

The Emergence of the Unmarked in L2 Acquisition: Interpreting Null Subjects*

Tomoko Monou^[1] and Shigeto Kawahara^[2]

MEJIRO UNIVERSITY/SENSYU UNIVERSITY^[1] and KEIO UNIVERSITY^[2]

1 Introduction

1.1 Synopsis

It is a common observation that the acquisition of L2 (second language) is significantly affected by L1 (first language) knowledge. The effect of L1 on L2 acquisition in the domain of phonetics and phonology is perhaps uncontroversial (Best and Tyler, 2007; Eckman, 2004a), and the same is true, at least to some extent, in the domain of syntax and semantics (Gass, 2006; Schwartz and Sprouse, 1996), or at their interface in particular. This effect of L1 on L2 acquisitions is generally known as “L1 transfer” (Schwartz and Sprouse, 1996; White, 2003).

However, there are observations that L1 transfer does not entirely govern L2 acquisition, hinting at the role of grammatical principles in L2 acquisition (see Gass 2006 and White 2003 for recent reviews). For example, it has been observed in the phonological literature that L2 learners go through a stage in which they only show unmarked structures (i.e. the emergence of the unmarked, or TETU: McCarthy and Prince 1994), despite the fact that there is no evidence for the preference toward those unmarked structures in L1 or L2 (Altenberg and Vago, 1983; Broselow et al., 1998; Broselow and Finer, 1991; Eckman, 2004a) (the definition of “unmarked” is clarified shortly below). The question that this paper addresses is whether we observe the emergence of the unmarked in L2

acquisition in domains other than phonology. There are some studies which answer positively to this question, if not unambiguously so (Ayoun, 1996; Broselow and Finer, 1991; Eckman, 2004b), and our study offers an additional case study.

In order to address this question of whether we observe the emergence of the unmarked in L2 acquisition, the current experiment tested the case of the interpretations of null subjects where L1 transfer and the markedness principle make different predictions. The experiment demonstrates that the majority of speakers show behaviors that are compatible with the markedness theory (i.e. they show the emergence of the unmarked), even when their native language allows both the unmarked and marked readings.

1.2 Background: what is markedness?

We first start our discussion by clarifying the notion of “markedness” (Jakobson 1941 and Trubetzkoy 1939/1969 *et seq.*), which has been used to express several different notions, not all of which are well received or well defined (Haspelmath, 2006). We use the notion of markedness which can be defined formally, following Greenberg’s (1978) seminal study on relating markedness with implicational universals. The formalization of markedness that we deploy in this paper is based on a cross-linguistic implicational universal (following e.g. Eckman 1977, 2004b; Greenberg 1978; Prince and Smolensky 1993/2004), as defined in (1).

- (1) The linguistic structure X is marked and Y is unmarked, if all languages that allow Y also allow X, but not vice versa.

One claim of the markedness theory is that speakers acquire unmarked structures before marked structures, both in L1 acquisition (Demuth, 2011; Gnanadesikan, 2004; Jakobson, 1941) and L2 acquisition (Eckman, 1977, 2004b; Jin, 2008).

One note on our use of markedness is in order: we can recast the definition of markedness in terms of the subset-superset relationship, as used in the Subset Principle in language acquisition (Berwick, 1985; Crain and Thornton, 1998; Wexler, 1993): The unmarked structure X is an element in the subset languages (also allowed in the superset languages). As long as markedness is defined in terms of implicational universal, the markedness theory, which predicts that learners start acquiring unmarked structures first (in the face of positive evidence), makes the same prediction as the Subset Principle.¹ See Monou (2013) for the interpretation of the current results from this perspective.

Now turning our attention back to the markedness theory, to illustrate the effect of markedness on language acquisition, we can consider the phonological crosslinguistic generalizations regarding the set of oral stop consonants. To simplify a bit, we find languages only with voiceless stops (e.g. Hawaiian: Pukui and Elbert 1979), and languages with both voiceless and voiced stops (e.g. English), but no languages that allow only voiced stops (Hayes and Steriade, 2004; Ohala, 1983). In this sense, voiceless stops are unmarked, and voiced stops are marked.

Broselow et al. (1998) show that when speakers of Mandarin Chinese learn English, they undergo a state in which they acquire only voiceless stops in coda, and not voiced stops (i.e. they show emergent coda devoicing), despite the fact that their native language allows neither voiceless nor voiced stops in coda position. Altenberg and Vago (1983) likewise show that Hungarian learners of

English sometimes show emergent coda devoicing, despite that both English and Hungarian have voiced stops.

