Distributive quantifier scope in English-Japanese and Korean-Japanese interlanguage

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This article reports on an experimental investigation of knowledge of distributivity in non-native (L2) Japanese learners whose first language (L1) is English or Korean. The availability of distributive scope in Japanese is modulated by word order and the semantic features of quantifiers. For English-speaking learners, these subtle interpretive phenomena are underdetermined in both the input and the L1. However, for Korean speakers, target-like knowledge could arise via L1 transfer. The results yield clear evidence of distinct developmental paths in the two L1 groups, testifying to L1 influence on the syntax-semantic interface. Nonetheless, some English-speaking learners exhibit target-like distributive readings despite the lack of direct evidence. This development of target-like knowledge in the absence of evidence is accounted for by integrating Sprouse's (2006) lexical transfer account of L2 acquisition and a Universal Grammar model (Beghelli (1995)) of distributive scope.

1. Introduction

This study investigates adult L2 knowledge of distributive readings of universal quantifiers, with the aim of shedding light on the roles of L1 knowledge and Universal Grammar (UG) in L2 acquisition at the syntax-semantics interface. A distributive interpretation arises when the individuals within the domain of one quantifier co-vary with those within the domain of another. Thus in *Everyone read a book*, a distributive reading obtains if each person read a distinct book. However, the availability of distributive interpretations is affected by the semantic features of different quantifiers and by word order, leading to variation both within a given language (when one quantifier allows distributivity but another one doesn't), and cross-linguistically. For L2 learners, acquisition of such idiosyncratic form-meaning effects often represents a severe learnability problem. This study builds on the small but growing

body of research that investigates syntax-semantics interface phenomena (see Slabakova (2006)) in order to discover (i) whether L2 learners of typologically distinct L1s exhibit divergent developmental paths with respect to the acquisition of target language phenomena; and (ii) whether L2 learners can overcome severe learnability problems at the syntax-semantics interface.

The utility of investigation of L2 learnability—or poverty-of-the-stimulus—problems has long been observed (White (1989a; 1989b), Schwartz and Sprouse (2000)). As is well known, the concept of poverty of the stimulus comes from L1 acquisition. Hornstein and Lightfoot (1981, 9) observed that "[p]eople attain knowledge of the structure of their language for which no evidence is available in the data to which they are exposed as children." Universal Grammar—a set of innate, linguistic constraints—is proposed as the mechanism that bridges this gap between the evidence (i.e., the input) and L1 knowledge. In L2 acquisition research, a key question concerns whether, similarly, learners attain knowledge of their L2 for which no evidence is available. In this case, evidence could potentially come not only from the target language input, but also via transfer from the L1, or from classroom instruction. If L2 learners demonstrate knowledge of a target-language property despite the absence of evidence from these three sources, then this would provide support for proposals that L2 acquisition is constrained by the same domain-specific mechanisms as L1 acquisition—in other words, by UG (e.g., Grondin and White (1996), Schwartz (1986), Schwartz and Sprouse (1994; 1996), Vainikka and Young-Scholten (1996)).

The L2 poverty of the stimulus problem in the present study concerns acquisition of distributive scope effects in Japanese that vary with scrambling and with quantifier type. Two previous studies indicate that L2 learners can overcome poverty of the stimulus in the domain of quantification along with word order permutation. Unsworth (2005), investigating English-

Dutch interlanguage, and Dekydtspotter, Sprouse & Swanson (2001), investigating English-French interlanguage, found that advanced learners demonstrated target-like knowledge of interpretive differences between sentences containing quantified NPs, where a minimal word order change resulted in a change to the number of interpretations available. In both cases, L2 acquisition of the absence of a particular interpretation is identified as a poverty-of-the-stimulus problem.

The present study expands on previous work by comparing learners with different L1s—English or Korean—in order to test for L1-transfer effects. Certain Japanese quantifier scope interpretation effects are shown to represent a poverty-of-the-stimulus problem for English-speaking learners, whereas for Korean-speaking learners, they could be acquired by L1 transfer. Adopting Schwartz and Sprouse's (1994, 1996) Full Transfer/Full Access model of L2 acquisition, whereby the L1 grammar in its entirety comprises the initial-state interlanguage, it is predicted that Korean-speaking learners of Japanese will demonstrate target-like scope interpretation in Japanese even at lower levels of proficiency, whereas English-speaking learners will not. This prediction is borne out by the experimental results. However, at higher proficiency levels, English-speaking learners demonstrate target-like scope interpretation in Japanese. In other words the advanced learners are able to overcome L2 poverty of the stimulus. This finding is argued to provide evidence that L2 acquisition is constrained by UG. The paper then concludes with an exploration—drawing on Sprouse's (2006) lexical transfer model of L2 acquisition—of how exactly UG mechanisms and L1 transfer may interact to yield the different patterns of development of knowledge of distributive quantifier scope found in English-Japanese and Korean-Japanese interlanguage.

2. Universal quantifiers and object-wide distributive scope in Japanese, Korean, and English

Japanese and Korean exhibit an interpretation contrast induced by scrambling, in sentences with an existentially-quantified subject and a universally quantified object (henceforth, 'QP-QP' sentences) (e.g., Beck & Kim (1997), Hoji (1985), Kim (1989), Kuno (1973), Kuroda (1970)). With canonical SOV word order, only a subject-wide interpretation is available, as shown in (1a). By contrast, scrambled OSV QP-QP sentences are ambiguous, allowing both subject-wide and object-wide interpretations (1b).[1, 2]

1. a. Japanese: Dareka-ga dono hon-mo yonda.
   Korean: Nwukwunka-ka enu chayk-ina ilkessta.
   someone-Nom every book read
   'Someone read every book.'

   Interpretation:
   S>O: There is some person *x*, such that *x* read every book.

[1] In the Japanese and Korean universally quantified NPs in (1a–b), quantificational force derives from a *wh*-word *dono*/*enu* 'which' in combination with a post-nominal quantificational particle *–mo* in Japanese and *–ina* (or *–na* after a vowel) in Korean. Throughout this paper, QPs with this form are glossed simply as 'every N'. Further details of this type of quantifier are provided later in this section.

[2] Aside from the scope interpretation difference when quantifiers are involved, I assume, following Miyagawa (2003, 179) (among others) that "SOV and OSV word orders are semantically essentially the same." Ishihara (2001) discusses discourse implications of scrambling.

b. Japanese: Dono hon-mo dareka-ga yonda.
Korean: Enu chayk-ina nwukwunka-ka ilkessta.
every book someone-Nom read
'Someone read every book. (scrambled)'

Interpretation:
S>O: There is some person *x*, such that *x* read every book.
O>S: For each book *y*, some person read *y*.

English, which does not exhibit scrambling, has ambiguous QP-QP sentences, allowing both S>O and O>S interpretations, like the scrambled Japanese and Korean QP-QP sentences:

2. Someone read every book.

Interpretation: S>O, O>S

However, the availability of the object-wide scope interpretation decreases in English if the object quantifier is *all* (Beghelli and Stowell (1997), Ioup (1975)):

3. Someone read all the books.

Interpretation: S>O, ??/*O>S

Given the data in (1–3), it seems reasonable to question whether Japanese *dono N-mo* and Korean *enu N-(i)na* would not be better glossed as 'all the N' instead of 'every N', and the sentences in (1a) more accurately compared with English (3) instead of (2). However, a defining difference between *all* and *every* is that the former allows a collective interpretation while the latter does not (Beghelli and Stowell (1997), Gil (1995), Lakoff (1972), Vendler (1967), among others). Thus (4a) can mean that the boys collectively carried a single table upstairs, or *all the boys* can distribute over *a table* such that each boy carried a distinct table. By contrast, (4b) has only the distributive meaning: each boy carried a distinct table.

4. a. All the boys carried a table upstairs.
   b. Every boy carried a table upstairs.

The possibility of a distributive interpretation is crucial in the present study. Beghelli (1995, 58, footnote 7) defines distributivity as follows:

5. […] a QP α occurring in a sentence *s* supports a distributive reading if under this reading we can construe individual elements in the domain of α to co-vary with (the witness set of) another quantifier β that also occurs in the logical representation of *s*.

Thus, in the object-wide scope interpretation of QP-QP sentences like (2), the books in the domain of *every book* can indeed be construed as individual elements that co-vary with distinct readers. By contrast, in *Someone read all the books*, the books cannot be construed as individual elements: only the collective interpretation of *all the books* is possible. A property of English *all* is that it can take scope distributively if it is in subject position (4a) but not in object position (3).

Like English, Japanese and Korean also have more than one universal quantifier that can modify a noun. The QPs glossed as 'every N' (1a–b), belong to a cross-linguistically occurring class of quantifiers in which quantificational force arises from the combination of a wh-word and a quantificational particle: *dono* 'which' and *–mo* 'also' in Japanese, *enu* 'which' and *–(i)na* 'or' in Korean. Such quantifiers display a number of characteristics that are not shared by English *every* (see, among others, Gill, Harlow and Tsoulas (2007), Kim and Kaufmann (2006) and Nishigauchi (1990; 1999) for in-depth discussion). However, data from Kawashima (1996) and Kim and Kaufman (2006) show that they share with *every* the property of allowing a distributive reading but lacking a collective reading. By contrast, alternative Japanese and Korean pre-nominal universal quantifiers yield a collective reading, like English *all*: *subete-no* in Japanese, which comprises the noun *subete* 'everything' and the Japanese genitive particle *no*; and *motun* in Korean, which derives from the noun *motwu* 'everything' with a pre-nominal suffix *–n*. This contrast between *dono…mo/enu…(i)na* 'every' compared with *subete/motun* 'all' is illustrated in (6) (based on Kim and Kaufman (2006) and personal communication with Min-Joo Kim, September 2007, and on author's own survey of native 10 native Japanese speakers).

6. a. Japanese: Dono gakusei-mo piano-o moti-ageta.
Korean: Enu haksayng-ina phiano-lul tulessta.
every student piano-Acc lifted
Distributive interpretation: 'Every student lifted a piano individually.'
Collective interpretation: *'The students all lifted a piano together.'

b. Japanese: Subete-no gakusei-wa piano-o moti-ageta.

Korean: Motun haksayng-un phiano-lul tulessta.

all student-Top piano-Acc lifted

Distributive interpretation: 'Every student lifted a piano individually.'

Collective interpretation: 'The students all lifted a piano together.'

In short, it is reasonable to consider Japanese *dono N-mo* and Korean *enu N-mo* the counterparts of English *every N* in the present QP-QP sentences (as indeed is the case in much of the literature comparing Japanese and Korean QP-QP interpretation with English: Beck and Kim (1997), Hoji (1985), Kim (1989), Sano (2004). Consequently, the absence of the object-wide scope interpretation in (1a) is unexpected, and can be taken to be a genuine cross-linguistic difference when compared with English (2).

The question of how to account for these cross-linguistic and language-internal variations in quantifier scope interpretation is a topic of ongoing research (see Szabolcsi (2001; 2007) for overviews). The present paper will consider a syntactic analysis by Beghelli (1995; 1997) and Beghelli and Stowell (1997), known as the Target Landing Sites model, which specifically addresses the effects of different types of quantifiers in English (e.g., *every* v. *all*), and also has the potential to account for the effects of scrambling on quantifier scope interpretation in Japanese and Korean. However, the key experimental hypotheses in the present study concern L2 acquisition of QP-QP interpretation in Japanese under poverty of the stimulus. As such, they are independent of any particular theory of the linguistic architecture of quantifier scope interpretation, since, following Schwartz & Sprouse (2000), a poverty-of-the-stimulus problem is a poverty-of-the-stimulus problem, no matter what formulation of the relevant UG constraints accounts for the phenomenon in question.

Therefore, presentation of the Target Landing Sites model is postponed until the discussion of the experimental findings in Section 7, where it is specifically relevant. The following section details how the cross-linguistic differences in Japanese, Korean and English QP-QP interpretation are incorporated into the present study's experimental hypotheses.

3. Japanese QP-QP interpretation and L2 learnability

For native English-speaking learners of Japanese, acquisition of the absence of object-wide scope in Japanese SOV QP-QP sentences (such as 1a) meets the criteria of an L2 poverty-of-the-stimulus problem. First, target-like knowledge cannot come from the L1, since, as shown in the previous section, English allows object-wide scope in equivalent QP-QP sentences. Second, the lack of object-wide scope cannot be induced from the target language input. It might be objected that the non-occurrence of Japanese SOV QP-QP sentences in an object-wide scope context would constitute the relevant 'indirect negative evidence' (Chomsky 1981: 9) required to induce that object-wide scope is impossible in such sentences. However, indirect negative evidence arises only in obligatory contexts. Thus, if there were a context in English in which a QP-QP sentence with object-wide scope must obligatorily be used, then English-speaking learners of Japanese might 'notice' that Japanese SOV QP-QP sentences are never used in equivalent contexts, and this might lead to induction of the lack of object-wide scope. Needless to say, there is no such obligatory context: the information expressed by the object-wide scope interpretation of a QP-QP sentence such as *Someone read every book* can always be expressed by an alternative construction, for example, *Every book was read by a different person*. Thus, the fact that English-speaking learners of Japanese do not encounter Japanese SOV QP-QP sentences with object-wide scope cannot logically preclude their existence. Finally, discussion with Japanese language teachers and examination of Japanese language textbooks (including AJLT (1996/1997) and Bowring and Laurie (1992))

confirms that the absence of object-wide scope in Japanese SOV QP-QP sentences is not a topic covered in Japanese language classes. In short, the sources available to English-speaking learners of Japanese do not provide overt evidence of the absence of object-wide scope in Japanese SOV QP-QP sentences with *dono N-mo* 'every N' as object QP. Consequently, if knowledge of the absence of object-wide scope arises in English-Japanese interlanguage, this would suggest that whatever internal mechanisms of UG constrain the acquisition of quantifier scope interpretation in L1 Japanese also operate in L2 acquisition. This logic applies whatever the architecture of UG with respect to scope interpretation.

