QUD affects how Japanese L2 learners interpret ambiguous English sentences

Introduction. Early research on quantifier scope relations in Japanese has noted that Japanese exhibits scope rigidity (Kuroda 1965, Kuno 1973, Hoji 1985, and much subsequent research; Cf. Kuno et al. 1999, Kuno & Takami 2002). Generally, a plain translation of "Everyone didn't jump over the fence," i.e., "*zen'in-ga saku-o tob-anak-atta* (everyone-NOM fence-ACC jump-NEG-PAST)," is considered to be unambiguously "All>Not." In order to convey the "Not>All" reading, there are several ways to construct a Japanese sentence, and among them is to employ a Topic marker -*wa* instead of the nominative case particle -*ga*. The sentence "*zen'in-wa saku-o tob-anak-atta* (everyone-<u>TOP</u> fence-ACC jump-NEG-PAST)" is suddenly unambiguous "Not>All." In addition, there are multiple ways to translate "All of the NPs" into Japanese, as shown by the sentences in (1), which are all possible translations of "All of the umbrellas didn't dry." Although it has often been discussed whether Japanese allows inverse scope reading or not, the literature has little quantitative survey to the best of the authors' knowledge. The current study (i) first presents a quantitative survey on how the different sentence types as in (1) are interpreted by native speakers, (ii) investigates how ambiguous English sentences are interpreted by Japanese speakers, and (iii) shows that their interpretation is much affected by Question under Discussion (QUD; Roberts 1996/2012, Büring 2003).

Survey. We recruited 218 Japanese-speaking college students for a survey to examine what interpretations ("All>Not" or "Not>All" or both) they access with six different types (3 word orders * 2 case particles) of Japanese sentences as in (1). An answer sheet contains target sentences and sets of pictures as in Figure 1, and they were instructed to mark any possible pictures for the given sentence. The results are summarized in Figure 2.

Experiment. We have so far recruited 53 Japanese-speaking college students who have studied English as a foreign language. The participants were handed an answer sheet with pairs of question and answer in English, and asked to translate the conversations into Japanese. Three types of question ("Did all…?", "Did any…?", and "What happened?") were a between-subjects factor. The rationale of the question type factor is the following – generally, an answer to a question is expected to be relevant to the QUD. Thus, different QUDs have different sets of relevant answers, as described in (2). To a question "Did all…?" as in (2a), relevant answers are "Yes, all of them did." or "No, not all of them did." If the answer is a negated one, the "Not>All" interpretation is more relevant than "All>Not (= none)." Similarly, if an answer to the "Did any…?"-quesiton is a negated one, the "All>Not" interpretation is more relevant than "Not>All (and ∃)." We hypothesized that QUD would modulate the interpretation of a potential ambiguous sentence. The neutral "What happened?"-question was employed to see the baseline of the students' preference. There were 5 target Q-A pairs (ambiguous in English), as well as 3 filler Q-A pairs, in one session.

Results and discussion. Preliminary results contain 265 (5*53) data points, among which 225 data points are able to be classified into either of the eleven sentence types (See Table 1). Types (i, iv, v, vii) can be interpreted as "All > Not," given the results of the survey. Type (ii) employs minimizer, which clearly indicates "All>Not." Type (iii) was not considered in the survey, but is another clear indication for "All > Not" on native speakers' intuition. Types (viii-x) are regarded as "Not >All." Type (xi) is highly ambiguous (50% ambiguous according to the survey), and we will leave open how to analyze it. We observe a strong preference for the surface scope, but notice that we see the QUD effect; as expected, more "Not>All" responses were elicited with the "Did all"-questions. Given that the target sentences were exactly the same across the conditions, the difference in response type is due to the effect of QUD.

Our results show two points: (i) Japanese leaners of English tend to interpret scopally ambiguous sentences with the surface scope interpretation, showing L1 transfer (See also Grüter et al. 2010), and (ii) QUD has an effect over the L2 population's interpretation of potentially scopally ambiguous sentences.

