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Kume, Keisuke and Marsden, Heather orcid.org/0000-0002-4885-3446 (2021) L2 acquisition of definiteness in Japanese floating numeral quantifiers : Can overt L1 morphology help? Linguistic Approaches to Bilingualism. ISSN 1879-9272

https://doi.org/10.1075/lab.20110.kum

Accepted for publication in *Linguistic Approaches to Bilingualism*, September 2021

L2 acquisition of definiteness in Japanese floating numeral quantifiers: Can overt L1 morphology help?

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Abstract

This study investigates the second language (L2) acquisition of a constraint on definiteness in Japanese floating numeral quantifiers (NQs) by native English and Korean speakers. The constraint arises because of the specific structural relation between a floating NQ and its associated noun, resulting in an obligatorily indefinite interpretation. The indirect—or, covert—encoding of definiteness in this structure allows investigation of predictions based on the cline of difficulty proposed by Cho and Slabakova (2014), whereby L2 acquisition of a covert property may be facilitated if the first language (L1) expresses the relevant feature overtly. English is such a language, having overt morphology to express definiteness, whereas Korean has floating NQs that are obligatorily, and covertly, indefinite, as in Japanese. Sensitivity to definiteness in Japanese floating NQs was measured using an acceptability judgement task. Although

both L1-Korean and L1-English speakers of Japanese showed sensitivity to the constraint at group level, follow-up analyses suggested that the Korean group had more consistent knowledge. We argue that the complexity of the acquisition task—which was greater for the English-speakers than the Korean-speakers—played a bigger role in attainment than overt versus covert encoding of the relevant feature in the L1.

Keywords

L2 Japanese; definiteness; feature reassembly; syntax-semantics interface; poverty of the stimulus

1. Introduction

A key theme of recent research into the L2 acquisition of syntax-semantics interface phenomena concerns identification of the factors that determine the relative ease or difficulty with which a given property is acquired (White, 2018). Lardiere's (2008, 2009) Feature Reassembly Hypothesis (FRH) provides a framework for investigating this issue. According to the FRH, L2 acquisition proceeds by means of mapping the formal feature sets associated with L1 functional morphemes onto perceived equivalents in the L2. These L1-based feature configurations may then undergo reassembly, if motivated by evidence

in the input. Certain predictions about ease of acquisition arise from this proposal. First, an L2 feature configuration that matches the L1 configuration should be easier to acquire (in the sense of being acquirable at an earlier stage) than the case where reassembly is needed in order to attain the L2 configuration. Second, an L2 feature configuration that does *not* match the L1 will be easier to acquire when there is clear evidence in the input to motivate the necessary reassembly, than when the relevant evidence is obscure or even non-existent. Several studies have yielded evidence consistent with these predictions (Cho & Slabakova, 2015; Gil & Marsden, 2013; Hwang & Lardiere, 2013; Su, 2018; Yuan, 2014).

Cho and Slabakova (2014), building on Slabakova (2009), proposed a refinement of these broad predictions that takes into account whether the expression of a given feature configuration is overt or covert. They argued that features that are realised overtly (i.e., by means of a dedicated morpheme) in the L2 will be easier to acquire than those whose realisation is indirect, or covert, (e.g., by means of word order), due to the more concrete, unambiguous evidence for overtly realised features. Combining overt/covert feature realisation with the notion of whether or not feature reassembly is required, they proposed the cline of difficulty given in Figure 1.

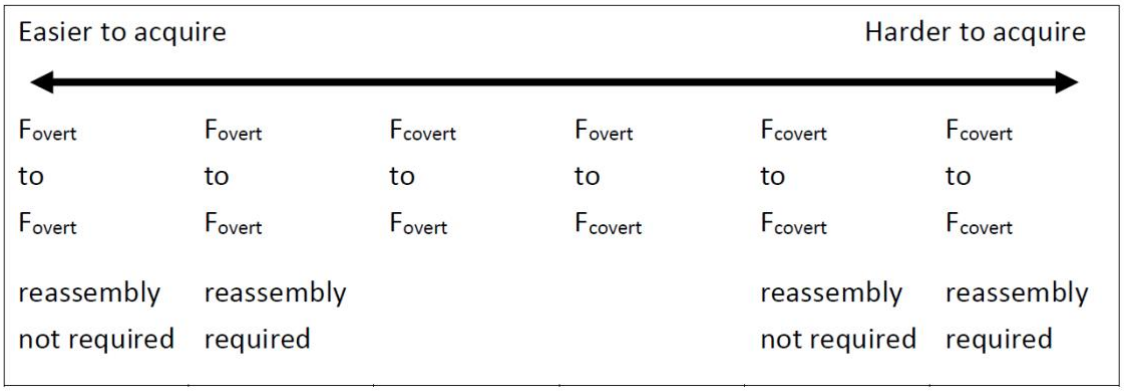


Figure 1.
Cline of difficulty in feature acquisition. Adapted from Cho & Slabakova (2014, p. 166)

The easiest acquisition task on this cline involves functional categories that are overtly realised in both L1 and L2, and have identical feature configurations, such that no feature reassembly is required. At the most difficult end are functional categories that are covertly realised in both languages, and where feature reassembly is required. Cho and Slabakova found evidence for this cline from an investigation of definiteness in L2 Russian by L1-Korean and L1-English speakers. All three languages have overt realisations of definiteness. English has articles, whose core function is to mark definiteness. Russian and Korean both have morphemes that mark definiteness as a secondary function: adjectival possessors in Russian and case-markers within noun-noun compounds Korean. Russian and Korean, additionally, have covert means of expressing definiteness through word order, although the conditions—and hence the feature configurations—for covert realisation of definiteness are different in the two languages. Cho and Slabakova found,

using a felicity judgement task, that both Korean and English speakers were successful in acquiring the overt realisation of definiteness in Russian adjectival possessors. However, on the covert property, whereas some advanced learners in the L1-English group responded in a target-like way, target-like performance was not observed in the L1-Korean learners even at advanced levels. Cho and Slabakova attributed this difference between the two groups to the greater challenge of identifying the need for feature reassembly in cases where both the L1 and L2 express the relevant feature covertly and where the conditions for covert realisation are different in each language. The English speakers, they argued, were able to make use of the presence of an overt definiteness feature as a tool for detection of the covertly realised feature in the L2.

A point on the cline that has not been investigated, to our knowledge, is the acquisition of a covert feature realisation for which the L1 has the same covert feature realisation. Cho and Slabakova (2014) place this in the second-most-difficult position, on the grounds that acquisition of covert properties is more difficult than overt properties, and that covert realisations in the L1 are less facilitative than overt. However, this suggests that the advantage (from the FRH) of being a "no reassembly required" case, is usurped by the overt–covert distinction. Whether this is a correct characterisation remains an empirical question, which the present study addresses by investigating the acquisition of a syntax-

semantics interface property of Japanese numeral quantifiers (NQs), by L1-Korean and L1-English speakers.

In Japanese, NQs, which comprise a number and a classifier (e.g., *go-nin* 'five-HUMAN.CLASSIFIER'), can occupy multiple syntactic positions, including preceding or following the noun. However, their interpretation as definite or indefinite is constrained by the interaction of word order and semantics (Furuya, 2012; Watanabe, 2006; among others). NQs that are immediately postnominal can be either definite or indefinite, whereas *floating* NQs, which are separated from the associated noun phrase, have only an indefinite interpretation. Korean exhibits the same property: floating NQs receive an indefinite interpretation that arises by virtue of their syntactic position (i.e., covertly). English, on the other hand, does not have floating NQs. Further, definiteness is realised overtly in English, predominantly through its article system, whereas in Japanese and Korean definiteness is realised predominantly through indirect, covert means. These crosslinguistic differences offer the opportunity to investigate the acquisition of a property in the second-most-difficult position on Cho and Slabakova's cline of difficulty. The cline predicts that acquisition of the covertly-realised constraint on definiteness in floating NQs in Japanese should be easier to acquire for L1-English speakers due to facilitation from the overt expression of definiteness in their L1, than for L1-Korean

speakers, whose L1 realises definiteness covertly.

