in (3b). The data in (4) present examples in which the interpretation of *sono* and a following noun covaries with a human quantificational antecedent. Similarly to (3), *sono* and the following noun can be construed as a variable in (4a), while *kono* and *ano* cannot in (4b).

(3) a. Dono kaisha-mo$_i$ [*sono*$_{i/j}$ shain-ga itibanda to] omotteiru.
which company-Par its/that employee-Nom is best that think
'Every company$_i$ thinks that its$_i$ employee/that$_j$ employee is the best.'

b. Dono kaisha-mo$_i$ [kono$_{*i/j}$ shain-ga /*ano*$_{*i/j}$ shain-ga itibanda to] omotteiru.
which company-Par this employee-Nom/that employee-Nom best that think
'Every company$_i$ thinks that this$_{*i/j}$ employee/that$_{*i/j}$ employee is the best.'

(4) a. Dono otokonohito-mo$_i$ *sono hito*$_{i/j}$-no kodomo-ni prezento-o age-ta.
which man-Par that person-Gen child-Dat present-Acc give-Pst
'Every man$_i$ gave a present to his$_i$/that person's$_j$ child.'

b. Dono otokonohito-mo$_i$ *kono hito*$_{*i/j}$-no/*ano hito*$_{*i/j}$-no kodomo-ni prezento-o
which man-Par this person-Gen/that person-Gen child-Dat present-Acc
age-ta.
give-Pst
'Every man$_i$ gave a present to this person's$_{*i/j}$/that person's$_{*i/j}$ child.'

Thus, Japanese allows the bound variable use of the demonstrative *sono.* In contrast, English generally does not allow the bound variable use of demonstra-

tives. The Japanese medial demonstrative *sono* can be translated as *that* in English; nevertheless, *that* usually does not permit a bound variable interpretation, as shown in (5), except in some limited cases. Elbourne (2005) suggests that *that boy /that senator* in (6) can be exceptionally construed as a variable, while *this boy/ this senator* cannot.

(5) a. Every company$_i$ thinks that that company$_{*i/j}$ is the best.
b. Every company$_i$ cares about that company's$_{*i/j}$ efficient employees.
(Noguchi, 1997)

(6) a. Every boy$_i$ dates a girl who adores that boy$_i$/this boy$_{*i}$.
b. Mary talked to no senator$_i$ before that senator$_i$/this senator$_{*i}$ was lobbied.
(Elbourne, 2005)

As we have seen so far, *sono* (and a following noun) can have a bound variable reading. To the best of my knowledge, no previous study gives an account of why *sono,* but not *ano,* can have a bound variable interpretation. Following Kratzer (1998) and Alonso-Ovalle & D'Introno (2001), I assume that referential expressions that lack lexical content, including *sono,* tend to work as bound variables. Kratzer suggests that pronouns in natural languages can be divided into two groups, (i) those that have lexical content and (ii) those that lack lexical content (Zero-pronouns). She proposes that Zero-pronouns that lack lexical features in their lexicon need to receive denotation from variable assignments, and consequently, they are obligatorily bound variables. Similarly, Alonso-Ovalle & D'Introno suggest that Kratzer's proposal explains the distribution of pronouns in Spanish. Although Kratzer and Alonso-Ovalle & D'Introno analyze pronouns, not demonstratives, I assume that their analyses can be extended to distributions of *sono* and *ano* as referential expressions. As we have observed in 2.1, *sono* is ana-

phorically used when either the speaker or the listener does not know the referent. By contrast, *ano* is used when both of them know the referent. In this sense, *sono* has less content than *ano,* and, accordingly, *sono* is more compatible with a bound variable interpretation than *ano.*

3. Experiments

3.1 Participants

A total of 36 L1 English speakers of L2 Japanese participated in two experiments. The participants were residents of Japan at the time of testing. They were divided into two proficiency groups, the advanced group and the intermediate group, by a Japanese language proficiency test adapted from Umeda (2008). The advanced group consisted of 19 L2ers, whose proficiency scores were, on average, 79 percent (range 69-100%). The intermediate group consisted of 17 L2ers and their proficiency scores were 50 percent on average (range 20-66%). Additionally, 20 native Japanese speakers participated as the control group. They were university students who had never been abroad for more than three months. Table 1 presents the profiles of the participants.