1.3 A case study: null subject construction

To test the theory of markedness in a domain other than phonology, especially in comparison with L1 transfer, our current study used null subject construction in Japanese and Mandarin Chinese, as exemplified in (2).

(2) Null subject construction in Japanese

a. San-nin-no keisatu-ga Sato-san-no ie-ni kita.
three-CL-no police-officer-NOM Ms. Sato-GEN house-DAT came
'Three police officers came to Ms. Sato's house.'

b. *e* Yamada-san-no ie-ni-mo kita.
NULL Ms. Yamada- GEN house- DAT -also came
'(The) Three police officers also came to Ms. Yamada's house.'

This sentence is ambiguous in terms of the interpretation of null subjects (see Oku 1998 and Takahashi 2008). In one reading, which we call the "pro reading", the three policemen who came to Ms. Yamada's house must be the same as those who came to Ms. Sato's house, as illustrated in Figure 1. On the other hand, in the other reading, which we call "quantificational reading", the two sets of three policemen do not have to be the same, as illustrated in Figure 2.

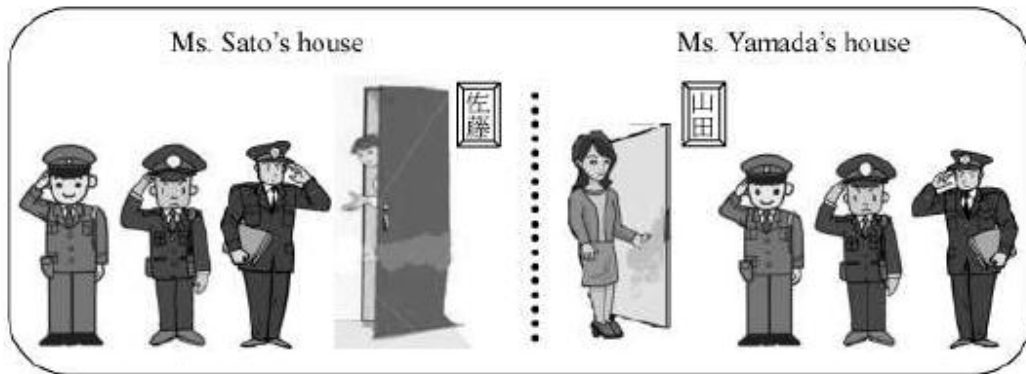


Figure 1: Illustration of the pro reading

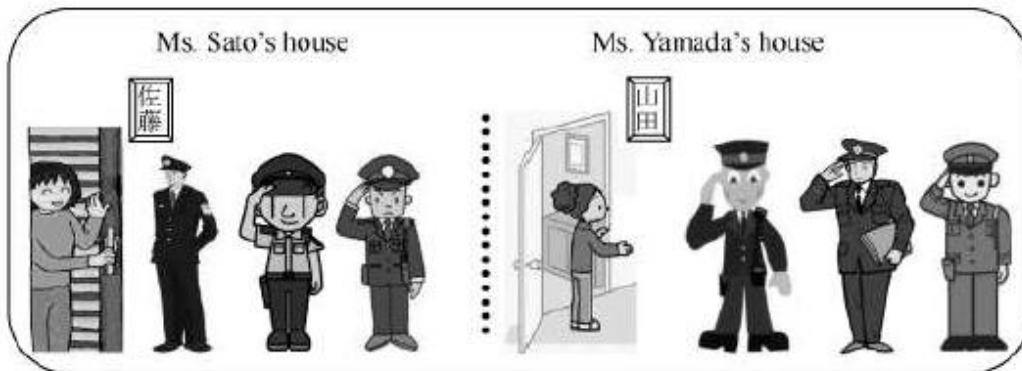


Figure 2: Illustration of the quantificational reading

The equivalent sentence in Mandarin Chinese, given in (3), on the other hand, is not ambiguous: it only allows the pro reading (as in Figure 1).²

(3) Null subject sentence in Mandarin Chinese

a. Sān-ge jǐngchá lái-le Zuǒténg jiā,
three-CL police-officer come-ASP Ms. Sato's house

‘Three police officers came to Ms. Sato’s house.’

b. e yě lái-le Shāntián jiā.

