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Acquisition of L2 English Negative Quantifiers without Equivalent Lexical Items in an L1

Abstract

This article investigates how second language learners interpret a scope bearing item in the target language. According to Sprouse (2006), L2 learners' task is to relabel their native language's lexical items in line with the features of the target language. An interesting lexical item is the English negative quantifier, for which there is no equivalent in Japanese. It was discovered that the default interpretation of the English negative quantifier by Japanese-speaking learners of English was a narrow scope reading (i.e., Quantifier Raising (QR) does not occur). We follow Beghelli and Stowell's (1997) elaborated functional structures for quantifier feature checking at Spec-Head agreement. Because Japanese is considered to be a "no agreement" language (Kuroda, 1992; Fukui & Sakai, 2003), QR is failed since the English negative quantifier cannot satisfy "agreement" for the feature-checking. Hence, even if the equivalent lexical item does not exist in Japanese, a grammatical constraint such as "no agreement" is transferred to the initial state of the second language (Full Transfer in Schwartz and Sprouse, 1996).

Keywords: second language acquisition, full transfer, full access, Japanese, English, quantifiers

Phenomena

The interpretation of quantifiers is different from a referential expression. Compare the following two sentences:

(1) John saw Bill.
(2) John saw every student.

Unlike (1) where *John* and *Bill* are referential expressions, *every student* in (2) is not. Namely, *every student* does not express a specific individual. Rather, it is a variable x which is bound by *every*. The scope properties of operators such as quantifiers must be syntactically represented (Haegeman, 1994, p. 491). And this is represented at Logical Form (LF) whose level encodes logico-semantic properties such as quantifiers (Haegeman, 1994, p. 491). An operator such as quantifiers has to occupy a scope position which is a left-peripheral position. To do so, the quantifier must be moved to a scope position (Quantifier Raising = QR) (Haegeman, 1994, p. 491):

(3) [$_{IP}$ every student*i* [$_{IP}$ John saw x*i*]]

More than one quantifier appears in a sentence, and such a sentence is ambiguous:

(4) A nurse looks after every child in this hospital. (S > O, O > S)
(Lee, Yip, & Wang, 1999, p. 40)

The above example (4) means that there is a particular nurse that looks after every child in this hospital (S > O reading) or that every child is looked after by a nurse in this hospital (O > S reading). In other words, the subject quantifier takes scope over the object quantifier and vice versa. Quantifier scope is determined by c-commanding relations at LF. In the Government and Binding (GB) framework, at Case positions at S-S, Quantifier Noun Phrase (QNP) moves to distinct scope positions at LF (May, 1977, 1985). Beghelli and Stowell (1997) call QR the Uniformity of Quantifier Scope Assignment:

> "The Uniformity of Quantifier Scope Assignment (Scope Uniformity)
> Quantifier Raising (QR) applies uniformly to all QPs. Neither QR nor any particular QP is landing-site selective; in principle, any QP can be adjoined to any (non-argument) XP."
>
> (Beghelli & Stowell, 1997, p. 72)

However, they depart from Scope Uniformity due to empirical reasons.

(5) a. Some tourists visited all the museums.
b. Some tourists visited every museum.

(Lee, Yip, & Wang, 1999, p. 41)

Although *all* and *every* are semantically similar, inverse scope is highly marked in (a), but it is available in (b). Beghelli and Stowell examined different behaviors of quantifiers and proposed distinct scope positions (we will come back to their structure). Each quantifier moves to the Spec position of the respective functional structure of the clause for feature-checking in the minimalist framework.

However, a language such as Japanese does not allow such ambiguous interpretations in the English equivalent as follows:

(6) Every horse didn't jump over the fence.
a. None of the horses jumped over the fence. (every > not: *every* takes scope over *not*.)
b. Some horses jumped and some didn't. (not > every: *not* takes scope over *every*.)

(7) Dono-uma-mo fensu-o tobikoer-are-nakat-ta
which-horse-Q fence-ACC jump-can-not-past
every > not, #not > every

Japanese is a scope-rigid language, so the surface order (or surface c-command) is the only available interpretation (Hoji, 1985). Hence, it is very interesting to ask how the learners of each language would acquire the relevant scope interpretations of the other language. Namely, English-speaking learners of Japanese must unlearn 'not > every' reading, while Japanese-speaking learners of English must learn 'not > every' reading. A fundamental task that learners of a second or a foreign language (henceforth L2 learners) must undertake is to acquire vocabulary in the target language. L2 learners must learn pronunciation as well as the relevant meanings and properties of the target lexical items. In the seminal work, Schwartz and Sprouse (1996) propose the Full Transfer/Full Access (FT/FA) model. This assumes that the initial state of the second language acquisition is the final state of the first language acquisition (FT). Hence the first language grammar (i.e., all the principles and parameter valued in the Ll grammar) is carried over to the initial state of the second language. Then, with the available data, the second language learners have to restructure the grammar to represent a target language, drawing from available options of UG (FA) (Schwartz & Sprouse, 1996, p. 41). Let us say that this is a UG-based approach.

Furthermore, Sprouse (2006) observes that L2 learners' task is to relabel the lexical items of their native language in the target language. An obvious relabeling task is to learn the pronunciation of the target language. A subtle but important aspect is to learn the morphological, syntactic, and semantic properties of the relevant lexical item in the L2 based on available L1 lexical items. Interesting questions emerge. If the lexical item is a scope bearing item that does not exist in their L1 language, are they able to learn ambiguous interpretations? If it is (or it is not) possible to acquire ambiguous interpretations, what are the implications for second/foreign language theory? These are the research questions in the present paper. It will be investigated how Japanese-speaking learners of English interpret the English negative quantifier since there is no equivalent in Japanese (Goro, 2007, p. 161).[1] Consider the following:

(8) The election of nobody surprised me.
  a. Nobody at all was elected, and that was surprising.
  b. Of those elected, none of them surprised me.

(9) Nobody's election surprised me.
  a. #Nobody at all was elected, and that was surprising.
  b. Of those elected, none of them surprised me.

(van Hout, Kamiya, & Roeper, 2013, p. 138)

(8a) is the narrow-scope reading in which *nobody* takes scope in its post-nominal position. (8b) is the wide-scope reading in which *nobody* takes scope over *election*. On the other hand, (9) is called passive nominals where *nobody* moves from the post-nominal position to the sentence initial position (van Hout et al., 2013, p. 143). Unlike (8), example (9) is unambiguous: only the wide-scope reading is available (van Hout et al., 2013, p. 138). We will review the details of this mechanism in (8) and (9) later.

Hence, Japanese-speaking learners of English must learn the relevant mechanism. Based on our survey conducted for Japanese-speaking learners of English, it is claimed that the default interpretation of the English negative quantifier is narrow scope reading. This indicates that Japanese-speaking learners of English fail to acquire ambiguous interpretations (or QR). As Schwartz and Sprouse claim, there are factors that contribute to L2 development: the initial state, input, the apparatus of UG and learnability considerations (Schwartz & Sprouse, 1996, p. 41). Our data is very rare in corpora. Hence, the availability of the relevant

[1] a. *nai-hito-ga kita
no-one-NOM came
'No one came.'
b. *nai-mono-o tabeta
no-thing-ACC ate
'(I) ate nothing.'

input may be a source of failure. Studies such as Kimura (2019; 2022) or Wu and Ionin (2021) also report that learners of English whose native language is a scope-rigid language fail to acquire QR. In those studies, there are equivalent lexical items (such as negation or universal quantifier) in their native languages, unlike our study. However, it is also reported that English-speaking learners of Japanese are more successful learning Japanese type of scope interpretations (Grüter, Lieberman, & Gualmini, 2010; Marsden, 2009). These studies point out that English is a semantically superset language (both surface and inverse scope readings), while Chinese and Japanese are subset languages (only surface scope reading) and that learners whose native language consists of the subset reading experience considerable difficulties acquiring the target interpretations. Therefore, we claim that the frequency of the relevant input is not the only factor contributing to the failure of acquiring QR. Having a superset interpretation of scope interpretation plays an important role for the successful acquisition of QR. Then, what does it mean to have both superset and subset interpretations? Following Beghelli and Stowell's elaborated functional projects for quantifiers, we claim that Japanese is different from English in terms of "agreement." Namely, Japanese does not follow Spec-Head agreement for feature checking, as Kuroda (1992) and Fukui and Sakai (2003) among others claim. As a result, Japanese native speakers only access the subset interpretation. Such a "no agreement" system applies to a lexical item in a second language. Although there is no English negative quantifier in Japanese, it is "no agreement" that forces Japanese-speaking learners of English to reach the subset reading. Hence, agreement plays an important role for acquiring a scope bearing item in the second language.

Note that the UG-based approach is not the only approach for second language acquisition. Rothman and Slabakova (2018) explain that UG-based scholars "investigate acceptability and interpretation through eliciting judgments" (Rothman & Slabakova, 2018, pp. 434–435). On the other hand, the usage-based approach, another account for second language acquisition, "predominantly looks at corpora and linguistic production" (Rothman & Slabakova, 2018, pp. 434–435). They account for the different approaches in terms of the different interests. UG-based scholars are concerned with learners' mental representation, while usage-based scholars are interested in what learners do with language (Rothman & Slabakova, 2018, p. 435). Although the approaches are different, Rothman and Slabakova claim that "a neutral reading of the conclusions shows both approaches are not so different" (Rothman & Slabakova, 2018, p. 435). Tan and Shojamanesh (2019) report that it is not clear whether grammatical learning is done by usage-based approach or universal grammar-based approach. They suggest that it is worthwhile to investigate the parameters and variables such as the role of L1 transfer, the interaction of the L1 in L2 input, or the impact of L1 on L2 proficiency levels among others in second language acquisition. The present paper does not aim to compare the UG-based theory

with alternative ones. Rather, we assume poverty of the stimulus argument (Chomsky, 1986; Hornstein & Lightfoot, 1981, among others). An example such as (6), (8), and (9) can hardly be found in a corpus. However, native English speakers come to understand that it is ambiguous. Given that there is not much obvious data, how can native speakers come to understand the relevant meanings? In terms of learners of English, could they acquire such interpretations without much evidence? This is the reason why we would like to approach the current problem set by the UG-based theory.