For native Korean-speaking learners of Japanese there is no poverty-of-the-stimulus problem. Target-like knowledge of the interpretive possibilities of Japanese SOV QP-QP sentences could derive from L1 knowledge, since native Korean also lacks an object-wide scope interpretation in SOV QP-QP sentences. Accordingly, if L1 knowledge plays a role in L2 acquisition, the developmental path of Korean-speaking learners of Japanese is expected to differ from that of English-speaking learners with respect to the interpretative possibilities of Japanese SOV QP-QP sentences with *dono N-mo* 'every N' as object QP.

Two research questions are thus identified:

7. Does the developmental path of native English-speaking learners of Japanese diverge from that of native Korean-speaking learners with respect to acquisition of the absence of object-wide scope in Japanese SOV QP-QP sentences with *dono N-mo* 'every N' as object QP?

8. Can native-English speaking learners of Japanese overcome poverty of the stimulus and acquire the absence of object-wide scope in Japanese SOV QP-QP sentences with *dono N-mo* 'every N' as object QP?

The experimental investigation of these questions aims to test Schwartz and Sprouse's (1994; 1996) Full Transfer/Full Access model of L2 acquisition. According to this model, the initial state of L2 acquisition is characterised by transfer of all of the abstract properties of the L1 grammar to the interlanguage. Subsequent restructuring of this L1-based interlanguage is motivated by failure to represent the target language input; and it is constrained by UG. Under Full Transfer/Full Access, the answer to the question in (7) is predicted to be 'yes'. If L1 knowledge transfers to the interlanguage, then the initial-state English-Japanese interlanguage will allow inverse scope on SOV QP-QP sentences, but the initial-state Korean-Japanese interlanguage will not. Considering (8), if L2 learners have full access to Universal Grammar, then any grammar that is attainable in L1 acquisition is potentially also attainable in L2 acquisition (provided that the transferred L1 knowledge does not obscure evidence in the input that might trigger a particular restructuring. See Schwartz and Sprouse 1994.). Therefore, the answer to (8) should also be 'yes'—but only for learners whose L2 grammar has undergone restructuring beyond the initial state with respect to quantifier scope interpretation. Such restructuring could not be instantaneous: some data must be processed in order to motivate restructuring. This leads to the prediction that target-like knowledge may be absent in lower proficiency learners but present in higher proficiency learners.

The research questions in (7) and (8) are thus re-formulated as hypotheses in terms of Full Transfer/Full Access, as follows:

9. Hypothesis 1: SOV QP-QP sentences with *dono N-mo* 'every N' as object
   a. Due to L1 transfer, lower proficiency learners of Japanese whose L1 is English will allow non-target-like object-wide scope.

b. Due to UG-constrained interlanguage restructuring, higher proficiency learners of Japanese whose L1 is English will reject non-target-like object-wide scope.

c Due to L1 transfer, lower (and higher) proficiency learners of Japanese whose L1 is Korean will reject non-target-like object-wide scope.

Two additional Japanese QP-QP sentence types are included in the investigation, for purposes of comparison: (i) scrambled OSV QP-QP sentences with *dono N-mo* 'every N' as the object (as in 1b); and (ii) SOV QP sentences with the collective *subete-no N* 'all the N' as object QP. Acquisition of the scope interpretation facts of these sentence types does not entail poverty-of-the-stimulus problems. In the latter case, knowledge of the lack of object-wide scope of *subete-no N* 'all the N' could arise by L1 transfer in both L1 groups, since, as seen in the previous section, collective universal quantifiers cross-linguistically do not readily take object-wide scope (assuming that the learners correctly identify *subete* 'all' as having a collective property). Turning back to the scrambled QP-QP sentences, knowledge of scope ambiguity could transfer directly from the L1 in Korean-Japanese interlanguage, since Korean scrambled QP-QP sentences are reported to be interpreted just as in Japanese. In English-Japanese interlanguage, learners must first acquire knowledge of scrambling, since this mechanism is not available in English and therefore cannot transfer to the interlanguage. Scrambling may be acquired via evidence in the input (although Iwasaki (2003, 297) points out, based on summary of a number of corpus studies, that [NP-Acc NP-Nom V] sentences are not common in Japanese). In addition, learners are likely to know about the flexibility of Japanese word order from classroom instruction. Textbooks may not specifically address scrambling, but they usually provide examples of [O…XP…V] sentences in the context of instruction on Japanese particles (e.g., 3A Network (1998, 140–142)). Assuming, thus, that English-speaking learners can interpret a scrambled OSV sentence, then they should allow

both subject-wide and object-wide readings whether or not their interlanguage knowledge is native-like with respect to scope interpretation in non-scrambled sentences. This is because, if the interlanguage allows both subject-wide and (non-native-like) object-wide scope in canonical SOV QP-QP sentences, then there is no reason why this ambiguity should not arise in scrambled OSV QP-QP sentences too. However, if restructuring has occurred so that the interlanguage is target-like in the non-scrambled context (i.e., object-wide scope is blocked) then QP-QP interpretation should presumably be target-like also in scrambled contexts, allowing both S>O and O>S scope. Thus, on the two comparison sentence types, hypotheses are as follows:

10. Hypothesis 2: OSV QP-QP sentences with *dono N-mo* 'every N' as object
    All learners will allow both subject-wide and object-wide scope, regardless of L1 or proficiency.

11. Hypothesis 3: SOV QP-QP sentences with *subete no-N* 'all the N' as object
    All learners will reject object-wide scope, regardless of L1 or proficiency.

Hypotheses 1–3 predict just one key divergence from native-like behaviour: the lower proficiency English-speaking learners of Japanese are predicted to (incorrectly) accept object-wide scope in SOV sentences with *dono N-mo* 'every N' as object. If this pattern arises, then the contrast between the lower proficiency English-speaking learners and the lower proficiency Korean-speaking learners will provide evidence of L1 transfer, while the contrast between the lower proficiency English-speaking learners and the higher proficiency English-speaking learners will provide evidence L2 acquisition being constrained by UG.

4. The experiment

4.1. Participants

Thirty-five English-speaking learners of Japanese ('EJ') and 38 Korean-speaking learners of Japanese ('KJ') participated in the experiment. The learner groups were each divided into intermediate and advanced proficiency sub-groups on the basis of scores on a 42-blank random cloze test. An exact-word scoring method was adopted, and the criterion for classification as 'advanced' was a score of at least 12, 12 being the lowest score within a control group of 30 native Japanese speakers (age 18–31; all resident in Japan at the time of participation). Accordingly, the participant groups detailed in Table 1 were determined ('int' = 'intermediate; 'adv' = 'advanced'). Note that the stringent exact-word scoring of the cloze test meant that even syntactically and semantically appropriate answers were marked wrong if they did not match the original text. Therefore, a very low cloze test score does not necessarily mean total inability to understand the text. For that reason, participants were not excluded on the basis of a low cloze test score. However, some were excluded on the basis of their responses to distractor items in the experimental task (see Section 5).

Table 1: L2 participants[3]

group	no.	age	years living in Japan (y;mo)	cloze test scores	details
		mean (range)	mean (range)	mean (SD) (range)	
EJ int	21	21 (19–30)	0;8 (0;0–1;6)	7.2 (2.2) (3–11)	Students of Japanese at UK universities, resident in UK at time of testing.
EJ adv	12	22 (21–23)	1;2 (1;0–2;2)	14.3 (2.0) (12–18)	
KJ int	23	28 (22–51)	0;6 (0;0–3;6)	6.78 (2.7) (1–11)	Students at universities in Japan or Korea (KJ int: 3 in Japan at time of testing, 20 in Korea; KJ adv: 10 in Japan; 5 in Korea.)
KJ adv	15	24 (21–31)	1;4 (0;0–2;9)	18.00 (4.93) (12–29)	

A one-way ANOVA performed on the learners' proficiency test scores shows that the overall effect of group is significant ($F(3,62) = 53.23$, $p < .001$). Post hoc Games Howell tests show that (i) within each L1 group, the intermediate group scores differ significantly from the advanced group scores ($p \leq .001$); and (ii) there are no significant differences between the scores of the two intermediate groups ($p = .884$) or the two advanced groups ($p = .063$).

In addition, data were collected from 21 native speakers of Japanese ('JJ'), 24 native speakers of English ('EE') and 22 native speakers of Korean ('KK'). All the native control participants were university students: the native Japanese participants (mean age = 23) were resident in Japan; the native Korean participants (mean age = 22) in Korea; and the native English (mean age = 18) in the UK.

[3] For the native Japanese controls group (n=30), the cloze test score data is as follows: mean, 22.4; SD, 4.43; range, 12–33. The native Japanese control group for the cloze test did not include any of the native Japanese

4.2. Procedure

The test design was developed through two stages of pilot testing (see Marsden (2004)) with native Japanese speakers, native English speakers, and English-speaking learners of Japanese (none of whom took part in the resulting task, described here). Judgements in the present task were sought about doubly-quantified SOV and OSV sentences in which the object QP and scope interpretation were varied, as shown in Table 2.

Table 2: Test item types

type	variable			example
	object QP	word order	scope	
Ia	*dono-N mo* 'every N'	SOV	S>O	Dareka-ga dono neko-mo nadeta. someone-NOM every cat stroked 'Someone stroked every cat.'
Ib			*O>S	
Ic		OSV	S>O	Dono neko-mo dareka-ga nadeta. every cat someone-NOM stroked 'Someone stroked every cat. (*scrambled*)'
Id			O>S	
IIa	*subete-no N* 'all the N'	SOV	S>O	Dareka-ga subete-no suutukeesu-o hakonda. someone-NOM all-GEN suitcase-ACC carried 'Someone carried all the suitcases.'
IIb			*O>S	

The scope variable was manipulated by means of pictures depicting either a subject-wide or object-wide context for each sentence. Figure 1 shows the subject-wide and object-wide

participants in the experimental study, detailed below.

scope pictures for the Type Ia–d examples from Table 2. (See the appendix for the full set of test items.)

Figure 1: Subject-wide and object-wide scope pictures for *Dareka-ga dono neko-mo nadeta* 'Someone stroked every cat'

S>O scope picture

O>S scope picture

Ten tokens were created of each type.[4] The resulting 60 test items were divided into two sets, in order to relieve the potentially great concentration burden of judging so many test items at once. Fourteen distractors were added to each set. The distractors were designed to blend in with the test sentences in that they all contained at least one quantified NP and they had the same basic structure as the test items, namely [SOV.PAST] or [OSV.PAST]. All participants judged both test sets, with at least a short break between the two sets.[5] To control for any

[4] As can be seen in the appendix, for each test type, five of the exemplars had *dareka* 'someone' as the existential subject QP, and five had a numerically modified noun such as *sannin-no onnanoko* 'three girls'. No effect of subject QP was predicted, and analysis of the results show that none occurred. The different subject QPs are not discussed further in the present paper.

[5] In most cases, there was about a week between judging the first and the second set. However, in some cases, timetable restrictions at the test venue meant that both sets had to be judged on the same day.

effects of the order of presentation, some participants judged Set 1 followed by Set 2, while the others judged Set 2 followed by Set 1. In addition, there were two random presentation orders for the test items within each set. Some participants experienced Order 1 while others experienced Order 2, which was the reverse of Order 1.

The procedure for judging the sentences was as follows. Participants viewed each picture on an overhead projector screen for 10 seconds without the corresponding sentence. Then, the written sentence was revealed, and, at the same time, an audio-recording of the sentence was played. (Recordings were made by a native speaker using neutral, natural stress.) The picture and sentence remained on the screen together for 15 seconds. Presenting the picture (that is to say, the interpretation) before the sentence was intended to reduce the possibility of participants determining their own interpretation of each sentence, then rejecting any picture-sentence pairings—possible or not—that did not match their preconceived idea.

