

Japanese/ Korean Linguistics

Volume 29

edited by
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Foreword

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The papers included in this volume represent the majority of plenary talks and oral and poster presentations at the 29th Japanese/Korean (J/K) Linguistics Conference held online on October 9–11, 2021, hosted jointly by Nagoya University and the National Institute for Japanese Language and Linguistics (NINJAL). Six invited speakers gave plenary talks at the conference: Noriko Iwasaki (Nanzan University), Peter Sells (York University), Yuki Hirose (University of Tokyo), Wataru Uegaki (University of Edinburgh), Taehong Cho (Hanyang University), and Bjarke Frellesvig (University of Oxford). There were 18 oral presentations and 22 poster presentations chosen by blind review from the 112 abstracts submitted. We are grateful to the 74 reviewers who agreed to review the abstracts, as well as to all of the invited speakers, presenters, and session chairs at the conference.

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Japanese/Korean Linguistics 29 is the first completely online proceedings in the history of J/K conferences. The “Online Publication Only” policy, to be practiced from this time on, certainly represents a significant shift from the previous paper-based J/K proceedings (Volumes 1 to 28). Paper-based proceedings will be missed by past J/K proceedings contributors including some of us editors. Nevertheless, we trust that online proceedings are a welcome move in view of speed and visibility (quotability) in this age of online publication. We also believe with certitude that J/K conferences will continue to be a unique, inspirational, and “homey” forum where cutting-edge research findings on Japanese/Korean linguistics are shared as in all previous J/K conferences.

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SECTION 1
Plenary Papers

Linguistic Functions of Prosody and Its Phonetic Encoding with Special Reference to Korean

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1 Introduction

This review article discusses some fundamental issues regarding linguistic functions of prosody that underlies speech variation on the surface. An important premise of the current discussion is that some significant portion of speech variation that appears to come about beyond the speaker control as a consequence of low-level phonetic processes is in fact conditioned systematically by multiple factors that stem from higher-order linguistic and non-linguistic structures. Central to such speech variation, as I will discuss, is prosodic structure that plays a pivotal role in modulating phonetic realization in reference to other structural information that may be available in the planning process of speech production. In the next sections, I will first discuss how speech variation may be related to higher-order linguistic structures such as information structure and syntax in conjunction with prosodic structure (Section 2). I will then outline how prosodic structure may be created in the speech planning process (Section 3), followed by discussing some intractable issues

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regarding the phonetic granularity that cannot be easily captured by a phonologically defined prosodic structure but must be reflected in the speech planning process (Section 4).

2 Speech Variation and Prosodic Structure

Speech is variable by nature as the speaker's motor execution is affected by various factors that stem from both speech-internal and external sources. One obvious speech-internal factor that contributes to speech variation is a physiological one. It is biomechanically difficult, if not impossible, for a speaker to assume an exact same articulatory posture (or to coordinate speech organs) to produce the exact same speech utterance even when it is repeated immediately one after another in the same communicative context. We, however, do not notice there exists such speech variation because it occurs at a phonetic level that does not participate in modulating the speaker's motor execution in any meaningful ways. But this source of speech variation magnifies when it comes to variation across speakers of the same variety or dialect of the language. This is because speakers inevitably differ in their anatomical dimensions of the articulatory apparatus. The resulting speaker variation thus provides speaker-specific idiosyncratic information that may serve as indexical information about the speaker, allowing us, for example, to identify who is talking over the phone (see Dellwo, Huckvale & Ashby, 2019, for related discussion). This type of speech variation, however, does not pertain directly to a delivery of linguistic message intended by an interlocutor, although such indexical information contributes to it to some extent (cf. Levi & Pisoni, 2007).

Another source of speech variation that is more pertinent to exchanging linguistic message is a paralinguistic one. We can easily picture ourselves producing the Korean greeting word *annjalyhasejo?* (안녕하세요? 'How are you?') differently depending on our mood or emotion on the day we say it. That is, by changing the way we produce the same utterance (e.g., *annjalyhasejo?*), we deliver a different paralinguistic message (e.g., mood) alongside the linguistic message to the listener. Thus, the paralinguistically driven source of variation may serve as indexical information about the speaker's mood or emotion.

Finally, more directly pertinent to a delivery of linguistic message is speech variation that makes reference to linguistic structure. For a better illustration of this point, let's imagine situations in (1a-d) in which a child may ask various questions in English.

- (1) a. Mommy, what did you say?
 - b. Mommy, who did you say dislikes hamburgers?
 - c. Mommy, what did you say Daddy dislikes?

- d. Mommy, can we go to McDonalds?
 (2) I said, Daddy dislikes hamburgers.

Here in response to each question in (1), a morpho-syntactically identical sentence with the same phonological (segmental) composition may be used as an answer in (2)—i.e., *I said, Daddy dislikes hamburgers*. But each question in (1), especially (1a-c), requires a different level of information that entails different types of focus realization on the surface (see Gussenhoven, 2008 for a review). (1a) requires new information embedded in the entire utterance, so that the whole sentence is expected to become a locus of required information—that is, the information structure of the interlocution entails *broad focus* falling on the whole utterance. On the other hand, the required information for (1b) and (1c) is much narrower in scope, specific to “who” and “what”, respectively. This type of focus is called *narrow focus* falling on the specific location “Daddy” or “hamburgers” in correspondence to “who” and “what.” Finally, in response to (1d), (2) can still be an answer, flouting the maxim of relation, but in an emphatic way (see below).

2.1 Prosodic Structure in Reference to Information Structure

While information structure determines the locus of information to be focused, it does not mean that it determines exactly how focus information is phonetically realized. There must be some kind of interaction between information structure and phonetic component of the grammar which governs phonetic implementation (motor execution). Whether information structure directly informs the phonetic component of the grammar is beyond the scope of the present review, but it is reasonable to assume for now that this is done via prosodic structure—i.e., information structure influences prosodic structure first which in turn provides an overall production ‘skeleton’ or articulatory frame according to which speech units are organized and articulated. So the basic premise, as mentioned at the outset of this review article, is that prosodic structure is a central component which interacts with various other linguistic structures, so that an interaction between a higher-order linguistic structure and the phonetic component is mediated by prosodic structure (see Cho, 2016, 2022 for further discussion). In this view, the information structure given in each case of (3a-c) is assumed to inform the speech planning process, so that a particular prosodic structure for a planned utterance is constructed in accordance with the information required by the interlocutor.

- (3) a. [Daddy] [dislikes hamburgers] (*broad focus*)
 H* L- (H*) H* L-L%
 b. [Daddy dislikes hamburgers] (*narrow focus on ‘Daddy’*)
 (L+)H* L-L%

- c. [Daddy dislikes hamburgers] (*narrow focus on 'hamburgers'*)
 (L+)H* L-L%
- d. [Daddy] [dislikes] [hamburgers] (*emphatic rendition*)
 (L+)H* L- (L+)H* L- (L+)H* L-L%

In (3), prosodic structure for each utterance is expressed roughly in line with prosodic labelling conventions of English Tones and Break Indices (ToBI) (Beckman & Ayers, 1994; Beckman, Hirschberg & Shattuck-Hufnagel, 2005). The labelling conventions were developed based on the Autosegmental-Metrical (AM) Theory of Intonational Phonology (e.g., Pierrehumbert & Beckman, 1988; Beckman, 1996; Shattuck-Hufnagel & Turk, 1996; Ladd, 2008). Prosodic structure as in (3) assumes association between a nuclear pitch accent (H* or L+H*) and a stressed syllable of a word to which the pitch accent is assigned. An 'L-' refers to a phrasal tone that follows a last nuclear pitch accent within a phrase, so that it configures the tune of the phrase filling the gap between a nuclear pitch accent and the end of a phrase, called an Intermediate phrase. Note that when there is more than one pitch accent in an Intermediate Phrase as in the second phrase ('dislikes hamburgers') of (3a), the last one becomes a nuclear pitch accent, and the preceding pitch accent is called a prenuclear pitch accent. An 'L%' refers to a boundary tone that is generally aligned with the last syllable of a larger phrase, called an Intonational Phrase, which is assumed to be the largest phrase in the hierarchy of prosodic structure.

The ToBI labelling as given in each utterance in (3) illustrates two important linguistic functions of prosodic structure—i.e., prominence marking (prominence distribution) and boundary marking (prosodic phrasing). Prominence is marked primarily by assigning a pitch accent to a word that is meant to be relatively more salient than any other prosodic constituents within an Intermediate Phrase. This is pertinent to our discussion on focus realization. In a broad focus condition, a pitch accent may be assigned to multiple words across the utterance as the whole utterance is meant to be the locus of information required by the interlocutor. Thus, a typical prominence distribution under broad focus is that a pitch accent is assigned to all three content words as in (3a). Prominence distribution is intricately related to prosodic boundary marking (or phrasing). In this particular case, the utterance that forms an Intonational Phrase is divided into two Intermediate Phrases as marked by L- in the middle. Note also that the prosodic structure assumed for (3a) may vary in the same broad focus condition, so that the verb *dislikes* may not receive a pitch accent, as indicated by a parenthetical H* and the entire utterance may be produced with one Intermediate Phrase under one Intonational Phrase.

(3b-c) illustrates two possible prosodic structures with the locus of information being 'Daddy' in response to 'Who' and 'hamburgers' in response to

‘What’. In these cases, it is most likely that one pitch accent is assigned to each utterance, and prominence is distributed in such a way that a pitch accent falls on the word that should be most salient in accordance with the information structure. Finally, (3d) illustrates a prosodic structure for the utterance where each content word forms a separate Intonational Phrase. One can imagine a situation where this rendition may occur—e.g., when a child tenaciously asks the same question again and again, the mom may say the utterance with a prosodic structure similar to (3d) preceded by ‘How many times do I have to tell you!’ This kind of rendition is much more emphatic compared to (3a) that may occur under broad focus.

Information structure, as outlined above, is assumed to inform the speech planning process where a particular prosodic structure for a planned utterance is constructed. It is proposed that a selection of prosodic structure occurs at least in part in reference to the information required by the interlocutor as in (3a-d). In such a speech planning model that I currently envisage, once an abstract prosodic structure (abstract in the sense that only categorically defined information is included such as phrasings and tonal assignments) is constructed in reference to information structure in the speech planning process, it is fed into the phonetic component of the grammar. Note that in a well received speech production model as proposed by Levelt and colleagues (Levelt 1989; Levelt et al., 1999), this kind of selection process is done by a device called “Prosody Generator,” which influences “phonetic spell-out procedures” that determines a final “phonetic plan.” Such phonetic plan should then be passed on to the phonetic component for motor execution. I propose that it is in this phonetic component where abstract phonological and prosodic units that comprise a planned utterance is fleshed out with actual phonetic content governed by a language-specific phonetic grammar (see Cho, 2015 for a related review). The phonetic grammar, as discussed in Keating (1984, 1985, 1990) and Cho & Ladefoged (1999), characterizes language arbitrariness in phonetic implementation, so that, for example, the same abstract phonological labelling for a stop consonant such as [voiced] or [aspirated] does not translate into the same phonetic values across languages (see Cho, Whalen & Docherty, 2019, for a recent survey). Rather, the actual phonetic implementation occurs in a language-specific way (or governed by a language-specific phonetic grammar), engendering, for example, phonetic variation in VOT for the same phonological label of [voiced] or [aspirated]. Similarly, association between tones and segmental units is specified in a symbolic representation at an abstract level, and it does not tell us about the fine phonetic detail of how the tonal target, for example, of L+H* is phonetically aligned with the segmental string. In fact, the tone-segment alignment for the same L+H tonal composition is best characterized as a gradient process that varies from language to language or from variety to variety of the same language (e.g., Arvaniti, Ladd & Mennen, 2000; Atterer & Ladd, 2004; Ladd,

Schepman, White, Quarmby & Stackhouse, 2009). The reader is referred to Chapter 5 of Ladd, 2008, where this issue is discussed under the rubric of the *Segmental Anchoring Hypothesis*. Here again, this subtle fine phonetic detail of the tone-segment alignment that differs across languages can be attributed to the language-specific phonetic rule which operates at the phonetic component of the grammar. It fine-tunes the actual phonetic implementation in a language-specific way that renders phonetic variation across languages (see Cho, 2015 for more discussion).

Now let us consider similar cases in Korean as in (4) and (5):

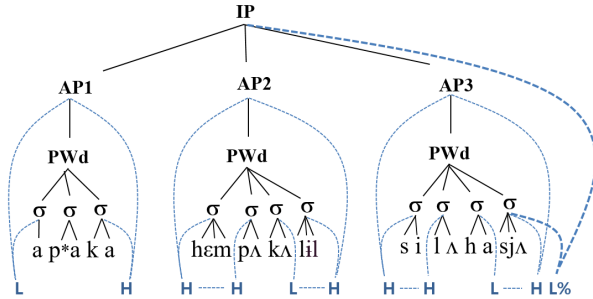
- (4) a. *amma mwʌlako hasjʌs*ʌjo?*
 엄마, 뭐라고 하셨어요?
 ‘Mommy, what did you say?’
 b. *amma, nuka hɛmpʌkʌlil silʌhantako hasjʌs*ʌjo?*
 엄마, 누가 햄버거를 싫어한다고 하셨어요?
 ‘Mommy, who did you say dislikes hamburgers?’
 c. *amma, ap*aka mwʌl silʌhantako hasjʌs*ʌjo?*
 엄마, 아빠가 뭘 싫어하신다고 하셨어요?
 ‘Mommy, what did you say Daddy dislikes?’
 d. *amma, mektonaldi kato twejo?*
 엄마, 맥도날드 가도 돼요?
 ‘Mommy, can we go to McDonalds?’
- (5) a. *broad focus*
 ((ap*aka) (hɛmpʌkʌlil) (silʌhasjʌ))
 아빠가 햄버거를 싫어하셔.
 ‘Daddy’ ‘hamburgers’ ‘dislikes’
 b. *narrow focus on ap*aka* (‘Daddy’)
 ((ap*aka hɛmpʌkʌlil silʌhasjʌ))
 c. *narrow focus on hɛmpʌkʌlil* (‘hamburgers’)
 ((ap*aka) (hɛmpʌkʌlil silʌhasjʌ))
 d. *an extremely emphatic case*
 ((ap*aka)) ((hɛmpʌkʌlil)) ((silʌhasjʌ))

Here, Korean employs a different prosodic system for focus realization, which stems from the difference in the typology of prosody between the two languages (Jun, 2014)—i.e., English as a head-prominence language versus Korean as an edge-prominence language. In English, a pitch accent is assigned to the head of an Intermediate Phrase, which is usually a lexically stressed syllable of a content word that is meant to receive prominence. On the other hand, Korean does not employ lexical stress and pitch accent in its prominence marking system, but rather it distributes prominence in terms of phrasing. For example, in a neutral or broad focus context, the utterance in

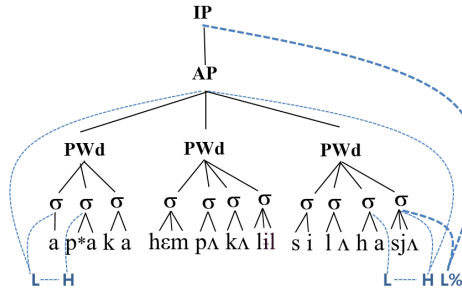
(5a) forms three small phrases, known as Accentual Phrases (AP), as marked by single parentheses. One or more APs can be grouped to form a larger prosodic constituent, an Intonational Phrase, as marked by double parentheses in (5).

