The Perception of Quantifier Raising in Japanese-English Bilinguals

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Abstract

This paper was originally written for Dr. Heather Bliss's Linguistics 282W course, *Writing for Linguistics*. The assignment asked students to expand on a previous writing exercise into a short experimental paper, with a research question, methodology, and results included accordingly. The paper uses APA citation style.

Semantically, there is scope ambiguity in the way sentences are formed. For example, the phrase "three girls petted every cat" can yield two meanings: either the three girls combined petted every cat as the surface scope, or each of the three girls petted every single cat as the inverse scope. This phenomenon is referred to as Quantifier Raising (QR) (May, 1977), and although it is well-documented for in English, QR is not a universal phenomenon. Some believe that Japanese does not exhibit QR (Hoji & Kuroda, 1998), while others assert otherwise (Han et al., 2009; Tanaka & Kizu, 2012). Yet, if QR is established in English, then the knowledge of a language with QR may influence the acceptability of scope interpretations in Japanese-English bilinguals. Thus, this study aims to answer the following research question: to what extent does Japanese-English bilingualism affect the perception of QR movement in Japanese? Two bilingual speakers of English and Japanese were recruited for an oral translation task in which target sentences that exhibited QR in English were elicited in Japanese. Discourse contexts were visually presented using diagrams to describe the intended scope of the scenario, as each sentence contained two possible scope interpretations. Participants were later asked whether their translation for one of the scopes applied to the other interpretation. The study found that Japanese-English bilinguals accepted the meaning behind inverse scope elicitations much more frequently compared to previous QR studies conducted on native, monolingual Japanese speakers. Thus, the knowledge of different languages—particularly those exhibiting QR—may

affect the overall perception of QR in Japanese, among other languages that have less pronounced scope ambiguities.

Introduction

When a sentence is scopally ambiguous due to the presence of more than one quantifier, Quantifier Raising (QR) may also be present. The scope—otherwise defined as the relationship between quantifiers and quantified expressions—of certain sentences may be left ambiguous because of multiple interpretations. The Y-Model proposed by Chomsky (1969) describes the architecture of grammar, stating that the surface structure of a sentence is further broken down into a phonological form and a logical form. The logical form, which corresponds to semantic meaning, is susceptible to an abstract movement operation that inverts the scope of the quantifiers as described by May (1977) and is not accounted for in Chomsky's Y-Model. Hence, QR serves as a hypothesis for how more than one reading can be derived from having multiple quantifiers in a sentence with only one surface representation.

While Hoji and Kuroda (1998) attested that QR is generally absent in Japanese, Tanaka and Kizu (2012) as well as Han et al. (2009) found that there are exceptions where obtaining an inverse scope is possible because of modifications in word order—a phenomenon referred to as scrambling. However, as Han et al.'s (2009) experiment regarding Japanese scope rigidity solely focused on monolingual Japanese speakers, further analyses are warranted to determine if the same findings would be attested in bilinguals—or whether QR in English would affect QR judgements in Japanese.

Notably, certain determiners in English—such as "a" or "the"—do not exist in Japanese, so meanings may have to be inferred from context instead. As a Chinese Canadian who has studied Japanese for several years, an investigation on QR seemed especially intriguing due to the additional layers of complexity in determining when QR movement may be absent in Japanese, which could potentially be analyzed and further compared cross-linguistically. Thus, this paper aims to answer the following research question: to what extent does Japanese-English bilingualism affect the perception of QR movement in Japanese? I hypothesize that QR movement will be observed in bilingual speakers of English and Japanese, but unlike Han et al.'s (2009) results, I also predict that QR will persist even without scrambling. If this is the case, then bilingual speakers will say that their translation accounts for both interpretations.

Methodology

Participant Characteristics

Two Japanese women currently residing in Canada were consulted for a fieldwork session. The participants, henceforth referred to as "R" and "S" for anonymity, are bilingual in both English and Japanese. Participant details are further elaborated on in Table 1, however, "R" has requested not to divulge their personal information.

Table 1. Characteristics of participants.