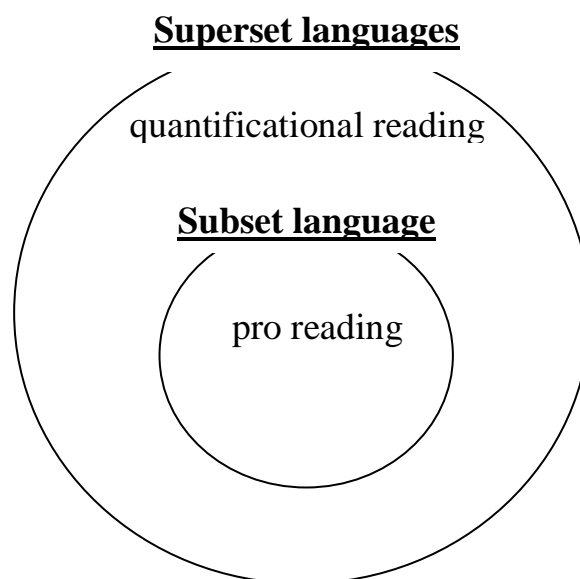
NULL also come-ASP Ms. Yamada's house

‘The three police officers also came to Ms. Yamada’s house.’

Japanese allows the two readings (the pro reading and the quantificational reading), while Mandarin Chinese allows only the pro reading.³ In this sense, Mandarin Chinese is a subset language with respect to Japanese, hinting at the markedness relationship between the two readings.

To further investigate this markedness relationship between the two readings, Monou (2013) (Chapter 6) conducted a cross-linguistic survey with 9 languages with null subjects. The result reveals: (i) languages with both readings (Korean, Japanese, and Greek), (ii) languages with only the pro reading (Basque, Mandarin Chinese, Italian, Serbo-Croatian, Spanish, and Turkish), but (iii) no languages with only the quantificational reading.⁴ The cross-linguistic distribution of the two readings is illustrated in (4).

(4) The markedness relationship between the two readings



Given the distribution illustrated in (4) and the definition of markedness in

(1), the pro reading is the unmarked reading (or the “subset reading”), while the quantificational reading is the marked reading (or the “superset reading”).⁵

Given this markedness relationship between the two readings, the markedness theory and L1 transfer make different predictions when Japanese speakers (the superset language) learn Mandarin Chinese (the subset languages) as L2. On the one hand, L1 transfer predicts that Japanese speakers would accept both readings in Mandarin Chinese sentences, since their L1 (=Japanese) allows both readings. On the other hand, the markedness principle predicts that Japanese speakers start with the unmarked, subset reading (i.e. the pro reading). The following experiment was set out to tease apart these two predictions.

2 Method

2.1 Participants

The experiment targeted introductory learners, who were unlikely to have learned the Mandarin Chinese pattern (see below for more on this). Targeting these participants allowed us to tap the initial L2 learning state. As a pre-test screening, Japanese speakers learning Mandarin Chinese were first tested on whether they knew all the Mandarin Chinese words used in the stimulus sentences and also if they are familiar with sequences of two sentences in Mandarin Chinese. If there was any word in the test sentences that they did not know or if they were not familiar with sequences of two sentences, then that participants data were excluded from the following analysis.

The remaining participants were 22 introductory-level Japanese learners of Mandarin Chinese, who were undergraduate students at Keio University, Tokyo, Japan. The age of first exposure to Mandarin Chinese ranged from 18;7 to 19;5 (average: 18;11—well after the critical period). The duration of exposure of

formal instruction in Japan ranged from 0;10 to 1;10. (average: 0;11, about a year). 10 native Mandarin Chinese-speakers also participated in this experiment as a control group.⁶

2.2 Stimuli

The target stimuli were five sets of Mandarin Chinese sentences with null subjects; the list of all the stimulus sentences is given in the appendix. As control stimuli, we also included five sets of equivalent Japanese sentences. Those who did not judge the Japanese control sentences as ambiguous were excluded from the analysis, because for those speakers, L1 transfer and the markedness theory do not make different predictions.

2.3 Task

The task was a truth value judgment task (Crain and Thornton, 1998). A picture that depicts a particular interpretation (examples shown previously in Figures 1 and 2) was shown along with each target sentence. The participants were asked to indicate whether each sentence correctly described the picture. The two questions on the same sentence were presented separately; i.e. there was only one question per trial. The task was thus not to judge whether there is an ambiguity for the stimulus sentences, nor was it to compare the grammaticality of the two readings for the stimulus sentences.

For each sentence, the picture that indicates the quantificational interpretation was presented before the picture that indicates the pro reading. It was expected to be easier for native Mandarin Chinese speakers and Japanese learners to assign the pro reading than the quantificational reading, and this ordering structure of the current experiment avoided the possibility of the pro

reading priming the quantificational reading for the same sentence.