(6)

(a) ((아빠가) (햄버거를) (싫어하셔))
 ((ap*aka) (hɛmpɾakalil) (silhasɔjɔ))
 ('Daddy'-NOM.) ('hamburgers'-ACC.) ('to dislike')



(b) ((아빠가 햄버거를 싫어하셔))
 ((ap*aka hɛmpɾakalil silhasɔjɔ))
 ('Daddy'-NOM. 'hamburgers'-ACC. to dislike')



The information about prosodic phrasing and tonal distribution provided here is largely in line with K-ToBI that has been developed to provide prosodic labelling conventions for Seoul Korean (Jun, 2000). The figure in (6a) illustrates a schematized prosodic structure with each word forming a separate AP. An AP is assigned with phrasal tones that form a canonical pattern of T(H...L)H. The phrasal tones at both ends are essential edge tones that demarcate the beginning and the end of an AP, while the parenthetical tones can be deleted (or completely undershot) specially when an AP is relatively shorter (bisyllabic), and can be realized on a word that contains more than two syllables. The initial 'T' can be an L tone or a H tone, conditioned by the laryngeal feature of the AP-initial segment, so that the initial syllable receives

a H tone with fortis or aspirated consonants (i.e., fortis/aspirated stops and affricates and fricatives /s, s*, h/) and an L tone elsewhere. So in (6a), AP2 and AP3 begin with a H tone since their initial segments are /h/ and /s/, respectively, whereas AP1 whose initial segment is a vowel begins with an L tone. As these tones are phrasal tones assigned to an AP, their association lines originate from an AP node. The boundary tone (e.g., H%, L%) that demarcates the end of an IP can in theory override the final phrasal tone (H) of the AP. But it should be in principle possible that an AP-final H and a boundary tone are combined to be realized as a complex tone HL%. But in Jun (2000), such a bitonal realization is taken to be a boundary tone which overrides the AP final H. Note that in the figures in (6), PWD refers to a Prosodic Word that is a prosodic constituent smaller than an AP, but it is often the case as in (6a) that one PWD forms one AP.

Now compare (5a) with (5b) whose prosodic structure is schematized in (6b). When *ap*aka* ('Daddy'-Nom) receives narrow focus in (5b), the utterance forms one phrase, so that the focused word is positioned at the left edge of the phrase to be prominent over the remainder of the phrase, hence an edge-prominence language. Since the three APs in a typical phrasing pattern in (5a) merges into one AP headed by the focused word at the left edge, this rephrasing is often called a 'dephrasing'—i.e., possible AP boundaries are deleted after a focused element. Similarly, in (5c), the focused word ('hamburgers') becomes the left edge of an AP. This AP, as a dephrasing process of focus realization, encompasses the following word that would otherwise form a separate AP in a neutral context. English shows a similar process but it is not phrasing but a placement of nuclear pitch accent on post-focal prosodic words that is suppressed. In the English case, the post-focal string is said to be 'de-accented' rather than 'de-phrased.' Finally, in (5d), as in English, all three words may form separate IPs, so that each word occurs at the edge of a largest phrase. This type of phrasing may occur in a context which requires extremely empathic speech. (Note that an intermediate level of phrase may in theory play a role in constructing prosodic structure in Korean, but how it is defined has not been fully articulated (see Jun, 2007 and 2011 for related discussion).) Here again, as discussed with English cases, prosodic structure that is constructed for a given sentence is assumed to provide an articulatory frame based on which abstract phonological units are organized and eventually fleshed out with phonetic content in a language-specific way governed by the phonetic grammar of the language, Seoul Korean.

2.2 Prosodic Structure in Reference to Syntax

In the previous section, I discussed how a morpho-syntactically same sentence structure in both English and Korean may be produced differently as a function of information structure, thus engendering considerable speech variation. We have now compelling evidence that this kind of speech variation

is not a random noise which impedes communicative processes, but it signals linguistic information. Crucially, such high-order linguistic information does not influence phonetic implementation directly, but through its interaction with prosodic structure, in such a way that a particular prosodic structure for a given utterance is determined in reference to information structure. But information structure is only one of many factors that influences a formation of prosodic structure. Another important contributing factor is syntactic structure. Examples in (7), which were adopted from Cho (2022), highlight the linguistic function of prosodic structure in interaction with syntactic structure.

- (7) a. 공사가다망하다
koŋ.sa.ka.ta.maŋ.ha.ta
- b. 공사가 다망하다
(koŋ.sa.ka) # (ta.maŋ.ha.ta)
 ('public and private matters'-NOM) ('to be busy')
 '(someone) is busy with various public and private matters'
- c. *(koŋ.sa.ka) # (ta) # (maŋ.ha.ta)*
 ('construction-NOM') ('all') ('to mess things up')
 'the construction is all messed up'
- d. *(koŋ.sa) # (ka.ta) # (maŋ.ha.ta)*
 ('construction site') ('to go') ('to mess things up')
 '(things) are messed up while going to a construction site'
- e. *(koŋ) # (sa.ka.ta) # (maŋ.ha.ta)*
 ('ball') ('to buy and go') ('to mess things up')
 '(things) are messed up while (someone) is going somewhere after buying a ball'
- (Note: These examples are adopted from (1) in Cho (2022))

The string of syllables in (7a) written without any space between syntactic constituents does not tell us about its underlying morpho-syntactic structure. In (7b), the same string of syllables is now written with a space between indented words. This space is in fact aligned with syntactic juncture between two major syntactic constituents, a subject NP (*koŋ.sa.ka*) and a VP (*ta.maŋ.ha.ta*), thus indicating the sentence's underlying syntactic structure. The orthographic convention is useful in a case like this to disambiguate a possible syntactic (structural) ambiguity. The same, however, does not hold in spoken language based on which a child acquires his/her mother tongue. As space is to written language, so is prosody to spoken language. Imagine that the sentence in (7a) is produced with no prosody—that is, with completely flat intonation and fixed duration and loudness across the syllables that comprise the sentence. As discussed in Cho (2022), the utterance with no prosody (i.e., no change in suprasegmental features such as pitch, duration and amplitude) does not provide any predictions about the speaker's planned

prosodic structure. It therefore renders multiple interpretations of prosodic structure, creating syntactic-structural ambiguity as exemplified in (7b-e).

For example, the prosodic juncture (boundary) of (7b) between two APs of (*koŋ.sa.ka*) and (*ta.maŋ.ha.ta*) is aligned with a major syntactic boundary between an NP and a VP, to mean '(someone) is very busy with various public and private matters.' With this prosodic phrasing, the last syllable *ka* of the first AP (*koŋ.sa.ka*) functions as a nominative marker, indicating that the preceding two syllables *koŋ.sa* form a subject NP (a lexicalized compound of *koŋ* 'public' and *sa* 'private'.) Another AP that groups the following four syllables (*ta.maŋ.ha.ta*) together indicates that it is most likely interpreted as one word meaning 'to be busy.' But the same first syllable *ta* in *ta.maŋ.ha.ta* may form a single AP as in (7c) (*koŋ.sa.ka*) (*ta*) (*maŋ.ha.ta*) in which case *ta* is likely to be interpreted as a monosyllabic adverb ('all'). (7d) shows another prosodic phrasing pattern that signals a different syntactic parsing. In (7d), the phrasing with three separate APs (*koŋ.sa*), (*ka.ta*) and (*maŋ.ha.ta*) is likely to mean that 'things are messed up while (someone) is going to the construction site.' There is yet another possible prosodic grouping with a different set of three APs—i.e., (*koŋ*) (*sa.ka.ta*) (*maŋ.ha.ta*) in (7e), indicating a different morpho-syntactic parsing. Here, the first AP (*koŋ*) is likely to be parsed as an object NP 'ball', and the second AP (*sa.ka.ta*) as a verb ('to buy and go'), meaning that '(things) are messed up while (someone) is going somewhere after buying a ball.'

The different phrasing patterns in (7) thus demonstrate that prosodic structure for a given utterance is built up in reference to morpho-syntactic structure (e.g., Nespor & Vogel, 1986; Selkirk, 1984, 1995). Crucially, however, this does not mean that syntactic structure governs prosodic structure nor does information structure (see Keating & Shattuck-Hufnagel, 2002, for related discussion). In fact, current theories of prosody reiterate its autonomy in the architecture of linguistic structure with a view that prosodic structure is a grammatical entity parsed in its own right (Beckman, 1996, Shattuck-Hufnagel & Turk (1996), Keating & Shattuck-Hufnagel, 2002; and see Cho, 2016 and 2022 for related discussion). The examples in English and Korean given in (3) and (5) are indeed in support of the autonomy of prosody. Recall that the same syntactic structure *Daddy dislikes hamburgers* both in English and Korean may be produced with different prosodic structures, leaving its morpho-syntactic structure (and its core linguistic meaning) intact. Similar evidence is found in Shattuck-Hufnagel and Turk (1996) who uses a classic example as shown below in (8). This illustrates discrepancy between prosodic structure and syntactic structure. Here a well-formed prosodic structure in (8a) is mismatched with a well-formed syntactic parsing in (8b) under the assumption that the head of PP (propositional phrase) must not be separately parsed from its complement NP.

- (8) a. Well-formed prosodic structure
(*Sesame Street is brought to you **by***, (*the Children's Television Workshop*)
- b. Well-formed syntactic structure
(*Sesame Street is brought to you*), (***by** the Children's Television Workshop*)

(from Shattuck-Hufnagel & Turk, 1996)

All these pieces of evidence taken together suggest that although syntax may influence the speaker's choice of prosody, a final construction of prosodic structure for a given utterance can be independent from syntactic structure. In the next sections, I will elaborate on how a prosodic structure may be selected, and how it may influence phonetic implementation. Before moving on, however, it is important to clarify that the term 'prosody' used in this paper does not simply refer to suprasegmental phonetic features such as pitch, duration and amplitude or intonational properties of the language whose variation signals prosodic boundaries and prominence distribution. As discussed in Shattuck-Hufnagel & Turk (1996) and Cho (2022), it must also refer to abstract prosodic structure itself that determines the phonological organization of speech units into higher-level prosodic constituents and their relative prominence within these constituents. In other words, prosody is defined as embracing these two phonetic and phonological (structural) aspects both of which must be simultaneously taken into account when investigating prosody within or across languages.

3 Prosodic Encoding

Thus far, I have discussed some core functions of prosodic structure or 'prosody.' It gives rise to speech variation on the surface. Such variation, however, is not a random noise that might arise with speech-internal factors such as the one that is inevitably created due to speaker-specific anatomical conditions. Rather, it reflects prosodic structure in relation to various speech-external factors that stem from either paralinguistic reasons or higher-order linguistic structures such as information structure and syntax. Other factors that also influence prosodic structure may include phonology, morphology, pragmatics and discourse (see Jun, 1993, Shattuck-Hufnagel & Turk, 1996, Cho, 2022 for related discussion).

The interplay between prosodic structure and other higher-order structural factors has implications for speech planning. From a perspective of speech planning, a selection of a particular prosodic structure for a given utterance can be considered as an end product after all these factors and their interactions as influencers on prosodic structure having been taken into account. Such a prosodic structure selection (building) process is related to *Prosodic Encoding*. The term is often used to indicate what particular higher-

order information is ‘encoded’ or reflected along some suprasegmental phonetic dimensions (e.g., pitch, duration, amplitude) of prosody as can be inferred in its use in ‘prosodic encoding of information structure’ (e.g., Kügler & Calhoun, 2021; Cole & Chodroff, 2020) or ‘prosodic encoding of topic and focus’ (e.g., Wang & Xu, 2011). But one can define Prosodic Encoding in concert with the structural view of prosody as discussed as the end of the previous section. That is, Prosodic Encoding may be defined as a process in speech planning that builds a final prosodic structure that must ‘encode’ multifaceted information stemming from a number of factors that marshal to influence prosodic structure.

This structural view of Prosodic Encoding also concerns realization of suprasegmental phonetic features as the prosodic structure building process entails specification of suprasegmental phonetic features that are needed to produce a planned prosodic structure. One such suprasegmental (prosodic) feature that may immediately come to mind is pitch as it plays an important role in determining two essential elements of prosodic structure—i.e., prominence distribution and boundary marking. This is in consistent with Autosegmental-Metrical Theory of Intonational Phonology (see Ladd, 2008 for a review) that assumes that prosodic structure is defined primarily by specification of tones or tone targets. The specification of tones is also an important part of ToBI conventions both in English and Korean. Thus, information about pitch at some level of detail must be contained in prosodic encoding process at least in the form of tonal targets.

What about duration? In ToBI conventions, the break indices imply that temporal information may be included in a prosodic structure in correlation with the strength of prosodic juncture. But the AM theory of Intonational Phonology does not specify the temporal information in phonological terms. In this framework, the temporal realization on the surface must be driven by some kind of phonetic implantation rule that translates the tonally-marked boundary and prominence of prosodic structure along the temporal dimensions. It is not, however, theoretically impossible to include durational information in Prosodic Encoding. Given the importance of temporal information in the phonetic realization of prosodic structure, I envision a successful model of Prosodic Encoding must specify durational features in some form.

One promising place to look for the inclusion of temporal information in Prosodic Encoding is Articulatory Phonology (Browman & Goldstein, 1992; Goldstein, Byrd & Saltzman, 2006; Byrd & Krivokapić, 2021). Articulatory Phonology assumes that phonological primitives are articulatory gestures that are defined in terms of both spatial and temporal dimensions along which articulatory movements occur. Byrd & Krivokapić (2021) provides an insightful discussion of how encoding of boundary and prominence information may be done by so-called ‘modulation’ gestures such as π -gesture and μ -gesture. The π -gesture (or ‘prosody’ gesture) is assumed to govern the temporal realization of gestures at prosodic junctures (Byrd & Saltzman, 2003)

whereas the μ -gesture modulates both the temporal and spatial realization of gestures under prominence (Saltzman, Nam, Krivokapić & Goldstein, 2008). For example, an assumed strength of prosodic juncture determines the activation level of π -gesture which modulates the rate of clock that controls the temporal realization of articulatory gestures—the stronger the prosodic juncture, the slower the articulatory movement. Note that the π -gesture itself is a non-track variable gesture that does not have a task to be realized in terms of vocal track constriction degree and location. It is a mere modulation gesture that overlaps with actual constriction gestures. On the other hand, the μ -gesture modulates both the spatial and temporal realization of articulatory gestures (or to be precise, there are two kinds of modulation gestures, temporal and spatial) in reference to the degree of prominence that is determined by lexical stress and phrasal pitch accent. The activation level of these modulation gestures, which determines the temporal realization of articulatory gestures, may be determined later in the production process after a planned prosodic structure is created or is specified at a stage where prosodic structure is created. This is a question beyond the scope of the current discussion, but it is an important one that is hoped to be answered by gesture-based theories of speech production.

Let us now assume that Prosodic Encoding returns a particular prosodic structure along with proper specification of suprasegmental features that are needed to signal boundary and prominence distribution. This entails another important question. Will the articulatory motor execution system for a planned utterance generate the identical speech output if the same prosodic structural information comes about as a result of prosodic encoding? Of course, this question is valid only when physically-conditioned speech variation that I discussed at the outset of this paper is effectively factored out. Let's consider (9a) in which a prosodic structure of the Korean utterance *ap*aka hɛmpʌkalil silʌhasʌ* ('Daddy dislikes hamburgers') is specified with one IP with three APs. Given that an AP in Korean is quite narrowly defined primarily in terms of tones in Jun (2000), its suprasegmental phonetic implementation of the prosodic structural information illustrated in (9a) may appear to be straightforward, thus not causing too much variation on the surface.