The test sentences were presented in standard Japanese script with standard Japanese phonetic glosses (*furigana*) above the ideographs, in order to ensure that learners would not have difficulty reading the sentences. To make the past tense seem appropriate, the participants were instructed that each picture showed events that happened yesterday. They were asked to consider 'does the picture match the sentence?' and to indicate their judgement on an answer sheet, using a 4-point rating scheme: –2 = "no, definitely not"; –1 = "not exactly"; +1 = "yes, kind of"; +2 = "yes, perfectly". A fifth option of "X" for "can't decide" was also available. The test items themselves did not appear on the answer sheet, thus minimising the chance of participants going back and changing answers. The test was preceded by a training session including six examples (not of the types in Table 2). This was to familiarise the participants with the rating system, and also to draw attention to the

complexity of some of the pictures and the need to pay attention to the details of each picture before answering.

The native English and Korean control groups completed versions of the task in their respective languages. The procedure was exactly as for the Japanese version. However, the test batteries were slightly different. The English version did not include the scrambled test items (i.e., Types Ic–d in Table 2). The Korean version investigated only the collective universal QP *motun N* 'all the N'. Additional Korean data were collected by seeking judgements from twelve native Korean speakers about the sentences in (12a–b).

12. a. Nwukwunka-ka enu koyangi-na ssutatumessta.
someone-Nom every cat stroked
'Someone stroked every cat.'

b. Enu koyangi-na nwukwunka-ka ssutatumessta.
every cat someone-Nom stroked
'Someone stroked every cat. (scrambled)'

The sentences in (12a–b) were presented to informants in standard Korean script, accompanied by the subject-wide and object-wide scope pictures shown in Figure 1.

5. Experimental results

The data from participants who got three or more distractor items wrong were excluded from the analysis, with the view that such errors could indicate problems with comprehension or attention. On this basis, one participant was excluded from the JJ group, three from the

intermediate EJ group, two from the intermediate KJ group, and four from the KK group. A further intermediate KJ participant was excluded due to an illegible answer sheet.

For the analysis, responses of "+1" or "+2" are considered to indicate acceptance of a particular scope interpretation, and responses of "–2" or '–1', rejection. Selections of "X" ("can't decide") accounted for only 0.005% of responses to the test items. Therefore, the "rejection" ratings are virtually a mirror image of the "acceptance" ratings. The results are presented here in terms of the proportions of acceptance ratings by group. A crucial index of the participants' knowledge of Japanese QP-QP scope interaction comes from the relative acceptability within each group of the three object-wide scope conditions. Therefore two paired samples t-tests were run for each group comparing (i) acceptance of object-wide scope in the two SOV sentence types: Type Ib (object = *dono N-mo* 'every N') v. Type IIb (object = *subete-no N* 'all the N'); and (ii) acceptance of object-wide scope of *dono N-mo* 'every N' in non-scrambled and scrambled QP-QP sentences: Type Ib (SOV) v. Type Id (OSV). (For the native English group, the two t-tests compared (i) Type Ib with Type IIb and (ii) Type Ib with Type Ia (S>O scope, object = *every N*.)) Since the Type Ib data for each group are used in two t-tests, α for these tests is set at .025 (.05/2). In addition, the statistical significance of key between-group contrasts is investigated by means of Repeated Measures ANOVA followed by post hoc tests.

5.1. Japanese, English, and Korean control data

The native control results, shown in Table 3, confirm that the theoretical claims about scope interpretation in Japanese, English and Korean are indeed attested in the experimental data.

Table 3: Percentage acceptance in native Japanese, English and Korean (raw numbers in parentheses)

	Type Ia	Type Ib	Type Ic	Type Id	Type IIa	Type IIb
obj QP:	Japanese: dono N-mo English: every N				Japanese: subete-no N English: all the N Korean: motun N	
word order	SOV		OSV		SOV	
scope:	S>O	O>S	S>O	O>S	S>O	O>S
GROUP						
JJ (n=20)	87.50 (175/200)	16.00 (32/200)	80.50 (161/200)	81.50 (163/200)	90.00 (180/200)	16.50 (33/200)
EE (n=24)	98.00 (115/240)	67.50 (162/240)	n/a	n/a	99.60 (239/240)	21.30 (51/240)
KK (n=22)	Experimental data not available. 12/12 0/12 ??? 8/12 Informally collected data described below.				77.30 (179/220)	20.00 (44/220)

Considering each group in turn, the native Japanese group has high rates of acceptance (>80%) for all sentence types except the two non-scrambled (SOV) object-wide sentence types, Types Ib and IIb, where acceptance is around 16%. Thus, as expected, object-wide scope is unacceptable in Japanese canonical SOV QP-QP sentences regardless of whether the object QP is *dono N-mo* 'every N' or *subete no N* 'all the N'. However, with scrambled OSV word order, object-wide scope becomes readily acceptable (Type Id, 81.6% acceptance). T-tests confirm that is no difference in the (un)acceptability of object-wide scope between *dono N-mo* 'every N' (Type Ib) and *subete-no N* 'all the N' (Type IIb) in non-scrambled QP-QP sentences (t = .396, df = 19, p = .697). However, object-wide scope is

significantly more acceptable on scrambled QP-QP sentences (Type Id) than canonical SOV sentences (Type Ib) ($t = -12.064$, $df = 19$, $p < .001$).

Turning to the native English data, the key difference compared with the native Japanese data is the considerably higher acceptance of object-wide scope on Type Ib, where the object QP is *every N*, although the acceptance rate of 67.5% is not as high as for subject-wide scope (≥98% on Types Ia and IIa). Nonetheless, this acceptance rate for object-wide scope with *every N* (Type Ib) is significantly higher than with *all the N* (Type IIb) (67.5% v. 21.3%: $t = 7.876$, $df = 23$, $p < .001$). A repeated measures ANOVA run on the non-scrambled sentence data (Types Ia, Ib, IIa and IIb) of the native Japanese and English controls as well as all the learner groups, reveals significant main effects of group ($F(5, 104) = 13.24$, $p < .001$), as well, scope (SOV v. OSV) ($F(1, 104) = 23.18$, $p < .001$) and object quantifier (*dono…mo*/*every* v. *subete*/*all*) ($F(1, 104) = 804.9$, $p < .001$). All interactions of the three variables are also significant. Post hoc Games Howell tests confirm that for Type Ib (O>S scope with *dono N-mo/every N*) the native English acceptance rate is significantly higher than that of the native Japanese group ($p < .001$). In other words, the data provide quantitative evidence of the cross-linguistic difference asserted in Section 2: object-wide scope is available in English SOV QP-QP sentences (with *every N* as the object QP) but not in Japanese.

The native English group's relatively lower acceptance of O>S scope than S>O scope with *every N* is consistent with numerous observations in the literature (e.g., Szabolcsi 2007: 21–22, "What tends to be difficult to tell is whether inverse scopal orders are possible."), and also with the findings of previous experimental studies. For example, in separate judgement tasks conducted by Kurtzman and MacDonald (1993) and Lee, Yip & Wang (1999), native English speakers accepted object-wide scope less readily than subject-wide scope in QP-QP test sentences where both scope readings were theoretically available. In the present native

English data set, a paired samples t-test shows that the contrast between object-wide scope and subject-wide scope with *every N* is statistically significant (Type Ia 98% v. Type Ib 67.5%: $t = 6.3$, $df = 23$, $p < .001$). This has implications for the analysis of the L2 Japanese data by native English speakers in that, when considering whether these learners have acquired native-like knowledge of the absence of object-wide scope with distributive quantifiers in Japanese, it will not be appropriate to measure whether their acceptance levels for object-wide scope with *dono N-mo* 'every N' (Type Ib) are significantly lower than for the subject-wide scope counterpart (Type Ia). The native English data show that such a significant difference might arise via L1 transfer. Instead, the analysis, reported in the following section, will focus on whether the English-speaking learners exhibit a target-like pattern across all three Japanese object-wide scope sentence types.

Turning to the informally collected data on the SOV and OSV versions of the Korean Type I sentence in (12), *Nwukwunka-ka enu koyangi-na ssutatumessta* 'Someone stroked every cat', all twelve informants accepted subject-wide scope for both the canonical (12a) and scrambled (12b) sentences; all rejected object-wide scope for the canonical sentence (12a); and eight of the twelve (67%) accepted object-wide scope on the scrambled sentence (12b). Thus, this informal finding is consistent with the claim that Korean patterns with Japanese, lacking an object-wide scope interpretation in SOV QP-QP sentences, but exhibiting both object-wide and subject-wide scope when the object QP is scrambled over the subject. The Korean data in Table 3 for the Type II sentences are also as expected: subject-wide scope is generally acceptable (77.3%) on SOV QP-QP sentences with *motun-N* 'all the N' as the object quantifier, but object-wide scope is unacceptable (20%).

In short, the native control data confirm that: (i) object-wide scope is acceptable in English QP-QP sentences when the object quantifier is *every*, but not when it is *all*; (ii) object-wide scope is not acceptable in Japanese or Korean SOV QP-QP sentences; (iii) both

object-wide and subject-wide scope are acceptable in scrambled Japanese and Korean QP-QP sentences with a distributive object quantifier.

5.2. L2 Japanese data

The rates of acceptance of the different sentence types by each learner group are presented in Table 4.

Table 4: Percentage acceptance in non-native Japanese (raw numbers in parentheses)

	Type Ia	Type Ib	Type Ic	Type Id	Type IIa	Type IIb
obj QP:	*dono N-mo* 'every N'				*subete-no N* 'all the N'	
word order	SOV		OSV		SOV	
scope:	S>O	O>S	S>O	O>S	S>O	O>S
GROUP	87.5	16.0	80.5	81.5	90	16.5
EJ int (n=19)	97.37 (185/190)	57.90 (110/190)	90.00 (171/190)	77.37 (147/190)	95.79 (182/190)	48.93 (93/190)
EJ adv (n=12)	95.83 (115/120)	43.33 (52/120)	83.33 (106/120)	65.00 (78/120)	100 (120/120)	28.33 (34/120)
KJ int (n=20)	89.50 (179/200)	30.50 (61/200)	82.50 (165/200)	70.00 (140/200)	93.50 (187/200)	19.50 (39/200)
KJ adv (n=15)	95.34 (143/150)	17.34 (15/150)	94.67 (142/150)	71.34 (107/150)	98.67 (148/150)	7.34 (11/150)

It is clear from Table 4 that all four learner groups have high acceptance rates (>82%) for all three subject-wide scope conditions, Types Ia, Ic and IIa. Thus, like the native Japanese controls, the learners readily accept subject-wide scope, regardless of the quantifier type or word order.

On the non-scrambled object-wide scope sentences, Types Ib and IIb, acceptance rates are considerably lower than for subject-wide scope—but not uniformly so. The intermediate English-speaking learner group has the highest rates of acceptance of object-wide scope: 57.9% on Type Ib (object = *dono N-mo* 'every N') and 48.93% on Type IIb (object = *subete no-N* 'all the N'). The advanced English-speaking group also has higher acceptance of object-wide scope than both Korean-speaking learner groups: 43.33% on Type Ib and 28.3% on Type IIb, compared with 30.5% (Type Ib) and 19.5% (Type IIb) by the intermediate Korean-speaking group and 17.35% (Type Ib) and 7.34% (Type IIb) by the advanced Korean-speaking group. All four learner groups accept object-wide scope with *subete-no N* 'all the N' (Type IIb) at somewhat lower rates than with *dono N-mo* 'every N' (Type Ib), but t-tests show that—as in the native Japanese group—this difference is not significant for the two advanced groups (EJ adv: 43.33% v. 28.33%, $t = 2.2$, $df = 11$, $p = .05$; KJ adv: 17.34% v. 7.34%, $t = 2.326$, $df = 14$, $p < .036$ [Recall that $\alpha = .025$.]). However, the contrast is significant in the intermediate English-speaking and the Korean-speaking groups (EJ int: 57.90% v. 48.93%, $t = 3.402$, $df = 18$, $p < .01$; KJ int: 30.50% v. 19.50%, $t = 2.948$, $df = 19$, $p < .01$). Looking at between-group differences, post hoc Games Howell tests (following the ANOVA reported in the previous section) show that the intermediate English-speaking group has significantly higher acceptance rates on Type Ib (object-wide scope with *dono-N mo* 'every N') and Type IIb (object-wide scope with *subete-no N* 'all the N') than the intermediate and advanced Korean-speaking learner groups, and also than the native Japanese group ($p < .01$). On Type IIb only, the intermediate English-speaking acceptance rate is also significantly higher than the native English acceptance rate ($p < .01$).