3 Results

Figure 3 presents a histogram which illustrates the distribution of participants according to the number of sentences for which the pro reading was accepted (out of 5 sentences). It shows that almost all the participants judged the pro reading to be possible: 20 out of 22 participants accepted the pro reading for more than 4 items out of 5 items; overall, the acceptance percentage of the pro reading across all the participants was 86.4%.

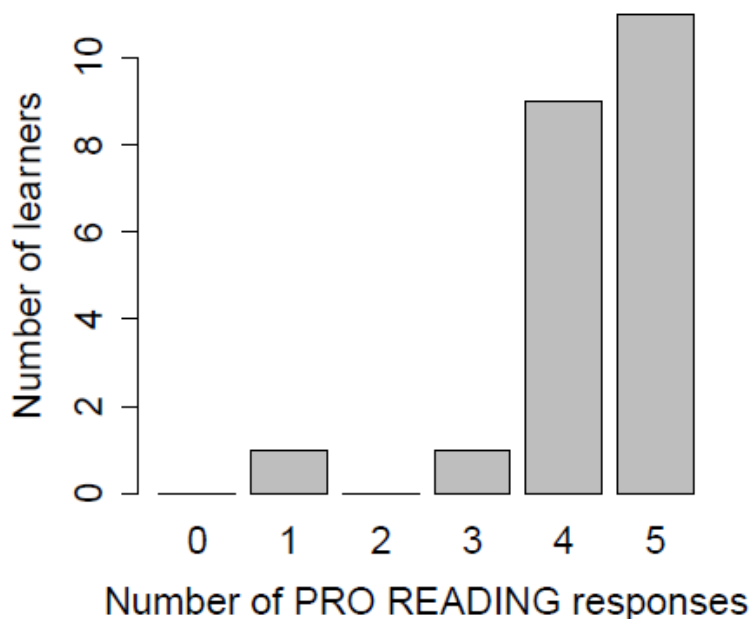


Figure 3: A histogram illustrating the distribution of participants according to the number of sentences for which the pro reading was accepted (out of 5 items).

Figure 4 illustrates how many participants accepted the quantificational reading how many times out of the 5 test items. In contrast to the pro reading, many learners rejected the quantificational reading; 15 speakers accepted the quantificational reading at most 2 times; the overall acceptance percentage was

35.5%. The difference between the two readings in terms of their acceptance rate is significant, according to a within-subject Wilcoxon test ($p < .001$).

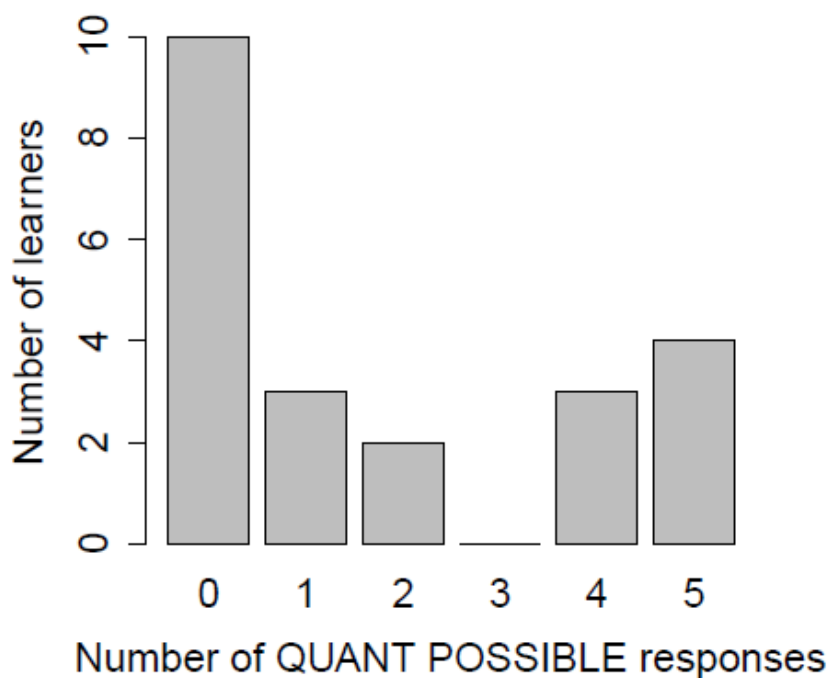


Figure 4: A histogram illustrating the distribution of participants according to the number of sentences for which quantificational reading was accepted (out of 5 items).