But things are not as simple as they appear. Let's compare two actual phonetic outputs of the same sentence produced based on the same prosodic structure as specified in (9a). Their acoustic waveforms and spectrograms are given in (10). Even a quick eyeballing of (10) indicates that the two seemingly identical utterances that may be transcribed as having the same prosodic structure are notably different along some phonetic dimensions such as pitch range, amplitude and duration. Some of the noticeable differences are marked by numbered squares in the figures. Compared to (10b), (10a) is produced with longer duration and greater amplitude for the first syllable /a/ (①); shorter duration and lower amplitude for /s/ (②), longer duration and greater

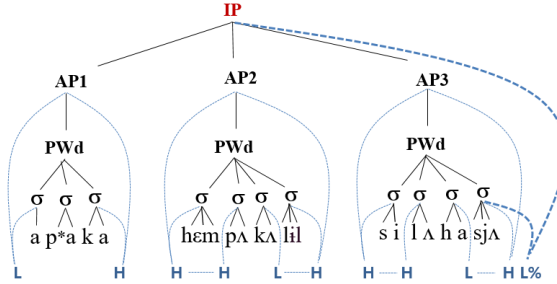
amplitude for the last vowel /jʌ/ (㉓), and a smaller pitch range for the second AP (㉔).

(9)

(a) ((아빠가) (햄버거를) (싫어하셔)) (One IP, Three APs)

((ap*aka) (hɛmpʌkʌlil) (silʌhasjʌ))

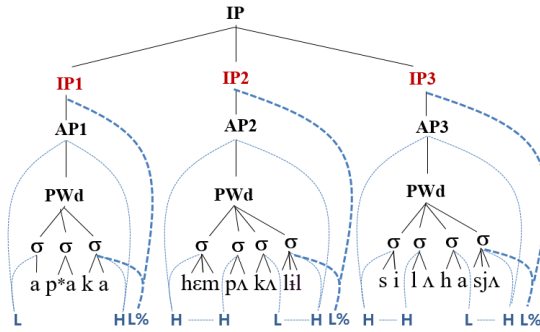
(*Daddy'-NOM.) (*hamburgers'-ACC.) (*'to dislike')



(b) ((아빠가) ((햄버거를)) ((싫어하셔)) (Three IPs)

((ap*aka) ((hɛmpʌkʌlil)) ((silʌhasjʌ))

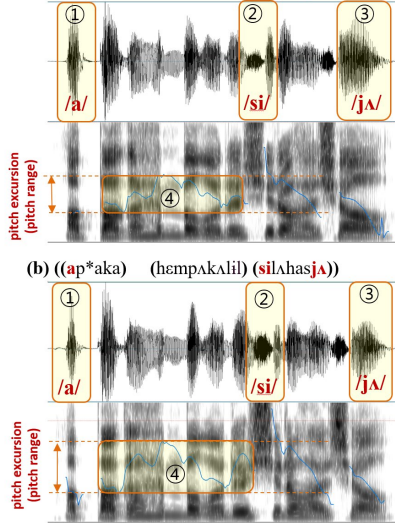
(*Daddy'-NOM.) (*hamburgers'-ACC.) (*'to dislike')



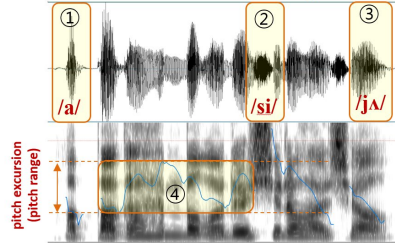
(10)

((아빠가) (햄버거를) (싫어하셔)) (One IP, Three APs)

(a) ((ap*aka) (hempakΔlil) (silΔhasjΔ))



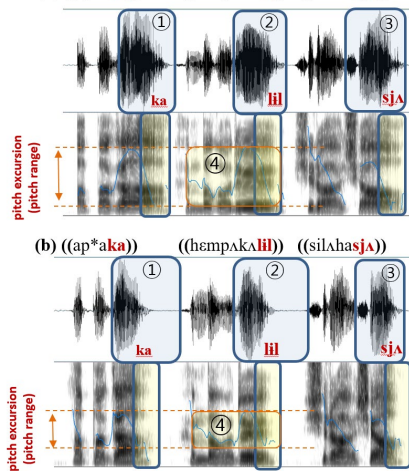
(b) ((ap*aka) (hempakΔlil) (silΔhasjΔ))



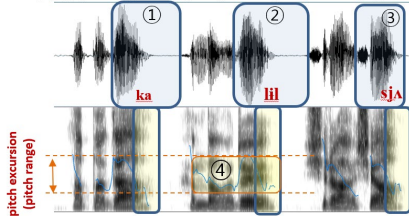
(11)

((아빠가) (햄버거를) (싫어하셔)) (Three IPs)

(a) ((ap*a~~ka~~) ((hempakΔlil) ((silΔhasjΔ))



(b) ((ap*a~~ka~~) ((hempakΔlil) ((silΔhasjΔ))



Discrepancy between utterances having the same prosodic specifications becomes more conspicuous with (9b) where the utterance has three IPs. Note that following Krivokapić and Byrd (2012), an IP is assumed to be recursive, so that an IP may govern one or more IPs (see also Ladd, 2008 for related

discussion). The acoustic waveforms and spectrograms of the two possible utterances of the same prosodic structure as specified in (9b) are given in (11). Here again, several substantial differences between the two utterances become immediately apparent. First, the final syllable of each IP (①-③), is longer in (11a) than in (11b). Second, the pause duration after the first and the second IP (①, ②) is shorter in (11a) than in (11b) (see Krivokapić, 2007, for further discussion on the relationship between phrasal length and pause duration). Third, the vowel (or the rhyme) of the IP-final syllable is more glottalized or creakier in (11a) than in (11b), as indicated by extended irregular periods evident in the spectrograms. Fourth, the pitch range for the second IP (④) is smaller in (11a) than in (11b).

4 Prosodic Strengthening and Fine Phonetic Detail

The acoustic-phonetic differences between the utterances illustrated in (10) and (11) in the previous section suggest that prosodic structure, as output of prosodic encoding (defined as such in the present discussion) does not suffice to account for fine-grained phonetic detail that differs between utterances with the same prosodic labelling. Moreover, there is a growing body of literature that demonstrates that the difference in fine-phonetic detail is not confined to suprasegmental phonetic features but it is reflected to a notable degree in the realization of segmental features (see Cho, 2016 for a general review and Cho, 2022 for a review on this issue in Korean). Variation in segmental realization that stems from prosodic structure has been discussed under the rubric of *prosodic strengthening*. Prosodic strengthening is used as a cover term to refer to the strengthening of realization of segmental features in marking two important elements of prosodic structure, boundary and prominence. While the reader is referred to Cho (2022) for a review on prosodic strengthening in Korean, I will briefly recapitulate some of the previous findings for an illustration of this point in Korean. (12) summarizes segmental variation due to prosodic structure at the left edge of a prosodic constituent known as *domain-initial strengthening*, and (13) summarizes focus-induced prominence effects.

- (12) *Domain-initial strengthening in Korean* (boundary-related prosodic strengthening at the left edge of prosodic constituent)
- a. Alveolar stop and nasal consonants are produced with an increased constriction between the tongue tip/blade and the palate (as measured with an electropalatography (EPG) system) in domain-initial position (at the left edge of a larger prosodic constituent such as an Intonational Phrase) compared to the same segments that occur in domain-medial position (at the left edge of a smaller prosodic constituent such as a Prosodic Word) (Cho & Keating, 2001).

- b. Both lenis and aspirated stops /p, p^h/ are produced with a longer VOT and a larger amount of airflow domain-initially than domain-medially (Cho & Jun, 2000).
 - c. The consonantal lip closing movement from a preceding vowel to a word-initial bilabial consonant, as measured with an Electromagnetic Articulograph (EMA), is larger in displacement, and longer in movement duration and slower in movement velocity in domain-initial position, compared to the same movement that occurs in domain-medial position (Cho, Son & Kim, 2016).
 - d. The F1-F2 acoustic vowel space as measured by an /i/-/a/-/u/ Euclidean area is expanded domain-initially (Cho, Lee & Kim, 2011).
 - e. Nasal consonants in NV are produced with reduced nasality (or tend to be denasalized) domain-initially, which is interpreted as suggesting a decrease of sonority but an increase of consonantality for an initial consonant due to domain-initial strengthening (Cho & Keating, 2001; Jang, Kim & Cho, 2018).
 - f. Vowels in NV are nasalized less domain-initially than domain-medially in line with the reduced nasality of the domain-initial nasal consonant (Jang, et al., 2018).
- (13) Prominence-related prosodic strengthening induced by focus
- a. The F1-F2 acoustic vowel space as measured by an /i/-/a/-/u/ Euclidean area is expanded under narrow focus. This focus-induced vowel space expansion is largely similar to the boundary-induced (domain-initial) expansion of vowel space described in (12d), although the exact directionality of the expansion is not the same (Cho, et al., 2011).
 - b. The aspirated stop /p^h/ is produced with a long VOT in the focused condition than in the unfocused one (Cho, et al., 2011), similar to domain-initial strengthening effect on VOT described in (12b).
 - c. Nasal consonants are produced with reduced nasality in the focused condition than in the unfocused one, similar to the boundary-related domain-initial strengthening effect. Again, in line with the reduced nasality of the nasal consonant, focus induces a reduction of coarticulatory vowel nasalization in both CVN and NVC context (Jang et al., 2018). The authors interpreted the results as suggesting a prominence-induced coarticulatory resistance that enhances the vowel's [oral] feature as was also found in English (Cho, Kim & Kim, 2017).
 - d. Both lenis and aspirated stops are produced with higher F0 on the following vowel in the focused condition than in the unfocused one,

although the effect size is larger for aspirated stops (Choi, Kim & Cho, 2020).¹

5 Phonetic encoding of prosodic structure

In the previous two sections, two important points were made. First, utterances produced with a particular prosodic structure that is built up during a prosodic encoding process may still differ in fine phonetic detail. Second, prosodic structure is signaled by an array of both suprasegmental and segmental phonetic features, so that the speaker produces an utterance according to a planned prosodic structure, by adjusting not only suprasegmental phonetic features, but also segmental realization as discussed above. Let's now return to the question that I raised earlier. Does the same prosodic structure that comes about as a result of Prosodic Encoding lead the articulatory motor execution system to generate the same phonetic output? We now have compelling evidence that the answer is no. Given the phonetic granularity that arises along both the suprasegmental and segmental dimensions with a particular prosodic structure, the phonologically-informed symbolic representation of prosody specified with tones and possibly with temporal features does not suffice to capture the fine-grained phonetic detail on the surface. This means that before a particular prosodic structure as output of prosodic encoding in a planning process is fed into the articulatory motor execution system, it must go through another process that mediates between prosodic encoding and phonetic implementation. The process can be called *Phonetic Encoding*. This term has been used in psycholinguistic models of speech production most heavily by Levelt and colleagues (Levelt, 1989; Levelt, Roelofs & Meyer, 1999). In traditional terms, Phonetic Encoding refers to a process in which phonological forms (as output of Phonological Encoding or Phonological Spell-out) are fleshed out with specific phonetic content to give rise to the specific phonetic form on the surface.

As discussed in depth in Keating & Shattuck-Hufnagel (2002) and Keating (2006), Phonetic Encoding in Levelt's model is rather limited as it does not take into account prosodic-structurally conditioned speech variation that we have discussed so far. Keating & Shattuck-Hufnagel (2002) propose that

¹ The increase of F0 for the lenis stop, which is often hypothesized to be phonologically specified with a low tone in the present-day Seoul Korean, stands in sharp contrast with the focus-induced phonetic enhancement of the L tone found in Mandarin Chinese (a tone language; cf. Chen & Gussenhoven, 2008) and South Kyungsang Korean (a lexical pitch accent language; cf. Cho, Kim & Kim, 2019), in both of which a tone concerns directly the phonological/lexical contrast. Based on this observation, Cho (2022) proposes that the L and H tones that may serve as acoustic correlates of the lenis-aspirated stop contrast are post-lexical tonal properties conditioned by prosodic structure, rather than what have emerged as phonological features due to a tonogenic sound change.

Phonetic Encoding must refer to prosodic structure, provided that prosodic structure is available earlier in the planning process. Keating (2006) provides further insights into this issue under the rubric of *Phonetic Encoding of Prosodic Structure*. This term, perhaps first theoretically elaborated by Keating (2006), can be broadly used to reiterate the fact that the detailed phonetic plan as output of Phonetic Encoding must contain sufficient information about the fine-grained phonetic variation as a function of prosodic structure. The phonetic plan will thus contain enough information to guide the articulatory motor execution system in producing an utterance as planned by the speaker. Keating concludes:

“In summary, when a speaker plans for the phonetic aspects of speech production, prosodic structure organizes the treatment of possibly every feature in every segment, and the interactions of segments. One aspect of this dependence is the relation between the strength of a prosodic position, and the phonetic strength of a segment in that position. A theory of phonetic encoding that incorporates this basic fact is a major challenge, but an important one.” (Keating, 2006: 183)

Is this the end of the story? The answer is only partly yes. We are still left with a question unsolved. Does Phonetic Encoding, even if it refers to prosodic structure, account for fine phonetic detail that may vary between utterances that are specified with the same prosodic structure generated in the planning process? More specifically, questions related to phonetic differences of the sort shown in (10) and (11) must be answered adequately. For example, where and how in the planning process is the durational difference of the pause determined for two utterances that are assumed to have the same prosodic structure? The same question applies to other differences such as in pitch range, voice quality (e.g., degree of creakiness or glottalization), the degree of phrase-final lengthening, and so on and so forth. As discussed above, in current AM theories of prosodic structure and intonational phonology, prosodic structure is rather coarsely defined, in such a way that it provides no principled predictions on the phonetic granularity beyond what may be predicted based on coarse prosodic specifications available in a prosodic structure.

One way to address this issue is by devising a way that Phonetic Encoding of Prosodic Structure includes the subtle phonetic granularity as intended by the speaker. In such a scheme, one can still maintain the basic tenet of AM theory—i.e., phonetic encoding of prosodic structure must refer to the abstract prosodic structure whose prosodic specifications are coarsely defined, but it should also have some kind of a built-in device or mechanism in the process of Phonetic Encoding that fine-tunes phonetic realization in reference to any other factors that contributes to building the granularity of the phonetic realization. Such a model is in fact reminiscent of a proposal made by Mücke & Grice (2014) that the effect of focus driven by information structure in

German is not mediated by accentuation that refers to prominence distribution of prosodic structure, but it directly influences phonetic realization in reference to information structure. More generally, in a speech planning model that I envisage, as I discussed in Section 2.1, such a fine-tuning of phonetic realization should occur at the phonetic component of the grammar which modulates the Phonetic Encoding process at the level of fine phonetic detail and in a language-specific way (cf. Keating, 1984, 1990; Cho & Ladefoged, 1999; Cho, et al., 2019).