This paper is structured as follows: The previous studies section will review the relevant previous studies. In particular, we will review L2 studies of scope interactions in which ambiguous sentences form a superset and a subset relation. In the quantifier raising, passive in nominalization and interpretations section, we will summarize the mechanism as to how the English negative quantifier is interpreted as wide scope and narrow scope interpretations, based on van Hout, Kamiya, and Roeper (2013). In the prediction section, we will make a prediction with regard to whether Japanese-speaking learners of English acquire the English negative quantifier. In the participants and procedures section, we will explain the survey design and analysis. In the result section, we will report the results of the present study. In the discussion section, we will discuss the implications for L2 learning processes based on the survey results. In the conclusions section, we will conclude this paper.

Previous Studies

One of the most influential studies in (generative) second language acquisition is Schwartz and Sprouse's (1996) Full Transfer/Full Access (FT/FA) model. In this model, "[...] the entirety of the L1 grammar (excluding the phonetic matrices of lexical/morphological items) is the L2 initial state (hence the term 'Full Transfer')" (Schwartz & Sprouse, 1996, p. 41). Hence, all principles and parameters valued in the learner's L1 are carried over as the initial state of the L2. Therefore, the task of L2 learners is to reset the values in their L1 based on the target language. However, resetting the values is not random. Rather, options are provided by UG (hence Full Access) (Schwartz & Sprouse, 1996, p. 41). Schwartz and Sprouse also claim that each intermediate state of restructuring grammar is a distinct interlanguage (grammar). To support the FT/FA model, Schwartz and Sprouse assume two auxiliary claims: "interlanguage must be analyzed on its own terms," and "convergence on the target language grammar is not guaranteed" (Schwartz & Sprouse, 1996, p. 42).

Related to the FT/FA model, Sprouse (2006) observes that L2 learners' task is to relabel the lexical items of their native language in the target language. In other words, this is the restructuring process of the morphological, syntactic, and semantic properties of the relevant lexical item in the L2 based on available L1 lexical items.

The FT/FA model influences many studies, but for the sake of the current paper, successful and unsuccessful cases of the L2 acquisition processes of scopally ambiguous interpretations will be reviewed. We will point out such ambiguous interpretations from the superset-subset relation. In addition, L2 learners whose native language allows both superset and subset interpretations have less difficulty learning an L2 that allows only the subset reading.

Grüter, Lieberman, and Gualmini (2010) reported that English-speaking learners of Japanese successfully acquired the interpretation between a negation and a disjunction, but that this was not the case for Japanese-speaking learners of English. Consider the following:

(10) [Doubutsu-wa] keeki-wo tabeta-ga, ninjin-ka piiman-wo tabenakatta.
Animal-Top cake-ACC eat-Past but, carrot-Or pepper-ACC eat-Neg-Past

(11) The [animal] ate the cake, but he didn't eat the carrot or the pepper.

(Grüter et al., 2010, p. 140)

These examples include a negation and a disjunction in both languages. However, the relevant interpretations are not the same. While the interaction between disjunction and negation in (11) is *not* taking scope over *or* (i.e., the animal ate neither the carrot nor the pepper = surface scope), the opposite is true for the Japanese counterpart in (10) (*or* > *not*; the animal didn't eat the carrot or didn't eat the pepper = inverse scope). Notice that the surface scope reading entails the inverse scope reading (i.e., if it is true that the animal ate neither the carrot nor the pepper, it is also true that the animal didn't eat the carrot or didn't eat the pepper, but not vice versa). This is known as privative ambiguity (Gualmini & Schwarz, 2009). Since L1 transfer takes place for both groups, it is important to know how native speakers of English and Japanese acquire the interaction between negation and disjunction. According to Grüter et al., while English-speaking adults and children accept the same truth conditions for (11), Japanese-speaking adults and children have different interpretations. Namely, Japanese-speaking children's interpretation of (10) is the same as that of English-speaking adults and children. So, the acquisition process of the Japanese-speaking children is to begin with the English-type interpretation, and with positive evidence of Japanese, they unlearn the English-type of interpretation (surface scope) and arrive at the Japanese-type of interpretation (inverse scope). Such a learning process is led by the semantic subset principle (Crain, Ni, & Conway, 1994) in which the Language Acquisition Device ensures that

the surface reading is always learned first (note that the surface reading entails the inverse reading, but not the other way around).

Grüter et al. reported that English-speaking learners of Japanese were more successful than Japanese-speaking learners of English in acquiring the relevant interpretations between negation and disjunction. Grüter et al. confirmed that there was evidence of L1 transfer at the initial stage of L2 with respect to the acquisition of the interpretation of negation and disjunction since the L1 interpretation was carried over to the L2, especially Japanese-speaking learners of English. English-speaking learners of Japanese seemed to adjust their English interpretation (surface scope) to the Japanese counterpart (inverse scope), as the semantic subset principle predicts.

Given that the age at first exposure to the target language is 18 years for English-speaking learners of Japanese and 12 years for Japanese-speaking learners of English, they are not at the initial state of learning the target language. However, Grüter et al. consider that the default interpretation of negation and disjunction in L1 persists until at least age 5: "Thus, one might expect similarly protracted development in L2 acquisition, and in consequence, a reflection of the initial default at least in beginner and intermediate L2 learners" (Grüter et al., 2010, p. 144). According to this study, only four out of 32 Japanese-speaking learners of English acquired the English readings, whereas 12 out of 20 English-speaking learners of Japanese successfully acquired the Japanese interpretation. In other words, as the semantic subset principle predicts, learners whose L1 allows the surface reading have an advantage over those whose L1 allows the inverse reading.

Another interesting study is Marsden (2009). She investigated the acquisition processes of Japanese interpretations of quantifier interactions by English-speaking learners of Japanese (and Korean-speaking learners of Japanese).

(12) Someone read every book. (some > every, every > some)

(13) Dareka-ga dono-hon-mo yonda.
someone-NOM every-book-mo read
'Someone read every book.' (some > every, #every > some)

While (12) is scopally ambiguous between *some* and *every*, its Japanese counterpart (13) is not, since Japanese is a scope-rigid language (i.e., the surface interpretation is the only interpretation; Hoji, 1985).[2] Hence, if we assume that English forms a superset (both surface and inverse scope readings), Japanese allows a subset (inverse scope).

[2] Note that the native Japanese control group (N = 21) confirms the theoretical claims (i.e., scope rigidity). Native Japanese speakers robustly accept the surface scope interpretation (87.5%) as opposed to the inverse scope interpretation (16%) in a sentence such as (13). See Marsden (2009, p. 146) for the results.

However, when scrambling occurs, the sentence becomes ambiguous:

(14) Dono-hon-mo*i* dareka-ga t*i* yonda.
every-book-mo someone-NOM read
Some > every, every > some

In this sentence, the object phrase that contains a universal quantifier moves to the sentence-initial position. As a result, the surface interpretation (i.e., every > some) and the reconstructed interpretation (some > every) become available. Therefore, there are two things that English-speaking learners of Japanese have to learn/overcome. First, in the ordinary Japanese word order (SOV), they have to learn that an object wide scope reading (i.e., every > some at LF) is not available, which is possible in the English counterpart. Second, they have to learn a phrasal movement (i.e., scrambling) that is not available in English. In addition, in the scrambled structure, the object phrase that contains the universal quantifier can be reconstructed at the original position; hence, the sentence is ambiguous. Nevertheless, English-Japanese interlanguage grammar allows the learners of Japanese to have access to both the every > some and the some > every interpretations. Marsden tested whether or not the intermediate learners of Japanese would differ from the advanced learners of Japanese in terms of which interpretations they are able to access.[3]

Marsden found that while the intermediate learners of Japanese seemed to have English-type interpretations due to L1 transfer, the advanced learners had access to the same interpretations as the native Japanese speakers. Thus, she claims that "[...] 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" (Marsden, 2009, p. 141). Successful learners were able to relabel L1 lexical features relating to the universal quantifier to their L2 counterparts (Sprouse, 2006). Marsden explains the relabeling processes based on the characteristics of Japanese universal quantifiers (i.e., dono N mo).

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

(Marsden, 2009, p. 157)

[3] Marsden assigned the learners' groups based on the scores of a 42-blank random cloze test whose content was not available in the paper.

The lexical feature of *every* in English is a [+singular] feature. However, as (15) shows, the Japanese universal quantifier appears as either singular or plural. Marsden explains that English-speaking learners of Japanese encounter and process enough examples like (15) and that such an example could motivate deletion of the [+singular] feature that is not compatible with the plural variant (Marsden, 2009, p. 158). Eventually, the learners' interlanguage grammar becomes that of native Japanese speakers.