Table 1 Participants' profiles

Group	n	Mean age	Frist exposure to Japanese (years of age)	Formal education (years)	Naturalistic exposure to Japanese (years)	Proficiency test scores (%)
Advanced L2ers	19	28 (20-37)	20 (15-30)	2.7 (0-5.6)	3.2 (0.3-7.7)	79 (69-100)
Intermediate L2ers	17	33 (21-61)	24 (17-55)	2.3 (0.3-4.5)	4.5 (0.1-8.7)	50 (20-66)
Native Japanese speakers	20	19 (18-20)	0	n/a	19 (18-20)	n/a

3.2 Experiment 1

Two off-line experiments were carried out. The first experiment was designed to test the knowledge of anaphoric use of demonstratives in discourse. The second experiment was designed to test the knowledge of bound variable use of demonstratives. The following part of this section explains the methodology of the first experiment.

The task in the first experiment was a sentence interpretation, in which the participants read written dialogs and chose appropriate referring expressions, including *sono* and *ano*. Two conditions were created. The example in (7) represents Condition S in which the referent is not known to the listener. In (7), the husband is talking about a person whom his wife has never met. In this condition, native Japanese speakers are expected to choose (a) *sono hito*. The participants were instructed to choose (c) when they thought both (a) *sono hito* and (b) *ano hito* were possible, and chose (d) 'I don't know' when they could not understand the sentence.

(7) Condition S: The referent is not known to the listener (n = 6)

Husband: Kyoo kaishano tikakude shiranai hito-ni
today company-Gen near don't know person-by
hanasikake-rare-ta-yo.
talk to-Pass-Pst
'I was talked to by a person who I don't know near my company today.'

Wife: Ara, soo-nano.
Oh that-is-Q
'Oh, really?'

Husband: Un. ( ), miti ni mayotte komattei-tanode,
yes road by is lost have difficulty-Pst since

tasuketeage-ta-yo.
help-Pst
'Yes. Since (he) was lost and was having difficulties, I helped him.'

Answer (a) *Sono hito* 'That person'
(b) *Ano hito* 'That person'
(c) (a) to (b) no izuremo ka 'Both (a) and (b) are possible'
(d) Wakaranai 'I don't know.'

The example in (8) shows Condition A, in which the speaker and the listener are talking about a person whom they both know. In this condition, native Japanese speakers are expected to choose option (b) *ano hito*. Each condition consisted of 6 test sentences.

(8) Condition A: The referent is known to the listener (n = 6)
Husband: Kyoo kaishano tikakude Yamamoto-san-ni a-tta-yo.
today company-Gen near Yamamoto-Mr-Dat meet-Pst
'I met Mr. Yamamoto near my company today.'
Wife: Ara, soo-nano. Hisasiburine.
Oh that-is-Q. long time no see
'Oh, really? You haven't seen him for a long time, have you?'
Husband: Un. ( ), miti ni mayotte komattei-tanode,
yes road by is lost have difficulty-Pst since
tasuketeage-ta-yo.
help-Pst
'No. Since (he) was lost and was having difficulties, I helped him.'

Answer (a) *Sono hito* 'That person'

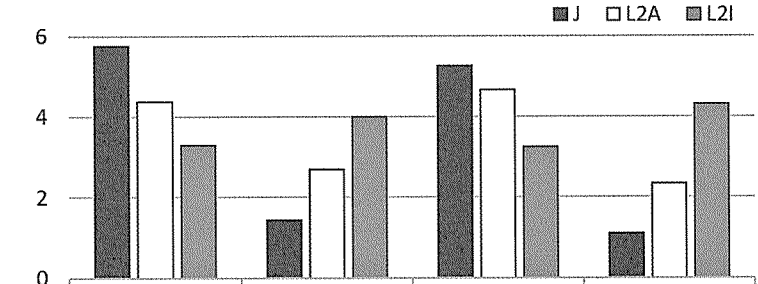
(b) *Ano hito* 'That person'

(c) (a) to (b) no izuremo ka 'Both (a) and (b) are possible'

(d) Wakaranai 'I don't know.'