This paper investigates this prediction experimentally. In Section 2, we detail the linguistic background to the NQ properties sketched out above. In Section 3, we specify the L2 acquisition problems and provide experimental predictions. Section 4 details the experiment, Section 5 presents the results, and Section 6 discusses the implications of the results for the FRH and the cline of difficulty.

2. Definiteness and numeral quantifiers in Japanese, Korean, and English

2.1 Definiteness

Definiteness is a discourse-related semantic feature that concerns the knowledge and mind state of the speaker and the hearer in the discourse. Following the *maximality* presupposition (Heim, 1991; Ionin, 2003), a Determiner Phrase (DP) is definite if the speaker and hearer presuppose that the set denoted by the NP within that DP contains whatever maximum number of elements is relevant to the context. Thus in English, where the article *the* encodes a [+definite] feature, the plural definite *the students* in (1a) indicates some relevant set of students (e.g., the students in a particular class) known to

both the speaker and hearer. When there is no presupposed set, the noun phrase is interpreted as indefinite (1b).

(1) a. I saw the students.
b. I saw some/ø students.

In article-less languages, such as Japanese and Korean, bare nouns are typically ambiguous in terms of number and definiteness, as illustrated for Japanese in (2).

(2) Gakusei-o mita.
student-ACC saw
'(I) saw the/a/some/ø student(s).'

The noun *gakusei* can be interpreted as definite or indefinite, as determined by the context, but there is no overt marking of this feature. There are a number of ways in which definiteness is indirectly indicated in both Japanese and Korean: for example, nouns followed by a topic-marking particle are typically definite, by virtue of discourse structure, whereby topics constitute presupposed information. Another example is the structure that is the focus of the present study, floating NQs, which, as detailed in the next section, can only be interpreted as indefinite.

2.2 Numeral quantifiers

Japanese and Korean are classifier languages in which nouns cannot combine with a numeral without a classifier (a lexical item representing a unit of measurement). Numeral classifiers are bound morphemes that combine with a numeral and which must agree with the semantic type of the noun that is modified by the resulting numeral quantifier. This is illustrated in (3), where omission of the classifier (CL), or use of a semantically inappropriate classifier, would result in ungrammaticality. This contrasts with English, where classifiers are not required with countable nouns.

(3) a. Japanese: gakusei san-nin
Korean: haksayng sey-myeng
student 3-$CL_{(HUMAN)}$
'three students'

b. Japanese: inu san-biki
Korean: kangoci sey-mali
dog 3-$CL_{(ANIMAL)}$
'three dogs'

c. Japanese: ringo san-ko
Korean: sakwa sey-kay
apple 3-$CL_{(INANIMATE)}$

‘three apples’

Japanese and Korean NQs can appear in different syntactic positions: prenominal (4a), postnominal (4b), and the floating (adverbial) position, after the case particle (4c) (Shin 2017; among others).[1] By contrast, while English has a number of quantifiers that can float (*all, both, each*; e.g., *the students all walked*), English numerals are allowed only in front of the associated NP (5).

(4) a. Prenominal NQ

Japanese: Hanako-ga [san-ko-no ringo]-o tabeta.

Korean: Young-Hee-ka [se-kay-uy sakwa]-lul mekessta.

Hanako/Young-Hee-NOM [three-CL-GEN apple]-ACC ate

‘Hanako/Young-Hee ate three apples.’

b. Postnominal NQ

Japanese: Hanako-ga [ringo san-ko]-o tabeta.

Korean: Young-Hee-ka [sakwa se-kay]-lul mekessta.

Hanako/Young-Hee-NOM [apple three-CL]-ACC ate

‘Hanako/Young-Hee ate three apples.’

c. Floating NQ

[1] The term ‘float(ing)’ is conventionally used to refer to quantifiers that are separated from the host noun phrase, without subscribing to any specific syntactic account. Nakanishi (2008) provides a comprehensive summary of syntactic derivation accounts of Japanese NQs.

Japanese:	Hanako-ga	[ringo]-o	san-ko	tabeta.
Korean:	Young-Hee-ka	[sakwa]-lul	se-kay	mekessta.
	Hanako/Young-Hee-NOM	[apple]-ACC	three-CL	ate

'Hanako/Young-Hee ate three apples.'

(5) Katie ate three apples / *apples three.

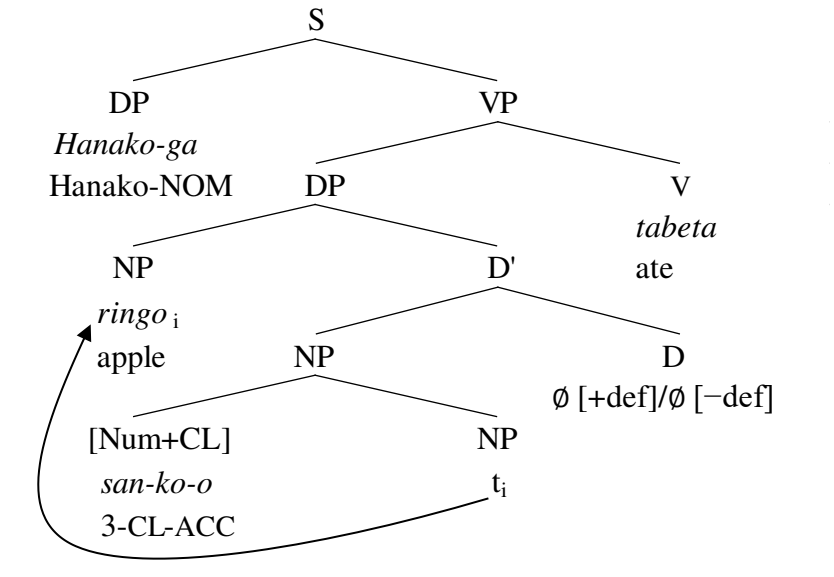
The three types of NQ construction in Japanese and Korean are often used to express the same proposition, as indicated by the English translations in (4). However, an interesting contrast between postnominal and floating NQs has been observed, in both Japanese and Korean, in terms of interpretation of definiteness: whereas postnominal NQs are compatible with both [+definite] and [−definite] interpretations, floating NQs can have only a [−definite] interpretation (Furuya, 2012; Lee, 2013; Shin, 2017; Watanabe, 2006; among others), as schematised in (6).

(6) Availability of definite/indefinite interpretations

NQ type	Example (from 4b–4c)	Indefinite: "three apples"	Definite: "the three apples"
Postnominal	… ringo san-ko-o … … apple 3-CL-ACC	✓	✓
Floating	… ringo-o san-ko … …apple-ACC 3-CL	✓	#

Drawing on the semantic accounts of properties of postnominal and floating NQs by Nakanishi (2007) and Shin (2017), the interpretive difference between the two NQ types arises from a difference in composition of the two structures. In a postnominal NQ structure, the NQ is argued to merge with the associated NP, quantifying individuals denoted by the NP within the nominal structure. Nakanishi assumes that the NQ is adjoined to the NP, and the NP obligatorily moves to [Spec, DP], as illustrated in (7).[2] Crucially, the head D in this structure can be either [+definite] or [−definite].