Learners are not explicitly taught that target sentences like (14) are ambiguous—rather, Marsden claims that the relevant interpretations in the target language are guided by the constraints in UG. That is, even L2 learners are still able to access the options provided by UG. This makes it possible for the advanced learners of Japanese in her study to acquire native-like interpretations. Hence, learners of Japanese transfer the L1 knowledge at the initial state of learning Japanese, but they gradually adjust interlanguage grammar, guided by UG options (Full Access).

It is not always the case that L2 learners can successfully acquire a target grammar. Kimura's (2019) study is the case in point. This study is in the opposite direction of Marsden (2009): Japanese-speaking learners of English acquire scope interactions. His main purpose is to examine whether or not Japanese-speaking learners of English could acquire QR based on the Interpretability Hypothesis (IH: Hawkins & Hattori, 2006; Tsimpli, 2003; Tsimpli & Dimitrakopolou, 2007 among others):

(16) "a. *Uninterpretable features* (*u*Fs) that are not selected by L1 are subject to the critical period effect.
b. The absence of *u*Fs is compensated for by the interpretable (iF) counterpart."
(Kimura, 2019, p. 1 on the manuscript; also see references in Kimura)

Kimura assumes a trigger for QR as "it is an uninterpretable feature, which I refer to uQUANT, that triggers QR. Just like the EPP feature, the uQUANT feature occurs in a functional head (DistP) (Beghelli & Stowell, 1997) and attracts a QP" (Kimura, 2019, p. 2 on the manuscript).

Kimura conducted an acceptability judgment test to see whether or not Japanese-speaking learners of English can access both surface and inverse scope interpretations in English such as 'A student read every book.'

Kimura acknowledges that the English interpretations form a superset (i.e., surface and inverse scope) and the Japanese interpretations form a subset (surface scope) (Kimura, 2019 on the manuscript, p. 4). He controlled the surface and inverse scope readings by the relevant contexts. He had 15 learners of English and seven native speaker control participants. These learners of English began to study English between ages 10 and 13, and their ages ranged

from 21 to 26 (M = 23.3) (Kimura, 2019, on the manuscript, p. 4). While native speakers in the control group accepted both the surface and inverse scope readings ($t(6) = 1.701$, two-tailed $p = 0.14$) (Kimura, 2019, on the manuscript, p. 5), Japanese native speakers overwhelmingly accepted the surface scope interpretation more than the inverse scope interpretation ($t(14) = 5.330$, two-tailed $p < .001$) (Kimura, 2019 on the manuscript, p. 6). Kimura notes that even advanced and intermediate-advanced learners totally rejected the inverse scope reading.[4] Hence, although English-speaking learners of Japanese had success acquiring Japanese scope interpretations, as in Marsden (2009), Japanese-speaking learners of English did not.

Furthermore, Kimura (2022) investigated how learners of English whose native language is Japanese would acquire the knowledge of the English universal quantifier. In particular, he examined the relevant features of *all* (collective/quasi-distributive features) and *every* (distributive feature) in terms of feature checking movement and L2 learner's acquisition of the distributive feature in English *every*. By conducting the picture-based acceptability judgment task for Japanese-speaking learners of English, he found that native Japanese speakers could not acquire the 'distributive' feature in *every*. Rather, they consider the feature of English *every* as 'collective/quasi-distributive.' Kimura pointed out that this was the problem why Japanese-speaking learners of English could not access inverse scope reading in the following sentence such as 'A boy loves every girl (a > every & every > a).'

Kimura's (2022) study reminds us of Marsden's study in which English-speaking learners of Japanese may encounter an example such as (15), which motivates them to change from the English type feature [+singular] of universal quantifier to the Japanese counterpart. However, although English universal quantifier *every* requires a singular noun, Japanese-speaking learners of English could not acquire the distributive feature in their interlanguage grammar.

We reviewed a few studies regarding L2 acquisition of scope interpretation. Generally speaking, English-speaking learners of Japanese are more successful in learning the interpretations of the scopal interactions than Japanese-speaking learners of English are. English has more interpretations, such as surface and inverse scope interpretations (or superset and subset interpretations) than Japanese does. And as we reviewed, Marsden's participants might have had enough evidence (such as a quasi-plural morpheme 'tati') to restructure the relevant feature, while that was not the case with Kimura's (2022) participants. So, it may be the case that learners whose interpretation is superset happen to see clear morphological evidence of the target language whose interpretation is subset. In the next Section, we will observe the English ambiguous sentences in which passivization occurs followed by QR, which is our target structure.

[4] Kimura notes that participants took the Oxford Quick Placement test.

Quantifier Raising, Passive in Nominalization and Interpretations

In this Section, we will review van Hout, Kamiya, and Roeper (2013) that show asymmetrical scope interpretations based on the appearance of the quantifier. In addition, it is the negative quantifier whose equivalent does not exist in Japanese. van Hout et al. observe the following pair of sentences and their respective interpretations.

(8) The election of nobody surprised me.
  a. Nobody at all was elected, and that was surprising.
  b. Of those elected, none of them surprised me.

(9) Nobody's election surprised me.
  a. #Nobody at all was elected, and that was surprising.
  b. Of those elected, none of them surprised me.

(van Hout et al., 2013, p. 138)

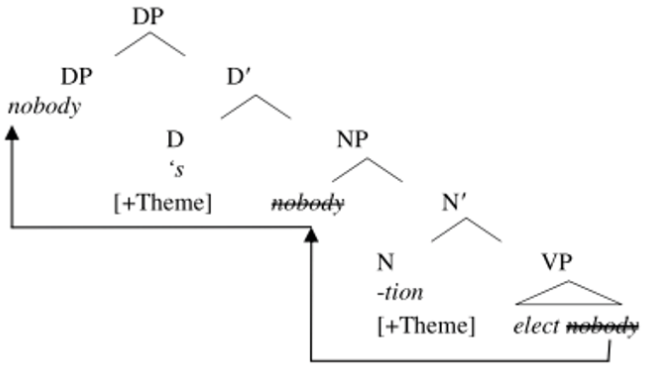
This is '-tion' nominalization. As far as the form goes, (8a) is an active nominal with which the Theme argument *nobody* in a post-nominal of-phrase (van Hout et al., 2013, p. 138). In addition, (8) is ambiguous. (8a) is the narrow-scope reading in which *nobody* takes scope in its post-nominal position. (8b) is the wide-scope reading in which *nobody* takes scope over *election*. On the other hand, (9) is called passive nominals where *nobody* moves from the post-nominal position to the sentence initial position (van Hout et al., 2013, p. 143). Unlike (8), example (9) is unambiguous: only the wide-scope reading is available (van Hout et al., 2013, p. 138). With such readings, they raised a question: "why are active '-tion' nominalizations with the quantified phrase in the post-nominal position ambiguous, whereas passive nominalizations with the quantifier prenominally exhibit scope freezing?" (van Hout et al., 2013, p. 138). van Hout et al. compare and contrast the structures of sentential passive vs. passive in nominalization. In the sentential passive, the motivation of movement for the theme argument is to obtain Case:

(17) _____ was arrested he → he was arrested he

However, van Hout et al. point out that the same motivation is not applied to passive in nominalization since "Case is provided by a dummy preposition in the post-nominal of-PPs" (van Hout et al., 2013, p. 139). They assume that there is a parallelism between sentence and noun, so they consider that the movement by Case is not the ultimate motivation. Rather, they propose that

"passivization essentially reserves the subject position for the Theme argument" (van Hout et al., 2013, p. 139). That is, "the Theme moves to satisfy a passive feature which attracts it to subject position" (van Hout et al., 2013, p. 142). This applies to (9). Then, why is it that passivization in the nominalization is unambiguous with respect to the negative quantifier? van Hout et al. propose the following derivation of passivization and the internal structure in nominalization.

(18)



(van Hout et al., 2013, p. 152)

van Hout et al. assume that there is VP within nominalization. In this derivation, *nobody* is generated as the object position in VP. And it moves to Spec-NP and further to Spec-DP. They claim that Spec-NP is A-position and Spec-DP is A'-position. The motivation of movement to Spec-NP is to satisfy the passive feature (or Extended Projection Principle = EPP van Hout et al., 2013, p. 139) and the motivation to Spec-DP is QR. Following Lasnik's (2003) generalization that reconstruction is not allowed after movement via an A-position to an A'–position, van Hout et al. explain that this movement path is the reason why *nobody* is unambiguous.

On the other hand, when *nobody* appears at the post-nominal position, it is interpreted at the in-situ position (= the narrow scope reading). Since the passive feature does not show up in this form, *nobody* directly moves to Spec-DP for QR (= the wide scope reading). Hence, anti-reconstruction does not occur in this movement. Therefore, it is ambiguous (van Hout et al., 2013, p. 139). In sum, there is an overt movement in English nominalization. The motivation of the movement is to satisfy the passive feature (or EPP). Does overt movement occur in Japanese?

Kishimoto (2006) extensively argues that there is no A-movement motivated by the EPP in Japanese noun phrases. The nominalizing morpheme *-kata* 'way

of' does not have an EPP feature (Kishimoto, 2006, p. 772), and lexical items must stay at the merge positions (no movement is allowed, as in b):

(19) a. John-no hon-no yomi-kata
John-GEN book-GEN read-way
'the way of John's reading books'
b. *hon-no John-no yomi-kata
book-GEN John-GEN read-way
'the way of John's reading books'

(Kishimoto, 2006, p. 789)

Therefore, in order to acquire the relevant interpretations in (8) and (9), Japanese-speaking learners of English must learn the property of the English negative quantifier and a movement motivated to satisfy the passive features.