3.3 Results of Experiment 1

Figure 1 shows the mean numbers of the responses (out of 6) in which the participants chose *sono* or *ano* in each condition. In Figure 1, J, L2 A, and L2 I represents the native Japanese control group, the advanced L2 group, and the intermediate L2 group, respectively. *Sono*-S shows the choice of *sono* in Condition S, in which the referent is not known to the listener. As expected, native Japanese speakers mostly chose *sono,* namely, 5.75 times out of all 6 times. In contrast, the advanced L2 group chose 4.37 times and the intermediate L2 group chose only 3.30 times. Table 2 presents statistical analysis (*t*-tests) on the mean group responses. Both the advanced and intermediate L2 groups were significantly different from the native Japanese group in choosing *sono* in Condition S ($p<0.01$). Figure 1 also shows that the native Japanese group chose *sono* in Condition A



	Sono-S	Sono-A	Ano-A	Ano-S
J	5.75	1.45	5.25	1.1
L2A	4.37	2.71	4.67	2.35
L2I	3.30	4.01	3.24	4.32

Figure 1 Task 1 group results

Table 2 Statistical analysis (comparison between the native Japanese group and each L2 group)

group	Sono-S			Sono-A			Ano-A			Ano-S		
	Mean	SD	t-test	Mean	SD	t-test	Mean	SD	t-test	Mean	SD	t-test
J	5.75	0.72	–	1.45	1.67	–	5.25	1.45	–	1.10	1.52	–
L2A	4.37	1.88	$p<0.01$	2.71	2.38	$p=0.06$	4.67	1.67	$p=0.25$	2.35	2.04	$p<0.05$
L2I	3.30	2.04	$p<0.01$	4.01	1.98	$p<0.01$	3.24	2.04	$p<0.01$	4.32	1.77	$p<0.01$

Table 3 The number of the participants who consistently chose *sono-S and rejected sono-A (at least 4 times out of 6)*

J	L2A	L2I
21/27 (72%)	10/19 (53%)	2/17 (12%)

only 1.45 times out of 6, as expected. By contrast, the intermediate L2 group chose *sono* significantly more often than the native Japanese group ($p<0.01$), while the advanced L2 group did not significantly differ from the control group ($p=0.0633$).

Table 3 shows the distribution of the number of participants who consistently made a distinction between the two conditions for *sono*. Here, the participants were counted when they chose *sono* in the appropriate context (i.e., *sono hito* in Condition S) at least 4 times out of 6 and did not choose *sono* in the inappropriate context (i.e., *sono hito* in Condition A) at least 4 times out of 6. It is shown that 21 out of the 27 native Japanese speakers (72%) made a clear distinction between the appropriate and inappropriate contexts for using *sono*. In contrast, only 10 out of the 19 advanced L2ers (53%) consistently made a distinction between the contexts. Regarding the intermediate L2 group, only 2 out of the 17 L2ers (12%) consistently made a distinction.

To summarize, the first experiment shows that the intermediate L2 group statistically differed from the native Japanese control group in interpreting *sono*. The advanced L2 group also differed from the control group in choosing *sono* in the

appropriate condition (i.e., Condition S) although they performed better in rejecting *sono* in the inappropriate condition (i.e., Condition A) than the intermediate group. These results suggest that anaphoric use of *sono* in discourse could be persistently problematic for L2ers. The next section will investigate the L2ers' knowledge of syntax/semantics in interpreting *sono.*

3.4. Experiment 2

In the second experiment, an interpretation task was administered to examine knowledge of bound variable use of *sono.* The participants read written test sentences and questions, as shown in (9). Then, they were instructed to choose the antecedent for *sono* from 4 options, (a) 'his own child', which represents a bound variable interpretation, (b) 'another person's child', which represents a disjoint interpretation, (c) 'both (a) and (b) are possible', and (d) 'I don't know.' Native Japanese speakers are expected to choose (c) in (9). The interpretation of *ano* was also tested in the same way, as shown in (10). In this case, native Japanese speakers are expected to choose (b) because *ano* does not allow a bound variable interpretation. The number of the test sentences for *sono* and *ano* was 6 respectively.