Another way to address the question is by assuming that prosodic structure itself is defined in a gradient way, so that once a prosodic structure is initially generated at some point in the planning process possibly in reference to syntax (see Keating & Shattuck-Hufnagel, 2002 for related discussion), it may continue to be refined in a gradient fashion in reference to other factors that might influence prosodic structuring. After all the factors having been taken into account, a final prosodic structure is fed into the phonetic plan with all the necessary information to guide the motor execution system to generate the final surface phonetic form of the utterance as planned by the speaker. A gradient view of prosodic structure is adopted by the π -gesture model where boundaries are represented gradiently rather than categorically (Byrd & Saltzman, 2003; see Byrd & Krivokapić, 2021, for related discussion), but it remains to be seen how prosodic structure as a whole can be represented in gradient terms.

6 Conclusion

In the present review, I have discussed how low-level speech variation along both segmental and suprasegmental dimensions may be related to higher-order linguistic structures such as information structure and syntax. The surface phonetic form of an utterance must therefore contain information that comes down from higher-order linguistic structures. It is underscored that prosodic structure plays a central role in shaping the surface phonetic form of an utterance in reference to such higher-order structural information. The phonetics-prosody interface (a fine-tuning of phonetic realization in reference to prosodic structure) is not as simple as it may look as it must take into account phonetic variation that cannot be captured by a coarsely-defined prosodic structure in currently prevalent linguistic theories of prosody. From a perspective of speech planning, prosodic structure, determined by Prosodic Encoding, must be encoded into the speech signal (Phonetic Encoding of Prosodic Structure) in such a way to reflect the phonetic granularity which is beyond what phonological descriptions of prosody can account for but is critical in decoding a linguistic message from the variable speech signal. Admittedly, the discussion made here leaves more questions than answers regarding the intricate interaction between phonetics and prosodic structure. But I am

certain that it will spark further research on detailed mechanisms of the phonetics-prosody interface in relation to various levels of linguistic structure, which will help to crystalize the role of prosodic component in the general architecture of the grammar of Korean and of other languages.

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On the Reconstruction of Pre-Old Japanese Morphology: OJ Grammatical Morphemes Reflecting Pre-OJ *k- ~ *s-

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1 Introduction

In an article published in 2001, I proposed that a number of grammatical forms in initial *t-* and *n-*, including case and conjunctive particles,

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perfective auxiliaries, and nonfinite verb endings, are related to the productive regular Old Japanese copulas in *n-* (mainly *ni* and *no*) and *t-* (mainly *to*) and reflect various morphologizations from two alternating proto-Japanese or pre-Old Japanese copula roots **n-* ~ **t-* (Frellesvig 2001). In subsequent work (e.g. Frellesvig 2008, 2012, 2013, 2019), I have proposed reconstruction of a number of different aspects of proto- and pre-Old Japanese morphology. Building in part on results and proposals set out in those publications,¹ and picking up on a briefly mentioned suggestion in Frellesvig 2010: 121, I will in this paper consider a number of grammatical forms from Old Japanese in initial *k-* and *s-* and propose that they have a common pre-Old Japanese or proto-Japanese source in two alternating roots **k-* ~ **s-*.

These forms include adjective predicators (‘adjectival copula’) and past tense suffixes for verbs, which for example, as is well known, share the forms *ki* and *si* (with opposite distribution of adnominal and conclusive function), as shown in these examples from the Man’yōshū, the 8th century poetry anthology which contains the bulk of the texts from the Old Japanese period.²

(1) Adjectival copula	Past tense
<p>topo-<i>ki</i> twosa-di far-ACP.ADN Tosa-road ‘The long road to Tosa’ (MYS 6.1022)</p>	<p>omopi-<i>ki</i> . long.for-PST.CLS ‘(I) have been longing (for my beloved)’ (MYS 4.501)</p>
<p>ama-di pa topo-<i>si</i> . heaven-road TOP far-ACP.CLS ‘The road to heaven is long’ (MYS 5.801)</p>	<p>omopi-<i>si</i> kimi long.for-PST.ADN my.lord ‘My lord, whom (I)’ve been longing for’ (MYS 4.644)</p>

¹ I will draw on and make reference to findings presented in those papers, but not rehearse or repeat background, documentation or argument.

² OJ is the oldest attested stage of Japanese, largely the language of the 8th century. For the general descriptive framework for OJ morphology and the transcription of OJ, as well as general facts about OJ, see Frellesvig 2010 (in particular chapters 1 to 3). In cited examples from OJ, phonographically written text is transcribed in *italics*, whereas logographically written text is transcribed in plain type. Examples will be drawn from the Man’yōshū. The poetic texts from the OJ period and the language contained in them may easily be accessed through the *Oxford-NINJAL Corpus of Old Japanese* (ONCOJ), which is heavily annotated and associated with powerful search functionality, at <https://oncoj.ninjal.ac.jp/>.

Abbreviations used in this paper which are not included in the Leipzig glosses are: ACP adjectival copula; ADN adnominal; CLS conclusive; FP focus particle; MPST modal past; NCONJ negative conjectural; NML nominal; PFX prefix; PROV provisional; RSP respect; SPST simple past. Language abbreviations: EMJ Early Middle Japanese (800-1200); OJ Old Japanese; pJ proto-Japanese.

These two different suffixes (adjectival copula and simple past tense), however, do not share just the forms *si* and *ki*, but in fact exhibit striking form overlaps through their paradigms. We will look at their forms together with a range of other grammatical OJ forms in *k-* and *s-*: First the adjectival copula and its forms will be introduced (§2) and then compared with the forms of the simple and modal past tense auxiliaries *-ki* and *-kyer-* (§3). The following sections discuss other OJ grammatical forms in *k-* and *s-*: focus particles *ka* and *so* (§4), *su* in the negative auxiliary *-zu* and semblative copula *nasu* (§5), the demonstratives *ko* and *so*, and the two irregular grammatical verbs *ko-* ‘come’ and *se-* ‘do’ (§6). Finally, §7 will summarize and discuss, proposing that all the forms considered derive from two alternating pre-OJ or pJ demonstrative roots **k- ~ *s-*, reflected in OJ as the demonstratives *ko* and *so*.

2 The Adjectival Copula

Adjectives may in OJ be used in various ways (see Frellesvig 2010: 79-93), but the main use is predication by a bound, inflecting suffix which here is referred to as the ‘adjectival copula’ because of its function to predicate adjectives. The three main forms of the adjectival copula, conclusive, adnominal and infinitive (adverbial), are exemplified in (2)-(4).

(2) *a ga mune ita-si*
 I GEN heart painful-ACP.CLS
 ‘My heart aches’ (MYS 15.3767)

(3) *kiywo-ki tuku-ywo*
 clear-ACP.ADN moon-night
 ‘A clear moon-lit night’ (MYS 20.4453)

(4) *kimi ga yuki ke naga-ku nari-nu*
 my.lord GEN go day long.ACP.INF become-PFV.CLS
 ‘It has been a long time since you left’ (MYS 5.867)

The adjectival copula inflects largely for the same categories as verbs, including finite conclusive, adnominal and exclamatory forms, a range of non-finite subordinating forms, and combinations with the negative and the conjectural auxiliaries. The full paradigm of the adjectival copula is composite and suppletive, as shown in (5). Some of these forms are very frequent, others quite rare. The paradigm of the following EMJ period is somewhat simpler and in particular without alternative forms for morphological categories and without

the negative, conjectural and nominal forms (see Frellesvig 2010: 233 about the EMJ paradigm).³

(5) Conclusive	<i>si</i>
Adnominal	<i>ki</i>
Exclamatory	<i>sa</i>
Exclamatory	<i>kyere</i>
Infinitive	<i>ku</i>
Infinitive	<i>mi</i>
Gerund	<i>kute</i>
Gerund	<i>mito</i>
Conditional	<i>kyeba</i>
Conditional	<i>kupa</i>
Provisional	<i>kyeba</i>
Provisional	<i>kyereba</i>
Concessive	<i>kyedo</i>
Concessive	<i>kyeredo</i>
Nominal	<i>kyeku</i>
Negative nominal	<i>kyenaku</i>
Conjectural	<i>kyemu</i>

These forms may be organized according to shape as shown in (6).

³ After OJ, *sa* and *mi* changed to become nominalizers, still used in modern Japanese: *tuyo-sa* ‘strength’, *tuyo-mi* ‘forte (strong point)’, but in OJ they took part in predicating adjectives. *Mito* was lost after OJ.

(6)

	<i>ku</i>	<i>ki</i>	<i>si</i>	<i>sa</i>	<i>mi</i>
Conclusive			<i>si</i>		
Adnominal		<i>ki</i>			
Exclamatory				<i>sa</i>	
Exclamatory		<i>kyere</i>			
Infinitive	<i>ku</i>				
Infinitive					<i>mi</i>
Gerund	<i>kute.</i>				
Gerund					<i>mito</i>
Conditional		<i>kyeba</i>			
Conditional	<i>kupa</i>				
Provisional		<i>kyeba</i>			
Provisional		<i>kyereba</i>			
Concessive		<i>kyedo</i>			
Concessive		<i>kyeredo</i>			
Nominal		<i>kyeku</i>			
Negative nominal		<i>kyenaku</i>			
Conjectural		<i>kyemu</i>			

Kute, *kupa* and *mito* are transparently built on *ku* and *mi*, respectively. The forms in *kye* may be thought to derive from contractions of *ki* with a form in initial *a* (*i-a > ye), further divided into two subsets, as in (7).

- (7) (a) *kyeba* < *ki-aba, *kyedo* < *ki-ado, *kyeku* < *ki-aku, *kyenaku* < *ki-anu-aku, *kyemu* < *ki-amu
(b) *kyere* < *ki-are, *kyereba* < *ki-ari-aba, *kyeredo* < *ki-ari-ado

The forms in (a) involve morphological material independently attested or well reconstructed with verbs: *aba ‘conditional’ (probably < *amu-pa ‘conjectural-TOP’), *ado ‘concessive’ (?< *amu-to), *aku* ‘nominalizer’, *an- ‘negative’, *am- ‘conjectural’. The forms in (b) have the existential verb *ari* interpolated between the adjectival copula root and the inflectional morpheme; it is the forms in (b) from among the forms in (5) which survive into EMJ and beyond, whereas the forms in (a) are lost. Note that also the nominal forms were lost, as part of the loss of the inflectional category of nominal also for verbs in general.

Other than the two *-mi* based forms in the paradigm, which I will say no more about here, we thus find forms built on *ku*, *ki*, *si*, and *sa* in the paradigm, suggesting alternating roots *k- ~ *s-.

3 Past Tense Auxiliaries

As is well known, OJ (as well as EMJ) had two past tense auxiliaries, simple past and modal past, exemplified in (8)-(9) and (10)-(11), respectively.

- (8) *kapyeri-kyeru pito kitar-eri to ipi-sikaba*
 return-come.STAT person arrive-STAT that say-SPST.PROV
potopoto sini-ki .
 almost die-SPST.CLS
 ‘When people said that someone who was coming back (from exile) had arrived, I almost died (thinking it was you)’ (MYS 15.3772)
- (9) *imo ga mi-si aputi no pana pa*
 beloved GEN look.at-SPST.ADN chinaberry.tree GEN flower TOP
tiri-nu besi .
 scatter-PFV must
 ‘The flowers of the chinaberry tree which my beloved looked at must have scattered.’ (MYS 5.798)
- (10) *wa ga yadwo no pana tatibana tiri-ni-kyeri* .
 I GEN house GEN flower tachibana fall-PFV-MPST.CLS
 ‘The flowers of the *tachibana* by my house had fallen’ (MYS 10.1969)
- (11) *ware pa ki-na-mu to ipi-kyereba*
 I TOP come-PFV-CONJ that say-MPST.PROV
 ‘When I said that I would come, ...’ (MYS 9.1740)

Looking at the full paradigms of these two auxiliaries, simple past (12) and modal past (13), it is clear that the simple past has a suppletive paradigm, while the forms of the modal past are like those of the irregular existential verb *ar-*; and it is conspicuous that both paradigms have widespread form overlap and identity with the *ki* and *si* based forms of the adjectival copula. Note that some of the simple past tense forms were lost in the transition to EMJ (or in early EMJ): conditional *kyeba* and the two nominal forms *kyeku* and *siku*.

- (12) Conclusive *ki*
 Adnominal *si*
 Exclamatory *sika*
 Conditional *kyeba*
 Conditional *seba*
 Concessive *sikado*
 Provisional *sikaba*
 Nominal *kyeku*
 Nominal *siku*
 Conjectural *kyemu*

- (13) Conclusive *kyeri*
 Adnominal *kyeru*
 Exclamatory *kyere*
 Concessive *kyeredo*
 Provisional *kyereba*
 Nominal *kyeraku*

Form identity between the paradigms of the adjectival copula and the past tense auxiliaries is as in (14):

- | | |
|--|--|
| <p>(14) Adjectival copula
 <i>si</i> conclusive
 <i>ki</i> adnominal
 <i>kyemu</i> conjectural
 <i>kyeba</i> conditional, provisional
 <i>kyeku</i> nominal</p> | <p>Simple past
 <i>si</i> adnominal
 <i>ki</i> conclusive
 <i>kyemu</i> conjectural
 <i>kyeba</i> conditional
 <i>kyeku</i> nominal</p> |
| <p><i>kyere</i> exclamatory
 <i>kyeredo</i> concessive
 <i>kyereba</i> provisional</p> | <p>Modal past
 <i>kyere</i> exclamatory
 <i>kyeredo</i> concessive
 <i>kyereba</i> provisional</p> |

The modal past forms are transparent contractions of *ki* with the existential verb *ar-*, *kyer-* < **ki-ar-*, like we saw with some of the forms of the adjectival copula in (7).

For the simple past, we first of all find identity with the adjectival copula in the forms *si* and *ki*. The syntactic function is opposite in the two paradigms, but as reported in Frellesvig (2012) the morphologically expressed differentiation between conclusive and adnominal function is most likely a secondary, late pre-OJ development (see also §5 below). This is well

illustrated by the fact that *si* and *ki* are found with the same additional morphological material, see (15)⁴.

The remaining forms from the simple past paradigm are shown in (15) in three subsets. The forms in (a) are identical with those in the adjectival copula paradigm and have the same diachronic derivation, cf. (7.a) above. Those in (b) are not identical, but significantly they are built on the shared form *si* contracted with the same additional morphological material as is found in (a) and in the adjectival copula (cf. (7)); the forms in (a) and (b) thus form part of the same pattern: built on *ki* and *si* contracted with the same morphological material, with both *ki* and *si* and the additional morphological matter shared with the adjectival copula. Finally, the forms in (c) involve a stem *sik*, with the same morphological material attached.⁵

- (15) (a) *kyeba* < *ki-aba, *kyeku* < *ki-aku, *kyemu* < *ki-amu
 (b) *seba* < *si-aba, *siku* < *si-(a)ku
 (c) *sikado* < *sik-ado, *sikaba* < *sik-aba, *sika* < *sik-a

It is very difficult to believe that this widespread form identity and shared morphological material between the adjectival copula and the two past tense suffixes could be due to chance. Rather, it suggests very strongly that they are closely related, with the adjectival copula, which displays the most variation, being the oldest and providing a clear morphological link with and between the other two, and that at least the forms in (14) and (15.a-b) reflect the same source as the adjectival copula, going back to the alternating roots *ki* ~ *si*.