Predictions

Now, how is the interpretation of the English negative quantifiers introduced to learners of English? We examined a popular reference book of English used in Japanese high schools. According to the book, a negative quantifier such as *no* is something that negates the noun that follows it:

(20) No money was left in my purse (Takahashi & Negishi, 2012, p. 310).

It explains that a negative quantifier negates a noun on the surface, but semantically speaking, it negates an entire sentence. It also explains that *no* can negate only nouns, not an entire sentence such as *No news is good news* (Takahashi & Negishi, 2012, p. 310). Furthermore, the reference book introduces *nothing*, *nobody*, and *none* as single lexical items, giving the Japanese equivalents *daremo ~nai*, meaning that they negate an entire sentence, as in *Nobody (no one) has come* (Takahashi & Negishi, 2012, p. 311). Therefore, there is no explicit instruction about the ambiguous interpretations of the English negative quantifiers in this textbook as in example (8).

In addition, the typological distance between languages would determine the direction and intensity of cross-language interaction. According to Haspelmath (1997), a negative quantifier such as *no x* is one of the rare types in world language (Haspelmath, 1997, p. 202). It never co-occurs with verbal negation: English no-series (Haspelmath, 1997, p. 201).

(21) a. Nobody came.
b. I saw nobody.

Haspelmath reports, "In my sample, the Latin type (V-NI) (which is English type)[5] is only represented by European languages, suggesting that it is an areal phenomenon.... Within Europe, the 10 languages of this type are Icelandic, Norwegian, Swedish, Danish, English, Frisian, German, French, Occitan, and Maltese (Bernini and Ramat, 1992: 205)" (Haspelmath, 1997, p. 202). So, the target lexical item (i.e., English negative quantifiers) is rare. In this situation, there is a possibility that learners may be able to acquire a new lexical item due to the absence of the relevant lexical or grammatical items in their native language (a kind of novelty effect) (Kleinmann, 1977, p. 104). Or because there is no closeness to the target lexical item, it may be hard for Japanese-speaking learners of English to acquire it (i.e., ambiguity).

But based on the previous studies such as Kimura, it may be difficult for Japanese-speaking learners of English to acquire QR of the English negative quantifier, given that there is no QR in Japanese. In addition, assuming that L1 grammar is carried over to the L2 initial state, it is possible that the Japanese-speaking learners of English will not show the characteristics of A-movement motivated by the passive feature (or EPP) (A-movement does not reconstruct), based on Kishimoto (2006). As a result, in terms of Full Transfer/Full Access, we can predict the following scenarios:

Full Transfer:

Because there is no English negative quantifier equivalent in Japanese, FT will not occur by theory. However, recall "all principles and parameters valued in the learner's L1 are carried over as the initial state of the L2" (Schwartz & Sprouse, 1996). In terms of grammar, there is no QR (or scope rigidity) in Japanese. So, let us suppose that the English negative quantifier comes with a feature such as [QR] for the sake of the present paper. The question is if the [QR] feature is transferred as [+QR] or [-QR]. Since Japanese is a scope rigid language, it is plausible to assume that [-QR] is transferred to new quantifiers (i.e., English negative quantifier). This assumption is compatible with Kimura's studies as well.

Because there is no A-movement in Japanese (Kishimoto, 2006), it is assumed that A-movement will not occur in learners' grammar. Therefore, although *nobody* as in *nobody's election* may be interpreted as the Theme argument, it may not be the result of A-movement.

[5] The parentheses are added by the author.

Full Access:

As we mentioned above, if QR is a feature, Japanese-speaking learners of English begin with a narrow scope and they will be able to obtain a wide scope reading guided by UG.

So, let us suppose the following learning scenarios for Japanese-speaking learners of English:

a) If they robustly interpret the English negative quantifier as narrow scope wherever it appears, that may imply that the default value for the negative quantifier is [-QR]. So, the learning path will restructure the value of QR, followed by A-movement constraint.
b) Unlike the Full Transfer hypothesis, if they interpret the English negative quantifier as both wide and narrow readings in *the election of nobody*, that may imply that their initial feature values are both wide and narrow (and QR is a part of the lexical item). Thus, the learning path is to acquire that A-movement constraint in *nobody's election*.

If scenario (a) holds, then, learners must see positive evidence to restructure the initial value. If scenario (b) holds, then, learners must see positive evidence to acquire the constraint of A-movement. We are motivated to assume these possibilities of the interpretation of the negative quantifier based on Goro (2015) and Zhou and Crain (2009). Both studies investigated the scope interactions between *some* and *every* (Goro, 2015) and between *every* and negation (Zhou & Crain, 2009) in native English children/adults and learners of English whose native language is Japanese (Goro, 2015) and Chinese (Zhou & Crain, 2009). Native English-speaking children/adults have access to both surface and inverse scope interpretations of sentences such as (6) and (12). Surprisingly, native Japanese children and native Chinese children also had access to both surface and inverse scope interpretations, unlike their adult counterparts. But as they grow older, learners will adjust the relevant interpretation. This is the reason to assume (a) and (b) scenarios.

Recall that a successful learning path is guided by the constraints provided by UG (Marsen, 2009). But as Grüter et al.'s (2010) and Kimura's (2019, 2022) works show, Japanese-speaking learners of English are not as successful as English-speaking learners of Japanese in quantification interpretations, given that robust positive evidence is not available. Most importantly, the superset-subset interpretations such as universal quantifiers between English and Japanese do not hold since there is no Japanese equivalent of the English negative quantifier. In this way, the robust reading by Japanese-speaking learners of English may reveal a default meaning of the English negative quantifier.

Participants and Procedures

Participants

We had 23 native English speakers as a control group (monolingual native English speakers). In addition, we had 54 learners of English whose native language is Japanese. The average years of study among the participants is 9.96 years, ranging from one year to 26 years. Out of the 54 participants, the majority began to study English in the 7th grade, around 13 years old (see their number of years studying English and TOEIC score in Appendix 1). These participants were recruited with the help of our colleagues at a Japanese university as well as personal contacts by one of the authors. The participants were paid $10 (1000 yen) upon completion of the survey.

Procedures

We conducted the experiment using an online survey format (Qualtrics), and all the responses were automatically recorded. First, the participants read a brief discourse context. Then, participants were given a sentence and were asked if it was an accurate description of the discourse context. Here are four examples to illustrate the above procedure:

Example 1: Negative quantifier post-nominal wide scope reading

Last month, the school PTO board held an election for new members. All three of the candidates, Mr. Howard, Ms. Kelly, and Ms. Stern, were incredibly popular. They had helped out at a lot of activities before, so everyone knew and liked them. As was expected, all of them were elected to be board members.

Q: Is the following sentence an accurate description of the above situation?

The election of no candidate was a surprise.

Yes/No

Example 2: Negative quantifier post-nominal narrow scope reading

The school PTO board had to elect three new members last month, but all of the candidates were so unpopular that no one was elected. So, they held another election this month, and Mr. Brown, Ms. Smith, and Ms. Walker ran for the positions. Everyone assumed they would win, but they were not elected. Now the PTO will have to hold yet another election next month.

Q: Is the following sentence an accurate description of the above situation?

The election of no candidate was a surprise.

Yes/No

Example 3: Negative quantifier pre-nominal wide scope reading

Last month, the school PTO board held an election for new members. All three of the candidates, Mr. Dixon, Ms. Lee, and Ms. Grant, were incredibly popular. They had helped out at a lot of activities before, so everyone knew and liked them. As was expected, all of them were elected to be board members.

Q: Is the following sentence an accurate description of the above situation?

No candidate's election was a surprise.

Yes/No

Example 4: Negative quantifier pre-nominal narrow scope reading (impossible interpretation by native English speakers)

The school PTO board had to elect three new members last month, but all of the candidates were so unpopular that no one was elected. So, they held another election this month, and Mr. Ellis, Ms. Schneider, and Ms. Walter ran for the positions. Everyone assumed they would win, but they were not elected. Now the PTO will have to hold yet another election next month.

Q: Is the following sentence an accurate description of the above situation?

No candidate's election was a surprise.

Yes/No

Note that example 4 is an impossible interpretation by van Hout, Kamiya, and Roeper's theory.

In addition to the above main test, we had a warmup test and a structure checking test. The purpose of the warmup test was to have participants become familiar with the test format, and the purpose of the structure checking test was to see whether learners of English would be able to understand the meaning of nominalization. In particular, van Hout et al. claim that the subject position in passivization (i.e., *nobody* at pre-nominal position) is reserved for the Theme argument. We were also motivated to include this test based on a pilot test in which some of the non-native speakers of English asked the meaning of nominalization, such as *the destruction of the city* vs. *the city's destruction*. Therefore, this test is only for learners of English.

Examples of the structural checking test are as follows:

Example:

Which sentence between (1) and (2) has the same meaning as the underlined part of the following sentence?

A) The army's destruction of the city was terrible. (active interpretation)

(1) The army destroyed the city.

(2) The city destroyed the army.

B) The city's destruction by the army was terrible. (passive interpretation)

(1) The army was destroyed by the city.

(2) The city was destroyed by the army.

Note that the contexts are written in Japanese for the learners of English to make sure they understand the contexts appropriately. Such a method was utilized by Dekydtspotter, Edmonds, Fultz, and Renaud (2010). The participants were free to go back to the previously answered questions and correct the answers if they wanted. There was no time limit. There were 12 test questions and 24 filler questions. We randomized the order of the presentations and prepared two versions of the test.