(7) Postnominal NQ structure



[2] The details are different in Shin's (2017) account but, crucially, Shin's structure also positions the NQ and associated NP within a DP complement of V. For simplicity, we indicate case markers as suffixes on the relevant element. Note, though, that in syntactic accounts of case marking, case markers are argued to attach to the whole nominal phrase (i.e., *ringo san-ko* in (7)) (e.g., Nakamura, 2018).

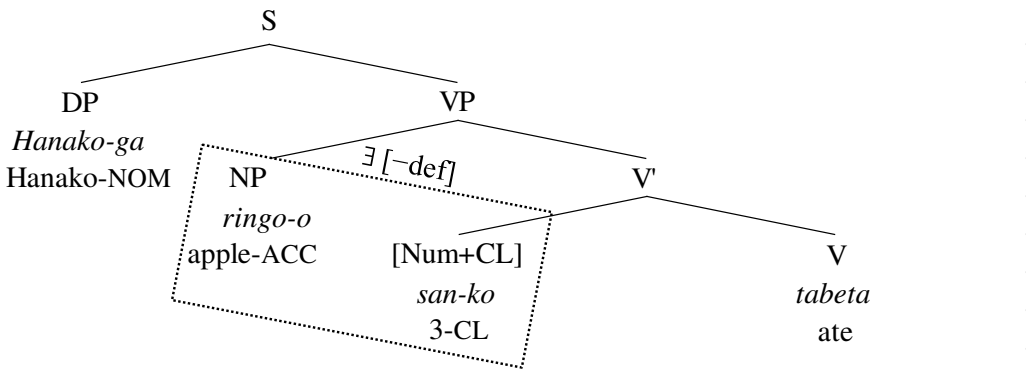
By contrast, in a floating NQ structure, both Nakanishi and Shin assume that the NQ merges first with the verb, as an adverbial.[3] The associated noun (the direct object, in a transitive predicate) is merged subsequently, as the internal argument of the verb. As a result, the NQ and the NP do not form a constituent. Further, when the NP merges with the intermediate V' node that contains the NQ, an existential operator is introduced into the semantics, and this operator binds a variable related to the NP. This resulting representation forces a [−definite] interpretation of the combination of the NQ and NP, as sketched in (8). The semantic representation is given in (9) (a simplified version of representations given in Nakanishi (2007) and Shin (2017)), where *y* is the variable that corresponds to the internal argument of the predicate.[4] Floating NQs thus quantify individuals like their postnominal counterparts do, but they do this through their composition with a verbal predicate, rather than within a DP.[5]

[3] Other theoretical accounts of floating NQs have also been proposed (e.g., Furuya, 2012; Kobayashi & Yoshimoto, 2001; Watanabe, 2006). Space prohibits a review of the different proposals.

[4] "INAN.OBJ(*y*)" represents the meaning of *ko*, the classifier for small inanimate objects. Additionally, *x* is the variable that corresponds to the external argument of the predicate (i.e., *Hanako*).

[5] A reviewer questioned whether the definiteness encoded through NQ constructions should be considered overt, like Cho and Slabakova's (2014) Russian overt definiteness expressed through possessors. The question was based on the apparent association between definiteness and the position of the case marker: following the noun in floating NQs and the classifier in postnominal NQs. However, we assume that this definiteness constraint depends crucially on whether the NQ is located within the host nominal structure (postnominal) or not (floating) (i.e., whether the NQ and the NP form a constituent), rather than on the position of the case marker. We adopt the general view from generative syntax that case markers do not contribute to the semantic computation because they represent Case features, which are uninterpretable, and thus eliminated before the syntactic derivation reaches LF (e.g., Chomsky, 1995; Fukui & Takano, 1998). In line with this, Nakanishi (2007) and Shin (2017) do not include the meaning of case markers in the semantic composition of NQ constructions. Thus, the definiteness constraint seems to derive essentially from the composition of NQ constructions (i.e., definiteness distinguished through word order, thus covert in Cho and Slabakova's terms). However, the indefiniteness encoded in Russian adjectival possessors is encoded

(8) Floating NQ structure



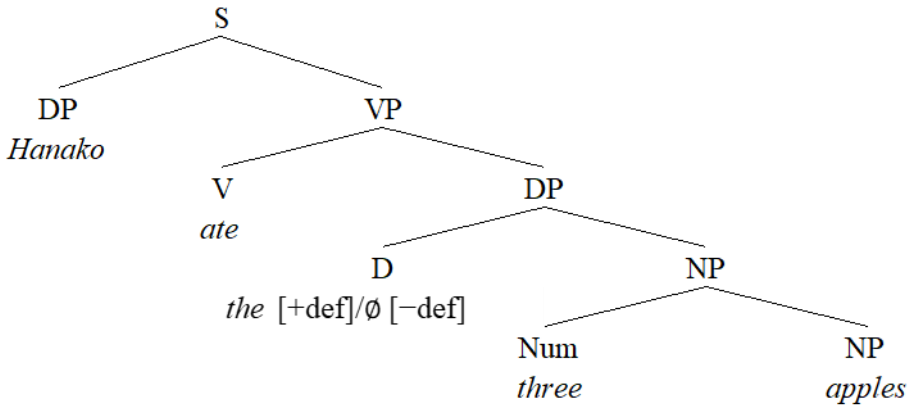
(9) ⟦ringo-o san-ko tabeta⟧ =

$$\lambda x \exists y\, [\text{APPLE}(y) \wedge \text{INAN.OBJ}(y) \wedge |y| = 3 \wedge [\text{ATE}\ (x, y)]$$

Turning to English NQs, they are assumed to be NP modifiers that adjoin to an NP, like adjectives (following Krifka, 1999; Verkuyl, 1981). Their definiteness value is straightforwardly determined by the head D that the [numeral + NP] merges with, as illustrated in (10).

directly—hence, overtly—through their morphology, which is distinct from nominal possessor morphology. Therefore, we consider the indefiniteness encoded in the floating NQ construction to be different in nature from that encoded in Russian adjectival possessors.

(10) English numeral construction



In sum, the difference between postnominal NQs and floating NQs in Japanese and Korean is accounted for by the compositional difference between the two structures, whereby an existential operator is obligatorily introduced in the floating NQ structure and this imposes a [–definite] interpretation. The implications of these cross-linguistic differences for the acquisition of Japanese NQs by Korean speakers and English speakers are explored in the following section.

3. Defining the L2 acquisition tasks and predictions

3.1 The acquisition problem

As a prerequisite to the acquisition of the semantic constraint on floating NQs, learners

must know certain essential properties of Japanese NQs: that Japanese numerals must combine with appropriate classifiers and that NQs can occur in multiple positions, including the adverbial position occupied by floating NQs. These properties should be acquirable based on positive evidence in the form of instances of NQs in the input. NQs are relatively frequent, even in language textbooks for beginner-level learners (e.g., the *Genki* series, Banno, Ohno, Sakane, Shinagawa, and Takashiki, 1999). However, the acquisition of the property in question—namely the semantic constraint, whereby the nominal associated with a floating NQ must be interpreted as indefinite—represents a greater challenge because it involves determining the relevant syntactic condition in which a definite interpretation of an NQ is blocked.

Lardiere (2009) assumes two factors that determine how readily a given acquisition task can be achieved: the extent to which relevant formal contrasts can be detected (whether morphological or arising from word order); and the degree of re-configuration of L1 features required in order to assemble features into the target configuration. In the case of the definiteness constraint on floating NQs, the challenge lies first in the detection because positive evidence for the constraint is not available. Even though instances of floating NQs in the input will be indefinite, this does not serve as evidence that a definite interpretation is disallowed. Further, the co-occurrence of floating NQs

with postnominal NQs, which can be either definite or indefinite, is likely to mitigate against establishing an exclusively indefinite interpretation of floating NQs. Moreover, relevant negative evidence, in the form of classroom instruction, also appears to be unavailable: examination of widely-used Japanese language textbooks (the *Genki* series (Banno et al., 1999); the *Minna no Nihongo* series (3A Network, 1998)), along with consultation with several Japanese language teachers, confirms that the semantic constraint is not typically covered in Japanese language education.