(9) Dono otoosan-mo$_i$ *sono*$_{i/j}$ itiban sitano ko-o kawaigaru
which father-Par that most young-Gen child-Acc love
'Every father$_i$ loves that$_{i/j}$ youngest child.'

Q. Dono otoosan mo dareno itibansitano kodomoo kawaigaru nodeshooka?
'Whose youngest child does every father love?'
Answer.(a) 'His own child' (bound variable interpretation)
(b) 'Another person's child' (disjoint interpretation)
(c) 'Both (a) and (b) are possible.'
(d) 'I don't know.'

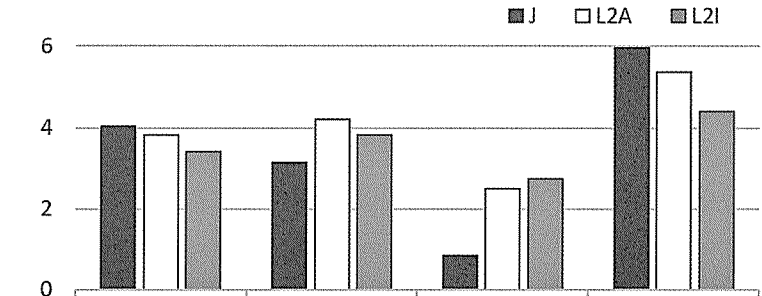
(10) Dono otoosan-mo$_i$ *ano*$_{*i/j}$ itibansitano ko-o kawaigaru

'Every father$_i$ loves that$_{*i/j}$ youngest child.'

3.5 Results of Experiment 2

Figure 2 shows the mean numbers of the responses out of 6 in which *sono* had a bound variable interpretation, *sono* had a disjoint interpretation, *ano* had a bound variable interpretation, and *ano* had a disjoint interpretation. Table 4 presents statistical analysis (*t*-tests) on the mean group responses. Three findings were obtained. First, the native Japanese group did not clearly accept a bound variable or disjoint interpretation of *sono.* They unexpectedly chose bound variable *sono* 4.05 times and disjoint *sono* 3.15 times out of 6. Second, with respect to bound variable *sono,* the L2ers did not significantly differ from the controls, as shown in Table 4. Both L2 groups accepted bound variable *sono* nearly 4 times out of 6 (3.83 and 3.41, respectively), just as the control group.

Table 5 shows the number of the participants who accepted bound variable *sono* at least 4 times out of 6. The table shows that the percentages of the L2



	Sono-bv	Sono-disj	Ano-bv	Ano-disj
J	4.05	3.15	0.85	5.95
L2A	3.83	4.20	2.51	5.36
L2I	3.41	3.82	2.75	4.39

Figure 2 Task 2 group results

Table 4 Statistical analysis (comparison between the native Japanese group and each L2 group)

group	Sono-bv			*Sono*-disj			Ano-bv			*Ano*-disj		
	Mean	SD	t-test	Mean	SD	t-test	Mean	SD	t-test	Mean	SD	t-test
J	4.05	1.85	–	3.15	2.18	–	0.85	1.35	–	5.95	0.22	–
L2A	3.83	1.94	$p = 0.72$	4.20	1.89	$p = 0.12$	2.51	2.16	$p < 0.01$	5.36	0.96	$P = 0.01$
L2I	3.41	1.79	$p = 0.31$	3.82	1.70	$p = 0.33$	2.75	2.39	$p < 0.01$	4.39	1.53	$p < 0.01$

Table 5 The number of the participants who consistently accepted *sono* with a bound variable interpretation (at least 4 out of 6)

J	L2A	L2I
16/27 (59%)	10/19 (53%)	8/17 (47%)

groups are between 47-53%, which are similar to that of the native Japanese group, 59%. This is in line with the group results in Figure 2 and Table 4, which show no significant difference between the native Japanese group and the L2 groups. To summarize the second experiment, it was found that the L2ers had the same knowledge of bound variable use of *sono* as native Japanese speakers.

4. Discussion

As we have seen in Section 3, the statistical analyses of group means in the two experiments show that the advanced L2 group differed from the control with respect to the anaphoric use of *sono* in discourse, as shown in 3.3, but not in the use of *sono* as bound variables, as shown in 3.5. The present study added new data from 10 L2ers to Okuma's (2017) data and reanalyzed them, with the results, nevertheless, remaining the same, showing a delay in the discourse-related knowledge of *sono*.