Functionally, this may be thought to have developed from a copula.⁶ First, the function of the adjectival copula was to predicate adjectives, i.e. that of a copula. Second, development of tense markers from copulas has been proposed at least as early as Franz Bopp who posited copula origins for many conjugational endings in Sanskrit (1816). For Japanese this is straightforwardly plausible both because of word order [nominal.predicate copula], and because of the fact that the two past tense suffixes attach to a stem of verbs

⁴ Note also that there are examples of the conclusive form of the adjectival copula modifying a noun even if they are rare, e.g. *kagurwo-si* kami ‘black-ACP.CLS hair; black hair’ (MYS 16.3791).

⁵ Note that whereas *aba, *amu, *ado and *aku form part of standard reconstructions of pre-OJ verbal morphology, the *a posited here as part of the exclamatory form *sika* is not as readily found. It is, however, tempting to see the adjectival copula form *sa* which functionally is similar to, but not identical with, simple past *sika* as involving the same material. And it is further possible that *sa* and *sika* are related to the anaphoric, demonstrative adverbs *sa* ‘that way’ and *sika* ‘that way’; cf. §6 on demonstratives.

⁶ See Kuznetsov (this volume) for additional hypotheses about the etymology of the modal past *kyer-*.

(the so-called *ren'yōkei* of traditional Japanese grammar) which is segmentally identical with both the infinitive and with the derived deverbal nominal, e.g. *omopi* in (1) which other than its use as a stem, could be infinitive ‘yearn for’ and a derived noun ‘yearning’, or similarly *sini* in (8) which is also exemplified as a deverbal nominal in (27) below; cf. further (§6) about deverbal nominals.⁷

4 Focus Particles

The particles *ka* and *so* fit well into the pattern proposed above of grammatical forms in *k-* and *s-* with copular function, or functions that can develop from copulas. *Ka* and *so* are well known for taking part in the focus construction *kakari-musubi*,⁸ exemplified in (16)-(17), where a focused constituent is marked by *ka* or *so* and the predicate of the sentence is in the adnominal form (see Frellesvig 2010: 247-257 for the basic facts about *kakari-musubi*; Quinn forthcoming for an insightful functional description and analysis).⁹ As suggested in the translations, many examples of *kakari-musubi* can felicitously be translated into *it*-clefts (or other clefts).

(16) *oyodure ka wa ga kiki-turu*
 lie KA I GEN hear-PFV.ADN
 ‘Was it a lie that I heard?’ (MYS 3.420)

(17) *wa ga kwopuru kimi so kizo no ywo ime ni*
 I GEN love.ADN my.lord SO last.night GEN night dream DAT
mi-ye-turu
 see-PASS-PFV.ADN
 ‘It was you, my beloved lord, that I saw last night in a dream’ (MYS 2.150)

However, we also find many examples of sentence final *ka* or *so* concluding a nominal predication. (18) is a 5-7-5-7-7 *waka* poem in which the first two verse lines (*ware nomwi so, kimi ni pa kwopuru*) show the *kakari-musubi*

⁷ It is worth noting that also a number of other verb suffixes which may be thought to derive from the same source as the *t-* and *n-* copulas attach to this stem (perfectives, gerund formant, etc., see Frellesvig 2001).

⁸ In OJ, *so* was the main form of that particle, with a variant *zo* being somewhat rarer (with more than three times as many instances of *so* as of *zo*), but in EMJ *zo* becomes the dominant and then sole form. It is generally assumed, also here, that *so* is the older form.

⁹ It should be borne in mind here that a main function of the ‘adnominal’ form was to form nominalized clauses, in addition to its function as the predicate in relative clauses after which it was named.

construction with *so*, and final three lines have a subject which is a nominalized clause with the nominalizer *koto* (*wa ga sekwo ga, kwopu to pu koto pa*) and a nominal predicate (*koto no nagusa*) concluded by *so*.

- (18) ware nomwi *so* kimi ni pa kwopuru .
 I only SO my.lord DAT TOP yearn.for.ADN
 [wa ga sekwo ga kwopu to pu koto pa]_{SBJ}
 I GEN husband GEN yearn.for COMP say thing TOP
 [koto no nagusa]_{PRED} *so*
 word COP.ADN comfort SO
 ‘It is only me who yearns for you (not the other way around). It is false words of comfort that you, my husband, say that you yearn for me’
 (MYS 4.656)

Other examples of nominal predications concluded by *ka* and *so* include (19)-(20), both with an anaphoric referential null-pronoun subject (the referent of which is mentioned in the preceding sentence) of the nominal predicate.

- (19) ... kapa no oto_i kiywosi .
 ... river GEN sound_i clear
 [∅_i]_{SBJ} [... pune no nami no sawaki]_{PRED} *ka*
 it_i ... boat GEN wave GEN noise KA
 ‘The sound from the river is clear. Is it (= the sound) the noise from the waves of the boat (which Hikoboshi of the Tanabata legend) is rowing?’
 (MYS 10.2047)

- (20) yuki_i na pumi sone .
 snow_i PROH step PROH
 [∅_i]_{SBJ} [sibasibamo pura-nu yuki]_{PRED} *so* .
 it_i over.and.over fall-NEG snow SO
 ‘Don’t step on the snow. It (= the snow) is snow that doesn’t fall often.’
 (MYS 19.4227)

Examples such as (19)-(20) above demonstrate that an important function of *ka* and *so* was to conclude nominal predications, i.e. the function of a copula.

Furthermore, it is worth here recalling Ohno’s (1993) proposal that the *kakari-musubi* construction originated in inversion of (a) nominalized subject clauses with the predicate in the adnominal form and (b) nominal predicates marked by one of the focus particles, such that for example the

diachronic source of (16) above would have been like (21), with *ka* concluding the nominal predication.

(21) [*wa ga kikituru*]_{SBJ} [*oyodure*]_{PRED} *ka*

Narrog 2021 is an impressive and immensely useful literature review of various hypotheses about the origin of the *kakari-musubi* construction and of the history of research on that topic; it may be consulted for many more references. In his survey, Narrog notes that ‘in Japanese linguistics, this [=Ohno’s] hypothesis has been met with scepticism, mainly for the reason that the expected source structures with verbs are largely absent in OJ’ (2021: 22). However, ‘non-inverted’ examples with a nominalized clause as subject and a nominal predicate are in fact not that difficult to come by, e.g. (22)-(23) with the nominalized clauses marked by *pa* and *mo*, and (24)-(26) with bare nominalized clauses.

(22) [*nagarape-tiru pa*]_{SBJ} [*nani no pana*]_{PRED} *so mo* .
 fall-scatter.ADN TOP what COPflower SO EMP
 ‘Which flower is it that is scattering?’ (lit. ‘That which is scattering, which flower is it?’) (MYS 8.1420)

(23) [*senoumi to nadukete aru mo*]_{SBJ}
 Se-no-umi COMP call be.ADN also
 [*sono yama no tutum-yeru umi*]_{PRED} *so* .
 that mountain GEN dam.in-STAT.ADN sea SO
 ‘It is the sea which dams in that mountain that is called Se-no-umi’ (lit.: ‘That which is called Se-no-umi is the sea which dams in that mountain’) (MYS 3.319)

(24) [*kimi ni ap-yeru*]_{SBJ} [*koyopi*]_{PRED} *ka*
 my.lord DAT meet-STAT.ADN tonight KA
 ‘It is tonight that I met you / Is it tonight that I met you?’ (lit. ‘That I met you is tonight’) (MYS 8.1613)

(25) [*sawosika no tuyu wake naka-mu*]_{SBJ}
 male.deer GEN dew brush.aside cry-CONJ.ADN
 [*takamatwo no nwo*]_{PRED} *so*
 Takamato GEN field SO
 ‘It is the field of Takamato where the male deer will cry out, brushing aside the dew’ (lit. ‘That/where the male deer will cry out, brushing aside the dew, is the field of Takamato’) (MYS 20.4297)

- (26) [wa ga sekwo ga pusa tawori-k-yeru]_{SBJ}
 I GEN husband GEN bunch break-come-STAT.ADN
 [wominapyesi]_{PRED} **ka mo**
 patrinia KA EMP
 ‘It is a bunch of patrinia that my husband has snapped off and brought’
 (lit. ‘That which my husband snapped off a bunch of and brought is
 patrinia’) (MYS 17.3943)

The data presented in this section shows first of all that it is highly plausible that copula is the basic, or original, function of *ka* and *so*. In that way, *ka* and *so* fit the form and function pattern suggested in the preceding sections. Second, it may be seen that Ohno’s hypothesis about the origin of *kakari-musubi* should not be discounted.¹⁰

5 Negative and Semblative

Pursuing further this hypothesis of a *k- ~ s-* alternation between grammatical forms, it may be proposed that the infinitive of the adjectival copula, *ku*, took part in a similar relation with *su*, a formant which may be thought to form part of etymology of the negative auxiliary *-zu* and the semblative copula *nasu*. This *su* shares remarkably similar morphology and overlapping functions with *ku*.

The negative auxiliary has the following main forms and uses:

- (27) Infinitive (adverbial)
a ga mopu imo ni apa-zu sini se-me
 I GEN yearn.for beloved DAT meet-NEG.INF dying do-CONJ
 ‘I will die without meeting my beloved’ (MYS 15.3740)
- (28) Conclusive
yuki wo ... miredomo aka-zu
 snow ACC look.at.CONC tire.of-NEG.CLS
 ‘I never get tired of looking at the snow’ (MYS 17.4001)

¹⁰ If Ohno’s hypothesis is correct, the ‘inversion’ probably came about as right dislocation of the bare (nominalized clausal) subject. Right dislocation was quite common in OJ (at a rough estimate, just under one in five main clauses in the poetic OJ texts have a right dislocated constituent; even if this is skewed by the genre, it is significant proportion). I am not sure why Narrog (ibid.) believes that an intermediary stage ‘XP=*so* [... verb]=*pa*’ would be necessary or involved. ‘Inversion’ of attested sentences like those in (24)-(26) is all that is needed.

(29) Adnominal

miredo aka-**nu** yosinwo *no* kapa
 look.at.CONC tire.of-NEG.ADN Yoshino GEN river
 ‘The river of Yoshino which I never get tired of looking at’ (MYS 1.37)

The full OJ paradigm of the negative includes forms for most of the categories which verbs inflect for, as shown in column (a) of (30). This is a suppletive paradigm that combines forms in *n-*, which have the same endings as regular lexical consonant stem verbs,¹¹ and forms built on *zu*. For the infinitive and gerund there are rare forms in *n-* (*ni*, *nito*), which were lost from the language in the transition to the following EMJ period. It may be thought that the OJ paradigm represents the last stage before the completion of a reformation of an earlier, pre-OJ, paradigm, as shown in (c), with a full set of regular forms in *n*, with the forms in (b) replacing pre-OJ forms to give the paradigm in (a), eventually without *ni* and *nito* (see Frellesvig 2008: 184-189 for details about the reformation of the paradigm of the negative, including its motivation).

(30)

	(a) OJ	(b)	(c) pre-OJ
Conclusive	<i>zu</i>	<i>zu</i> < * <i>ni</i> - <i>su</i>	* <i>nu</i>
Adnominal	<i>nu</i>		<i>nu</i>
Exclamatory	<i>ne</i>		<i>ne</i>
Infinitive	<i>zu</i> (~ <i>ni</i>)	<i>zu</i> < * <i>ni</i> - <i>su</i>	<i>ni</i>
Gerund	<i>zute</i> (~ <i>nito</i>)	<i>zute</i> < * <i>ni</i> - <i>su</i> - <i>te</i>	<i>nito</i>
Conditional	<i>zupa</i>	<i>zupa</i> < * <i>ni</i> - <i>su</i> - <i>pa</i>	* <i>naba</i>
Provisional	<i>neba</i>		<i>neba</i>
Concessive	<i>nedo</i>		<i>nedo</i>
Nominal	<i>naku</i>		<i>naku</i>

The forms in (b) were based on the pre-OJ infinitive *ni* extended with *su*.¹² This *su* is traditionally thought to be the conclusive form of the verb *se-* ‘do’ and accordingly the use of *zu* as infinitive said to be secondary. However, the morphology of *zu*, with direct affixation of *te* and *pa* to form further forms, and the use as infinitive (adverbial), is exactly like the use of *ku* in the

¹¹ Except that the gerund in *-to* is slightly irregular: Regular verb gerunds have *-te*, but *to* is also found in the paradigm of the adjectival copula in *mito*, cf. (5) above.

¹² *Ni* itself is usually thought to be cognate with the Korean negation *ani*. See Frellesvig 2019: 247-248 about the reinterpretation of the negative adverb *ani*, vestigially attested in OJ, as a verb ending, and Frellesvig 2008: 184 about the resegmentation from V(erb)-*ani* to V.*a-ni*.

paradigm of the adjectival copula, and it seems more likely that *zu* is primarily the infinitive form and that the use of *zu* in conclusive function is secondary and an extended use of the infinitive; see further below in this section about this.

The second grammatical form to be considered in this section is the semblative copula ('be like') *nasu* (which has an Eastern OJ variant *nosu*) which is used in the following ways (although the conclusive use is rare).

(31) Adverbial

asa-pi *nasu* magupasi *mo*
 morning-sun SMBL beautiful EMP
 'It (= the province of Ise) is beautiful like the morning sun!' (MYS 13.3234)

(32) Adnominal

matama nasu *putatu no isi*
 jewel SMBL two COP stone
 'Two stones which are like jewels' (MYS 5.813)

(33) Conclusive

kwopuraku *pa* *puzi no takane ni* *puru yuki*
 long.for.NML TOP Fuji GEN peak DAT fall snow
nasu mo
 SMBL EMP
 'My longing for you is like the snow that falls on the peak of Fuji!'
 (MYS 14.3358)

Diachronically, *nasu* may be thought to reflect the *n*-copula root *na* (cf. OJ copula *ni* and *no*, see Frellesvig 2001) and the formant *su*: *nasu* < **na-su*.

Thus, we find the same relation between *ku* in the paradigm of the adjectival copula which forms the infinitive/adverbial form, and *su* which is found in the semblative copula and in the negative, as we do between the *k*- and *s*-initial forms within and between the paradigms of the adjectival copula and the two past tense auxiliaries, here in an alternation *ku* ~ *su*.

(34) **Adjectival copula**

ku infinitive

ku infinitive

kute gerund

kupa conditional

Semblative copula

nasu < **na-su* adverbial, adnominal, conclusive

Negative

zu < **ni-su* infinitive, conclusive

zute < **ni-su-te* gerund

zupa < **ni-su-pa* conditional

While adjectival copula *ku* is used only as infinitive/adverbial, the *su* proposed here as part of the origin of the semblative copula and the negative was used without morphologically expressed differentiation between adverbial, adnominal and conclusive function.¹³ Morphological differentiation between conclusive and adnominal has traditionally been regarded as a basic and primitive feature of Japanese verb/predicate morphology through time (and usually is projected back on to and reconstructed for pJ), but it rather seems likely that it was in fact not a feature of early pre-OJ or pJ, but a late pre-OJ innovation (see Frellesvig 2012), and it should therefore not be surprising that we find forms which do not exhibit this differentiation.

In particular, it may be suggested that the basic function of *su* was infinitive/adverbializing, much like adjectival copula *ku* and the regular copula *ni*, and that the use of the forms it attached to was extended to conclusive, and for the semblative copula also adnominal, function. This finds a good functional parallel within OJ and EMJ in the use of the infinitive of the stative existential verb *ari* in both conclusive and infinitive function.