Finally, we want to mention the nature of the examples and benefits for L2 learners. Examples under the investigation were rare in corpora. Similarly, examples in Marsden or Kimura whose works were introduced in an earlier section may be rare. In addition, examples under investigation are ambiguous. Hence, it is plausible to ask if the ability to acquire ambiguous interpretations is useful to the L2 learner. We considered this matter and refer to Piantadosi, Tily, and Gibson (2012). They argued for two beneficial properties of ambiguity: (a) "where context is informative about meaning, unambiguous language is partly redundant with the context and therefore inefficient"; (b) "ambiguity allows the re-use of words and sounds which are more easily produced or understood" (Piantadosi et al., 2012, p. 3). They mainly investigated lexical ambiguities such as *run* could be "a run in a pantyhose, a run in baseball, a jog, to run, a stretch of consecutive events" (Piantadosi et al., 2012, p. 6). But ambiguity is ubiquitous, and these authors claim that ambiguity is not harmful to actual communication since interlocutors are able to effectively disambiguate between possible meanings (Piantadosi et al., 2012, p. 4). These authors also reported that structural ambiguities that slow down human comprehension are extremely rare. But they reported that language users avoided conceptual ambiguities in communication (Piantadosi et al., 2012, p. 17). We are aware that the study done by Piantadosi et al. is not about scope ambiguity and L2 acquisition. We understand authenticity is important for language teaching/learning. However, the benefits for learners of foreign/second language seem to hold, given that language is a tool for communication. Namely, instead of clarifying the relevant interpretation with more words as can be seen in (a) and (b) readings in example (6), speakers could make a shorter sentence (i.e., more economical to communicate). Even as an interlocutor, had they known the scopal ambiguity, they will be able to understand the intended ambiguous interpretation without being confused. So, it is meaningful to learn the scopal ambiguity as well as other ambiguities,[6] although teaching such a topic may not be a top priority.

[6] Marsden (2018) reported the usefulness of the research found in generative approach to SLA in the classroom where language teachers teach grammar.

Analysis

In the statistical analyses, three mixed effects logistic regressions were conducted, and they explored relationships between native English speakers, learners of English, scope of negative quantifiers, and the interpretation results. Mixed effects analyses are appropriate because we had the 4-level predictor (scope) with the categorical values for each unit of observation, while also considering the random effects of different topics and participants. We made use of the glmer model, which is a generalized linear mixed-effects model (in R as "lme4" package), using a dummy coding scheme. Here, in all three models, the 4-level predictor (scope) is represented with three codes (plus the intercept term), where the intercept represents the predicted value for a baseline category. Baseline category here is the level (post-nom-narrow), and the three codes of the other levels' labels (post-nom-wide, pre-nom-wide, and pre-nom-narrow) represent the deviations of the other groups from the baseline category. In the model where we investigate whether being L1 or L2 affects the interpretation results, a 2-level categorical predictor is added (L1, L2) and L1 is the baseline. In the model that focuses on L2 learners, their TOEIC scores are included as an additional continuous predictor to explore whether the English skills affect the interpretation results while controlling for scope. The TOEIC scores were mean-centered, so the models could better interpret effects while controlling for the variability in the covariate. All models included the same categorical random effects; they were included to account for the fact that the model assumes that the baseline level of the response (i.e., the intercept, post-nom-narrow) may differ across different levels of topics of the sentences as well as the participants, therefore random intercepts were included. There is no theoretical foundation to assume that the scope of the sentence's effects would be different for sentence topics or the participants, as the relevant interpretation remains, therefore random slopes were not included. In addition, because every participant has entries of speaking all three types of sentences (topics) for all four different testing scopes, these factors become fully crossed and hence can be considered not nested in the model.

Results

The following tables display the mean and standard deviations for the structural checking test for learners of English.

Table 1

Structural Checking Test Results

	Mean	Standard Deviation
Active interpretation (e.g., the army's destruction of the city) (*N* = 54)	83.6%	.86310
Passive interpretation (e.g., the city's destruction by the army) (*N* = 54)	75.0%	.80529

For the active interpretation, learners of English scored 83.6%, while they scored 75.0% for the passive interpretation. So, the learners' group correctly interpreted the target structures.

Next, Figures 1 and 2 display the percentages of correct and incorrect interpretations of negative quantifiers. Note that post_nom_narrow represents post-nominal narrow scope reading, post_nom_wide represents post-nominal wide scope reading, pre_nom_narrow represents pre-nominal narrow scope reading, and pre_nom_wide represents pre-nominal wide scope reading.

Figure 1

Native English Speakers' Interpretations

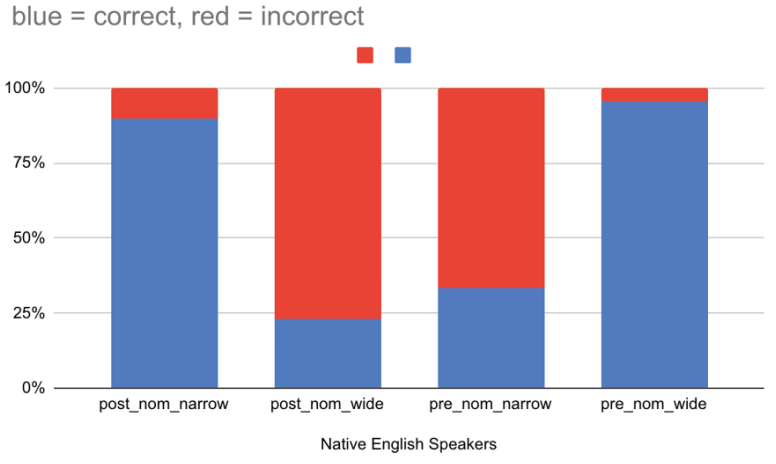
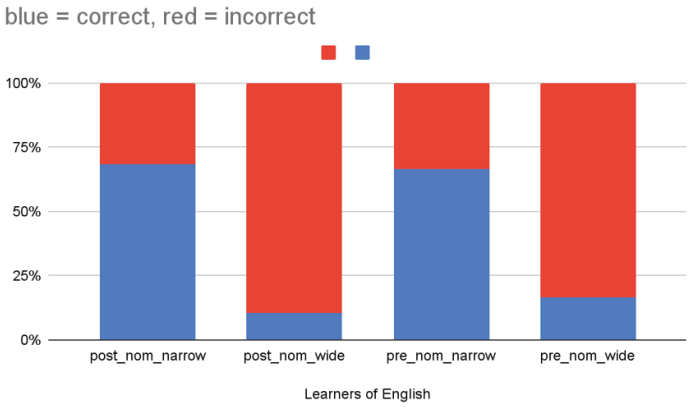


Figure 2

English Learners' Interpretations



Native English speakers accepted 89.9% in the post-nominal narrow scope reading, 23.2% in the post-nominal wide scope reading, 33.3% in the pre-nominal narrow scope reading, and 95.7% in the pre-nominal wide scope reading. Note that the post-nominal wide scope reading is accepted a lot lower than the post-nominal narrow scope reading. Wu and Ionin (2021) reported that native English speakers dispreferred an inverse scope reading in examples such as 'All the pirates didn't leave the ship' (not > all) or 'one dog got every bone (every > one).' So, the current result may not be unusual.

Learners of English, on the other hand, accepted 68.5% in the post-nominal narrow scope reading, 10.3% in the post-nominal wide scope reading, 66.7% in the pre-nominal narrow scope reading, and 16.4% in the pre-nominal wide scope reading. Note that pre-nominal narrow scope reading is supposed to be impossible in van Hout et al. (2013) and that the acceptance rate of both narrow scope readings (i.e., pre-nominal narrow and post-nominal narrow) are almost the same.

For native English speakers, the fixed effect was scope type (pre-nominal wide scope, pre-nominal narrow scope, post-nominal wide scope, and post-nominal narrow scope, = 4 levels). The random effects were participants (= 23) and topics (student, teacher, candidate = 3 levels, which are relevant words appearing in test sentences). The dependent variable is interpretations (0 = correct and 1 = incorrect: 2 levels). Note 0 represents that the subject did not make a mistake when interpreting the sentence, while 1 represents that there was a mistake. Compared to the baseline level of Scope (post-nominal narrow as intercept, $p < 0.0001$), two out of the three levels showed significance in effecting the correct interpretation while considering the random effects of Topic and Participant. Marginal log-odds for a post-nominal wide scope ($p < 0.0001$)

results in a false interpretation of 3.6209, corresponding to a marginal probability of 97.4%. Similarly, marginal log-odds for a pre-nominal narrow scope ($p < 0.0001$) results in a false interpretation of 3.6209, corresponding to a marginal probability of 95.6%. Further Anova Test (using 'Type III' to include the interactions between fixed and random effects) also shows that Scope, as the fixed effect, is significant for influencing the output of Interpretation.

For learners of English, the fixed effect was scope type (pre-nominal wide scope, pre-nominal narrow scope, post-nominal wide scope, and post-nominal narrow scope = 4 levels). The random effects were participants (= 54) and topics (student, teacher, candidate = 3 levels, which are relevant words appearing in test sentences), and TOEIC scores (continuous variable, mean-centered at mean = 624.5). The dependent variable is interpretations (0 = correct and 1 = incorrect: 2 levels). The TOEIC score as an independent variable did not show statistical significance in changing the outcome (interpretation) for English learners ($p = 0.62189$). With the post-nominal narrow scope as the intercept ($p = 0.00682$), significant differences were found in pre-nominal wide scope ($p < 0.0001$) and post-nominal wide scope ($p < 0.0001$), marginal probability for these two levels producing a false interpretation of 97.3% and 95.2% But there is no statistical significance for pre-nominal narrow scope ($p = 0.59410$). The partial output is below (and the entire output is displayed in Appendix 2).