4 Discussion

4.1 The emergence of the unmarked

The majority of the participants showed the behavior that is compatible with the theory of markedness (they showed the emergence of the unmarked); i.e. they accepted only the unmarked, pro reading. Therefore, the behavior of these participants supports the theory of markedness (or the Subset Principle; see Monou 2013).

However, some other learners accepted both readings (the marked and unmarked). L1 transfer may have governed the behavior of these speakers. It

may be that there are two groups of speakers, one group following the markedness principle and the other group following L1 transfer. It is interesting that no participants showed a mixed behavior—no participants judged the quantificational reading to be possible 3 times out of 5 items.

One may argue that the participants who showed the emergence of the unmarked effect could have simply learned the lack of quantificational reading in Mandarin Chinese. However, there are three pieces of evidence that that scenario is unlikely. First, their textbooks (*Daigaku Itinenseinotameno Chugokugo* ‘Chinese Textbook for Freshman’ and *Daigaku Ninenseinotameno Chugokugo* ‘Chinese Textbook for Sophomore’) do not mention the potential ambiguity of null subject sentences. Second, their language instructors testified that they do not explicitly teach the ambiguity in Japanese. Third, after the experiment, the participants all reported that they had never been explicitly taught the ambiguity of null subject constructions.

Alternatively, one could also argue that the participants simply did not like ambiguity. This explanation is unlikely, because all the participants, whose data are reported in this paper, did not have a trouble detecting the ambiguity for Japanese sentences (i.e. the control stimuli). Recall also that the task was not to detect an ambiguity of the test sentences.

One final issue is that it could have been that the quantificational reading imposed more processing burden, because it introduced a new set of referents (see Figure 2). This purported additional psycholinguistic burden may have led to the rejection of the quantificational reading in the current experiment. While additional studies are necessary to address this alternative, so far we found no evidence that this purported difference in processing burden influences their judgments when they judged L1 sentences—those participants reported in this

paper are those that did not find difficulty in identifying the quantificational reading in Japanese. In addition, we do not yet know if the quantificational reading imposes substantially more psycholinguistic burden to process than the pro reading in this context. This assumption needs to be shown in future experimental work (cf. Crain and Steedman 1985).

4.2 More remaining questions and issues

Before concluding this paper, we discuss some remaining questions and issues. First, one may be concerned about the small number of items and the order effect (although the ordering of the stimuli was done for a reason; see above). We acknowledge that these could be concerns, and plan to run follow-up studies with more test items, possibly with randomization of all stimulus sentences.

Second, a question arises as to why the participants in our current study split into two groups—those that followed the markedness principle and those that followed L1 transfer. We do not have clear answers to this question. At least their age and duration of exposure to L2 are comparable across all participants, which therefore cannot be the separating factor.

A related question is whether, in other similar situations in which L1 transfer and grammatical principles conflict, L2 learners split into those that follow L1 transfer and those that follow grammatical principles. Monou (2013), in Chapter 4, reports a similar split in the case of the interpretation of bare nouns by Japanese speakers learning Mandarin Chinese; but again, further experimentation is needed to address this question.

The current experiment may raise more questions than it answers, but it is hoped that it leads to further experimentation on the issue of how L1 transfer,

grammatical principles, and possibly psycholinguistic factors interact in L2 acquisition.

4.3 Final summary

L1 transfer and some linguistic mechanisms (markedness pressure or the Subset Principle) can conflict. In the case of the interpretation of null subjects, while some speakers showed evidence for L1 transfer, many speakers showed behaviors that are compatible with the grammatical principle(s) (the emergence of the unmarked or the Subset Principle)—the behavior of the majority of these speakers cannot be explained by L1 transfer.

Appendix: the list of stimulus sentences

- (A) a. Sān-ge jǐngchá lái-le Gāoqiáo jiā,
three-CL police officer come-ASP Ms. Takahashi's house
'The three police officers came to Ms. Sato's house.'
- b. *e* yě lái-le Língmù jiā.
also come-ASP Ms. Suzuki's house
'**They** also came to Ms. Suzuki's house.'
- (B) a. Liǎng-ge xiǎoshòuyuán lái-le Zuǒténg jiā,
two-CL salesman come-ASP Ms. Sato's house
'The two salesmen came to Ms. Sato's house.'
- b. *e* yě lái-le Shāntián jiā.
also come-ASP Ms. Yamada's house
'**They** also came to Ms. Yamada's house.'
- (C) a. Liǎng-ge bàozhǐjìzhě lái-le Língmù jiā,
two-CL newspaper reporter come-ASP Ms. Suzuki's house
'The two newspaper reporters came to Ms. Suzuki's house.'

b. *e* yě lái-le Zhōngcūn jiā.
also come-ASP Ms. Nakamura's house
'**They** also came to Ms. Nakamura's house.'