Why, then, is discourse-related knowledge delayed? I suggest that one of the reasons is complexity of finding antecedents of *sono* in discourse. Reinhart (2006)

proposes two distinct procedures for pronoun resolution, covaluation and binding, with the former more complex than the latter. For example, the sentence in (11b) is ambiguous. The pronoun, *she* in (11b) refers to either *Lucie* in the previous sentence (11a) (i.e., covaluation) or the matrix subject *Lili* in the same sentence (i. e., binding). Reinhart explains each procedure, as in (12). In the case of binding, the variable is bound by the λ-operator. The predicate denotes the set of individuals who think that they have gotten the flu, and the sentence means that *Lili* is included in this set, as in (12b). Here, the interpretation of (11b) closes without checking the previous sentence (11a). By contrast, in the case of covaluation (12 a), the predicate contains a free variable z, the value of which is assigned in the discourse. In other words, we retrieve the entry for *Lucie* in the previous sentence (11a) when we encounter *she* in (11b). Thus, covaluation needs one more step than binding in finding the antecedents of pronouns. I assume that similar complexity is required in finding antecedents of *sono* in discourse. By contrast, in finding referents of bound variable use of *sono,* the procedure is less complex because we do not need to check previous sentences in discourse. The complexity of referent resolution in the utterance context causes a delay of L2ers' knowledge of the anaphoric use of *sono* in discourse.

(11) a. Lucie$_i$ didn't show up today.

b. Lili$_j$ thinks she$_{i/j}$ has gotten the flue.

(12) a. Covaluation

Lili (λx (x thinks z has gotten the flu) & z = Lucie)

b. Binding

Lili (λx (x thinks x has gotten the flu))

5. Conclusion

The present study investigated L2 acquisition of two domains of knowledge of the Japanese demonstrative, *sono*: one relating to discourse and the other relating to syntax or semantics. The former is required when *sono* is interpreted as a referential expression in discourse. The latter is required when *sono* is interpreted as a bound variable in a sentence. A previous study, Okuma (2007), tested 26 L1 English speakers of L2 Japanese and found a delay in the discourse-related knowledge of *sono*. The present study added new data from 10 L1 English speakers of L2 Japanese to Okuma's data and reanalyzed them. The results support Okuma, showing that the acquisition of the discourse-related knowledge of *sono* is more problematic than the acquisition of the syntax/semantics-related knowledge of *sono*. Following Reinhart (2016), I argue that the delay of discourse-related knowledge of *sono* is, at least partially, attributable to the complexity of finding antecedents of referential expressions in discourse.

Acknowledgments

I thank Professor Isao Ueda for his guidance in the MA program at Osaka University of Foreign Studies. He also gave me warm encouragement when I went on to study in the PhD program at McGill University in Canada, and looked for a professional job in Japan. Without his help, I would not have been able to develop my career as a linguist.

謝辞

上田功先生には、大阪外国語大学の修士課程でご指導頂きました他、カナダへの留学や帰国後の就職時など、折に触れて温かいアドバイスを賜り、心から感謝申し上げます。外大入学時には試験でも面接でも満足に答えられな

かった学生が、先生の親身なご指導のお陰で、大学で言語学を教える立場にまでなることができました。先生にお教え頂いたことを胸に、今後も精進して参ります。

*Tokiko Okuma, Mie University, tokuma@ars.mie-u.ac.jp. The earlier versions of this paper were presented at Pacific Second Language Research Forum (PacSLRF 2016), The First International Conference on Theoretical East Asian Psycholinguistics (ICTEAP-1), and the 14th Generative Approached to Second Language Acquisition Conference (GASLA). I would like to thank the audience at these conferences, who provided useful suggestions.

Notes

1 Here, being 'deictic' means that when the demonstrative receives its reference from extralinguistic elements, such as utterance and pointing out.

2 'Use *anaphorically*' means the cases in which a demonstrative picks up its references from another phrase in preceding or following text (Heim & Kratzer 1998).

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