Turning to object-wide scope with scrambled word order (Type Id), the learners' acceptance rates lie between 65% (EJ adv) and 77.4% (EJ int). In other words, object-wide scope is substantially more acceptable in OSV sentences than SOV sentences, but it is not

quite as highly acceptable as subject-wide scope. T-tests confirm that for all four learner groups the acceptance of object-wide scope on the scrambled QP-QP sentences is significantly higher than on their non-scrambled counterparts (Type Ib v. Type Id: EJ int: $t = –9.943$, $df = 18$, $p < .001$; EJ adv: $t = –4.311$, $df = 11$, $p < .01$; KJ int: $t = –7.535$, $df = 19$, $p < .001$; KJ adv: $t = –6.772$, $df = 14$, $p < .001$). A second ANOVA (word order x scope x group), run on the native Japanese and the learner data on Types Ia, Ib, Ic and Id, reveals a significant effect for word order ($F(1, 81) = 109$, $p < .001$) (as well as significant effects for scope ($F(1, 81) = 109$, $p < .001$) and group ($F(4, 81) = 3.678$, $p < .01$), and for interactions of the variables). The significant main effect of word order is clearly due to the cross-group pattern of generally accepting both subject-wide and object-wide scope on scrambled QP-QP sentences, while generally not accepting object-wide scope on non-scrambled QP-QP sentences. Post hoc Games Howell tests do not show any significant between-group differences with regard to word order.

Table 5 summarises the learner results for the object-wide scope conditions, along with the native Japanese results for comparison, in the context of the responses predicted by the experimental hypotheses.

Table 5: Hypothesised responses and actual acceptance rates for the learner groups and the native Japanese group on the object-wide scope test types

Group	Hypothesis 1 (Type Ib) SOV word order object = *dono N-mo*		Hypothesis 2 (Type Id) OSV word order object = *dono N-mo*		Hypothesis 3 (Type IIb) SOV word order object = *subete-no N*	
	prediction	**actual acceptance rate (%)**	**prediction**	**actual acceptance rate (%)**	**prediction**	**actual acceptance rate (%)**
EJ int	accept	57.9	accept	***77.4	reject	**48.9
EJ adv	reject	43.4	accept	***65.0	reject	28.3
KJ int	reject	30.5	accept	***70.0	reject	**19.5
KJ adv	reject	17.3	accept	***71.3	reject	7.3
JJ	reject	16.0	accept	***81.5	reject	16.5

Notes: i. Shading indicates a significant between-group difference compared with the EJ int rate

ii. Asterisks indicate a significant within-group difference compared with the Type Ib rate: ** = $p<.01$; *** = $p<.001$.

Table 5 shows that, in gross terms, all the groups behaved as hypothesised: wherever a "reject" response is predicted, the actual acceptance rate is below 50%, showing that the majority of responses indicated rejection; and wherever an "accept" response is predicted, the actual acceptance rate is above 50%, showing that the majority of responses indicated acceptance. However, some of the rates—including, crucially, some intermediate EJ group rates—are only barely above or below the 50% mid-point. This point is taken into consideration in a more fine-toothed analysis of the results as they relate to the hypotheses, in the following section.

6. Discussion

The discussion comprises three sections. The first section considers the results in relation to the hypotheses. The second section takes a look at individual learner consistency in order to address the indeterminacy of some of the group results. The joint conclusion of these two sections is that the findings provide robust evidence for L1 transfer and for UG in L2 acquisition. The final section then offers an account of how UG constraints interact with L1 transfer and the input to allow English-speaking learners of Japanese to overcome the poverty-of-the-stimulus problem they face in acquisition of the absence of distributive object-wide scope in Japanese SOV QP-QP sentences.

6.1. The hypotheses

Hypothesis 1 ((9), repeated in (13) below), predicted between-group differences with respect to the distributive interpretation of *dono N-mo* 'every N' in non-scrambled QP-QP sentences.

13. Hypothesis 1: SOV QP-QP sentences with *dono N-mo* 'every N' as object (Type Ib)
    a. Due to L1 transfer, lower proficiency learners of Japanese whose L1 is English will allow non-target-like distributive object-wide scope.
    b. Due to UG-constrained interlanguage restructuring, higher proficiency learners of Japanese whose L1 is English will reject non-target-like distributive object-wide scope.
    c Due to L1 transfer, lower (and higher) proficiency learners of Japanese whose L1 is Korean will reject non-target-like distributive object-wide scope.

The predicted difference between the intermediate English-speaking learners and the Korean-speaking learners is clearly borne out. The majority of responses to Type Ib by the

intermediate English-speaking group indicated acceptance of object-wide scope, and this acceptance rate differed significantly from the considerably lower acceptance rates by the two Korean-speaking groups. Given that the proficiency task showed the two intermediate learner groups to have equivalent L2 Japanese proficiency, then their differential knowledge of Japanese scope interpretation is readily accounted for in terms of their different L1s. English allows object-wide scope and Korean does not: the intermediate English-speaking learners allow object-wide scope in Japanese, the intermediate Korean-speaking learners do not. This result provides strong support for Full Transfer.

Turning to Part b of Hypothesis 1, the results are consistent with the predicted difference between the intermediate and advanced English-speaking learners: the advanced English-speaking group, overall, rejected object-wide scope in SOV QP-QP sentences with *dono N-mo* 'every N'. Since acquisition of the absence of object-wide scope for this sentence type is a poverty-of-the-stimulus problem, the fact that the advanced group tended nonetheless to reject object-wide scope suggests UG-constrained acquisition, consistent with Full Access. However, the difference between the intermediate and advanced English-speaking groups was not significant. Moreover, the Type Ib rates for both groups—57.9% and 43.4%—are hovering around the chance level of 50%. Thus, although they reflect the predicted pattern, statistically, the results are indeterminate. Further investigation of these results, and what they say about Full Access, is the topic of Section 6.2.

Hypotheses 2 ((10), repeated in (14)) made predictions about object-wide scope in scrambled QP-QP sentences. Hypothesis 3 ((11), repeated in (15)) was concerned with object-wide scope with *subete-no N* 'all the N'.

14. Hypothesis 2: OSV QP-QP sentences with *dono N-mo* 'every N' as object (Types Ic–d)
    All learners will allow both subject-wide and distributive object-wide scope, regardless of L1 or proficiency.

15. Hypothesis 3: SOV QP-QP sentences with *subete no-N* 'all the N' as object (Type IIb)
    All learners will reject distributive object-wide scope, regardless of L1 or proficiency.

Hypothesis 2 is clearly supported. The majority of learner responses on the scrambled QP-QP sentence types were 'accept' responses: >82% for subject-wide scope (Type Ic) and 65% to 77.4% for object-wide scope (Type Id). Moreover, all learner groups, like the native Japanese group, had significantly higher rates of acceptance of object-wide scope in OSV sentences compared with object-wide scope in SOV sentences. Even the intermediate English-speaking group made this distinction, although this group's acceptance rate for object-wide scope on SOV sentences was considerably higher than the other learner groups'. For the Korean-speaking learners, this target-like response pattern is expected due to L1 transfer, thus the result is compatible with Full Transfer. For the English-speaking learners, as explained in Section 3, target-like behaviour on scrambled sentences could arise whether the learners still have an L1-based grammar with respect to scope interpretation, or whether their grammar has been restructured. Either way, target-like behaviour by the English-speaking learners is compatible with Full Transfer/Full Access.

Hypothesis 3 is also supported, in broad terms, in that the acceptance rates for Type IIb (O>S scope with *subete-no N* 'all the N' as object) were below 50% in each learner group. However, at 48.9%, the acceptance rate for the intermediate English-speaking learners is again close to chance level, and requires closer examination. This rather high rate of acceptance of object-wide scope with *subete-no N* 'all the N' by the intermediate English-

speaking learners is unexpected if the learners' interlanguage grammar is still based on the L1, since the native English group had a significantly lower rate, at 21.3%. On the other hand, the intermediate English-speaking group's 48.9% acceptance of object-wide scope of *subete-no N* 'all the N' is significantly lower than its acceptance rate for object-wide scope of *dono N-mo* 'every N', and a similar significant difference (though of much greater magnitude) is found between the native English group's higher acceptance of object-wide scope of *every N* compared with *all the N*. In short, the intermediate English-speaking group's response to object-wide scope with *subete-no N* 'all the N' shows hallmarks of L1 transfer, but is not completely as expected. The intermediate Korean-speaking learners' significantly higher acceptance of *dono N-mo* than *subete-no N* is also not predicted by L1 transfer. An account of these two discrepancies is included in Section 6.3.

To summarise, overall the hypotheses are confirmed, and the findings are consistent with Full Transfer/Full Access. Further investigation of some of the indeterminate results is presented in the following section.

6.2. Individual consistency

Three of the English-speaking learner group acceptance rates were close to the chance level: 57.9% by the intermediate group and 43.4% by the advanced group on Type Ib (object-wide scope of *dono N-mo* 'every N'; SOV word order), and 48.9% by the intermediate group on Type IIb (object-wide scope of *subete-no* N 'all the N'; SOV word order). This could indicate that all the learners answered randomly on these test items. However, examination of individual participant consistency on each test type shows that this is not the case. Table 6 presents consistency data for the English-speaking learners on all three object-wide scope types, along with native Japanese and native English control data, for comparison. A participant is considered to "consistently accept" an answer type if she or he selected +1 or

+2 on the rating scale for at least eight of the ten exemplars of that type. "Consistent rejection" is defined as selection of –2 or –1 on at least eight of the ten exemplars of that type, and "inconsistency" indicates response patterns that correspond neither to consistent acceptance nor to consistent rejection.

Table 6: No. (%) of individuals demonstrating consistent acceptance, consistent rejection, and inconsistency, on Types Ib and IIb

	Type Ib (O>S scope, SOV, object = *dono N-mo* 'every N';)			**Type IIb** (O>S scope, SOV, object = *subete-no N* 'all the N';)		
	acc	**rej**	**inc**	**acc**	**rej**	**inc**
EE (n=24)	12 (50%)	2 (8.3%)	10 (41.7%)	1 (4.2%)	15 (62.5%)	8 (33.3%)
EJ int (n=19)	8 (42.1%)	3 (15.8%)	8 (42.1%)	4 (21.1%)	5 (26.3%)	10 (52.6%)
EJ adv (n=12)	5 (41.7%)	6 (50.0%)	1 (8.3%)	1 (8.3%)	7 (58.3%)	4 (33.3%)
JJ (n=20)	0	14 (70%)	6 (30%)	0	14 (70%)	6 (30%)

Note: "acc" = consistent acceptance; "rej" = consistent rejection; "inc" = inconsistency

Considering first the intermediate English-speaking learners on Type Ib, Table 6 shows that while eight of the participants—almost half the group—were inconsistent in their responses, the remaining 11 participants answered consistently: eight accepted object-wide scope and three rejected it. These proportions of consistent acceptance, consistent rejection and inconsistency are almost identical to those of the native English group. The rather high level (41.7%) of inconsistency in the native English group can be seen as further quantitative

evidence of the relative difficulty of obtaining a distributive object-wide scope interpretation even when such an interpretation is theoretically possible. Some individuals may be able to get this reading easily while others do not, leading to inconsistency. The similarity in the consistency patterns of the intermediate English-speaking learner group and the native English control group, provides further support for an L1-transfer account of the L2 data.

The intermediate English-Japanese and the native English control patterns for Type Ib differ considerably from the advanced English-Japanese and the native Japanese control patterns. In the advanced English-Japanese group, only one learner has an inconsistent response pattern while five consistently accept object-wide scope (= non-target-like behaviour) and six consistently reject object-wide scope. This pattern contrasts again with the native Japanese pattern, where there are no individuals who consistently accept object-wide scope: 14 reject it (70%) and six are inconsistent (30%). The advanced English-Japanese group thus appears to have two populations: those who allow object-wide scope in Japanese, and those who do not. The proportion that consistently rejects object-wide scope (50%) is substantially higher than in the native English control group (8.3%). Thus, although consistent rejection of object-wide scope might be expected in around 8% of an English-speaking L2 Japanese population even if their grammar is influenced by their L1, it seems reasonable to assume that the majority of the advanced English-speaking learners who consistently rejected object-wide scope did so because they have target-like knowledge of quantifier scope, and not because they were among the small minority who might always reject object-wide scope even in English (and therefore may have an English-like representation of quantifier scope interpretation in their interlanguage). In other words, these English-speaking learners provide evidence for Full Access: their interlanguage has undergone restructuring so that it is target-like with respect to distributive object-wide scope in Japanese, despite poverty of the stimulus. Since poverty of the stimulus by definition

entails that there is no overt evidence for the interpretation acquired, then the learners' knowledge must arise from internal mechanisms, namely UG.

Turning to the intermediate English-speaking learners' consistency data for Type IIb, in this case, just over half of the group (52.6%) are inconsistent in their responses, while only 5 (26.2%) reject object-wide scope with *subete-no N* 'all the N'. In the native English and the native Japanese groups, the majority demonstrate consistent rejection of object-wide scope with *subete-no N/all the N* (62.5% and 70%, respectively). Thus the intermediate English-speaking learners' pattern is not predicted by L1 transfer; nor does it show convergence towards the target.

Examination of individual consistency has thus yielded two results. First, it has been shown that at least some English-speaking learners of Japanese were able to overcome poverty of the stimulus and acquire native-like knowledge of the absence of object-wide scope in Japanese. This provides evidence for UG in L2 acquisition, and this in turn raises the important question of what triggers the relevant UG-constrained interlanguage restructuring. Second, the intermediate English-speaking learners' indeterminacy with respect to object-wide scope of *subete no-N* 'all the N' appears problematic for L1 transfer. The following section explores an account of how target-like knowledge of Japanese QP-QP scope interpretation might arise in English-speaking learners, and also suggests a solution to the problematic *subete*.