In short, external evidence for the definiteness constraint on Japanese NQs is scarce. For L1-English learners of Japanese, it represents an L2 poverty-of-the-stimulus problem, in that, in addition to the absence of external evidence, the L1 grammar also lacks any corresponding L1 floating NQ or word order permutation that restricts the definiteness of NQs. An L2 poverty-of-the-stimulus problem arises when learners must attain L2 knowledge for which no evidence is available, whether from the natural target language input, L1 transfer, or instruction (e.g., White, 2003). Previous studies on the L2 acquisition of other phenomena under poverty of the stimulus have shown that such phenomena can nonetheless be acquired in some cases, particularly by more advanced learners (e.g., Dekydtspotter & Sprouse, 2001; Dekydtspotter, Sprouse, & Swanson, 2001; Marsden, 2008, 2009; Unsworth, 2005). These studies argue that acquisition in

such cases must arise via innately given mechanisms of Universal Grammar (UG), since external direct evidence for the property is unavailable. Interestingly, the only previous study of L2 acquisition of Japanese NQs (to our knowledge), Okuma (2019), also investigates a poverty-of-the-stimulus phenomenon. Okuma investigated whether English-speaking learners of Japanese could acquire a different semantic restriction on floating NQs (independent of the definiteness constraint), whereby floating NQs can have only a collective interpretation, but postnominal NQs can have either a distributive or a collective interpretation (e.g., Nakanishi, 2007). For example, the postnominal NQ in (11a) results in two interpretations: that three students worked individually to each submit a separate piece of homework (the distributive interpretation); or that three students worked together to submit one piece of homework (the collective interpretation). By contrast, (11b), with a floating NQ, allows only the distributive interpretation.

(11) a. Gakusei san-nin-ga kyoo syukudai-o dasita.
student three-CL-NOM today homework-ACC submitted
'Three students submitted homework today.'
Interpretation: ✓distributive ✓collective

b. Gakusei-ga kyoo san-nin syukudai-o dasita.
student -NOM today three-CL homework-ACC submitted

'Three students submitted homework today.'

Interpretation: ✓distributive ✗collective

(Okuma, 2019, p. 497)

Okuma argues that there is no corresponding semantic restriction in the learners' L1, English; nor is it taught in Japanese language classrooms. Similar to the definiteness restriction on floating NQs, there is also no direct positive evidence in the input that floating NQs are restricted to a distributive interpretation. Okuma investigated whether English-speaking learners of Japanese could acquire the restriction. She conducted a truth-value judgment task with 18 English-speaking learners of Japanese of intermediate to advanced proficiency. The results showed that although the L2 learners did not reliably distinguish between the collective and distributive interpretation of floating NQs at the group level, four out of the 18 learners made a target-like distinction. Accordingly, Okuma argued that successful acquisition of the semantic constraint on Japanese floating NQs is possible despite the learnability problem.

In addition to focusing on a different semantic constraint on floating NQs, the present study differs from Okuma's in that it compares learners facing an L2 poverty-of-the stimulus problem with a group for whom poverty-of-the stimulus is not involved, by virtue of their L1, Korean. If Korean speakers of Japanese can draw on their L1 grammar,

then at the point of recognising the existence of floating NQs in Japanese, the formal properties of the floating NQ construction in their L1 could, in principle, be mapped onto its Japanese counterpart, leading to the definiteness constraint automatically falling into place. However, the FRH and Cho and Slabakova's cline of difficulty proposal offer distinct predictions about the way in which such facilitation from the L1 might occur. The following subsection articulates these predictions.

3.2 Predictions

As noted above, the FRH proposes that relative ease of L2 acquisition is affected by the degree of re-configuration of L1 features required in order to assemble features into the target configuration. The greater the reassembly required, the more potentially difficult the task. Cho and Slabakova's (2014) cline of difficulty (Figure 1) integrates that notion with the proposal that overtly realised features in the L2 are easier to acquire than covertly realised features. Of particular relevance to the present study is the acquisition task defined on the cline as "F_{covert} to F_{covert}, reassembly not required". This is the second most difficult task on the cline, and it is the task faced by the Korean-speaking learners in our study. By contrast, the English-speakers of Japanese face the task defined as "F_{overt} to F_{covert}", because their L1 has overt realisations of the [–definite] feature (i.e., the determiners *a* and *some*), while the target structure involves covert realisation of this

feature. This "F_{overt} to F_{covert}" task automatically involves feature reassembly (in terms of changing the manner of feature realisation from overt to covert) but its position on the cline predicts that it is relatively easier than the "F_{covert} to F_{covert}, reassembly not required" task.

The relative positions of these two tasks on the cline of difficulty imply a proposal that covert realisation of features in the L1 (as in the case of definiteness in floating NQs in Korean, in the current study) may not aid the L2 acquisition of corresponding features, although Cho and Slabakova do not state this explicitly. This contrasts with the FRH proposal that the greater the degree of reassembly required, the more difficult the task. Under that view, "F_{covert} to F_{covert} reassembly not required" should be easier than "F_{overt} to F_{covert}". The present study is designed to investigate which of these two positions is correct. We address the research question stated in (12):

(12) *Research Question*

Is L2 acquisition of a covertly-realised feature easier when the L1 realises that feature in the same covert manner, or when the L1 expresses the feature overtly but in a different manner?

We test two alternative predictions, based on the FRH and the cline of difficulty, respectively:

(13) a. FRH prediction

Korean-speaking learners will acquire the [–definite] interpretation of floating NQs in Japanese more easily than English-speaking learners.

b. Cline of difficulty prediction

English-speaking learners will acquire the [–definite] interpretation of floating NQs in Japanese more easily than Korean-speaking learners.

The FRH prediction reflects the greater magnitude of the reassembly task faced by English-speaking learners compared with the Korean-speaking learners. The cline of difficulty prediction reflects the assumption that, in terms of acquiring an L2 covert feature, having an overt realisation of that feature in the L1 (as in English) is more facilitative than having a covert realisation (Korean). We note that these predictions do not explicitly address the detection problem outlined in Section 3.1. However, this problem seems to be subsumed by the degree of facilitation ascribed to covertly realised L1 features in each account. If a covertly realised L1 feature can facilitate acquisition,

then, as argued in the previous section, the detection problem does not apply to L1-Korean speakers, because their L1 provides the relevant feature configuration of floating NQs. But if covertly realised L1 features do not facilitate acquisition, as the cline of difficulty suggests, then the L1-Korean speakers may face the same problem as the L1-English speakers in detecting the obligatory [–definite] interpretation of Japanese floating NQs. These predictions are tested in the experimental study reported in the next section.

4. The experimental study[6]

4.1 Participants

Forty L2 Japanese speakers participated in the study: 20 with Korean as their L1 and 20 with English. Participants with relatively advanced L2 Japanese proficiency were recruited, because measuring the knowledge of a context-dependent linguistic property involves comprehending context in addition to the target sentences. The participants' L2 level must be high enough to do this. Further, previous studies of subtle syntax-semantics phenomena (cited above) have found that effects of L1 influence can still be detected in more advanced learners. The English-speaking participants included 14 UK university students with a Japanese-related major (of whom 8 resided in Japan at the time of testing),

[6] This experiment was conducted as part of the first author's doctoral research (Kume, 2021).