Participant	Age	Gender	Birthplace	Languages other than EN/JP known?
"R"	Adult	Female	Not Given	No; English and Japanese only
"S"	50's	Female	Canada	No; English and Japanese only

Sentence Translation Task

Participants were individually asked to orally translate four English sentences with QR and without scrambling into Japanese using a picture displayed on an iPad screen. The visual representation gave the participants one of the two discourse contexts and helped guide their scope interpretations, as per Tables 2 to 5. The procedure followed Matthewson's (2004) approach to semantic fieldwork, in which sentences are directly elicited using diagrams to represent discourse contexts. Additionally, the study took place in a quiet room without any other people. For consistency in verb conjugations, translations were specified to be made in the plain/casual form.

Table 2. Visual cues and scope interpretations of the sentence "Three girls petted every cat."

English Sentence	Scope	Visual Representation[1]	Context
"Three girls petted every cat."	Surface		The three girls combined have petted every cat.
	Inverse		Each of the three girls have petted every single cat.

[1] All graphics were taken from KindPNG, a non-copyright image source, and later assembled into the visual representations shown here.

Table 3. Visual cues and scope interpretations of the sentence "Two boys want a video game."

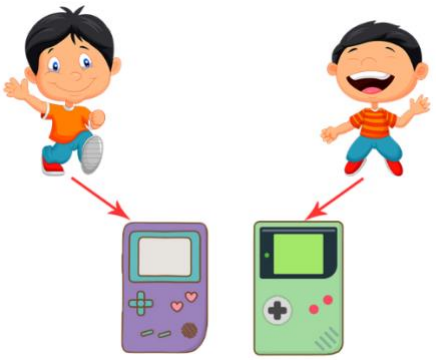
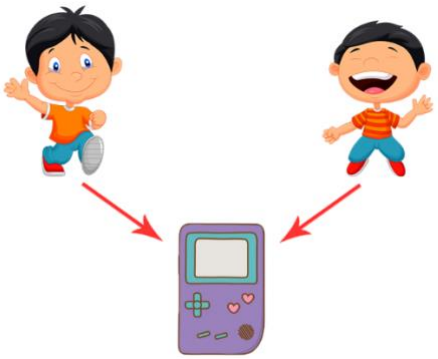
Sentence	Scope	Visual Representation	Context
"Two boys want a video game."	Surface		The two boys want a video game, but not specifically the same one.
	Inverse		The two boys want the same video game.

Table 4. Visual cues and scope interpretations of the sentence "All dogs like a snack."

Sentence	Scope	Visual Representation	Context
"All dogs like a snack."	Surface		All dogs like some sort of snack, but not any one snack specifically.
	Inverse		All dogs like this one specific snack.

Table 5. Visual cues and scope interpretations of the sentence "Every student brought a textbook."

Sentence	Scope	Visual Representation	Context
"Every student brought a textbook."	Surface		All of the students brought their own, individual textbooks.
	Inverse		Collectively, all the students brought a single, specific textbook.

Each participant saw the same images for elicitation but in opposite orders to prevent bias. Additionally, the two filler questions with only one scope interpretation from Table 6 were added to prevent consultants from guessing the true nature of the study.

Table 6. Filler sentences without scope ambiguity.

English Sentence	Visual Representation
"Mary goes to school with her older brother."	
"The friends played together at the park."	

Responses to the first scope interpretation were typed on a laptop before presenting the second diagram for each of the critical sentences containing scope ambiguity. A translation for the second image was then elicited, but if the translations between the two scope interpretations were different, then the participant was asked whether the second diagram could have been described by the first translation. Thus, ten sentences were elicited in total—eight of which were critical items. After all the elicitation data was collected, participants were debriefed on the purpose behind the study.

Results

From the critical items in Table 7, the sentences with scope ambiguity were generally translated similarly—or even the same, in the case of "[t]wo boys want a video game"—between the surface and inverse scope interpretations in both "R" and "S"'s translations. For the most part, participants believed that their translated sentence from one scope was also acceptable for the other scope, except for "S"'s distinction in "[e]very student brought a textbook." In "S"'s inverse scope translation, a more specific distinction was made that only one textbook (*itsusatsu no kyoukasho*) was brought between the students. As the "a" determiner is absent from Japanese grammar, the word for textbook (*kyoukasho*) used in the other elicitations was presumably inferred to be plural based on context alone.

Table 7. Results of elicited sentences with scope ambiguity.