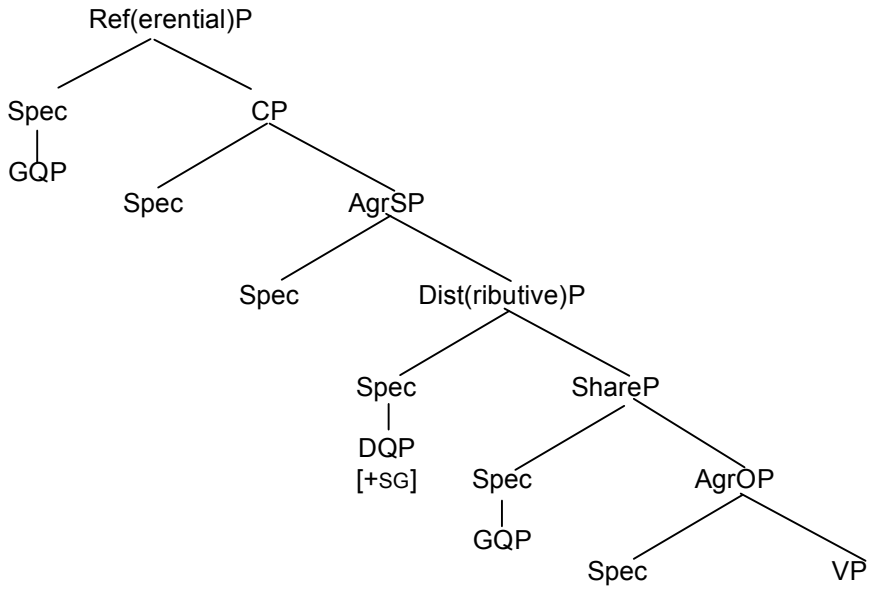
6.3. Outstanding questions

It is not possible to speculate upon how English-speaking learners might acquire native-like Japanese QP-QP interpretation without adopting a specific account of scope interpretation. The account adopted here, the Target Landing Sites model (Beghelli (1995, 1997), Beghelli and Stowell (1997)), is chosen because it specifically addresses the different properties of

different types of quantifier (e.g., *every* v. *all*), in contrast to many accounts that treat all quantifiers equally (e.g., Hoji (1995), Hornstein (1995), Huang (1992)). In addition, although it is formulated only with reference to English, it can be successfully applied to the Japanese and Korean QP-QP sentences discussed in this paper. A concise outline of the Target Landing Sites model is presented below. However, the conclusions about L1 transfer and UG in L2 acquisition do not hinge on this model. Any model that accounts for L1 knowledge of the Japanese facts must also be able to account for knowledge of these facts in English-Japanese interlanguage acquired under poverty of the stimulus.

The Target Landing Sites model proposes that quantifiers fall into distinct syntactic categories by virtue of their semantic properties. Quantifiers like *every* that always support a distributive interpretation are 'Distributive Quantifiers' (DQP), while *all*, which (as described in Section 2) can always support a collective interpretation but only supports a distributive interpretation under certain conditions, is a 'Group-denoting Quantifier' (GQP), along with other non-universal quantifiers including *some* and numerical quantifiers. These different quantifier types must check features in designated functional projections, and their scope interpretation is a function of this feature-checking, which takes place post spell-out, at logical form. The proposed functional projections for quantifiers are shown in (16) (following Beghelli (1995, 72)). GQPs must check a [+group referent] feature in RefP (a topic-related position) or ShareP; DQPs must check a [+distributive] feature in DistP.

16.



Crucially, only QPs with a [+singular] agreement feature can land in Spec,DistP. This means that *all the N* cannot access Spec,DistP, since it takes plural agreement, in contrast to *every N*, as shown in (17).

17. a. All the *student/students passed the exam.
    b. Every student/*students passed the exam.

In common with most syntactic analyses of scope interpretation, the Target Landing Sites model allows QP1 to take scope over QP2 if QP1 c-commands QP2 (Hoji (1995), Hornstein (1995), Huang (1982), May (1977; 1985), etc.). However, the model additionally addresses distributive scope specifically. There are two mechanisms by which QP1 can scope distributively over QP2. In the first, the distributor must land in Spec,DistP (in other words, it must be a universal QP with a [+singular] feature) and the distributee in Spec,ShareP. This is what happens with the object-wide scope interpretation of the English QP-QP sentence

Someone read every book, for which the logical form in (18a) is proposed. The subject-wide reading (not a distributive reading) is represented in (18b). (Curly brackets indicate reconstruction, and QPs can reconstruct if the landing site of reconstruction is one in which semantic or morphological features are checked (Beghelli (1995, 78)).)

18. a. [AgrSP t_i [DistP every book$_j$ [ShareP {someone}$_i$ [AgrOP t_j [VP read t_j]]]]]
    b. [RefP Someone$_i$ [AgrSP t_i [DistP every book$_j$ [AgrOP t_j [VP read t_j]]]]]

In (18a), *every book* c-commands *someone* in the crucial [DistP ...[ShareP...]] structure, giving rise to the distributive, object-wide scope interpretation, "for every book *x* a distinct person read *x*." In (18b) *every book* is c-commanded by, and hence under the scope of, *someone* in RefP, yielding the non-distributive subject-wide scope interpretation, "there is some person *y* such that *y* read every book."

Object-wide scope along the lines of (18a) is unavailable when the QP is *all the N*, because *all* does not have a [+singular] feature and thus is barred from Spec,DistP. However, the second mechanism for distributive scope, "pseudo-distributivity," accounts for distributive scope of *all* when it occurs in subject position, as in *All the students read two books* (i.e., for each student there is a distinct set of two books). In pseudo-distributivity, a covert operator corresponding to the floating quantifier *each* c-commands the distributee QP. Covert *each* can occur between AgrSP and AgrOP, but not above AgrSP (just as overt *each* cannot occur in a pre-subject position, e.g., **Each the girls ate an apple*). Thus the LF representation of the distributive, S>O interpretation of (19a) is as shown in (19b) (based on Beghelli (1997: 379)):

19. a. All the students read two books.

b. [RefP All the students$_i$ [AgrSP t_i [*each* [ShareP two books$_j$ [AgrOP t_j [VP read t_j]]]]]]

In (19b), the two QPs, *all the students* and *two books* have moved to RefP and ShareP, respectively, in order to check their [+group referent] features. The fact that RefP c-commands ShareP is not enough for a QP in RefP to act as a distributor. The distributee QP must additionally be c-commanded by covert *each*, which, in (19b) occurs within AgrSP, since the distributor is the subject.

Thus *all the N* can take distributive scope over another QP when it is in subject position. However, in object position, inverse distributive scope is unavailable. This is because, as described above, covert *each* cannot occur above AgrSP. Therefore, considering the sentence *Someone read all the books,* even if [*all the books*] checks its features in Spec,RefP, the associated covert *each* could would be restricted to the object's base position, AgrOP or VP, and therefore could not c-command *someone*.

Applying the Target Landing Sites model to Japanese and Korean, it can be argued that all the universal QPs under consideration in this paper must be GQPs, because, like English *all the N*, they are not inherently singular.[6] This is clear from (20–21), which show that the Japanese and Korean universal QPs can occur with or without plural markers:

20. a. Japanese: Dono gakusei(-tati)-mo siken ni ukatta.
    b. Korean: Enu haksayng(-tul)-ina sihen ey hapkyektoyta.
    every student(-Pl) exam in succeeded
    'Every student(s) passed the exam.'

[6] If *dono…mo* and *enu…(i)na* are to be classed as GQPs, then the name of this category, "Group-denoting quantifier," and the feature it must check [+ group referent] become inappropriate, since, as argued in Section 2, these quantifiers lack a collective (i.e., group) interpretation. This problem is left aside here.

21. a. Japanese: Subete-no gakusei(-tati)-wa siken ni ukatta.
    b. Korean: Motun haksayng/(-tul)-un sihen ey hapkyektoyta.
    all the student(-Pl)-Top exam in succeeded
    'All the student(s) passed the exam.'

Consequently, object-wide scope in canonical SOV QP-QP sentences is ruled out in the same way as it is for English *all the N*. It is reasonable to assume that covert *each* in a Japanese SOV sentence also cannot occur above AgrSP, because this position is ungrammatical for overt *sorezore* 'each' (example based on Sakaguchi 1998: 119, fn 3):

22. (*Sorezore) otoko-tati-ga Hanako-o aisite-iru.
    each man-Pl-Nom Hanako-Acc love
    '(*Each) the men love Hanako.'

However, in a scrambled sentence, *sorezore* can scramble with the object:

23. [Kodomo-tati-o sorezore]$_i$ sensei-ga t_i sikatta.
    child-Pl-Acc each teacher-Nom scolded
    'A teacher scolded each child. (scrambled)'

This means that, considering the scrambled Japanese QP-QP sentence in (24a), pseudo-distributivity can account for the object-wide scope interpretation via the representation in

(24b). The non-distributive subject-wide reading is represented in (24c) ('XP' indicates the landing site of scrambling):[7]

24. a. Dono hon-mo dareka-ga yonda.
every book someone-Nom read
'Someone read every book. (scrambled)'

b. [RefP dono hon-mo$_j$ [XP t_j [*each* [AgrSP t_i [ShareP {dareka-ga}$_i$ [AgrOP t_j [VP t_j yonda]]]]]]]

c. [RefP dareka-ga$_i$ [XP t_j [AgrSP t_i [ShareP {dono hon-mo}$_j$ [AgrOP t_j [VP t_j yonda]]]]]]

In (24b), covert *each* is associated with the object QP in XP, and it c-commands the subject QP, yielding the object-wide scope interpretation. In (24c), *dareka* 'someone' takes scope in Spec,RefP and *dono hon-mo* 'every N' in Spec,ShareP (reconstructing from the landing site of scrambling, XP). Thus the non-distributive subject-wide scope reading obtains. Korean scope rigidity in SOV QP-QP sentences and ambiguity in OSV QP-QP sentences can be accounted for similarly.

The Target Landing Sites model thus proposes that pseudo-distributivity, along with the articulated phrase structure that includes the projections RefP, DistP and ShareP are mechanisms provided by Universal Grammar. The locus of cross-linguistic variation in

[7] There is ongoing debate about whether object-scrambling in a Japanese OSV sentence occurs via A'-movement to a projection above IP, or A-movement to Spec,IP, or indeed via both mechanisms (see Miyagawa (2003), Nemoto (1999)). Here, A'-movement is indicated, but the analysis still works if the scrambled object lands in Spec,IP.

quantifier scope interpretation thus must be the lexicon: some languages, like English, have universal quantifiers with a [+singular] feature, and these quantifiers can land in DistP; other languages, like Japanese and Korean, do not have quantifiers with a [+singular] specification, and this leads to the unavailability of inverse scope in [S…O…] QP-QP sentences in these languages.

Assuming this model is correct, then for English-speakers to acquire native-like knowledge, they must come to know that Japanese quantifiers cannot be inherently singular or plural. Sprouse's (2006) elucidation of "Full Transfer" is helpful here. He argues (2006, 174) that "Full Transfer" in L2 acquisition boils down to "retention of the L1 lexicon (minus phonetic features)." Development of the L1-based interlanguage lexicon is then a process of "relabeling" (Sprouse borrows the term from the Lefebvre's (1998) Relexification Hypothesis of Creole formation) and subsequent restructuring of features: learners relabel the L1-based entries with the (learner's perception of the) target language phonetic matrices, then modify the morphological, syntactic and semantic features of each entry as motivated by the usage of the target language lexemes in the input. Under this model, the initial-state English-Japanese interlanguage must contain a lexical slot that has all the (non-phonetic) properties of English *every*, including a [+singular] feature. A native Japanese grammar, on the other hand, contains slots for *dono* 'which' and *mo* 'also' with morphosyntactic properties that encode the possibility of these morphemes combining with a noun to form 'every N'. Crucially (under the Target Landing Sites model), neither *dono* nor *mo* should have a [+/– singular] feature. The task of English-speaking learners of Japanese thus must be to relabel the English 'every' slot as [*dono* …-*mo*] and to restructure the features so that they eventually match the features of native Japanese [*dono* …-*mo*]. Clearly, the [+singular] feature transferred from English *every* could potentially remain on the interlanguage [*dono* …-*mo*] entry, given that

[*dono …-mo*] can have a singular interpretation compatible with this feature, as already seen in (18), repeated in (25).