6 Demonstratives *ko* and *so*, and the Verbs *ko-* ‘come’ and *se-* ‘do’

The final forms in *k-* and *s-* to be considered here are the two demonstratives *ko* and *so* and the two verbs *ko-* ‘come’ and *se-* ‘do’.

OJ had two main demonstrative pronouns, *ko* ‘proximal; speaker’ and *so* ‘non-proximal; non-speaker’, each used on their own and with some further extended forms, e.g. the locational demonstratives *koko*, *soko*, as well as more distantly related forms, e.g. *kaku* ‘this way’ and *sate* ‘that way’ (see Frellesvig 2010: 139-43 for more detail). OJ *ko* and *so* are the direct ancestors of the *ko-* and *so-* forms in the three-term *ko-so-a* demonstrative system of Modern Japanese, but the OJ system of demonstratives was somewhat different from Modern Japanese: As shown by Hashimoto (1966), it was basically a two-term system, with ‘speaker’ vs. ‘non-speaker’ as the basic reference, and furthermore and importantly, *ko* was mostly used deictically, e.g. (35), whereas *so* mostly was used anaphorically, with, e.g. (36), or without an explicit antecedent.¹⁴

¹³ For the negative, *zu* < **ni-su* was of course not used in adnominal function, as the functions it was replacing did not include the adnominal function (cf. Frellesvig 2008).

¹⁴ Note, though, that the OJ demonstrative system may have gone back to an earlier pre-OJ three-term system, **i* ‘proximal’ **ki* ‘mesial’ **si* ‘distal’, from which the **i* term was lost resulting in a reinterpretation of the two remaining terms (see Frellesvig and Whitman 2008: 27-29).

(35) *are pa wasurezi ko no tatibana wo*
 I TOP forget.NCONJ this GEN mandarin.orange ACC
 ‘I will not forget it, this mandarin orange (which the poet was looking at)’ (MYS 18.4058)

(36) *amanogapa pasi watas-eraba*
 Milky.Way bridge build.across-STAT.COND
so_i no pe yu mo i-watara-sa-mu
 that GEN top ABL even PFX-go.across-RSP-CONJ
 ‘If a bridge_i had been built across the Milky Way, she (Tanabata, the Weaver star) would cross on top of it_i (= the bridge).’ (MYS 18.4126)

There is a fairly close functional parallel between the demonstratives *ko* and *so* and the two irregular verbs *ko-* ‘come’ and *se-* ‘do’. The full simple paradigms of these two verbs are shown in (37); other than the shape of the basic stem, they inflect identically.

(37)

	<i>ko-</i> ‘come’	<i>se-</i> ‘do’
Conclusive	<i>ku</i>	<i>su</i>
Adnominal	<i>kuru</i>	<i>suru</i>
Exclamatory	<i>kure</i>	<i>sure</i>
Imperative	<i>ko</i>	<i>se(yo)</i>
Negative conjectural	<i>kozi</i>	<i>sezi</i>
Optative	<i>kona</i>	<i>sena</i>
Infinitive	<i>ki</i>	<i>si</i>
Gerund	<i>kite</i>	<i>site</i>
Continuative	<i>kitutu</i>	<i>situtu</i>
Conditional	<i>koba</i>	<i>seba</i>
Concessive	<i>kuredo</i>	<i>suredo</i>
Provisional	<i>kureba</i>	<i>sureba</i>
Nominal	<i>kuraku</i>	<i>suraku</i>

Ko- ‘come’ is a speaker-focused deictic motion verb, (38), and thus a straight-forward form and verbal function match with demonstrative *ko*.

(38) *ikwoma no yama wo kwoyete so aga kuru*
 Ikoma GEN mountain ACC crossing FP I GEN come.ADN
 ‘I come (here), crossing over Mount Ikoma’ (MYS 15.3590)

The verb *se-* ‘do’ is functionally more complex. *Se* is usually treated as a, or even the prototypical, transitive verb in modern and pre-modern Japanese and furthermore as the transitive counterpart of *nar-* ‘become’. Etymologically, the transitive counterpart of *nar-* is *nas-* ‘make’, but it is certainly true that *se-* in modern Japanese has transitive and causative uses, particularly in resultative constructions, and it is usually assumed that there is some etymological relation between *se-* and the transitive verb formant *-s-* (as for example in *nas-*) and also the causative formant *-sase-* which comes into the language in the EMJ period. However, in OJ, *se-* had no lexical uses and had, outside of resultative constructions, no transitivity associated with it; *se-* was essentially a grammatical element with the following main uses (see further Frellesvig 2013):

- (a) as a pro-verb, (39)
 - (b) in resultative (and a few other raising) constructions, (40)
 - (c) to predicate activity nominals, both lexical activity nouns, (41), and (de)verbal activity nominals, (42).
- (39) *suga-makura aze ka maka_i-sa-mu . kworo se_i ta-makura*
 sedge-pillow why FP roll-RSP-CONJ darling do.IMP arm-pillow
 ‘Why would you lie with a pillow made of sedge? Darling, lie with my arms as your pillow’ (MYS 14.3369)

The collocation *makura mak-* means ‘roll a pillow/headrest; lie with/use as a pillow’, and in this example, *mak-* is the explicit antecedent of *se* ‘do!’. There are also many examples of pro-verb *se-* without an explicit antecedent.

- (40) *awoyagwi wo kadura ni situtu*
 green.willow ACC hair.decoration COP.INF do.CONT
 ‘Making the green willow into a hair-decoration’ (MYS 5.825)
- (41) *iza kwo-domo tapawaza na se so*
 INTJ child-PL acting.foolishly PROH do PROH
 ‘Hey, children, don’t act foolishly’ (MYS 20.4487)
- (42) *izari suru ama no turi-bune*
 fishing do diver GEN fishing-boat
 ‘The fishing boats of the divers who are fishing’ (MYS 15.3609)

Pro-verb *se-* is a straightforward functional match with demonstrative *so* in its function as a pro form. It may further be suggested that it is the pro-verb use which gave rise to the resultative use of *se-* and that this originated in

grammaticalization or conventionalization of instances of *se-* to stand in for or replace lexical verbs with resultative uses, such as *tukur-* ‘make (into)’, or the just mentioned *mak-*, which in the collocation with *makura* in addition to its direct object frame (*makura mak-* / *makura wo mak-*) from (39), also is used in a resultative frame *N wo makura ni/to mak-*, see (43).

- (43) *urabuti wo makura ni makite*
 bay.shore ACC pillow COP.INF roll.GER
 ‘Using/with the shore of the bay as your pillow’ (MYS 13.3339)

The final main use of *se-* is as a predicator of what I here call ‘activity nominals’. These include a quite small number of actual nouns, such as *tapawaza* in (41), but the great majority are (de)verbal forms such as *izari* ‘fishing’ in (42) or *sini* ‘dying’ in (27) above. These latter forms are identical in shape with the inflected verb infinitive and with the stem to which some suffixes attach, including the past tense auxiliaries discussed in §3.¹⁵ The reason I refer to these forms as ‘deverbal nominals’ is that they syntactically have a great deal in common with the ‘verbal nouns’ of NJ, e.g. *benkyoo* ‘studying’, in that both are predicated by *se-* and both clearly exhibit both nominal and verbal properties (see Frellesvig 2013).¹⁶ A significant difference between the NJ verbal nouns and the OJ deverbal nominals is of course that the former make up their own part of speech, or at least a clearly morphologically and syntactically delineated subgroup of verbs, whereas the OJ deverbal nominals were productively formed from verbs. It is still not clear what the difference was in OJ between using a verb in a simple inflected form and using it with *se-*. However, for the purposes here, what is significant is that *se-* used with the deverbal nominals and with activity nouns functions as a simple predicator, carrying morphological information, that is, like a copula.¹⁷ This is not shared by demonstrative *so*, but it should be kept in mind that the relation between demonstratives and copulas is well established cross-linguistically, the latter developing out of the former. Interestingly, the uses of *se-* can be thought to preserve and reflect an earlier stage in the development of some of the other

¹⁵ In traditional Japanese grammar, all of these functions are lumped together under the label ‘*ren yōkei*’. They are certainly diachronically and/or derivationally related, but in a synchronic analysis, they should be distinguished.

¹⁶ This shows that although verbal nouns today overwhelmingly are Sino-Japanese, constructions existed in Japanese prior to the adoption of these Sino-Japanese words into which they could easily fit, facilitating their intake. If the term ‘gerund’ were not used in Japanese grammar for another form, it would be an obvious choice for the OJ deverbal forms which have a great deal in common with the gerunds of for example English or Latin.

¹⁷ Note also that *se-* is used in copula function in expressions like *pitori site* ‘alone, being alone’.

forms discussed in this paper, prior to their morphologization. First, *se-* predicates a form (deverbal nominal) which is segmentally identical with the stem to which the past tense suffixes attach. Second, although *se-* has some copular function, it is morphologically free in that it does not have to be adjacent to the nominal it predicates, but can be separated by a particle, adverb, or other material. This is not the case for the regular OJ and later copulas (*no, ni, nar-, to, etc.*) which are clitics, or for suffixes and particles discussed in §§2-5 which are either bound morphemes (adjectival copula, past tense suffixes, *su*) or clitics (particles).

In terms of form, demonstrative *so* and *se-* ‘do’ are not as close a match as demonstrative *ko* and *ko-* ‘come’. However, it is likely that the synchronically basic stem of ‘do’, *se-*, diachronically is derived and goes back to a pJ/pre-OJ root **sə* which may be thought to be reflected in OJ in *so/sonē* in the prohibitive construction *na VERB so/sonē* (see (20) and (41) above for examples).¹⁸

Thus, there is a strong functional fit between the demonstratives *ko* and *so* and the two irregular verbs *ko-* and *se-*: *ko* and *ko-* are both speaker-focused deictics, and *so* and *se-* are both anaphoric pro-forms, with *se-* exhibiting further specialized copula-(like) and simple predicating uses. On the reconstruction of the root underlying *se-* as *so* (< **sə*), these forms can be reduced to a simple alternation *ko* ~ *so*.

7 Concluding

The hypothesis offered in this paper is that the forms discussed in this paper, summarized in Table 1 by morphology/part of speech,¹⁹ are related and diachronically reflect the same material, in the form of two alternating roots **k-* ~ **s-*.

¹⁸ *Na* was originally a negative adverb; *so* may be thought to reflect the use as imperative of an earlier root of ‘do’ (the original pattern of imperatives of vowel base verbs was to use the basic stem) and *sonē* an archaic optative form of ‘do’, suggesting a diachronically underlying root *so* (< **sə*: pre-OJ **/ə/* > OJ */o/* through regular sound change). On this suggestion, the basic stem *se-* incorporates the same derivational matter as the bigrade verbs and diachronically derives from pre-OJ **sə-y* > OJ *se*.

¹⁹ I have provisionally included the forms from the simple past which involve *sik*.

	<i>k-</i>	<i>s-</i>
adjectival copula	<i>ki</i> <i>kyeba, kyedo, kyeku, kyenaku, kyemu</i> <i>kyere, kyereba, kyeredo</i> <i>ku, kute, kupa</i>	<i>si</i> <i>seba</i> <i>sa</i>
simple past tense	<i>ki</i> <i>kyeba, kyeku, kyemu</i>	<i>si, siku</i> <i>seba</i> <i>sika, sikado, sikaba</i>
modal past tense	<i>kyeri, kyeru, kyere, kyeredo, kyereba,</i> <i>kyeraku</i>	
negative		<i>zu < *ni-su, zute < *ni-</i> <i>sute, zupa < *ni-supu</i>
semblative copula		<i>nasu < na-su</i>
focus particles	<i>ka</i>	<i>so</i>
demonstratives	<i>ko</i>	<i>so</i>
grammatical verbs	<i>ko-</i>	<i>se- (~ so)</i>

Table 1. *K- ~ s-* forms by morphology and part of speech.

The forms in Table 1 take part in one of four alternations, three of which include forms of the adjectival copula, as summarized in (44) and shown in Table 2 by phonological shape.

(44) *ki ~ si*: instantiated in most of the forms within the adjectival copula and simple past tense paradigms, as well as between these two paradigms, and between the modal past and the adjectival copula paradigms.

ku ~ su: adjectival copula infinitive *ku* (and gerund and conditional) and infinitive/adverbializer *su* in the negative infinitive/conclusive (and gerund and conditional) *zu < *ni-su* and the semblative copula *nasu < na-su*.

ka ~ sa: focus particle *ka* and adjectival copula exclamatory *sa*. These two are morphologically different.

ko ~ so: demonstrative *ko* and *ko-* ‘come’, and *se-* (*~ so*) ‘do’ and focus particle *so*.

<p><i>ki</i></p> <p>adjectival copula <i>ki; kyeba, kyedo, kyeku, kyenaku, kyemu</i></p> <p>simple past <i>ki; kyeba, kyeku, kyemu</i></p> <p>adjectival copula <i>kyere, kyereba, kyeredo</i></p> <p>modal past <i>kyeri, kyeru, kyere, kyereba, kyeredo, kyeraku</i></p>	<p><i>si</i></p> <p>adjectival copula <i>si; seba</i></p> <p>simple past <i>si, siku; seba; sika, sikado, sikaba</i></p>
<p><i>ku</i></p> <p>adjectival copula <i>ku, kute, kupa</i></p>	<p><i>su</i></p> <p>negative <i>zu < *ni-su, zute < *ni-sute, zupa < *ni-supu</i></p> <p>semblative <i>nasu < na-su</i></p>
<p><i>ka</i></p> <p>focus particle <i>ka</i></p>	<p><i>sa</i></p> <p>adjectival copula <i>sa</i></p>
<p><i>ko</i></p> <p>demonstrative <i>ko</i></p> <p>verb <i>ko-</i> ‘come’</p>	<p><i>so</i></p> <p>demonstrative <i>so</i></p> <p>verb <i>se-</i> (<i>~ so</i>) ‘do’</p> <p>focus particle <i>so</i></p>

Table 2. *K- ~ s-* forms by shape.

Phonologically, the alternations include the vowels /i, a, o, u/. I shall not here say much about the vowels, particularly because the present state of our understanding of the role of vowels in pre-OJ word formation outside of some simple parts of verb derivation and inflection is quite limited,²⁰ except to say that all four OJ vowels represented are direct, simple reflexes of vowels found in all reconstructions of pJ vowels, from the most minimal, four-vowel reconstruction (e.g. Martin 1987): OJ /i/ < pJ */i/, /a/ < */a/, /o/ < */ə/, /u/ < */u/; to the most maximal, seven-vowel reconstruction (e.g. Frellesvig and Whitman 2008): OJ /i/ < pJ */i, e/, /a/ < */a/, /o/ < */i, ə/, /u/ < */u, o/.²¹ All four vowels in the alternating forms could therefore be direct, simple reflexes of pJ material.

Morphologically, the forms range between bound morphemes (adjectival copula, simple and modal past tense, *su* infinitive/adverbializer), particles (focus particles), and full words (demonstratives and verbs). The members of each alternation are in some cases distributed morphologically differently (e.g. *ka* particle, *sa* bound morpheme), but there is some internal coherence in that the *ki* ~ *si* and *ku* ~ *su* forms all are bound morphemes and *ko* ~ *so* mostly are full words (demonstratives and verbs), except for the particle *so*.