Participant	English Sentence	Scope	Japanese Translation (Romaji)	Applicable to Other Scope?
"R"	"Three girls petted every cat."	Surface	San-nin no onna no ko ga dono neko wo nadeta.	Yes
		Inverse	San-nin no onna no ko ga neko minna nadeta.	
"S"		Surface	San-nin no onna no ko ga dono neko mo nadeta.	Yes
		Inverse		
"R"	"Two boys want a video game."	Surface	Futari no otoko no ko ga bideo geemu ga hoshigatteiru.	Yes
		Inverse		
"S"		Surface	Futari no otoko no ko ga bideo geemu ga hoshii.	Yes
		Inverse		
"R"	"All dogs like a snack."	Surface	Dono inu mo okashi ga suki.	Yes
		Inverse	Inu wa minna okashi ga suki.	
"S"		Surface	Dono inu mo oyatsu ga suki.	Yes
		Inverse		
"R"	"Every student brought a textbook."	Surface	Dono gakusei mo kyoukasho wo motte kita.	Yes
		Inverse		
"S"		Surface	Dono gakusei mo kyoukasho wo motte kita.	**No**
		Inverse	Gakusei-tachi wa itsusatsu no kyoukasho wo motte kita.	

Discussion

In support of the hypothesis, the participants of this study generally accepted their translations of surface scope interpretations of scope ambiguous sentences for the inverse scope, and vice-versa. This observation implies that the perception of QR to bilingual English and Japanese speakers is more heavily influenced by their existing knowledge of English, unlike the less prevalent QR in Japanese perceived by monolingual speakers (Han et al., 2009).

The most prominent limitation of the experiment is its limited sample size. As "R" and "S" are both adult women, it would be difficult to generalize the findings to the entire population of bilingual English and Japanese speakers due to their shared characteristics. Future investigations with a larger variety of participants, including exploring the perception of Japanese QR in more bilingual men and youth, would be beneficial in extrapolating the results of similar research. As languages change even between generations, an intergenerational approach to uncovering the perceptions of QR in speakers of Japanese may also help explain why there are so many different opinions regarding whether Japanese QR movement exists.

Additionally, a comparative analysis between bilingual speakers born in Canada and Japan as an avenue for future research would also be justified as monolingual Japanese speakers who have acquired English as a second language may hold different views than those who are more accustomed to English as a mother tongue. However, the one strength among the sample of participants chosen is that both participants only know English and Japanese, implying that they are not influenced by scope accessibility in other languages. Hence, the knowledge of English and Japanese can be isolated without additional confounding variables such as fluency in other languages hindering QR judgements.

Translation tasks themselves pose other limitations to consider, as translations to target languages do not always convey the same message as the source language. Slight variations in the translation of sentences were observed from the results, but even within the phrases elicited from only two participants, the difference in outputs for the same sentence should not be disregarded.

As the semantic fieldwork was only conducted in one sitting rather than spread out across multiple days due to timing and availability constraints, the participants had given both scope interpretations relatively close one after another. Hence, there may have been bias in the second scope elicitation with the

first still fresh in their minds, but the use of two filler questions also helped mitigate this limitation by detracting attention from the QR questions.

Nonetheless, QR in Japanese bilinguals can also be further extended through the addition of scrambling in the scope translation task. Scrambling, which is described by Agbayani et al. (2014) as the "movement of a single syntactic constituent (usually NP or PP) to a clause-initial position," would hypothetically exhibit QR as instances of surface and inverse scope are already accepted by monolingual Japanese speakers in the presence of scrambling (Han et al., 2009). Unfortunately, I was hesitant to include scrambling in this simple experiment due to my own inability to process more syntactically complex sentences in Japanese as a foreign language learner. Yet, the presence of scrambling has also been documented in other languages, such as Czech (Biskup, 2006) and Russian (Bailyn, 2001), so cross-linguistic studies comparing QR movements with scrambling—especially within bilingual speakers of both English, or any other language with well-documented QR, and a language with QR that may be less pronounced—would serve as a valuable investigation.

Conclusion

While the presence of QR in Japanese is still highly debated with results varying from one researcher to another, this experiment is among those that can attest to the existence of QR movement in Japanese from a bilingual standpoint. Regardless, these perceptions of scope ambiguity are subject to change over time, which warrants future research into the complexities behind QR in not only Japanese, but other disputable languages as well. The phenomenon of QR is nonetheless intricate and raises a multifaceted approach to semantic scope ambiguity.

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