Figure 3

Native English Speakers

```
Fixed effects:
                    Estimate Std. Error z value Pr(>|z|)
(Intercept)          -2.3251     0.4415  -5.266 1.39e-07 ***
Scopepost_nom_wide    3.6209     0.5391   6.716 1.86e-11 ***
Scopepre_nom_narrow   3.0789     0.5130   6.001 1.96e-09 ***
Scopepre_nom_wide    -0.9288     0.7208  -1.289    0.198
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Figure 4

Learners of English

```
Fixed effects:
                     Estimate Std. Error z value Pr(>|z|)
(Intercept)         -0.9818818  0.3629501  -2.705  0.00682 **
Scopepost_nom_wide   3.6017534  0.3665600   9.826  < 2e-16 ***
Scopepre_nom_narrow  0.1421737  0.2667893   0.533  0.59410
Scopepre_nom_wide    2.9880797  0.3262446   9.159  < 2e-16 ***
TOEIC_centered       0.0005967  0.0012099   0.493  0.62189
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

After exploring the variables in the data, and concluding that L1 and L2 speakers have different interactions with the scope of the sentence and subsequent interpretation correction rate, we constructed the last model to directly compare and examine effects the of L1 and L2, their interactions to the scope, and how that would affect the interpretation. Since TOEIC score has proven to not be a useful variable, it is excluded during the selection process. Summary statistics shows that controlling for the effects of the scope of each sentence and considering the random effects, L1 vs. L2 is a significant factor ($p = 0.00236$) in getting the right interpretation, where being an English learner increases the log odds of getting the wrong interpretation by 1.5819. Detailed interaction terms between L1/L2 and sentence scopes further confirms the effect: when looking at the interaction term between L1/L2 and pre-nominal narrow scope, the odds of getting this type of sentences wrong for L2 speakers are approximately 0.038 times (transformed log-odds of –3.2647) of the odds of L1 speakers; on the other hand, the interaction term between L1/L2 and pre-nominal wide scope indicates that when looking at a sentence with this scope, the odds of L2 speakers getting the wrong interpretation is 47.6 times the odds for the L1 (transformed log-odds of 3.8636) speakers. Both of the aforementioned interactions are significant ($p < 0.0001$), whereas the effect of post-nominal wide scope interacting with L1/L2 did not yield significant insights.

The partial output is below (and the entire output is displayed in Appendix 2).