4 Japanese language instructors at UK and US universities, and 2 university teachers in Japan. The Korean-speaking participants included 17 undergraduate students at Japanese universities and 2 Korean language teachers. All but one resided in Japan at the time of testing; the remaining one was studying in the US. Table 1 provides demographic information about the L2 participants.

Table 1.
Participant information

Group	Age	Age of exposure to Japanese	Formal Japanese language education [in years]	Length of residency in Japan [in years]
Korean speakers (n = 20)	25.2 (6.48)	14.9 (3.60)	6 (5.58)	3.3 (4.46)
English speakers (n = 20)	29.9 (12.77)	17.7 (3.44)	9 (8.00)	6.2 (10.37)

Note. () = SD.

Two control groups of native Japanese participants were also recruited: a group of 26 who completed a cloze test used as a Japanese language proficiency measure, and a group of 20 who completed the experimental task. (Both tasks are described below.) The cloze test participants were students attending short-term programmes at a UK university at the time of testing (M age = 21.1, SD = 5.18). The experimental task participants were university

students and professionals, residing in Japan (*M* age = 34.0, *SD* = 11.92).

4.2 The proficiency test

A cloze task, adapted from Marsden (2005), was used as a measure of Japanese language proficiency.[7] Participants selected the correct words to fill 42 blanks in a passage from multiple-choice options. The scores of the native Japanese participants served as a reference level. Performance is summarised in Table 2.

Table 2.
Scores on cloze test (0–42 points)

Group	*M*	*SD*	Range
Native Japanese controls (n = 26)	38.62 (92%)	2.17	34–42 (81–100%)
Korean-speaking learners (n = 20)	36.70 (87%)	3.37	28–42 (67–100%)
English-speaking learners (n = 20)	34.15 (81%)	4.63	26–42 (62–100%)

Table 2 shows that the L2 groups' mean proficiency scores and ranges largely overlap with the native speakers', suggesting that they can indeed be considered to be relatively advanced. Results of a one-way between-participants ANOVA yielded a significant effect of L1 on proficiency score (F (2, 63) = 9.58, p > .001). Post hoc multiple comparisons by the Tukey HSD test indicated that the English-speaking group differed significantly from

[7] To our knowledge, there is no short proficiency task for Japanese that provides a mapping to a standardised set of levels, such as the Common European Frame of Reference (Council of Europe, 2001). Cloze tests have been shown to provide a valid measure of L2 proficiency (e.g., Jonz, 1990).

the Japanese group (*M-Diff* = 4.47, *CI 95%* [2.02, 6.19], $p > .001$). However, the Korean-speaking group did not significantly differ from the Japanese or the English-speaking group. Taken together, these results suggest that the L2 groups are more or less matched in terms of their proficiency although the Korean group has a greater number of learners performing in the native range.

4.3 Experimental task design

Intuitions about the definiteness of Japanese NQs were measured by means of an acceptability judgement task (AJT). A set of 16 experimental item pairs was created. The two target sentences within each pair differed only in the NQ: either a postnominal NQ or a floating NQ. Definiteness was manipulated by means of a context presented before each target sentence: eight of the 16 pairs had a [+definite] context, and eight a [−definite] context, as illustrated in (14–15). (Contexts are presented in English here, for convenience, but contexts and target sentences were all presented in Japanese in the experiment.)

(14) [+definite]

Taroo is a good tennis player. He had tennis matches with his friends, Takasi, Hirosi and Goroo yesterday.

Taroo-wa itumono yooni {yuuzin san-nin-o / yuuzin-o san-nin}
Taroo-TOP always like {friend 3-CL-ACC / friend-ACC 3-CL}
kantanni sugu makasite-simai-masita

easily quickly beat-finish-did

'He, as always, beat the three friends easily and quickly.'

(15) [−definite]

A new restaurant just opened near Hanako's house and she wants to go there. But, since she does not want to go alone, …

Hanako-wa kinoo {yuuzin huta-ri-o / yuuzin-o huta-ri}

Hanako-TOP yesterday {friend 2-CL-ACC / friend-ACC 2-CL}

sassoku ranti-ni sasotte-mimasita

at.once lunch-for invite-tried

'Hanako went ahead and asked two friends out for lunch yesterday.'

In [+definite] contexts (14), where a presupposed referent was established for the reader (i.e., the participant) by the context sentence, floating NQs were expected to be judged less acceptable than postnominal NQs. In [−definite] contexts (15), where the target noun is mentioned for the first time in the target sentence (thus no presupposed referent), both types of NQ were expected to be equally acceptable.[8] Two lists of test items were created,

[8] As a reviewer pointed out, this study did not distinguish between definiteness and specificity, defined as presuppositionality/partitivity (e.g., Enç, 1991): all the [+definite] contexts were [+specific] and all the [−definite] were [−specific]. However, we assume that the constraint concerns definiteness rather than specificity because it has been confirmed through an independent experimental study using an AJT with similar test items that both types of NQ are equally acceptable in [−definite, +specific] contexts (Kume, 2019).

so that no participant judged both the postnominal and floating version of the same sentence: participants saw each item in only one condition. Eighty fillers were mixed with each list of 16 experimental sentences. The fillers were designed to balance the number of acceptable and unacceptable items within each list.[9]

The task was administered using the online survey tool, Qualtrics (Version: Oct. 2019–Feb. 2020). Experimental items and fillers were pseudo-randomized per participant. The task was self-paced, with no time pressure. For each item, participants viewed the context and the underlined target sentence together. They rated each target sentence for its acceptability as a continuation of the context, using a 7-point scale of 0 (completely odd) to 6 (completely natural). An *I don't know* option was also offered. Participants were asked to then press a button to reveal the next test item. It was not possible to go back and change answers.

4.4 Procedure

The L2 participants completed all components of the testing as a web-based survey, comprising an information sheet and consent form; a short demographic questionnaire; the AJT, which included a training session with four practice examples; and the cloze test.

[9] The AJT materials are archived in the Open Science Framework (OSF) repository (https://osf.io/7nf86/).

The whole process took 60-70 minutes. The native Japanese experiment participants completed all elements except the cloze test, taking 30-45 minutes.

5. Results

Group mean acceptability ratings were calculated for each quantifier type for each definiteness condition, as illustrated in Figures 2 ([+definite]) and 3 ([−definite]). *I don't know* responses were excluded, which affected 1.04% of the data (10/960: 3 from the English group and 7 from the Korean group divided roughly evenly between the [+definite] and [–definite] conditions).

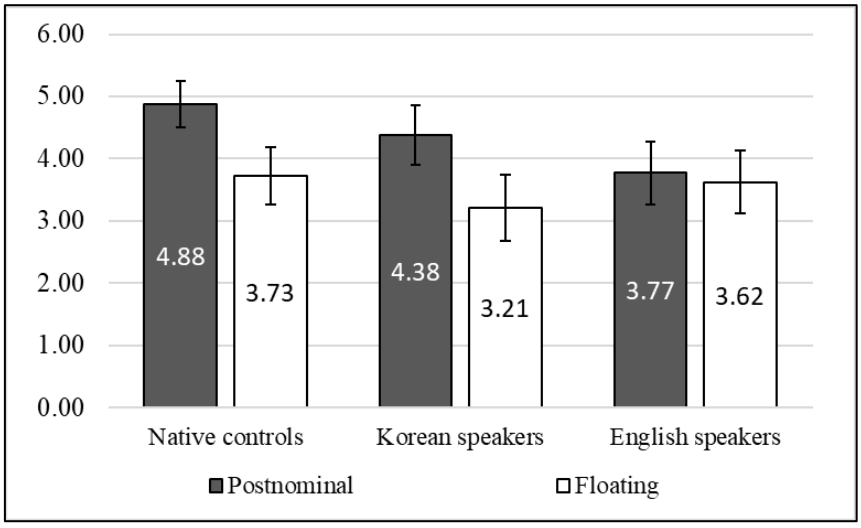


Figure 2.
Mean acceptability ratings in [+definite] contexts (error bars = SE).