Functionally, a copula function, or copula origin, is common to most of the forms, as described in the preceding sections: adjectival copula, simple and modal past, focus particles, infinitive/adverbializer *su* in *na-su* and in *zu* < *ni-su, and some uses of *se-* ‘do’. However, first, the forms that have copula function are restricted and/or specialized: the adjectival copula is used only with adjectives, *se-* ‘do’ only to predicate certain types of nominals, and the particles *ka* and *so* have emphatic, exclamative and/or interrogative force. For simple nominal predication, including predication of nominal adjectives, the regular *n-* copula (*no, ni nar-*), which is the source of the Modern Japanese copula forms *da, desu, de, ni, no, na* etc., or less frequently the *t-* copula (*to*), also still in use in modern Japanese, were used. This suggests that the *k- ~ s-* based copula forms were older and generally had been replaced by the *n-* and *t-* copula forms, except in restricted, specialized contexts.

Second, not all the *k ~ s* forms have copula function. This is the case for the two demonstratives and *ko-* ‘come’, but also for some of the functions of *se-* ‘do’. A relation between demonstratives and copula is cross-linguistically

²⁰ For example, in verb inflection *-i* is associated with infinitive/nonfinite inflection and *-u* is associated with finite (conclusive) inflection. That is clearly not the case for the forms here.

²¹ It should be noted that it today is commonly accepted that the adnominal *ki* in the adjectival copula paradigm reflects an earlier **ke* which gave *ki* through mid-vowel raising (through an intermediate stage *kye* which is attested in Eastern OJ, alongside a few forms with *ke*). It is thus possible that all instantiations of the *ki ~ si* alternation actually go back to **ke ~ *se*, but that does not affect the substance of the reconstructions proposed here, and in particular not the main point that all the forms discussed reflect a **k- ~ *s-* alternation.

well established, but always, as far as I am aware, from demonstrative to copula, not the other way. This suggests that a plausible scenario for the relationship between all of the forms considered here is that the demonstratives reflected in OJ as *ko* and *so* were the source of the other forms. Thus, the hypothesis can be restated more precisely as in (45).

- (45) The forms summarized in Tables 1 and 2 are related and ultimately diachronically derive from two alternating pre-OJ or pJ demonstrative roots **k-* ~ **s-* which are reflected in OJ as the demonstratives *ko* and *so*.

The main developments involved may be summarized as in (46).²²

- (46) (a) development from the demonstratives of the two verbs *ko-* ‘come’ and *so-~se-* as verbalizations of the core function of the demonstratives
(b) development from the demonstratives of copulas (the attested uses of *se-* likely reflecting one stage in this development), including the adjectival copula
(c) development from copula of focus particles
(d) development from copula of the past tense auxiliaries

Finally, as for the origin, or source, of the *k* ~ *s* alternation, there are two possibilities: Either (a), it is ultimately a suppletive relation, with a separate source for each of the two members, or (b), the members of the alternation reflect a split of a single source (which could have taken place before or after pJ). Assuming (a), we would like to be able to identify separate candidates for each member. The two demonstratives might be candidates, but they are in a close paradigmatic relationship. Assuming (b), we would ultimately both have to identify a plausible single source and propose some kind of condition for the split. As a single source, a palatal **/c/* might present itself, but the OJ material gives us no grounds on which to propose conditions for a split. Dialect divergence with separate sound changes, followed by dialect convergence or borrowing would be a possibility, but that remains completely speculative. The fact that there is little evidence of a *k* ~ *s* alternation elsewhere

²² This proposal, that the demonstratives are the source of the other forms, would seem to suggest that *ko* ~ *so* reflects the earliest or original alternation, and that other forms involve incorporation of additional material, or morphological use of vowel alternations. However, as mentioned above, it is at present not possible meaningfully to discuss the vowels involved in the alternations.

within the language makes it difficult to consider actual phonological conditions.²³

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²³ Without attaching too much importance to this, it should be mentioned that it is possible to identify a few OJ lexical items which seem to exhibit a *k* ~ *s* alternation, including the following: *toki* ‘time’ ~ *tosi* ‘year’; *aka* ‘bright, red’ ~ *asa* ‘morning’ (cf. also *akatoki* ‘dawn’); *okure* ‘be (left) behind’ ~ *oso* ‘late’; *kosi* ‘lower back’ ~ *se-so* ‘back’; *kapa* ‘river’ ~ *sapa* ‘mountain stream; marsh’; *kup* ‘eat’ ~ *sup* ‘imbibe, inhale’. It should also be noted that the Korean ‘do’ verb, Middle Korean *ho* > Modern Korean *ha-ta*, is easier to compare with OJ *se-* (~ *so* < **sə*) if OJ *se-* ultimately reflects a single root which split into **k-* ~ **s-*, as K /*h*/ generally has better correspondences with J /*k*/ than with J /*s*/. This could also contribute to understanding correspondences like LMK *hel’* ‘lower back’ :: OJ *kosi* ~ *so-*. Both of these points, Japanese internal lexical *k* ~ *s* alternations, and correspondences of Korean /*h*/ mainly with J /*k*/, but also with J /*s*/ could be taken to support a single origin for the *k* ~ *s* alternation in the grammatical forms examined in this paper.

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Strong NPIs, the Scope of Negation, and the Components of Interpretation of *Sika/Pakkey* in Japanese and Korean*

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1 Introduction

1.1 Outline of the Paper

This paper is concerned with data from Japanese and Korean which involves NPIs and other phrases that are licensed by or associate with negation. I think that the observations here argue for certain general strategies of analysis, though I do not propose any specific formalization here.

After this brief section of introduction and background, Section 2 is concerned with the scope of negation, and where negation needs to scope to license an NPI. This can be diagnosed using examples which involve both an NPI and a focus phrase which associates with negation. The main goal of the paper is to consider some aspects of the meaning of *sika/pakkey*-phrases, which must co-occur with negation to give the meaning of ‘only’, and hence are types of NPI. Section 3 presents the background to the analysis of *sika/pakkey*. I briefly survey the main features of the meaning of ‘only’, and the re-

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lated meaning of exceptives, to consider where *sika/pakkey*-phrases actually fit in to that landscape. Then section 4 considers the interaction of *sika/pakkey* with other NPIs in the same clause, and I argue that the surface position of a *sika/pakkey* relative to any other NPI matters for the final interpretation. The observations in sections 3 and 4 are briefly summarized at the end of the paper, as to what they indicate about necessary components of the analysis of the meaning of *sika/pakkey*.

1.2 Background

The earliest work on negation in Japanese and Korean (J/K) (e.g. McGloin 1976 on Japanese) took the position that it scopes rather low, and that NPIs immediately outscope negation. Negation can take scope over different clause-level constituents, but has low default scope (Korean, Sells and Kim 2006, Sells 2010; Japanese, Kuno 1980, Yatabe 1996, Shimoyama 2011). To illustrate how negation scope can be considered, I begin with a subset of the ‘strong’ NPIs, NPIs which are licensed only by an overt expression of negation (more or less), such as *dare-mo* and similar NPIs in Japanese, and *amwu-to* and similar NPIs in Korean.

A Japanese form like *dare-mo* may be interpreted as a true universal quantifier or as an NPI, depending on the pitch-accent pattern. The true universal has accent on the initial syllable; the NPI is unaccented. I do not represent this in the examples, but it should be controlled for, in the interpretations.

There has been debate in the literature about the nature of NPIs, such as those in (1), precisely with regard to their scope relation to negation.

- (1) a. *dare-mo ko-na-katta*
anyone come-NEG-PAST
‘No one came.’
- b. *amwu-to o-ci anh-ass-ta*
anyone come-COMP NEG-PAST-DECL
‘No one came.’

The analytical question is whether an NPI is best analysed as a kind of universal quantifier, with negation in its immediate scope: $\forall\neg$, or whether it is best analysed as existential in the immediate scope of negation: $\neg\exists$. For the English example (2), the two options are shown by the formulae in (a) and (b):

- (2) John has not read any books.
- a. $\forall x[\text{book}(x) \rightarrow \neg\text{read}(j, x)]$ NPI scopes over negation
- b. $\neg\exists x[\text{book}(x) \wedge \text{read}(j, x)]$ negation scopes over NPI

For English NPIs, the consensus is that they are existentials (as in (2b)),

within the scope of negation (e.g. Horn 2005 for an overview). Further, Linebarger (1987) argued that existential NPIs must be in the immediate scope of negation, and she proposed the ‘Immediate Scope Constraint’ (ISC) on licensing.

For Japanese and Korean, though, the analysis in (2a) seems more strongly supported. This is taken up in the next section.

2 Negation, NPIs, and Focus Phrases

2.1 NPIs and Negation Scope

Several researchers have argued that NPIs in J/K outscope negation, including: Chung and Park (1998), Kim (1999), Lee (2001), Kim (2002), Han et al. (2007), Sells (2001), Sells and Kim (2006), Shimoyama (2011).

Sells and Kim (2006) make a more precise claim about (*amwu*-type) NPIs in Korean and their scopal relation to negation; they argue that an NPI immediately outscores it, and propose a generalization of Linebarger’s Immediate Scope Constraint:

- (3) *Generalized Immediate Scope Constraint (GISC)*
 An NPI and negation are in an immediate scope relation with each other.

As a quantifier that scopes over negation, an NPI in J/K is therefore a kind of universal quantifier as in (2a), but it differs in some semantic and pragmatic properties from a true universal quantifier (see Sells and Kim 2006).

One argument involves the situation in which an NPI is licensed but there is also an intervening quantificational adverb, as in the following Korean examples. In the interpretation, negation must scope **just under** the NPI, but not under the adverb as well. NPIs are shown in red in all the examples that follow, and glossed in italics.

- (4) **amwu-to** hangsang cip-ey iss-ci anh-ass-ta
anyone always home-at be-COMP NEG-PAST-DECL
 a. ‘Nobody was at home all the time.’ (respecting GISC)
(NPI > Neg > always)
 b. *‘For everyone, it was always the case that he was not at home.’
(NPI > always > Neg) (violation of GISC)

The example is grammatical with long-form negation but not with lexical negation (or at least, is much more marked with lexical negation), as in (5b):

- (5) a. **amwu-to** cip-ey eps-ess-ta
anyone home-at not.be-PAST-DECL
 ‘No one was at home.’ (‘Everyone was not at home.’)

- b. ***amwu-to** hangsang cip-ey eps-ess-ta
anyone always home-at not.be-PAST-DECL
 (the only possible scope order is *NPI* > *always* > *Neg*,
 but this violates GISC)

The reasoning about the scopal relation of NPI and negation goes as follows. (5b) is ungrammatical with lexical negation, which cannot take scope over another quantifier, even though it can otherwise license an NPI in subject position, as in (5a). In (5a) there is no other quantifier interrupting the licensing relationship between negation and the NPI. Now, if it had been assumed that negation scopes **over** an NPI subject in order to license it, negation should equally scope over the subject in all cases, and there should be no contrast between the examples in (5), or between (4) and (5b).

2.2 Attraction to Focus

Other evidence about the scope of negation when it licenses an NPI comes from the interaction of that licensing with attraction to focus – wherein negation associates with a focussed sub-constituent of a sentence. Starting again with English, the NPI in (6) is acceptable only if the negation is not attracted to focus (Ladusaw 1983):

- (6) John didn't meet anyone on [Sunday]_F.
 a. It was on Sunday that John didn't meet anyone.
 (no attraction of Neg to focus)
 b. *It wasn't on Sunday that John met anyone.
 (attraction of Neg to focus; cannot license NPI)

Ladusaw observed that negation cannot both license an NPI and be attracted to focus; attraction to focus would require a scope structure *Neg* > *Focus* > *anyone*, which would violate the ISC for the English existential NPI.

Now looking at comparable examples in Korean, the facts are different: negation can both license an NPI ('above' negation), and target a separate focus ('below' negation) (noted by Sohn 1995). This difference between English and Korean can only be traced to relative licensing properties of NPIs.

- (7) Mina-nun **amwu-to** [ilyoil]_F-ey manna-ci-nun anh-ass-ta
 Mina-TOP *anyone* Sunday-on meet-COMP-FOC NEG-PAST-DECL
 'Whoever it was, it wasn't on [Sunday]_F that Mina met him.'
- (8) kutul-un **amwu il-to** [wanpyekhakey]_F ha-ci-nun
 they-TOP *any work* perfectly do-COMP-FOC
 anh-ass-ta
 NEG-PAST-DECL

‘They didn’t do any work [perfectly]_F.’ (adverb negated)

Such examples show that the scope relation must be *NPI* > *Neg* > *Focus*, so that the NPI outscopes *Neg* on the one hand, and *Neg* can negate another constituent on the other. This scope structure is only consistent with the universal analysis of NPIs, where an NPI takes negation in its immediate scope, respecting the GISC.

Looking further into negation and focus, Sohn (1995, 2004) made some important observations about how focus phrases associate with negation. First, consider examples without NPIs, where negation will associate with a *nun*-marked focus phrase. The examples are coded to show the subject and object; due to the location of the *nun*-marking negation scopes high in (9), over the subject, but it scopes under the subject in (10):

- (9) [twu salam ta-**nun**]_{SU} [manhun chayk-ul]_{DO} ilk-ci
 two person all-FOC many book-ACC read-COMP
 anh-ass-ta
 NEG-PAST-DECL
 ‘It is not the case that BOTH of them read many books.’
 (The only scope order is *Neg* > *both* > *many*.)
- (10) [manhun salam-i]_{SU} [twu salam ta-**nun**]_{DO} chotayha-ci
 many person-NOM two person all-FOC invite-COMP
 anh-ass-ta
 NEG-PAST-DECL
 ‘Many people did not invite BOTH of them.’ (*many* > *Neg* > *both*)

So now, on the view that an NPI requires negation to scope under it, it is expected in (11a) that the NPI blocks negation from associating with the focus. In (11b), the lower phrase is scrambled over the higher one, and the example is fully acceptable:

- (11) a. ?*[twu salam ta-**nun**]_{SU} **amwukes-to**_{DO} cohaha-ci
 two person all-FOC *anything* like-COMP
 anh-ass-ta
 NEG-PAST-DECL
 Intended: ‘It’s not the case that BOTH of them liked anything.’
 (*Neg* > *both* > *NPI*)
- b. **amwukes-to**_{DO} [twu salam ta-**nun**]_{SU} t_{DO} cohaha-ci
anything [two person all-FOC] like-COMP
 anh-ass-ta
 NEG-PAST-DECL

‘There was nothing that BOTH of them liked.’ (*NPI > Neg > both*)

In (11b) both phrases can have the appropriate relationship to negation, respecting the GISC. The same is true in (12), in which the base order gives the right configuration for the interpretation to be compatible with the GISC:

- (12) **amwu-to** [twu salam ta-**nun**] chotayha-ci anh-ass-ta
anyone two person all-FOC invite-COMP NEG-PAST-DECL
 ‘No one invited BOTH of them.’ (*NPI > Neg > both*)

From the above considerations, I conclude that the strong NPIs in J/K are licensed by negation but scope above it. Hence a lower focus can also associate with negation, in contrast to the situation in English.