Figure 5

Native vs. Learners of English Comparison

```
Fixed effects:
                              Estimate Std. Error z value Pr(>|z|)
(Intercept)                    -2.5314     0.5240  -4.831 1.36e-06 ***
L1_L2L2                         1.5819     0.5201   3.041  0.00236 **
Scopepost_nom_wide              3.9610     0.5421   7.307 2.73e-13 ***
Scopepre_nom_narrow             3.3645     0.5191   6.481 9.10e-11 ***
Scopepre_nom_wide              -0.9483     0.7286  -1.302  0.19307
L1_L2L2:Scopepost_nom_wide     -0.4477     0.6269  -0.714  0.47514
L1_L2L2:Scopepre_nom_narrow    -3.2647     0.5800  -5.629 1.82e-08 ***
L1_L2L2:Scopepre_nom_wide       3.8636     0.7942   4.865 1.14e-06 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

The present study shows notable contrastive results between native English speakers and learners of English. First of all, native English speakers robustly access the wide scope reading when the negative quantifier is at the pre-nominal position. On the other hand, this trend was not observed in learners of English. Second, related to the pre-nominal position, learners of English tended to in-

terpret the negative quantifier as the narrow scope reading, and van Hout et al. report that this interpretation is not possible. Overall, learners of English tended to interpret the negative quantifier as the narrow scope reading wherever it appeared. As the previous studies show, Japanese is a scope-rigid language (hence, no QR). It seems that learners of English have not acquired QR in the target sentences.

All in all, the current study shows the similar trend as the previous studies such as Kimura (2019; 2022) and Wu and Ionin (2021). Namely, it is difficult to acquire QR if one's native language is a scope-rigid language.

However, we would like to commit ourselves to the comparative fallacy (Bley-Vroman, 1983; White, 2003). In particular, we want to focus on those whose TOEIC scores are above 900.

Table 2

TOEIC Scores and Leaners' Interpretations

TOEIC Scores	Pre-nominal wide scope	Post-nominal wide scope
900	0/3	0/3
905	3/3	3/3
915	1/3	0/3
920	1/3	0/3
920	0/3	0/3

One participant whose TOEIC score is 905 accurately interpreted the target sentences. Namely, this participant was able to QR the negative quantifier. More precisely, this participant was able to move the negative quantifier from the post-nominal position to the pre-nominal position by A-movement (passive movement). Since A-movement does not reconstruct, the only available interpretation is (9b) type. We checked the participant's history of learning English. This participant began studying English at the age of one year. It is not entirely clear how intensively this participant has been studying English based on the current survey. However, it may be the case that this participant might have acquired QR and the characteristics of A-movement. Other higher score participants show the robustness of non-QR interpretations for the target sentences. As the statistical analysis indicates, there is no correlation between higher scores of TOEIC and the achievement of QR.

Discussion

We discussed the possible outcomes in Full Transfer and Full Access for the learning patterns of Japanese-speaking learners of English for the English negative quantifier in an earlier section. We laid out two scenarios.

The first scenario is that there is no QR, hence, wherever the English negative quantifier appears, it is robustly narrow scope. The result shows that was the case for the learners. In particular, there was a sharp contrast between native English speakers and the Japanese-speaking learners of English in the wide scope reading. It is true that no QR is in the learners' interlanguage grammar. And notice that those participants have been studying English for a while (see the participants section and the Appendix 1), hence, it implies that no relevant evidence or motivation was available to restructure the interlanguage grammar.

The second scenario is that both wide and narrow scope are available. But as we saw, that was not the case. One implication is that it is not clear if the Japanese-speaking learners of English move the English negative quantifier from the post-nominal position to the pre-nominal position. In the structural test, we found that the majority of the learners understand that the negative quantifier in the pre-nominal position is for Theme argument. However, since the learners have not acquired QR, it is not clear if the negative quantifier base-generated at the pre-nominal position directly or if it is derived by movement. But in terms of FT, since there is no A-movement in Japanese, it may be the case that the learners base-generate the negative quantifier at the pre-nominal position. This implies that the learners assign genitive case of *nobody's* at Spe-NP in chart (18). If genitive case was assigned at Spec-DP, the wide scope reading could have been available (hence, QR could have been acquired).

Based on the results, the initial interpretation of the English negative quantifier by Japanese-speaking learners of English is the narrow scope reading. In terms of the Full Transfer hypothesis, [-QR] feature is transferred to the English negative quantifier. Hence, to acquire the wide scope reading and the A-movement constraint, learners have to see the relevant evidence to change their interlanguage grammar (assuming that will be guided by UG). But what is the relevant evidence, given that our examples are rare in corpora? And how long should we expect that interlanguage grammar will be restructured?

Let us recall the successful L2 learners of Japanese in Grüter et al. (2010) and Marsden (2009). They began to study Japanese at the age of 18 years old (Grüter et al., 2010), and the average age of Marsden's participants was 21 years old for the intermediate learners and 22 for the advanced learners (Marsden, 2009, p. 143). Hence, they were adults when they began to study Japanese. On the other hand, the average age to begin studying English among the participants in the present study is around 13 years old, and the average years of study

among the participants is 9.96 years (ranging from one year to 26 years). So, the participants in the present study began to learn English a lot earlier and have studied it longer. Japanese-speaking learners of English in the present study could have had a better chance to restructure their interlanguage grammar. Given that the data in Marsden's study or our data are rare,[7] a source of the asymmetrical acquisition results may be from somewhere else.

Regarding relevant data to change the interlanguage grammar, let us assume van Hout et al.'s explanation for both wide and narrow scope readings. If both wide and narrow scope interpretations are default ones, then learners must unlearn the narrow scope reading when the negative quantifier appears at the pre-nominal position. Unlearning the narrow scope reading can be piggybacked by learning the A-movement constraint. van Hout et al. assume Purely EPP Eliminates Reconstruction (PEPPER) (A-movement only for EPP does not reconstruct) by Nevins and Anand (2003). van Hout et al. show the minimal pair on this:

(22) a. Nobody was elected in the morning.
b. Nobody's election surprised us.

(van Hout et al., 2013, p. 155)

In (a) example which is a passive sentence, *nobody* is moved from the object position of *elected* to Spec-TP for EPP and nominative Case. So, the motivation of the movement is not just for EPP. As a result, (a) is ambiguous: 'In the morning, nobody at all was elected'; (b) 'Of those elected, none was in the morning' (van Hout et al., 2013, p. 138). However, the motivation of *nobody* in (b) example is for EPP, so the only available meaning is 'for those elected, none surprised us.' Lasnik (2003) also demonstrates that under subject to object A-movement construction, negation cannot take scope over the universal quantifier.

[7] Data/inputs are crucial for language learning (in the present context, SLA). According to Zyzik (2009), the traditional poverty of the stimulus can be interpreted as the real problem facing many classroom L2 learners in a usage-based perspective. Namely, it is "the lack of exposure to sufficiently rich and varied input" (Zyzik, 2009, p. 56). Zyzik also cites Bley-Vroman (1989) who suggested that "one of the factors responsible for the low levels of ultimate attainment is the impoverished input" (Zyzik, 2009, p. 56). This is compatible with the results of Marsden's study. That is, intermediate learners of Japanese could not acquire the Japanese type of scope interpretations, while advanced learners of Japanese could. Advanced learners in Marsden's study could be exposed to more data in their interlanguage. However, what we have to be careful of is the type of data. Following Iwasaki (2003), Marsden reported that a scrambled sentence such as (14) was rare in the actual speech. Even if the relevant evidence is rare in actual usage, the fact that the advanced learners of Japanese were able to achieve the target interpretation makes us think that the authenticity and abundant data are not the only evidence we need. This may have to do with the traditional poverty of the stimulus argument.

(23) The mathematician made every even number out not to be the sum of two primes.

(every > not, * not > every)

On the other hand, when *every even number* does not overtly move, ambiguous readings are available:

(24) The mathematician made out every even number not to be the sum of two primes.

(every > not, not > every)

These examples serve as a piece of evidence to adjust when and where both wide and narrow or only wide scope reading occur.

In addition, the following example shows that multiple Specs in English are possible. van Hout et al. identify the outer spec (*Macy's*) as a A-bar position and the inner Spec (*men's*) as A-position:

(25) Macy's men's jeans sale

(van Hout et al., 2013, p. 153)

How could native English speakers (especially children) come to understand the landing site of *nobody* in the passivization in nominal as in (22b)? We assume that UG guides native English speakers to understand the relevant landing site. Hence, the above examples motivate native English speakers to understand the landing site as well as to eliminate the narrow scope reading. If the narrow scope is the default interpretation, then learners can add the wide scope interpretation by hearing (22a) or (24) where a speaker intends to convey the wide scope reading. These examples may or may not serve as evidence to acquire the interpretations of the English negative quantifier by Japanese-speaking learners of English. Here is why.

Let us consider how the initial grammar in a learner's mind undergoes changes. According to Goro (2015), Japanese-speaking children understand the following example as ambiguous, just as the English counterpart in the translation.

(26) Dareka-ga dono-sensei-mo hihansita.
someone-Nom every-professor-mo criticized
'Someone criticized every professor.'
(some > every: there is a particular person that criticized every professor; every > some: every professor was criticized by someone)

Hence the initial interpretation of (26) is different from that of Japanese-speaking adults. However, Japanese-speaking children eventually unlearn the inverse scope reading (i.e., every > some). Goro explains that the impossible interpretation (i.e., every > some) is a consequence of some other property of the language; hence, children do not have to depend on input evidence to determine what is impossible (Goro, 2015, p. 167). Goro claims that it is the semantic property of the *-ga* marked subject (nominative case) in (26) that invokes the scope rigidity effect since the implicature of *-ga* is the exhaustive listing (Goro, 2015, p. 169). Namely, expunging the impossible reading is a piggyback on learning the nominative case (and its meaning).

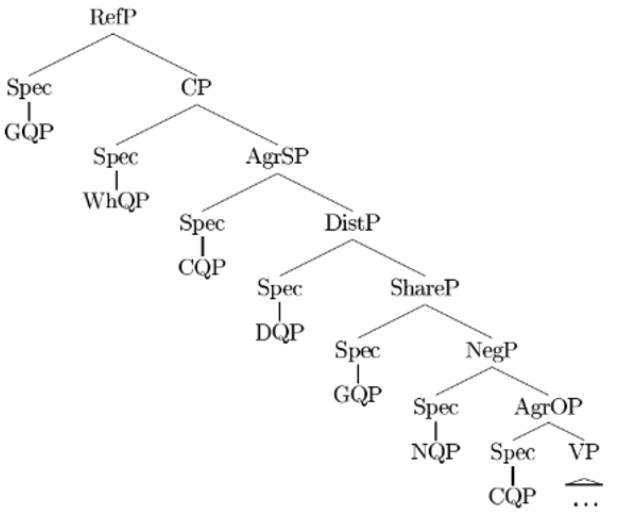
Turning to L2, Marsden explains that the quasi-plural morpheme 'tati' is crucial to restructure the initial values. Namely, example (14) and (26) are unambiguous in Japanese, and by Full Transfer, English-speaking learners of Japanese initially interpret (14) as ambiguous. With understanding a morpheme 'tati,' they come to reset their initial value of the Japanese universal quantifier. About (15), the rareness of such an example led Marsden to conclude the poverty of the stimulus argument. That is, learners are guided by options available in UG. Therefore, resetting the initial values about the Japanese universal quantifier by native Japanese speakers and learners of Japanese seems to go through different paths.

Then, what would be crucial evidence for Japanese-speaking learners of English to reset the initial value to acquire the English negative quantifier? As far as we know, there is no study about native English children's initial interpretation of the negative quantifier, so it is very difficult to imagine. Although the English negative quantifier appears at pre- and post-nominal positions (i.e., *nobody's election* vs. *the election of nobody*), such a positional difference is not enough to restructure the initial value for Japanese-speaking learners of English. So, we think that explicit instruction about the target interpretation may be a source of restructuring the initially instantiated value since the relevant inputs are rare. Wu and Ionin's (2021) work also supports this view. They explicitly instructed Chinese-speaking learners of English about ambiguous interpretations of English scope sentences such as (6) in the intervention study. But even if learners were taught the target interpretations explicitly, they could not generalize the availability of inverse scope to the other configuration. Hence, the acquisition of scopally ambiguous sentences by learners whose native language is scopally rigid cannot easily acquire the target interpretations. But can we say anything about the present results in broader perspectives?

As we observed earlier, there are superset-subset interpretations in quantifier interactions. In particular, both Marsden and Kimura discussed the features of the target lexical items. As Kimura discussed, QR may be an uninterpretable feature just like EPP, and if this was not acquired before the critical period, it may be a lot harder to acquire later in life. Furthermore, Kimura also as-

sumes that Japanese-speaking learners of English could not acquire a distributive feature of English *every*, and this may be a reason why they interpreted English *every* as a collective interpretation, which is a Japanese equivalent interpretation. In other words, they could not move *every* to the respective Spec position of the functional projection in the spirit of Beghelli and Stowell (1997). In their system, Beghelli and Stowell assume that each quantifier moves to the respective Spec position of functional projections.

(27)



(Beghelli & Stowell, 1997, p. 76)

Let us assume their system for now. According to Beghelli and Stowell, negative quantifiers bear [+Neg] feature, and [+Neg] feature is checked via Spec-Head agreement with Neg^0 head. They claim that the morpheme *no* of the negative quantifier carries logico-semantic features (Beghelli & Stowell, 1997, p. 73). If Spec-Head agreement licenses the [+Neg] feature, we can assume that the wide scope interpretation is coded at that position, while the narrow scope position is coded at the in-situ position. This could be an equivalent derivation of van Hout et al.: The wide scope reading is coded at the QRed position, while the narrow scope reading is at in-situ position, although they do not specify NegP nor [+Neg] on the negative quantifier. The most crucial condition in Beghelli and Stowell's system is 'agreement.' Does Japanese have the same 'agreement' system as English? Fukui and Sakai (2003) and Kuroda (1992) among others say 'no.' Kuroda (1992) and Fukui and Sakai (2003) investigate the Case/case marking system between English and Japanese and assume that languages are

parametrized as to whether agreement is forced or not and also claim that Japanese does not belong to forced agreement languages such as English. Here are the relevant examples:

(28) Multiple nominative case marking
Hiroshima-ga huyu-ga kaki-ga oisii
-NOM winter-NOM oyster-NOM be delicious
'In Hiroshima, oysters are delicious in winter.'
(Fukui & Sakai, 2003, p. 354)

In example (28), there are multiple nominative case particles *-ga* in one sentence.

(29) Case alterations
a. Taroo-ga Kumiko-ga/o kawaii to omot-ta
-NOM -NOM/ACC pretty that though
'Taro thought Kumiko is pretty./ Taro considered Kumiko to be pretty.'
b. Hanako-ga/no siranai koto-o Taroo-ga sitte-iru
-NOM/GEN not-know thing-ACC -NOM knows
'Taro knows something that Hanako does not know.'
(Fukui & Sakai, 2003, p. 354)

In (29), nominative case particle *-ga* is alternated with accusative case particle *-o* in (a) example or genitive case *-no* in (b) example. These examples indicate that Japanese Case/case marking is not licensed at Spec-TP agreement as other European languages, do hence, these researchers are motivated to claim that Japanese is not an 'agreement' language, unlike English.

Fukui and Sakai propose "[a] functional category has to be visible (i.e., detectable) in the primary linguistic data" (Fukui & Sakai, 2003, p. 327). To do so, they claim that the functional category has to have phonetic content in order to be pronounced, directly visible at Phonetic Form. Examining the potential functional lexical item such as an interrogative particle, case particle, and genitive case, Fukui and Sakai conclude "there is no known evidence that these elements trigger agreement/feature checking phenomena" (Fukui & Sakai, 2003, p. 366). Kuroda (1992) and Fukui and Sakai (2003) conclude that there is no compelling evidence for postulating a formal and mechanical feature checking mechanism via agreement as the English counterpart.

Without a feature checking mechanism via agreement, there is no reason that each quantifier moves to the respective Spec positions. As a result, it is plausible that Japanese is a scope rigid language. Agreement may be a key reason why Japanese-speaking learners of English cannot have the wide scope reading of the English negative quantifier. Although there is no equivalent

of the English negative quantifier in Japanese, 'without agreement' guides learners not to access the wide scope interpretation. Earlier, we proposed that the [-QR] feature be given to the English negative quantifier when native Japanese learned it. But typologically speaking, it is more plausible to assume that agreement is crucial. Hence, UG still plays an important role in acquiring a second language. Namely, 'without agreement' is the final stage of L1 Japanese/at the beginning of learning English (Full Transfer). Upon seeing the English negative quantifier, learners apply the 'no agreement' constraint, resulting in no wide scope interpretation by Japanese-speaking learners of English. Hence, the learning process is to restructure the value of the agreement system. This assumption matches the results by Japanese-speaking learners of English.

Conclusions

In this paper, we explored if Japanese-speaking learners of English were able to acquire the English negative quantifier, whose equivalent does not exist in Japanese. We considered the acquisition processes in terms of the Full Transfer/Full Access perspectives with two scenarios.

The relevant input is very rare, so it is very difficult for Japanese-speaking learners of English to acquire the target interpretations. Therefore, explicit instructions will be partially helpful to them. The present paper also pointed out that English-speaking learners of Japanese are more likely to acquire the Japanese type scope interpretations, although the available data is also rare. For the scope interpretations in the present paper, English native speakers can access both surface and inverse scope (or narrow and wide scope) interpretations. That was called superset readings, while Japanese native speakers access only a subset reading. These superset and subset readings can be equated with agreement and non-agreement languages in Beghelli and Stowell's system. That is, superset interpretations seem to be correlated with a language with the agreement language such as English, while a subset interpretation is equated with the non-agreement language such as Japanese. The question is why speakers with the agreement language are more likely to adapt the non-agreement language, but not vice versa. The answer for this question is beyond the scope of the present study.

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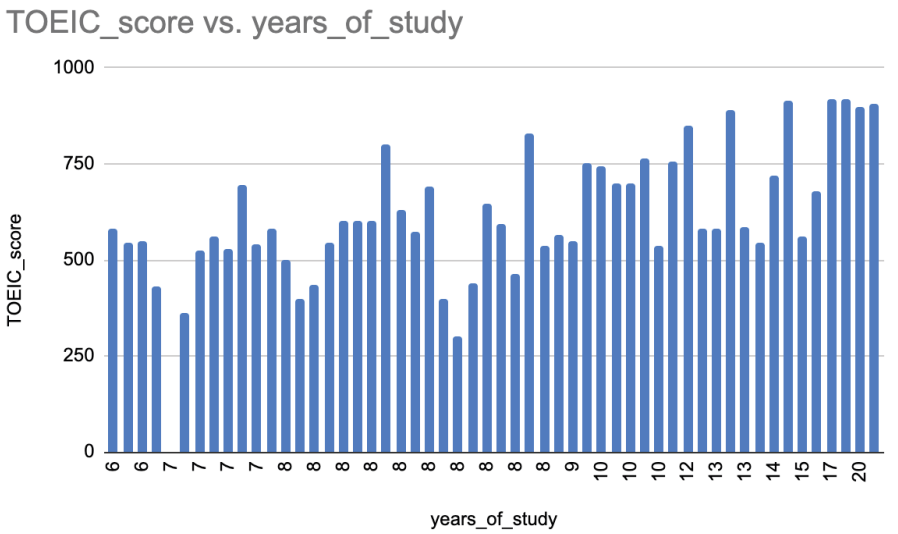
Appendix 1

Overview of TOEIC Scores in the Study



Appendix 2

Mixed Effect Models (Full Report)

Figure 3 (Native vs. Learners of English Comparison)