25. Dono-gakusei(-tati)-mo siken ni ukatta.
Every student(-Pl) exam in succeeded
'Every student(s) passed the exam.'

Such a representation (i.e., [*dono …-mo*] with a [+singular] feature transferred from *every*) would account for the behaviour of English-speaking learners in the present study who allowed *dono N-mo* 'every N' to take distributive object-wide scope, unlike native-speakers of Japanese. However, if the learner encounters and processes enough examples like (25), in which *dono N-mo* 'every N' occurs sometimes with and sometimes without a plural affix, this could motivate deletion of the non-native-like [+singular] feature on [*dono …-mo*], since this feature would be incompatible with the plural variant. Following such a restructuring of the interlanguage lexicon, QP-QP-scope interpretation should take place in a native-like way, the additional mechanisms of pseudo-distributivity and phrase structure being given by UG. The lexical transfer model thus provides an account for the success of the few advanced English-speaking learners of Japanese who demonstrated knowledge of the absence of object-wide scope with Japanese *dono N-mo*, despite there being no direct evidence in the input about the availability or otherwise of this scope reading.

Sprouse's (2006) lexical transfer proposal, in conjunction with the Target Landing Sites model, may also provide solutions to the two remaining problems: why did the intermediate English-speaking learners show a high level of inconsistency with respect to object-wide scope with *subete-no N* 'all the N'; and why did the intermediate Korean-speaking learners have a significantly higher acceptance rate for object-wide scope with *dono*

N-mo 'every N' than *subete-no N* 'all the N' (though both rates were relatively low, at <31%).

Considering English-Japanese interlanguage first, under Sprouse's interpretation of Full Transfer, the initial-state English-Japanese interlanguage must contain a lexical slot with all the non-phonetic properties of English *all*. The prediction that English-speaking learners of Japanese would reject object-wide scope for nouns quantified by *subete(-no)* entails that the learners would identify *subete* as being a collective universal quantifier that could map onto this slot corresponding to *all*. However, the learners' encounters with *subete(-no)* in the input may not necessarily provide a context that differentiates it from the interlanguage slot with the features of English *every*. Therefore learners may incorrectly allow *subete(-no)* to fill the lexical slot of *every* and consequently have the [+singular] feature that facilitates distributive object-wide scope.

The solution for the intermediate Korean-speaking learners' higher acceptance rate of object-wide scope with *dono N-mo* 'every N' than *subete-no N* 'all the N' is more speculative. The initial-state Korean-Japanese interlanguage must include lexical slots with all the semantic, syntactic and morphological properties of *enu* 'which', *(i)na* 'or' and *motun* 'all'. As with Japanese *dono N-mo* 'every N', the possibility of *enu* and *(i)na* combining to form *enu N-(i)na* 'every N' is presumably encoded in the morphosyntactic properties of the two separate morphemes. However, Japanese *dono N-mo* contains the particle *mo* 'and'; not a morpheme with the meaning 'or' like Korean *(i)na*. Korean also has a particle, *to*, meaning 'and', and *to* can combine with a wh-word to form a quantifier, but the combination *enu…to* is a negative polarity item and thus can only occur with a negated verb, as exemplified in (26):

26. Enu haksayng-to tapcang-ul acik anh-hayssta/*hayssta.

which student-and answer-Acc yet Neg-did/did

'No student has replied yet.'/*'Any/every student has replied yet.'

Initially, Korean-speaking learners are expected to relabel the lexical entry based on Korean *to* 'and' with the Japanese *mo* 'and'. If the Korean-based features of this slot remain unchanged, then the learners may allow [*dono…mo*] with the features of a negative polarity item, like Korean [*enu…to*] (but unlike native Japanese [*dono…mo*]). Clearly, a lexical entry [*dono…mo*] with the features of a negative polarity item would not be predicted to yield object-wide scope in affirmative SOV QP-QP sentences, therefore this possibility does not alter the initial hypothesis the intermediate-level Korean-speaking learners of will reject object-wide scope. However, it adds a layer of potential confusion: if an item turns up in an affirmative sentence even though, according to the lexicon, it has negative polarity features, this could be confusing and lead to errors in interpretation. Indeed, instances of [*dono…mo*] in affirmative sentences could provide precisely the evidence required to motivate deletion of whatever features produce negative-polarity sensitivity, although it seems reasonable to assume that such restructuring may not actually take place within the context of participating in an experiment. The claim here, then, is that the possibility of associating Japanese *dono…mo* 'every' with Korean *enu…to* 'no' instead of (or perhaps even at the same time as) with *enu…(i)na* 'every' may lead to confusion that results in a higher (though still not high, at 30.5%) acceptance of object-wide scope with *dono N-mo* than with *subete-no N*. By contrast, there is no similar confound potentially affecting the acquisition of *subete-no N* by Korean-speaking learners. Korean has a noun *motwu* whose meaning corresponds closely to Japanese *subete* 'all', therefore an interlanguage slot with the features of Korean *motwu* is a clear candidate for re-labelling as *subete*. Both *motwu* and *subete* make use of a grammatical affix when modifying a noun: the attributive *–n* in Korean, and the genitive marker *–no* in

Japanese. The scope for confusion, under a lexical transfer account of acquisition of *subete-no N* this seems considerably reduced compared with *dono…mo*.

To summarise, this section has provided a plausible account of how the advanced English-speaking learners' knowledge of the availability of Japanese distributive object-wide scope could develop despite the lack of any direct evidence in the input. Innate linguistic mechanisms (in the form of the architecture proposed by the Target Landing Sites model of quantifier scope interpretation) interact with the interlanguage lexicon, which (following Sprouse 2006) is populated by means of lexical-level L1 transfer at the initial state of L2 acquisition. This leads initially to errors, but on encountering relevant data, the key lexical items can be restructured to include the target features, and this automatically results in target-like interpretation of Japanese QP-QP sentences. In addition, the lexical-level L1 transfer account has also been shown to provide explanations for unexpected findings in the intermediate English and intermediate Korean data.

7. Conclusion

The aim of the present study was to shed light on the roles of L1 knowledge and UG in the acquisition of quantifier scope interpretation and its interaction with scrambling in L2 Japanese. Two key findings were that (i) there were differences between intermediate English-speaking and Korean-speaking learners with respect to their knowledge of Japanese QP-QP scope interpretation that clearly reflected the properties of each group's L1; (ii) some advanced English-speaking learners of Japanese demonstrated knowledge of L2 Japanese QP-QP interpretation despite under-determination of the relevant facts by the sources available (input, L1 knowledge and classroom instruction). These findings support Schwartz and Sprouse's (1994, 1996) Full Transfer/Full Access hypothesis: L1 knowledge transfers in its entirety to the interlanguage at the initial state of L2 acquisition, and UG is available to the

learner during the course of acquisition. Moreover, subsets of results that appeared at first glance to be unpredicted by L1 Transfer were shown to be explicable under Sprouse's (2006) formulation of Full Transfer, whereby transfer takes place at the lexical level.

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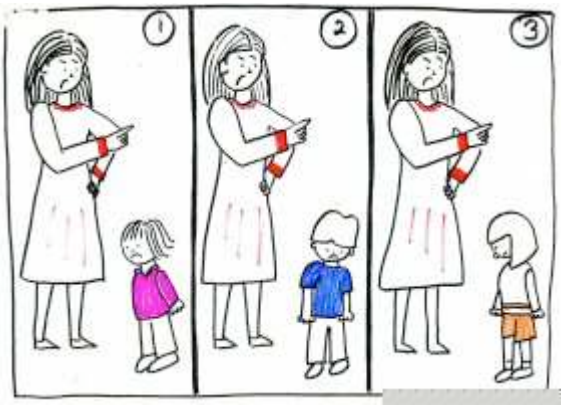
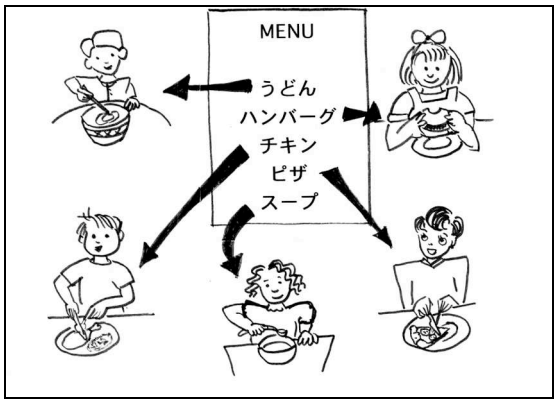
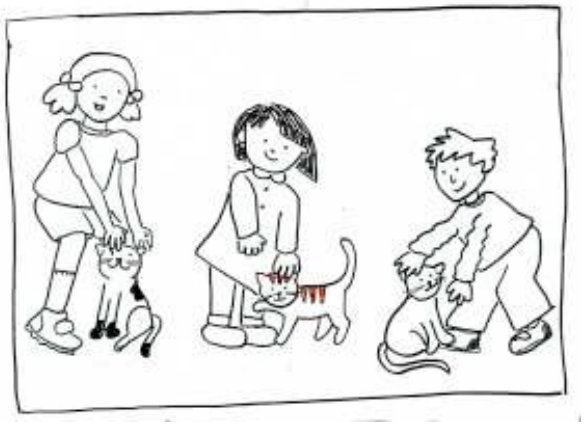
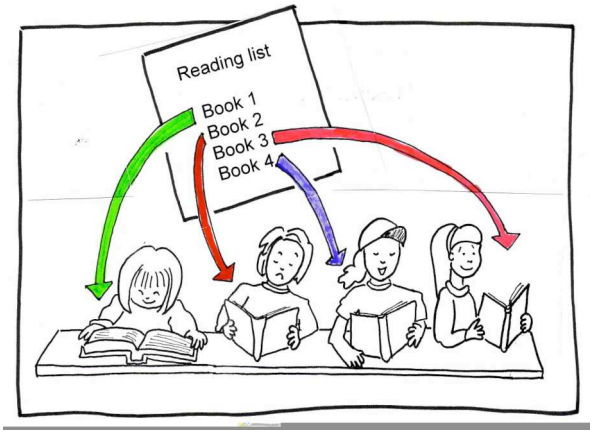
Appendix: Japanese test items

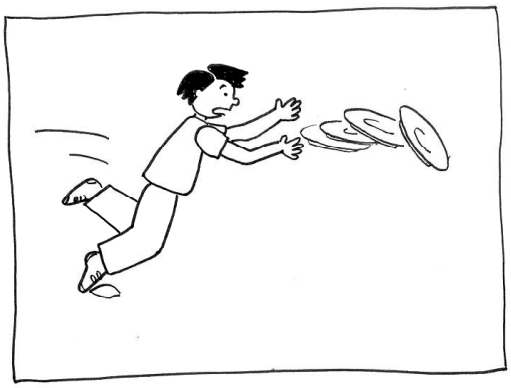
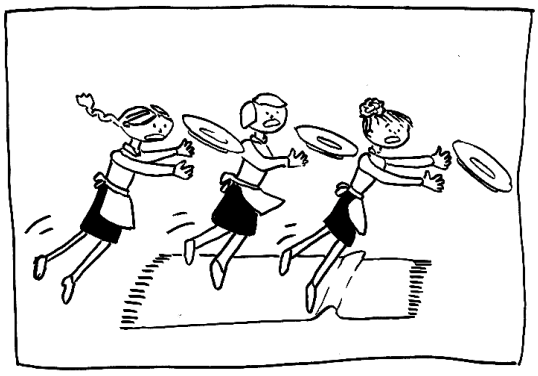
Note: In the actual experiment, the sentences were presented only in Japanese script. Here, they are listed in romanised form, with gloss and translation. Also, the pictures appeared in colour in the test, to aid disambiguation. Where the pictures contain Japanese words, an English translation is given here, but there was no translation in the actual test.