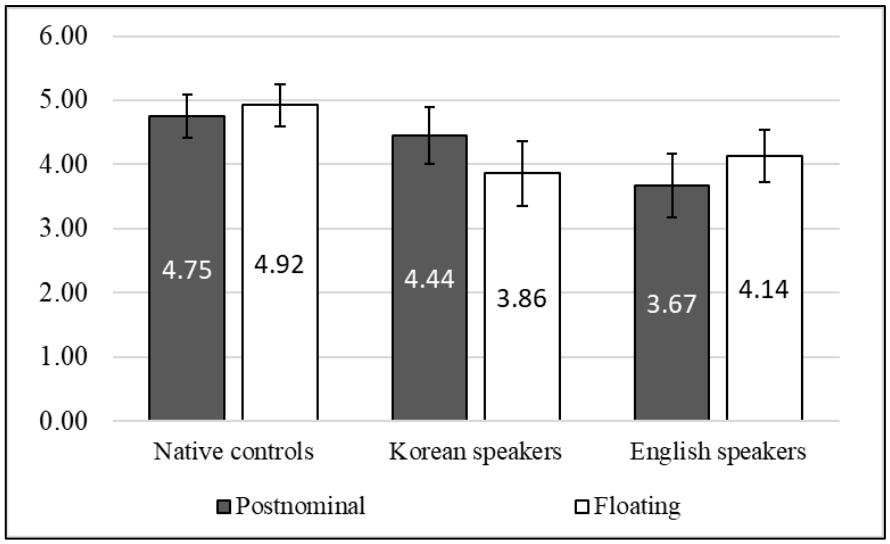


Figure 3.
Mean acceptability ratings in [−definite] contexts (error bars = SE).

Recall that the [+definite] context is where a difference in degree of acceptability between the two NQs is expected. From Figure 2, this difference appears to be present in the native control group and the Korean group. Both gave floating NQs lower ratings than postnominal NQs.[10] However, in the English group, there is almost no difference between the two types of NQ. Turning to the [−definite] context (Figure 3), the native control group rated both NQ types almost equally, with ratings towards the higher end of the scale, as expected. Each learner group also rated the two NQ types similarly.

[10] One might ask why the native group does not have more categorical ratings, with the acceptable conditions rated at the top of the scale and the unacceptable at the bottom. We speculate that this is due to the nature of the task, where sentences must be judged in light of a context, rather than on the basis of "simple" within-sentence (un)grammaticality. Crucially, as the statistical analysis confirms, in the key [+definite] contexts, the native group's ratings for floating NQs are significantly lower than for postnominal NQs, confirming that they treat the two structures differently.

For further analysis, an ordinal mixed-effects model was fitted to the raw ratings using the *clmm* function in the *ordinal* package (Christensen, 2018), in the R statistical environment (R Core Team, 2018). Ordinal regression was used because it is an appropriate method for rating scale data (Liddell & Kruschke, 2018), and it can be applied without the need for transforming the data to a ratio scale. The model was maximal (Barr, Levy, Scheepers, & Tily, 2013): the fixed effects were DEFINITENESS (*[−definite], [+definite]*), QUANTIFIER TYPE (*floating, postnominal*), and L1 (*Japanese*, *Korean, English*), and their interactions. Random intercepts were included for participants and items, with QUANTIFIER TYPE, DEFINITENESS and their interaction as random by-participant slopes, and QUANTIFIER TYPE, L1 and their interaction as random by-item slopes. Sum coding was applied to the two binary variables, and Helmert coding was applied to the L1 variable, so that first the L1 group was compared with the two L2 groups together, and then the two L2 groups were compared with each other.

Table 3 shows the results of this analysis. Of key interest are the interactions. While the three-way interactions were not significant (suggesting that no group differs from the others in terms of the relationship between DEFINITENESS and QUANTIFIER TYPE), there were two significant two-way interactions. The significant interaction of QUANTIFIER TYPE and DEFINITENESS shows that, across the three groups, ratings for each definiteness

condition depend on the type of NQ. In other words, the interaction comes from the lower ratings on floating NQs in the [+definite] condition compared with the [−definite] (Figures 2–3). The other significant interaction, between QUANTIFIER TYPE and the contrast between the Korean and English group, means the effect of QUANTIFIER TYPE differs between these two groups. The model also revealed main effects of QUANTIFIER TYPE and of L1 when comparing the Japanese group with the two L2 groups combined. The former indicates higher ratings overall for postnominal NQs than floating NQs. The latter is due to the native speakers having generally higher ratings than the L2 speakers.

Table 3.

Results of the omnibus ordinal model for acceptability scores

Fixed Effects	*β*	*SE*	*z*	*p*
Definiteness	−0.223	0.356	−0.627	.531
quantifier type	0.545	0.176	3.099	.002 **
L1(1): Japanese vs. (Korean & English)	0.438	0.211	2.071	.038 *
L1(2): Korean vs. English	0.143	0.157	0.917	.359
definiteness × quantifier type	0.948	0.297	3.186	.001 **
definiteness × L1(1): Japanese vs. (Korean & English)	−0.198	0.311	−0.637	.524
definiteness × L1(2): Korean vs. English	−0.020	0.192	−0.104	.917
quantifier type × L1(1): Japanese vs. (Korean & English)	0.060	0.250	0.242	.809
quantifier type × L1(2): Korean vs. English	0.607	0.209	2.905	.004 **
definiteness × quantifier type × L1(1): Japanese vs. (Korean & English)	0.575	0.426	1.348	.178
definiteness × quantifier type × L1(2): Korean vs. English	0.163	0.347	0.470	.638

Note. Formula: rating ~ quantifier type * L1 * definiteness + (quantifier type * definiteness | participant) + (quantifier type * L1 | item). Coding: definiteness: [+definite] = 0.5, [−definite] = −0.5; quantifier type: postnominal = 0.5, floating = −0.5; L1: Japanese = [1.0, 0], Korean = [−0.5, 1], English = [−0.5, −1].

** $p < .01$, * $p < .05$.

The interaction of QUANTIFIER TYPE and DEFINITENESS testifies to sensitivity to the definiteness constraint—in the form of lower ratings on floating NQs in just the [+definite] context—across all the data. At first glance, the absence of any effect of group on this interaction seems surprising, in light of the picture seen in Figure 2, where the English group appeared to make no distinction between postnominal and floating NQs in the [+definite] condition. To explore this further, we conducted post hoc nested comparisons of the effects of quantifier type within each group, and we examined the response patterns by individual for the [+definite] context.

Table 4 shows the statistical results for the nested models. The model for the [+definite] condition indicated that ratings for the postnominal NQs were significantly higher than for the floating NQs in the Japanese and Korean groups, but not in the English group. Although these nested models cannot provide concrete evidence of between-group differences, because there was no three-way interaction in the main model, they provide suggestive evidence that the Korean speakers are more consistent in penalizing floating NQs than their English counterparts. In the [−definite] model, the effect of quantifier type was not significant for the Japanese or the English groups, though it was marginal (p = .058) for the Korean group. This suggests that in the [−definite] context, all groups rated both types of NQ more or less equally, although the Korean group was inclined to rate

the postnominal NQs slightly higher than the floating NQs.[11]

Table 4.