```
> summary(model)
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation)
['glmerMod']
 Family: binomial  ( logit )
Formula: Interpretation ~ Scope + (1 | Topic) + (1 | Participant)
   Data: L1_data

     AIC      BIC   logLik deviance df.resid
   242.2    263.9   -115.1    230.2      270

Scaled residuals:
    Min      1Q  Median      3Q     Max
-1.9086 -0.3624 -0.1792  0.5239  4.4324

Random effects:
 Groups      Name        Variance  Std.Dev.
 Participant (Intercept) 3.737e-01 0.6113412
 Topic       (Intercept) 1.437e-09 0.0000379
Number of obs: 276, groups:  Participant, 23; Topic, 3

Fixed effects:
                   Estimate Std. Error z value Pr(>|z|)
(Intercept)         -2.3251     0.4415  -5.266 1.39e-07 ***
Scopepost_nom_wide   3.6209     0.5391   6.716 1.86e-11 ***
Scopepre_nom_narrow  3.0789     0.5130   6.001 1.96e-09 ***
Scopepre_nom_wide   -0.9288     0.7208  -1.289    0.198
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr) Scpps__ Scppr_nm_n
Scppst_nm_w -0.791
Scppr_nm_nr -0.815  0.716
Scppr_nm_wd -0.511  0.416   0.438

> Anova(model,type="III")
Analysis of Deviance Table (Type III Wald chisquare tests)

Response: Interpretation
             Chisq Df Pr(>Chisq)
(Intercept) 27.736  1  1.391e-07 ***
Scope       72.900  3  1.021e-15 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 4 (Learners of English)

```
> summary(model)
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation)
['glmerMod']
 Family: binomial  ( logit )
Formula: Interpretation ~ Scope + TOEIC_centered + (1 | Topic) + (1 |
Participant)
   Data: L2_data

     AIC      BIC   logLik deviance df.resid
   632.3    663.6   -309.1    618.3      641

Scaled residuals:
    Min      1Q  Median      3Q     Max
-7.0380 -0.5042  0.2090  0.4290  5.0472

Random effects:
 Groups      Name        Variance Std.Dev.
 Participant (Intercept) 1.1840   1.0881
 Topic       (Intercept) 0.2149   0.4636
Number of obs: 648, groups:  Participant, 54; Topic, 3

Fixed effects:
                      Estimate Std. Error z value Pr(>|z|)
(Intercept)         -0.9818818  0.3629501  -2.705  0.00682 **
Scopepost_nom_wide   3.6017534  0.3665600   9.826  < 2e-16 ***
Scopepre_nom_narrow  0.1421737  0.2667893   0.533  0.59410
Scopepre_nom_wide    2.9880797  0.3262446   9.159  < 2e-16 ***
TOEIC_centered       0.0005967  0.0012099   0.493  0.62189
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr) Scpps__ Scppr_nm_n Scppr_nm_w
Scppst_nm_w -0.324
Scppr_nm_nr -0.376  0.380
Scppr_nm_wd -0.355  0.477   0.426
TOEIC_cntrd -0.004  0.018   0.002      0.021

> Anova(model,type="III")
Analysis of Deviance Table (Type III Wald chisquare tests)

Response: Interpretation
                 Chisq Df Pr(>Chisq)
(Intercept)      7.3185  1   0.006825 **
Scope          149.8474  3  < 2.2e-16 ***
TOEIC_centered   0.2432  1   0.621892
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

Figure 5 (Native vs. Learners of English Comparison)

```
> summary(model)
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: binomial  ( logit )
Formula: Interpretation ~ L1_L2 * Scope + (1 | Topic) + (1 | Participant)
   Data: full_data

     AIC      BIC   logLik deviance df.resid
   877.7    926.2   -428.9    857.7      926

Scaled residuals:
    Min      1Q  Median      3Q     Max
-6.2962 -0.4881  0.1883  0.4252  5.4392

Random effects:
 Groups      Name        Variance Std.Dev.
 Participant (Intercept) 0.928    0.9633
 Topic       (Intercept) 0.157    0.3963
Number of obs: 936, groups:  Participant, 78; Topic, 3

Fixed effects:
                           Estimate Std. Error z value Pr(>|z|)
(Intercept)                 -2.5314     0.5240  -4.831 1.36e-06 ***
L1_L2L2                      1.5819     0.5201   3.041  0.00236 **
Scopepost_nom_wide           3.9610     0.5421   7.307 2.73e-13 ***
Scopepre_nom_narrow          3.3645     0.5191   6.481 9.10e-11 ***
Scopepre_nom_wide           -0.9483     0.7286  -1.302  0.19307
L1_L2L2:Scopepost_nom_wide  -0.4477     0.6269  -0.714  0.47514
L1_L2L2:Scopepre_nom_narrow -3.2647     0.5800  -5.629 1.82e-08 ***
L1_L2L2:Scopepre_nom_wide    3.8636     0.7942   4.865 1.14e-06 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
                 (Intr) L1_L2L2 Scpps__ Scppr_nm_n Scppr_nm_w L1_L2L2:Scpps__ L1_L2L2:Scppr_nm_n
L1_L2L2          -0.808
Scppst_nm_w      -0.664  0.656
Scppr_nm_nr      -0.683  0.678   0.693
Scppr_nm_wd      -0.446  0.450   0.429   0.449
L1_L2L2:Scpps__   0.551 -0.665  -0.828  -0.567     -0.373
L1_L2L2:Scppr_nm_n  0.611 -0.720  -0.619  -0.894     -0.402      0.602
L1_L2L2:Scppr_nm_w  0.394 -0.491  -0.368  -0.390     -0.919      0.420    0.424

> Anova(model,type="III")
Analysis of Deviance Table (Type III Wald chisquare tests)

Response: Interpretation
             Chisq Df Pr(>Chisq)
(Intercept) 23.3402  1  1.357e-06 ***
L1_L2        9.2498  1   0.002355 **
Scope       87.7001  3  < 2.2e-16 ***
L1_L2:Scope 98.2915  3  < 2.2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```