(D) a. Sān-ge xiǎotōur jìnrù-le Xiǎolín jiā,
three-CL thief break.into-ASP Ms. Kobayashi's house
'The three thieves broke into Ms. Kobayashi's house.'

b. *e* yě jìnrù-le Tiánzhōng jiā.
also break.into-ASP Ms. Tanaka's house
'**They** also broke into Ms. Tanaka's house.'

(E) a. Liǎng-ge yóudìyuán lái-le Yīténg jiā,
two-CL postofficer come-ASP Ms. Ito's house
'The two postofficers came to Ms. Ito's house.'

b. *e* yě lái-le Língmù jiā.
also come-ASP Ms. Suzuki's house
'**They** also came to Ms. Suzuki's house.'

Notes

*The experiment was first reported in Chapter 3 of Monou (2013). Portions of this experiment were presented at various occasions, including the 12th Annual Conference of the Japan Second Language Association, TPL, and Tokyo Conference on Psycholinguistics 2013. We are grateful for the feedback we received at these occasions. We also would like to express our gratitude to Makiko Hirakawa, Julien Musolino, Yukio Otsu, and William O'Grady for valuable comments and suggestions. We thank Chris Kish and Jess Trombetta for checking the English of the final draft. All remaining errors are ours.

¹ Optimality Theory (Prince and Smolensky, 1993/2004), which capitalizes on markedness principles, posits that in the initial state, all markedness constraints, which prohibit marked structures, are ranked higher than faithfulness constraints, which require faithful mapping between inputs and outputs. This $M \gg F$ bias is proposed to account for the general subset problem in language learning (e.g. Smolensky 1996 and Tesar and Smolensky 1998, p.253-254).

² If the subjects are left adjacent to the verb (where elements get a nonspecific interpretation in general), elided null subjects in Mandarin Chinese can refer to a different set of (three) police officers (Li Fei and Na Ta, p.c.). However, what is crucial here is the quantificational reading is impossible in sentences that we study in our experiment. This point is confirmed by the control participants in our experiment.

³ We do not address the question of where this difference between the two languages comes from. For example, assuming that the null subject arises from ellipsis (see Oku 1998 and Takahashi 2008), it may be that Japanese noun phrase structures copied to a null subject position at LF are different from their Mandarin Chinese counterparts (see e.g. Cheng and Sybesma 1999; Kagegawa 2000; Tateishi 1989; Watanabe 2006 for relevant discussion).

⁴ We do not intend to argue that a sample of 9 languages is enough to establish a universal markedness relationship, but we take it that this survey provides a reasonable start. Also, as one may expect, there are some complications in some languages (it is sometimes not as simple as “this language allows only the pro reading”). See Monou (2013) (Chapter 6) for actual sentences and details.

⁵ This markedness asymmetry may be grounded in an additional processing burden of introducing new referents for the quantificational reading (cf. Eckman 2004b; Hawkins and Cutler 1988; Hawkins 1992), but we nevertheless take the

position that this psycholinguistic difficulty is grammaticalized via some abstraction (Monou, 2013). To reproduce the argument, in a sentence like (i):

- (i) a. Atsushi_i-ga Hanako-no ie-ni kita.
Atsushi-NOM Hanako-no house-DAT came
'Atsushi came to Hanako's house.'
- b. Mayumi_j-ga Mika-no ie-ni kita.
Mayumi-NOM Mika-no house-DAT came
'Mayumi came to Mika's house.'
- c. $e_{*i/j}$ Naomi-no ie-ni-mo kita.
Naomi-no house-DAT-ALSO came
'Mayumi came to Naomi's house.'

The null subject in (i-c) cannot refer to the non-local subject (i.e. Atsushi) at all, regardless of how far—or close—they are. If the referents of the null subjects are determined only on the basis of processing burden, we would observe a more gradient pattern; the most local subject is easiest to co-refer, the second to most local subject is next, etc. The dichotomy between local and non-local subjects indicates that some sort of abstract is at work.

⁶The result from the control group (native speakers of Mandarin Chinese) shows that the quantificational reading is generally impossible in Mandarin Chinese; the reading was rejected 84% of the time.

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(tomoko.monou@gmail.com)

(kawahara@icl.keio.ac.jp)