Results of separate nested ordinal models for acceptability scores for each condition

Fixed Effects	*β*	*SE*	*z*	*p*
[+definite] condition				
L1(1): Japanese vs. (Korean & English)	0.331	0.198	1.667	.095 †
L1(2): Korean vs. English	0.109	0.164	0.666	.506
L1: Japanese / quantifier type	1.271	0.409	3.110	.002 **
L1: Korean / quantifier type	1.450	0.492	2.950	.003 **
L1: English / quantifier type	0.190	0.424	0.447	.655
[–definite] condition				
L1(1): Japanese vs. (Korean & English)	0.604	0.331	1.826	.068 †
L1(2): Korean vs. English	0.168	0.211	0.799	.424
L1: Japanese / quantifier type	−0.213	0.376	−0.568	.570
L1: Korean / quantifier type	0.726	0.384	1.893	.058 †
L1: English / quantifier type	−0.364	0.367	−0.992	.321

Note. Formula: rating ~ L1 / quantifier type + (quantifier type | participant) + (quantifier type * L1 | item). "*x* / *y*" represents the effect of variable *y* with variable *x* held constant. ** $p < .01$, † $p < .10$

Turning to the distribution of the rating patterns for the [+definite] context by individual, Table 5 shows, for each group, how many individuals had lower mean ratings

[11] The Korean group's preference for postnominal NQs seems likely to be a transfer effect, reflecting the greater frequency of postnominal NQs in Korean. Kim and Yang (2006) report 15% postnominal and only 5% floating NQs in a corpus containing 694 Korean NQs. In Japanese, it is floating quantifiers that occur more frequently: 21% floating vs. 6% postnominal in a corpus of 858 Japanese NQs (Kim, 1995). This preference for postnominal NQs could augment the size of the quantifier type effect in the Korean group in the crucial [+definite] context, but since the effect in this context is considerably larger than the effect in the [–definite] context (Table 4), this preference alone cannot account for the size of the difference between the two NQ types in the [+definite] context.

for floating NQs than postnominal NQs by at least 1 point (the target pattern), how many had the opposite (non-target) pattern, and how many showed between-condition differences of less than 1. The ranges of magnitudes of mean ratings differences are also given.[12]

Table 5.
Distribution of response patterns within each group, in the [+ definite] condition

L1	Postnominal minus Floating ≥ 1		Difference between Postnominal and Floating < |1|	Floating minus Postnominal ≥ 1	
	N	Size of difference	*N*	*N*	Size of difference
Japanese	11	1.00–3.25	9	0	N/A
Korean	12	1.00–4.50	7	1	1.17
English	9	1.00–5.25	5	6	1.00–4.25

Note. *N* = number of participants with the given response pattern. Size of difference is given in points on the rating scale.

It is clear from Table 5 that the greatest amount of variation is found within the English group, and this group had the largest number of non-target response patterns. Crucially,

[12] A reviewer queried the use of individual mean ratings because the size of difference does not tell us about individual consistency across items. Unfortunately, we cannot check individual consistency across items because participants read each item only in one condition. However, the primary aim of this analysis is to find an explanation for the absence of the three-way interactions in the main statistical model (Table 3), even though Figure 2 suggests that the L1-English group behaves differently from the other two groups. We believe that the analysis provided here still serves this purpose.

however, even in this group, roughly half of the individuals rate floating NQs lower than postnominal NQs.[13] This confirms that, despite the absence of clear differentiation between the quantifier types within the English group, the target response pattern was nonetheless the most frequent pattern in this group, too. This helps to explain why, even though Figure 2 suggested that the English group did not differentiate between the two quantifier types, there was nonetheless no three-way interaction in the omnibus model: the overall pattern for all three groups is indeed that floating NQs receive a lower rating than postnominal NQs in the [+definite] context, suggesting that all three groups are sensitive to the definiteness constraint.

6. Discussion

The two predictions formulated about English speakers' and Korean speakers' acquisition of Japanese floating NQs are restated in (16) (previously, 13):

[13] Among those in the middle category, two each of the nine native controls and seven L1-Korean speakers had a postnominal NQ rating fractionally lower than 1 (numerically non-target), whereas three of the five L1-English speakers did.

(16) a. FRH prediction

Korean-speaking learners will acquire the [–definite] interpretation of floating NQs in Japanese more easily than English-speaking learners.

b. Cline of difficulty prediction

English-speaking learners will acquire the [–definite] interpretation of floating NQs in Japanese more easily than Korean-speaking learners.

Although on first glance, the descriptive results seemed to suggest that only the Korean-speaking group, and not the English-speaking group, showed sensitivity to the definiteness constraint on Japanese floating NQs, the statistical analyses provided evidence of this sensitivity across all participants. This evidence came from the combination of the significant interaction of DEFINITENESS and QUANTIFIER TYPE with the absence of three-way interactions of QUANTIFIER TYPE, DEFINITENESS, and L1. However, the post hoc nested models suggested that the L1-Korean group differentiated more consistently between the two quantifier types in the [+definite] condition than the L1-English group. Further, examination of individual response patterns confirmed that, even in the L1 English group, just under half the participants rated floating NQs lower than postnominal NQs in the [+definite] condition. Taken together, the data suggest that

the definiteness constraint on floating NQs is acquirable by both L2 groups, but that it is easier for Korean speakers than English speakers, in the sense that the L1-Korean behaviour on this condition was more consistent, and more similar to the native Japanese responses, than the L1-English group's behaviour was. On this basis, the FRH prediction is supported, and the cline of difficulty prediction is not. In what follows, the discussion focuses on three main themes: implications of the present findings for the cline of difficulty; the question of how English-speaking learners can acquire the definiteness constraint, given the L2 poverty of the stimulus; and finally some directions for future research.

6.1 Implications for the cline of difficulty approach

Recall that on Cho and Slabakova's (2014) cline of difficulty, an acquisition task in which the L1 represents the relevant feature overtly but the L2 represents it covertly ("F_{overt} to F_{covert}") is predicted to be easier than when both L1 and L2 represent the feature covertly in the same configuration ("F_{covert} to F_{covert}, reassembly not required"). In the present study, the English-speaking learners face the first task, while the Korean-speaking learners face the second. As the L1-English speakers' task necessarily involves feature reassembly but the L1-Korean speakers' does not, our findings suggest that it may be the requirement for feature reassembly, rather than the overt or covert nature of the feature in the L1 that plays

a determining role in the relative difficulty of the task. In Cho and Slabakova's study, which motivated the cline of difficulty, the task of acquiring covertly realised definiteness features in Russian involved feature reassembly for both the L1-English and the L1-Korean group. The task was relatively less difficult for the L1-English group, which Cho and Slabakova ascribed to it being an "F_{overt} to F_{covert}" task compared with the "F_{covert} to F_{covert}, reassembly required" task faced by the Korean learners of Russian.

Considering the present findings alongside Cho and Slabakova's, it seems that the "F_{covert} to F_{covert}, reassembly NOT required" task should be re-positioned towards the easier end of the cline than cases that require feature reassembly for acquisition of a covert feature. However, further evidence is needed about whether a "F_{covert} to F_{covert}, reassembly NOT required" task would be easier than the case in which both features are overt, but reassembly is required. The cline of difficulty predicts that acquisition of the overt feature should be easier, despite the requirement of reassembly. An alternative prediction would be that acquisition that involves feature reassembly is always more difficult than acquisition where no feature reassembly is required, but within that, overt features are easier to acquire than covert, and the presence of an overt L1 feature is more facilitative than a covert L1 feature. The revised cline would be as illustrated in Figure 4, which builds Cho and Slabakova's covert/overt distinction into the proposal from Lardiere

(2009) that the more complex the feature reassembly required, the more difficult the acquisition task. This revised cline accounts for the present study's findings and Cho and Slabakova's, though further research is needed, particularly to test the second and third points on the cline.