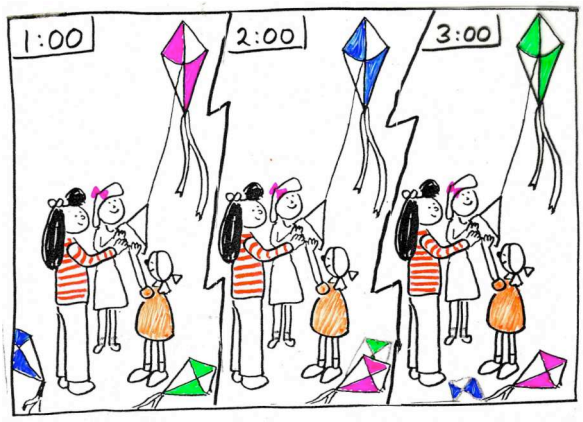
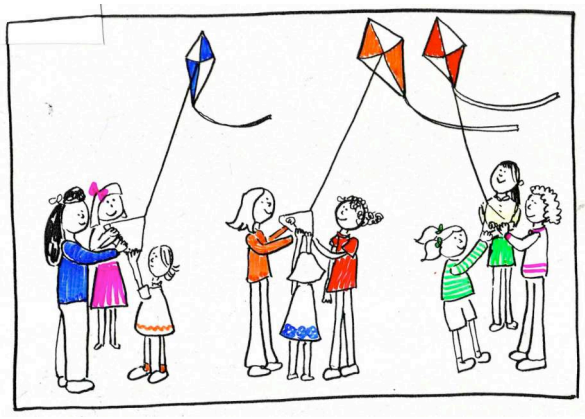
S>O scope items	**O>S scope items**
Picture for items Ia.1 & Ic.1:  	**Picture for items Ib.1 & Id.1:** 
Type Ia, item Ia.1 Dareka-ga dono kodomo-mo sikatta someone-Nom every child scolded 'Someone scolded every child.'	**Type Ib, item Ib.1** *as opposite*
Type Ic, item Ic.1 Dono kodomo-mo dareka-ga sikatta every child someone-Nom scolded 'Someone scolded every child. (*scrambled*)'	**Type Id, item Id.1** *as opposite*

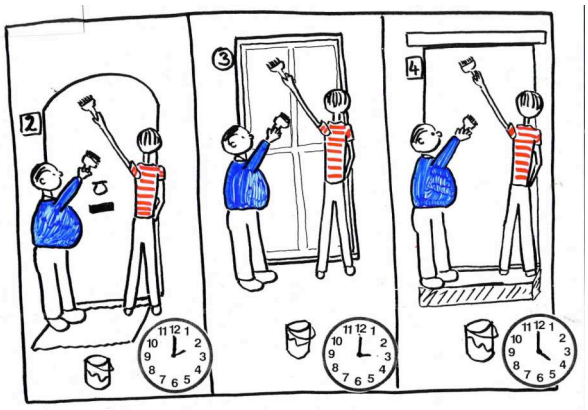
S>O scope items	**O>S scope items**
Picture for items Ia.2 & Ic.2:  Translation of words on menu: noodles, hamburger, chicken, pizza, soup	**Picture for items Ib.2 & Id.2:** 
Type Ia, item Ia.2 Dareka-ga dono ryouri-mo tabeta-mita someone-Nom every dish eat-tried 'Someone tried every dish.'	**Type Ib, item Ib.2** *as opposite*
Type Ic, item Ic.2 Dono ryouri-mo dareka-ga tabeta-mita every dish someone-Nom eat-tried 'Someone tried every dish. (scrambled)'	**Type Id, item Id.2** *as opposite*

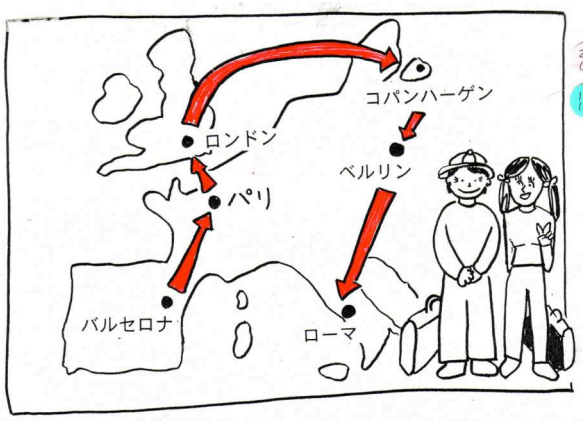
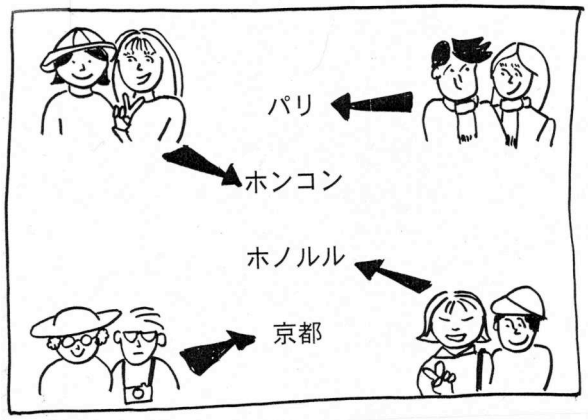
S>O scope items	**O>S scope items**
Picture for items Ia.3 & Ic.3: 	**Picture for items Ib.3 & Id.3:** 
Type Ia, item Ia.3 Dareka-ga dono neko-mo nadeta. someone-Nom every cat stroked 'Someone stroked every cat.'	**Type Ib, item Ib.3** *as opposite*
Type Ic, item Ic.3 Dono neko-mo dareka-ga nadeta. every cat someone-Nom stroked 'Someone stroked every cat. (scrambled)'	**Type Id, item Id.3** *as opposite*

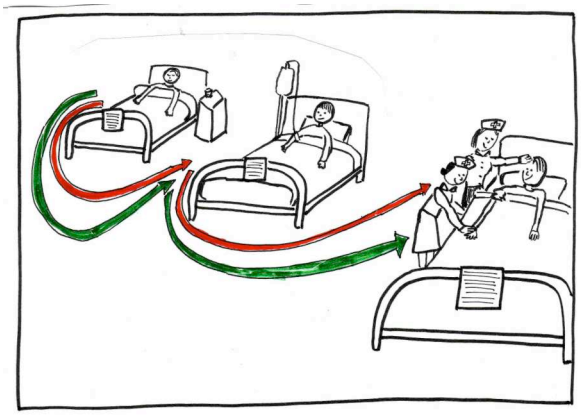
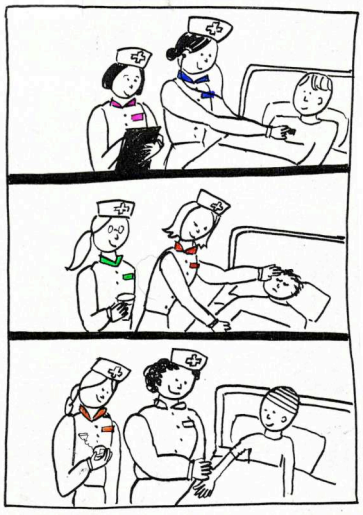
S>O scope items	**O>S scope items**
Picture for items Ia.4 & Ic.4:  	**Picture for items Ib.4 & Id.4:** 
Type Ia, item Ia.4 Dareka-ga dono hon-mo yonda. someone-Nom every book read 'Someone read every book.'	**Type Ib, item Ib.4** *as opposite*
Type Ic, item Ic.4 Dono hon-mo dareka-ga yonda. every book someone-Nom read 'Someone read every book. (scrambled)'	**Type Id, item Id.4** *as opposite*

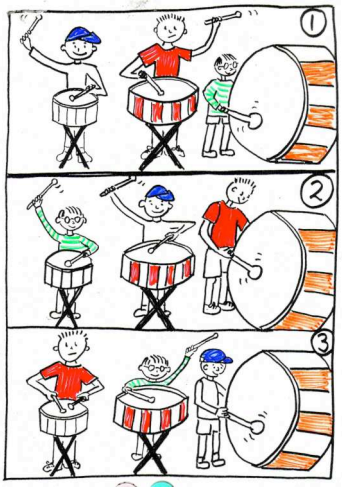
S>O scope items	**O>S scope items**
Picture for items Ia.5 & Ic.5: 	**Picture for items Ib.5 & Id.5:** 
Type Ia, item Ia.5 Dareka-ga dono sara-mo otosita. someone-Nom every plate dropped 'Someone dropped every plate.'	**Type Ib, item Ib.5** *as opposite*
Type Ic, item Ic.5 Dono sara-mo dareka-ga otosita. every plate someone-Nom dropped 'Someone dropped every plate. (scrambled)'	**Type Id, item Id.5** *as opposite*

S>O scope items	**O>S scope items**
Picture for items Ia.6 & Ic.6:  	**Picture for items Ib.6 & Id.6:** 
Type Ia, item Ia.6 Sannin-no-onnanoko-ga dono tako-mo ageta. three-Gen-girl-Nom every kite raised 'Three girls flew every kite.'	**Type Ib, item Ib.6** *as opposite*
Type Ic, item Ic.6 Dono tako-mo sannin-no-onnanoko-ga ageta. every kite three-Gen-girl-Nom raised 'Three girls flew every kite. (scrambled)'	**Type Id, item Id.6** *as opposite*

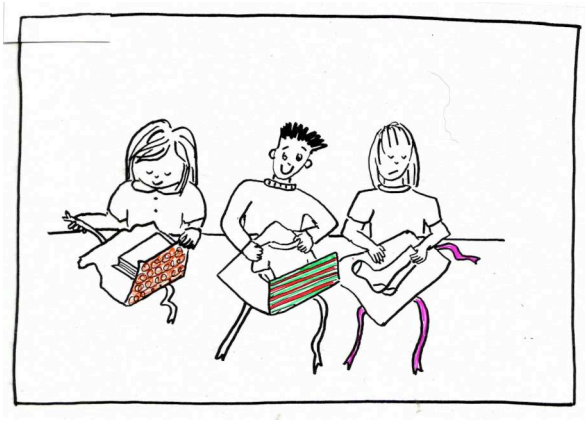
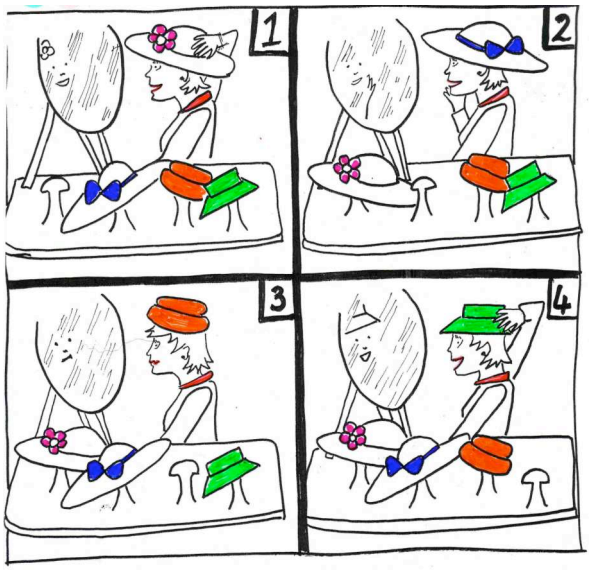
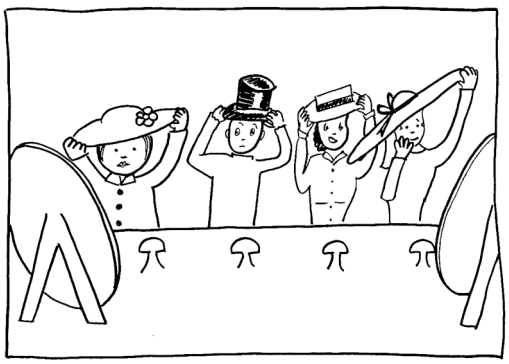
S>O scope items	**O>S scope items**
Picture for items Ia.7 & Ic.7:  	**Picture for items Ib.7 & Id.7:** 
Type Ia, item Ia.7 Hutari-no-otoko-ga dono doa-mo nutta. two-Gen-man-Nom every door painted 'Two men painted every door.'	**Type Ib, item Ib.7** *as opposite*
Type Ic, item Ic.7 Dono doa-mo hutari-no-otoko-ga nutta. every door two-Gen-men-Nom painted 'Two men painted every door. (scrambled)'	**Type Id, item Id.7** *as opposite*

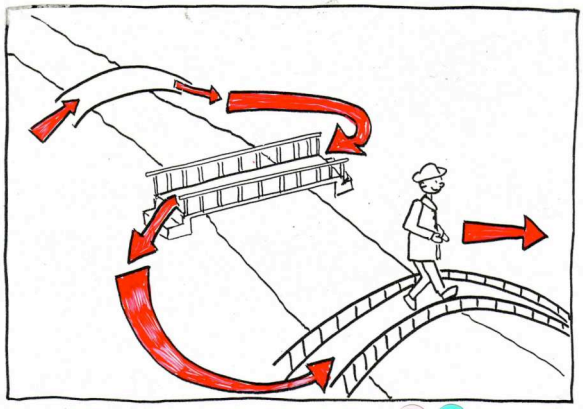
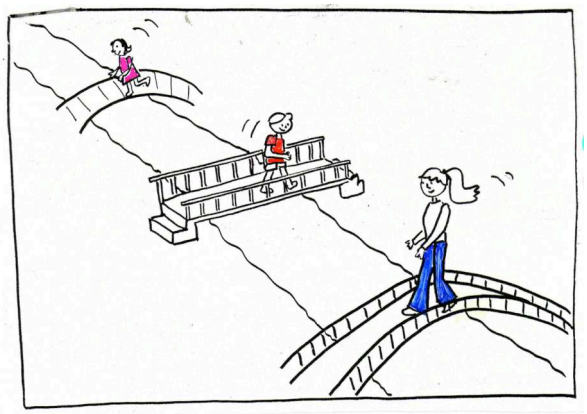
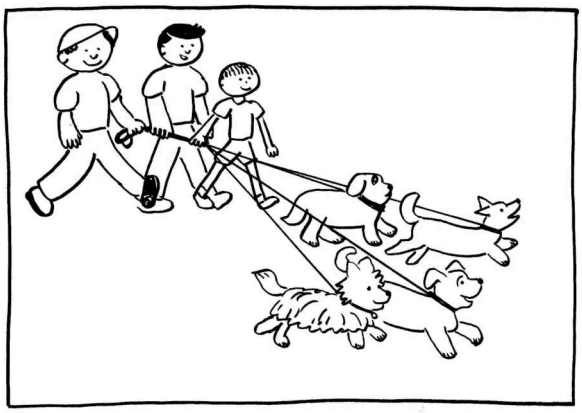
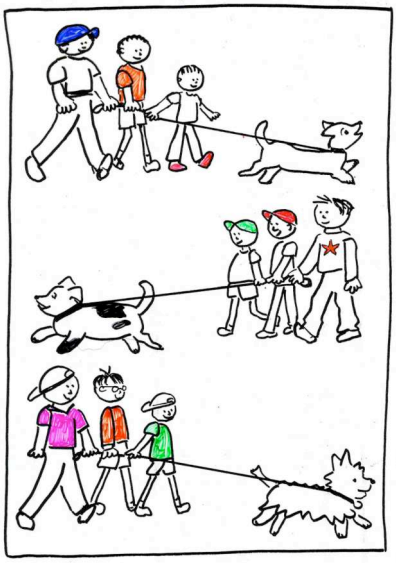
S>O scope items	O>S scope items
Picture for items Ia.8 & Ic.8:  Translation (following arrows): Barcelona, Paris, London, Copenhagen, Berlin, Rome	**Picture for items Ib.8 & Id.8:**  Translation: Paris, Hong Kong, Honolulu, Kyoto
Type Ia, item Ia.8 Hutari-no-kankoukyaku-ga dono mati-mo kenbutu-sita. two-Gen-tourist-Nom every city visited 'Three girls flew every kite.'	**Type Ib, item Ib.8** *as opposite*
Type Ic, item Ic.8 Dono mati-mo hutari-no-kankoukyaku-ga kenbutu-sita. every city two-Gen-tourist-Nom visited 'Two tourists visited every city. (scrambled)'	**Type Id, item Id.8** *as opposite*