(1) List of six conditions and example sentence for "All of the umbrellas didn't dry."

    a. [NP-ga-All]   Kasa-ga   zembu kawak-anak-atta-yo.
                     umbrella-NOM   all   dry-NEG-PAST-PARTICLE
    b. [NP-All-ga]   Kasa   zembu-ga   kawak-anak-atta-yo.
                     umbrella all-NOM   dry-NEG-PAST-PARTICLE
    c. [NP-wa-All]   Kasa-wa   zembu kawak-anak-atta-yo.
                     umbrella-TOP   all   dry-NEG-PAST-PARTICLE
    d. [NP-All-wa]   Kasa   zembu-ga   kawak-anak-atta-yo.
                     umbrella all-TOP   dry-NEG-PAST-PARTICLE
    e. [All-gen-NP-ga] Subete-no kasa-ga   kawak-anak-atta-yo.
                     all-GEN   umbrella-NOM   dry-NEG-PAST-PARTICLE
    f. [All-gen-NP-wa] Subete-no kasa-wa   kawak-anak-atta-yo.
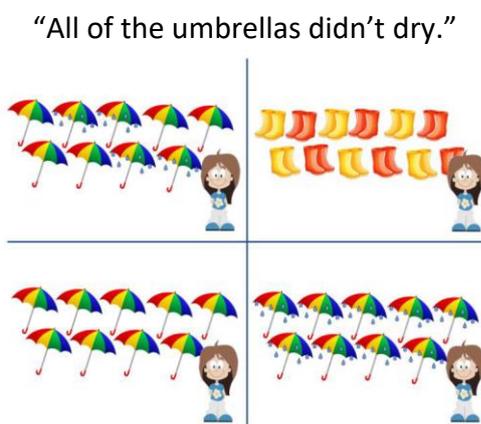   all-GEN   umbrella-TOP dry-NEG-PAST-PARTICLE

"All of the umbrellas didn't dry."

Figure 1: An example of an item
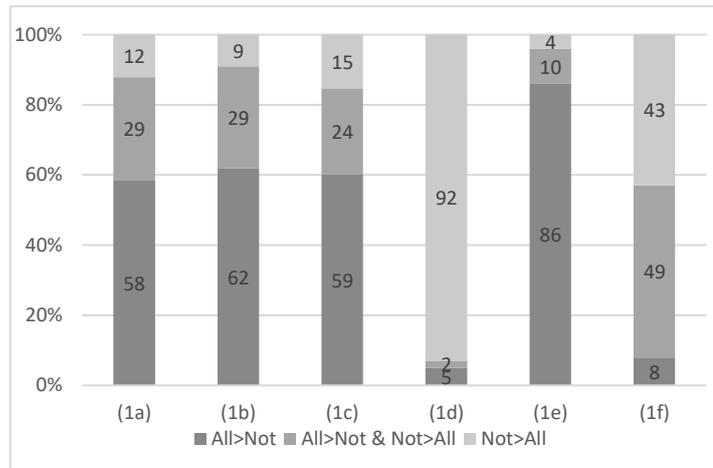

Figure 2: Results of the survey

(2) a. "Did all of the umbrellas dry?" – {Yes, all of them did. / No, not all of them did.}
    b. "Did any of the umbrellas dry?" – {Yes, some of them did. / No, none did.}
    c. "What happened?" – Relevant answers could be anything that is relevant in the context.

Classification		Did all?	Did any?	Baseline	Total #
Indicating "All>Not" interpretation	(i) All-gen-NP-*ga* … Neg	18	22	45	85
	(ii) Minimizer	0	12	1	13
	(iii) NP-gen-All-*ga* …Neg	1	5	2	8
	(iv) NP-All-*ga* … Neg	5	0	0	5
	(v) NP-*ga*-All … Neg	0	0	5	5
	(vi) All-NP … Neg	3	0	0	3
	(vii) NP-*wa*-All … Neg	2	0	5	7
		29	**39**	**58**	**126**
Indicating "Not>All" interpretation	(viii) All-*wa* … Neg	8	0	0	8
	(ix) NP-*wa* All-*wa* … Neg	2	0	0	2
	(x) It's not the case that …	5	5	5	15
		15	**5**	**5**	**25**
Unable to classify (highly ambiguous)	(xi) All-gen-NP-*wa* … Neg				74

Table 1: Results of the experiment