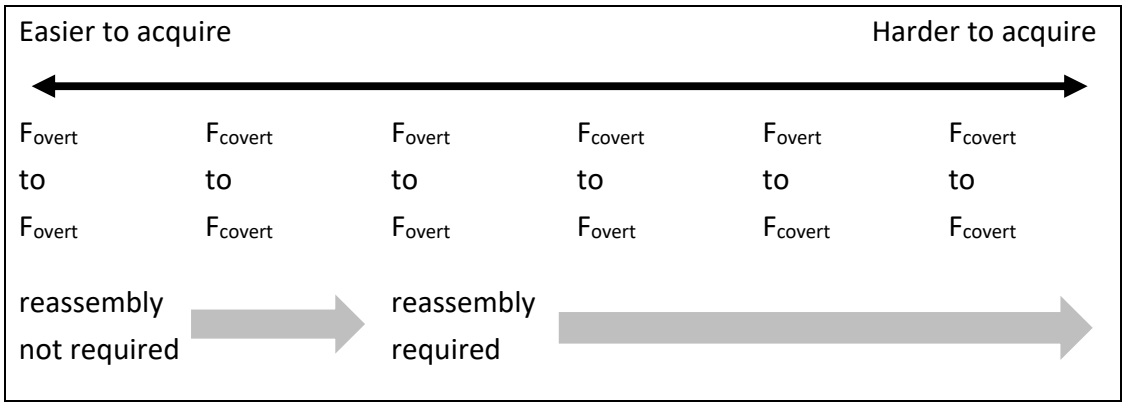


Figure 4.
Revised cline of difficulty incorporating feature reassembly

6.2 Learning mechanisms

Although the present results do not support the order on Cho and Slabakova's (2014) cline, this does not rule out the potential positive effect of overt realization of a feature in the L1 for acquisition of an L2 property that engages that feature covertly. In principle, those English-speaking learners who tended to reject floating NQs in definite contexts may have made use of the overt realization of definiteness in the L1 as some kind of heuristic. For example, they could have noticed that nominals associated with floating NQs can

always correspond to English DPs with the D valued [−definite]. Cho and Slabakova put forward a similar learning strategy for their English-speaking learners acquiring the covert expression of definiteness via word order in L2 Russian (p. 183). Learners could also make use of statistical information about the distribution of NQs and possible meanings for each position, particularly the information that floating NQs are frequently used in [−definite] contexts but not in [+definite] contexts. Utilizing such evidence, English-speaking learners might inductively learn the semantic constraint. However, such "statistical preemption" is argued to be likely only when "an alternative formulation with the same function is consistently witnessed" in contexts where a preempted form is expected to be appropriate (Boyd & Goldberg, 2011, p. 55). That is, for effective preemption of floating NQs in [+definite] contexts, there needs to be one specific type of NQ consistently used in place of floating NQs. This requirement seems unlikely to be met, given that other NQ constructions (prenominal and postnominal) can occur in both definite and indefinite contexts. Given such evidence, it may be difficult to successfully pre-empt floating NQs in [+definite] contexts.

The alternative account of the finding that at least some English-speaking learners were able to acquire the definiteness constraint is the account applied by previous studies that found successful acquisition despite L2 poverty of the stimulus (e.g., Dekydtspotter

et al., 2001; Marsden, 2009; and others): that the constraint itself does not need to be learned from evidence in the input, but that it is given by UG. Specifically, the definiteness constraint on Japanese floating NQs appears to be a product of universal syntax-semantic computation of the floating construction rather than a lexical property of Japanese NQs alone. If this is the case, the semantic constraint will be automatically activated in the L2 grammar, once learners acquire the essential properties of Japanese numerals, namely that they must combine with classifiers, and, crucially, that Japanese NQs can float—unlike English NQs. Such an account still predicts earlier acquisition by L1-Korean speakers than L1-English speakers, because Korean speakers can transfer all properties of floating NQ structures directly from their L1, as soon as the floating NQ structure is detected in Japanese.

English-speaking learners may face an additional complication if they initially assume that Japanese NQs are equivalent to English phrases that include a numeral and a classifier, such as *three flocks (of birds)*, which cannot float. The learners would then need to reconfigure this L1-based representation of NQs into the target specification, which arguably takes more time and effort to complete, compared to the Korean-speaking learners' task. In fact, we speculate that an important difference between Japanese NQs and English phrases like *three flocks* could be the key to the acquisition of the definiteness

constraint on floating NQs. Recall that Japanese classifiers are bound morphemes. By contrast, the classifier in *three flocks of birds* is a free morpheme. Kobuchi-Philip (2007) argues that it is the morphological status of Japanese NQs as compound words that allows them to occur in the floating quantifier position; conversely, the fact that English numerals combine with classifiers to form a multi-word phrase is what prohibits them from floating. If this analysis is correct, then English learners of Japanese must acquire the compound-word morphology of Japanese NQs before acquiring the target properties of floating NQs.

6.3 Future research directions

The first section of this discussion has already specified one research gap in terms of testing Cho and Slabakova's cline of difficulty. Namely, we have identified the need to compare cases where a feature is realised covertly and identically in both the L1 and the L2 (such as the definiteness constraint on floating NQs in Japanese and Korean) with cases where a feature is overtly realised in both languages but reassembly is required. A second research gap arises from the discussion in section 6.2. Since acquisition of the target phenomenon was an L2 poverty-of-the-stimulus problem for the English group, but not for the Korean group, it might be argued that this adds a layer of difficulty that could obscure observation of the relationship between the nature of the feature realisation (overt/covert) and whether or not reassembly is required. Thus, an informative additional

study would be to investigate the same points on Cho and Slabakova's cline of difficulty, but with L1-L2 configurations in which there is no L2 poverty-of-the-stimulus problem for either group.

7. Conclusions

The broad research question addressed by this study asks whether L2 acquisition of a covertly-realised feature is easier when the L1 realises that feature in the same covert manner, or when the L1 expresses the feature overtly but in a different manner. The results of an acceptability judgement task investigating knowledge of the definiteness constraint on Japanese floating NQs by L1-English and L1-Korean speakers showed that, at group level, both groups showed sensitivity to the constraint. However, post hoc analyses and investigation of individual response patterns suggested that the first task is easier: the L1-Korean group, whose L1 employs the same covertly realised definiteness constraint as Japanese, exhibited more consistent lower ratings of Japanese floating NQs in a [+definite] context than the L1-English group, for whom the acquisition task involves reconfiguration of a feature that is overt in the L1.

Applying these results to Cho and Slabakova's (2014) cline of difficulty calls into question their proposal that acquisition is easier when the L1 represents the relevant

feature overtly and the L2 represents it covertly than when both L1 and L2 represent the feature covertly. Further, the present findings suggest that the complexity of the feature reassembly task may play a greater role than whether a relevant L1 or L2 feature is covertly realised, in determining how difficult a given L2 property is to acquire. Our proposed revised cline of difficulty (Figure 4) positioned all tasks that involve feature reconfiguration towards the more difficult end of the cline than those involving no reconfiguration. Within this division, covert feature realisation in the L1 or L2 could determine difficulty. This revised cline would accommodate both the present findings and Cho and Slabakova's findings on definiteness in L2 Russian, though further research is needed to determine its wider applicability.

Accepted for publication in *Linguistic Approaches to Bilingualism*, September 2021

Acknowledgements

We are grateful to three anonymous reviewers and to the journal editors for helpful feedback on earlier versions of this paper.

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Accepted for publication in *Linguistic Approaches to Bilingualism*, September 2021

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