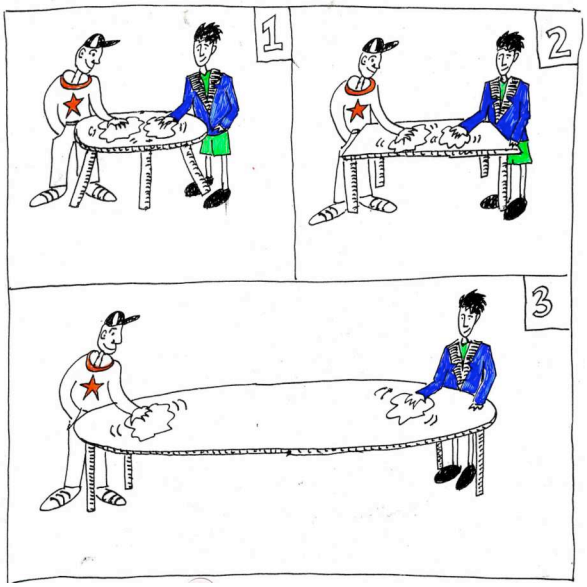
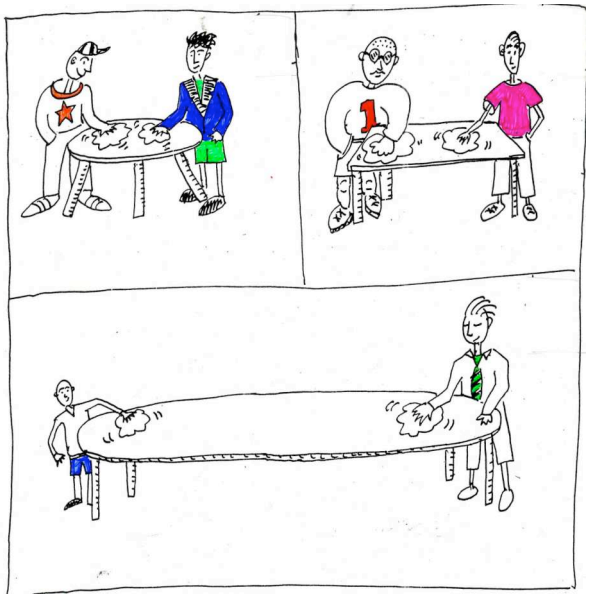
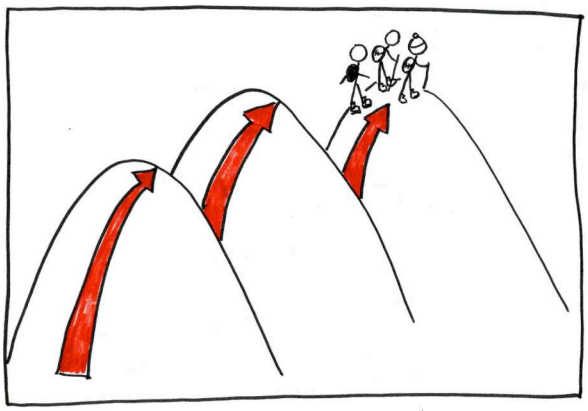
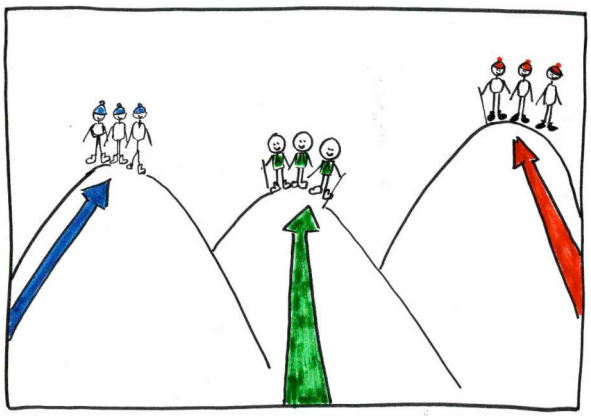
S>O scope items	**O>S scope items**
Picture for items Ia.9 & Ic.9: 	**Picture for items Ib.9 & Id.9:** 
Type Ia, item Ia.9 Hutari-no-kangohu-ga dono kanzya-mo kanbyou-sita. two-Gen-nurse-Nom every patient looked after 'Two nurses looked after every patient.'	**Type Ib, item Ib.9** *as opposite*
Type Ic, item Ic.9 Dono kanzya-mo hutari-no-kangohu-ga kanbyou-sita. every patient two-Gen-nurse-Nom looked after 'Two nurses looked after every patient. (scrambled)'	**Type Id, item Id.9** *as opposite*

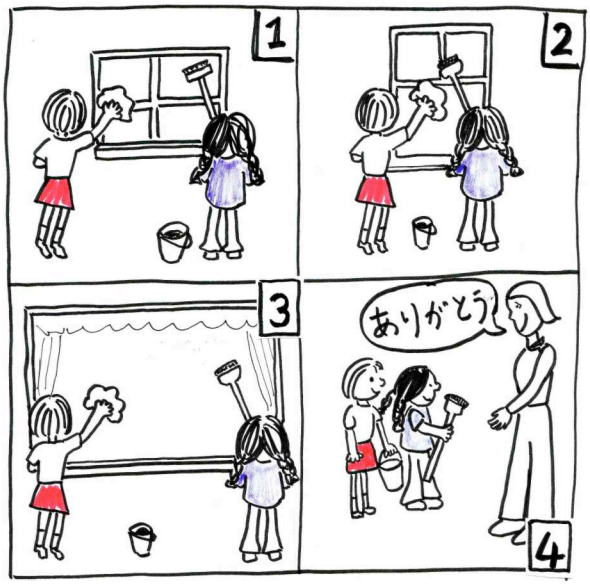
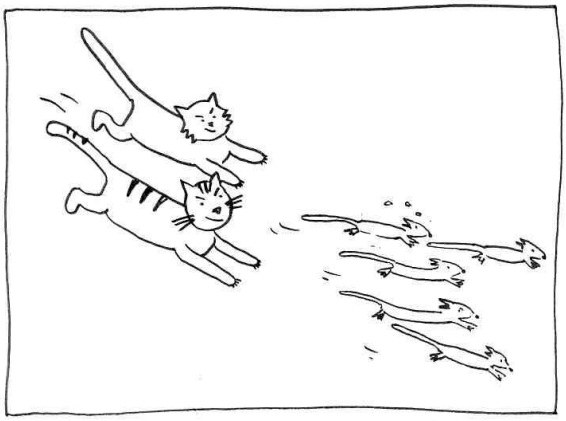
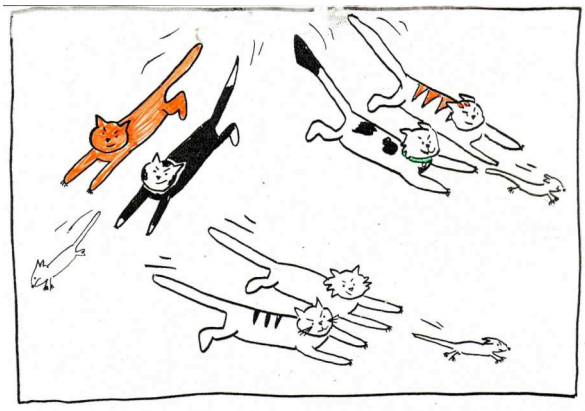
S>O scope items	**O>S scope items**
Picture for items Ia.10 & Ic.10:  	**Picture for items Ib.10 & Id.10:** 
Type Ia, item Ia.10 Sannin-no-otokonoko-ga dono taiko-mo utta. three-Gen-boy-Nom every drum beat 'Three boys beat every drum.'	**Type Ib, item Ib.10** *as opposite*
Type Ic, item Ic.10 Dono taiko-mo sannin-no-otokonoko-ga utta. every drum three-Gen-boy-Nom beat 'Three boys beat every drum. (scrambled)'	**Type Id, item Id.10** *as opposite*

S>O scope items	**O>S scope items**
Picture for item IIa.1: 	**Picture for item IIb.1:** 
Type IIa, item Ia.1 Dareka-ga subete-no kasa-o sasita. someone-Nom all-Gen umbrella-Acc put up 'Someone put up all the umbrellas.'	**Type IIb, item IIb.1** *as opposite*
Picture for item IIa.2: 	**Picture for item IIb.2:** 
Type IIa, item Ia.2 Dareka-ga subete-no suutukeesu-o hakonda. someone-Nom all-Gen suitcase-Acc carried 'Someone carried all the suitcases.'	**Type IIb, item IIb.2** *as opposite*

S>O scope items	**O>S scope items**
Picture for item IIa.3:  	**Picture for item IIb.3:** 
Type IIa, item IIa.3 Dareka-ga subete-no purezento-o aketa. someone-Nom all-Gen present-Acc opened 'Someone opened all the presents.'	**Type IIb, item IIb.3** *as opposite*
Picture for item IIa.4:  	**Picture for item IIb.4:** 
Type IIa, item IIa.4 Dareka-ga subete-no bousi-o kabutte-mita. someone-Nom all-Gen hat-Acc put on-tried 'Someone tried on all the hats.'	**Type IIb, item IIb.4** *as opposite*

S>O scope items	O>S scope items
Picture for item IIa.5: 	**Picture for item IIb.5:** 
Type IIa, item IIa.5 Dareka-ga subete-no hasi-o watatta. someone-Nom all-Gen bridge-Acc crossed 'Someone crossed all the bridges.'	**Type IIb, item IIb.5** *as opposite*
Picture for item IIa.6: 	**Picture for item IIb.6:** 
Type IIa, item IIa.6 Sannin-no-otokonoko-ga subete-no inu-o sanpo ni turete-itta. three-Gen-boy-Nom all-Gen dog-Acc walk-Loc take-went 'Three boys took all the dogs for a walk.'	**Type IIb, item IIb.6** *as opposite*

S>O scope items	O>S scope items
Picture for item IIa.7: 	**Picture for item IIb.7:** 
Type IIa, item IIa.7 Hutari-no-otokonoko-ga subete-no teeburu-o huita. two-Gen-boy-Nom all-Gen table-Acc wiped 'Two boys wiped all the tables.'	**Type IIb, item IIb.7** *as opposite*
Picture for item IIa.8: 	**Picture for item IIb.8:** 
Type IIa, item IIa.8 Sannin-no-tozankyaku-ga subete-no yama-ni nobotta. three-Gen-hiker-Nom all-Gen mountain-Loc climbed 'Three hikers climbed all the mountains.'	**Type IIb, item IIb.8** *as opposite*

S>O scope items	**O>S scope items**
Picture for item IIa.9:  Translation (picture 4): 'Thank you!"	**Picture for item IIb.9:** 
Type IIa, item IIa.9 Hutari-no onnanoko-ga subete-no mado-o aratta. two-Gen girl-Nom all-Gen window-Acc washed 'Two girls washed all the windows.'	**Type IIb, item IIb.9** *as opposite*
Picture for item IIa.10: 	**Picture for item IIb.10:** 
Type IIa, item IIa.10 Nihiki-no-neko-ga subete-no nezumi-o otta. two-Gen-cat-Nom all-Gen mouse-Acc chased 'Two cats chased all the mice.'	**Type IIb, item IIb.10** *as opposite*