The Japanese examples in (13) provide corroborating evidence about relative scope and about how different elements are scopally licensed. They are modified from examples in Shimoyama (2009). McGloin (1976) showed that a *wa*-marked phrase in Japanese can be interpreted as a focus which negation associates with, as in (13a), but negation cannot associate with focus – scoping over it – and license a lower NPI at the same time, as in (13b), which has the same formal properties as (11a):

- (13) a. zennin-wa omiyage-o motte ko-na-katta
 all-FOC souvenir-ACC bring-NEG-PAST
 ‘Not all brought a souvenir.’
 b. ?*zennin-wa omiyage-o **nani-mo** motte ko-na-katta
 all-FOC souvenir-ACC *anything* bring-NEG-PAST
 Intended: ‘It is not the case that everyone brought some or other souvenir.’

3 Finding Where Exclusives Fit in the Landscape

The main topic of this paper is the interpretation of *sika/pakkey*-phrases, involving an investigation of the components that go into that interpretation. In this section I provide a context for a consideration of these components. Given that *sika/pakkey* in construction with negation means ‘only’, I begin with a brief overview, and then consider to what extent *sika/pakkey* can be considered markers of exceptives.

3.1 Only

Let us look at some equivalents for the English example in (14), which is followed by Korean examples; Japanese equivalents are in (15). In each pair of J/K examples, in the first example ‘only’ is expressed by a form that does not require negation, and in the second, the *sika/pakkey* forms are used. In all

the examples that follow, *sika/pakkey* are marked in purple.

- (14) ‘Yesterday, only Mina went to the office.’
- a. ecey-nun Mina-man samwusil-ey ka-ss-ta
yesterday-TOP Mina-only office-to go-PAST-DECL
- b. ecey-nun Mina-pakkey samwusil-ey ka-ci
yesterday-TOP Mina-EXCL office-to go-COMP
anh-ass-ta
NEG-PAST-DECL
(‘No one except Mina went to the office.’)
- (15) a. kinoo-wa Mina-dake zimusyo-ni it-ta.
yesterday-TOP Mina-only office-to go-PAST
- b. kinoo-wa Mina-sika zimusyo-ni ik-ana-katta.
yesterday-TOP Mina-EXCL office-to go-NEG-PAST
(‘No one except Mina went to the office.’)

It is well accepted that there are two parts to the meaning of ‘only’, the negative part and the positive part. For the examples above, and taking the meaning as expressed in English, these amount to:

- (16) a. No one other than Mina went to the office. (‘negative’)
i.e. For all x such that $x \neq$ Mina, x did not go to the office.
- b. Mina went to the office. (‘positive’)

In the J/K examples above, the a-version appears to express the positive part directly (i.e. there is no overt negation in the example), and so the negative part must be computed via some semantic mechanism. The b-version examples do have overt negation, of course, and so we would hypothesise that it is the negative part of the meaning that is (more or less) directly expressed – see the further account of this in section 4 below – and the positive part must be computed.

In the formal semantics literature on ‘only’, there are many different analyses of the parts of meaning in (16), but here I will continue at the level of observations. It has been noted previously that the negative part has a universal character, but the positive part has an existential character (e.g. von Stechow 1994, Horn 1996). The existential component of ‘only’ can be illustrated with examples such as (17), here from Horn (1996):

- (17) Only Democrats supported Clinton.

Perhaps surprisingly, this does not have the negative and positive components as in (18), but rather it has those in (19):

- (18) a. All non-Democrats did not support Clinton. ('negative')
 b. (So,) all Democrats supported Clinton. ('positive, universal')
- (19) a. All non-Democrats did not support Clinton. ('negative')
 b. Some Democrats supported Clinton. ('positive, existential')
 i.e. If any x supported Clinton, x is a Democrat.

In other words, 'only' does not fully partition the domain: it does not partition into a set of individuals of which some property does not hold, and a complement set of individuals of which the property does hold (this is what characterizes (18)). Rather, there are two propositions, one of which has a negative character, which has a universal interpretation over the relevant domain, and the other has a positive character, but is existential in nature.

Both Horn (1996) and von Stechow (1997) take the view that the existential interpretation in the positive part of the interpretation arises because use of *Democrats* in (17) is generic(-like): a generic does not commit the speaker to a universal claim, as generics can allow for exceptions.

3.2 Exceptives

sika/pakkey-phrases seem to have some properties of exceptives, and the etymology of *pakkey* (meaning 'outside') at least suggests that it could be an exceptive. So in this subsection I move on to look at some important aspects of the interpretation of exceptives, with a view to understanding the account of *sika/pakkey*. They could be considered to form exceptive constructions; and the semantics of 'only' constructions and of exceptive constructions is known to be similar (e.g. von Stechow 1994).

To provide some context for the discussion to follow, I summarize some main features of exceptives as presented in García Álvarez (2009), including some of his examples, such as those in (20):

- (20) a. every human culture except some nomadic societies ...
 b. (There were) no marked complications except three cases of skin irritation.

García Álvarez makes several key observations about the semantics of exceptives which should be captured in the correct analysis:

- (21) a. There is a generalization, and there is an exception to that generalization, which have opposite polarities (polarity reversal).
 b. The exception part is necessarily existential: **there is** an exception.
 c. The exception is 'small' with regard to the generalization.
 d. Polarity reversal is actually stated on predicates, not propositions.

My claim here is that *sika/pakkey* have only some of these properties, and so they are not truly exceptives.

The first point to note follows (21c) – the exception should be (contextually, relevantly) small. Hence (22b) is odd:

- (22) a. No students except Kim and Sandy finished the exam.
b. ??No students except 75 final-years finished the exam.

Next, let us look further at (21a), and the notion of polarity reversal. This is what generates the positive and negative parts of interpretation, exactly similar to what is described above for ‘only’. (The absolute polarity of the ‘positive’ and ‘negative’ parts will of course be determined by whether the predicate in an exceptive example is itself non-negated or is negated. This will be important in the discussion below.)

There are examples (again from Garcıa Alvarez) which have the same existential character as we saw above for ‘only’, in the positive part.

- (23) a. “We rowed every day except some Sundays,” he said.
b. Every film but some minor productions received a positive review.

In order to derive the correct truth conditions for such examples, Garcıa Alvarez argues that polarity reversal cannot be stated at the proposition level, but rather must happen at the predicate level. Using (24) as an illustrative example, polarity reversal over propositions gives the wrong truth conditions when the exception itself is existentially quantified. This is the interpretation in (24b), which can only be true if no first-year student finished the exam; but this is not what (24) means. Instead, the existential quantifier must scope over the predicate, with negation at the predicate level, as in (24c):

- (24) All students except some first-years finished the exam.
a. Positive part:
‘Removing some students from the domain, all finished the exam.’
b. Negative part: Reverse the polarity of (a) over the proposition.
*‘It is not the case that some first-years finished the exam.’
→ incorrect truth conditions
c. Negative part: Reverse the polarity of (a) over the predicate.
‘Some first years have the property of not finishing the exam.’
→ correct truth conditions

So, schematically, if we apply Garcıa Alvarez’ scheme to an example in which the predicate is negated – in preparation for the consideration of *sika/*

pakkey below, this is how polarity reversal applies in exceptives:

- (25) Schematically: “X except Y not-P”
- For all elements in {X – Y}, not-P holds.
 - Now take the predicate and reverse it:
 - If P holds, it holds of elements of Y.
 - And P does hold, because **there is** an exception.

For a negative generalization like (25a), the exception will necessarily be positive, and as the exception must exist, there will be some instantiation.

3.3 *Sika/Pakkey* are Exclusives, not Exceptives

From the considerations above, I do not think it can be sustained to treat *sika/pakkey* as exceptives. If we were to make this connection, some aspects of the interpretation of *sika/pakkey* are covered: treating them as exceptives (along the lines of ‘No one except Mina went to the office.’) accounts for the polarity reversal between the negative and positive parts of the meaning. Furukawa (2006) and Yoshimura (2007), among others, take the exceptive route. *sika/pakkey* could be treated as a variation on the basic exceptive: one difference is that there is usually no overt host (the ‘X’ in (25)) for these exceptives.

However, *sika/pakkey* can be used to express meanings which are incompatible with a true exceptive. In the following examples, *sika/pakkey* actually present the extent of a generalization, not an exception to it. With a numeral, *sika/pakkey* has a scalar ‘no more than’ interpretation (see e.g. Yeom 2015), as the examples below (first Japanese, then Korean) show.

- (26) The harp is an instrument which has many strings. To play it, it would be useful to have many fingers, but people only have 10 fingers:
- ningen-ni-wa zyup-pon-**sika** yubi-ga na-i
people-DAT-TOP 10-CL-EXCL finger-NOM NEG-PRES
 - salam-un sonkalak-i yel-kay-**pakkey** eps-ta
people-TOP finger-NOM ten-CL-EXCL NEG.PRES-DECL
- (27) You only get one life, so make the most of it:
- anata-ni-wa hito-tu-**sika** inoti-ga nai
you-DAT-TOP one-CL-EXCL life-NOM NEG-PRES
 - insayng-un hana-**pakkey** eps-ta
life-TOP one-EXCL NEG.PRES-DECL

The meanings here, obviously, have an ‘only’ interpretation, but it does not seem that that interpretation could be derived from an exceptive: “You have no fingers except 10” and “You have no lives except one” are very strange.

Other aspects of interpretation are shared between *sika/pakkey*-phrases

and true exceptives. As I noted above, *sika/pakkey* share with ‘only’ the existential component of interpretation. (28) again presents a Japanese and then an equivalent Korean example, with a rough gloss for each. The example does not mean that non-Americans did not go to that place and that all Americans did go there, but rather, it means that if anyone went there, that person is American:

- (28) Only Americans went to that place.
- | | | |
|-----------------------------|---------------|------------------|
| amerika-zin- sika | sono basyo-ni | ik-ana-katta |
| mikwuk-salam- pakkey | ku kos-ey | ka-ci anh-ass-ta |
| American-EXCL | that place-to | did.not.go |
- a. For all x , if x is not American, x did not go to that place.
(negative, universal)
- b. If anyone x did go to that place, x is American.
(positive, existential)

So, schematically, my proposal is that we outline the semantics of these expressions as follows:

- (29) “Y-*sika/pakkey* not-P”
- a. All relevant alternatives to elements of Y have the property not-P.
- b. Predicate reversal: if anything has the property P, it is an element of Y. (this yields the ‘positive’ part)
- c. There is an instantiation of this (this yields the existential part of the meaning).

In *sika/pakkey*-examples, the expressed negation provides the negative part of the meaning, as in (29a). That negation can also license another NPI (section 4). The other part of the meaning is derived by predicate reversal, but in a conditional structure, as in (29b). The contribution in (29c) is actually the part that creates the existential import of the positive part of the meaning.

Researchers who have investigated ‘only’ have suggested that the existential nature of the positive component can be accounted for by a generic interpretation of the noun (e.g. Horn 1996, von Stechow 1997). However, I am not sure that this works for all examples, such as (30). The example is past tense and episodic, which would not seem compatible with a generic interpretation:

- (30) a. Due to the pandemic, only local people attended the meeting.
- | | | | |
|-------------------------|-----------------|-------------|-------------------|
| kansen.bakuhatu-no-tame | tikaku-ni | sum-u | hito- sika |
| pandemic-GEN-because | nearby-at | live-PRES | person-EXCL |
| kaigi-ni | syusseki | si-na-katta | |
| meeting-DAT | attend-NEG-PAST | | |

- c. phaynteymik ttaymwun-ey ciyek cwumin-tul-**pakkey**
 pandemic because-DAT local resident-PL-EXCL
 hoyuy-ey chamsek ha-ci anh-ass-ta
 meeting-DAT attend-COMP NEG-PAST-DECL

The source of existentiality might be found in the parts of the meaning of *sika/pakkey* which **do** carry over from exceptives: that the proposition generated via polarity reversal on the predicate has an instantiation. (As García Álvarez puts it: there **is** an exception.)

4 The ‘Scope’ of *Sika/Pakkey*

sika/pakkey look like NPIs, and indeed must be licensed by clause-mate negation; but they are not exceptives. I will refer to *sika/pakkey*-phrases as “exclusive” phrases, following the nomenclature for ‘only’ in some of the current literature (e.g. Hasegawa and Koenig 2011, Ido and Kubota 2021). The consensus is that these exclusives scope over negation, as this allows for a fairly straightforward compositional semantic interpretation (e.g. Furukawa 2006, Yoshimura 2007, Yeom 2015). In other words, they share this property with other NPIs in J/K: they need to be licensed by clause-mate negation and they scope over that negation.

What exactly is the status of negation in *sika/pakkey* clauses? – Is it just a constructional marker of the exclusive, or is it semantically potent? It can be shown that it is semantically potent, as another NPI can be licensed in the same clause as a *sika/pakkey*-phrase, as shown in the examples below. Even though *sika/pakkey*-phrases are not true exceptives, to isolate the components of interpretation, it is actually instructive to treat them as if they were. In the examples that follow, I first give a translation as an exceptive, which will become relevant further below, and then the second translation more directly states the meaning:

- (31) a. Mina-**pakkey amwu kes-to** mek-ci anh-ass-ta
 Mina-EXCL *anything* eat-COMP NEG-PAST-DECL
 ‘Except Mina, no one ate anything.’
 → ‘Only Mina ate something.’
 b. Mina-**pakkey amwu tey-to** ka-ci anh-ass-ta
 Mina-EXCL *any place* go-COMP NEG-PAST-DECL
 ‘Except Mina, no one went anywhere.’
 → ‘Only Mina went somewhere.’
- (32) a. Mina-**sika nani-mo** tabe-na-katta
 Mina-EXCL *anything* eat-NEG-PAST
 ‘Except Mina, no one ate anything.’
 → ‘Only Mina ate something.’

- b. Mina-**sika doko-ni-mo** ik-ana-katta
 Mina-EXCL *any place* go-NEG-PAST
 ‘Except Mina, no one went anywhere.’
 → ‘Only Mina went somewhere.’

These examples are instructive as to the actual scope of negation. If the (red) NPI scopes over negation, as argued here, then a *sika/pakkey*-phrase does not take a negated predicate in its direct scope – negation is actually ‘lower down’.

We can test this by looking further at the interaction between *sika/pakkey* and an NPI. Over some years, it has been noted that certain interactions between an NPI and a *sika/pakkey*-phrase lead to an interpretation in which the NPI receives something like a universal reading, e.g. Aoyagi and Ishii (1994), Sells (2001), Kuno and Whitman (2004), Shimoyama (2011). The examples are like those above, but with the phrases in the reverse order, NPI then *sika/pakkey*; so in Korean, *amwu* then *pakkey*. The *amwu* NPI is still grammatical, but seems to have more of a universal(-like) interpretation:

- (33) **amwu tey-to** Mina-**pakkey** ka-ci anh-ass-ta
any place Mina-EXCL go-COMP NEG-PAST-DECL
 ‘Wherever it is, except Mina, no one went there.’
 (‘Only Mina went anywhere you might think of.’)

Not all speakers find such examples (fully) acceptable; but the observation goes back over 20 years. Japanese examples like (33) can be found in (Kuno and Whitman, 2004, 209), who note:

“A similar observation was made for the Japanese NPI *dare-mo* ‘anyone’ in the oral presentation of Kuno (2000):

- (34) ^{??/??} **daremo** syuumatu ni hanniti **sika** benkyoosi-na-i
anyone weekend on half-day EXCL study-NEG-PRES
- Predicted Interpretation: *‘No one studies only half a day on weekend.’
 - Actual Interpretation: ‘No matter which person *x* you pick, it is not the case that *x* studies any more than half a day on weekend; Everyone works only half a day on weekend.’ ”

Similar examples are given in Shimoyama (2011), here with her translations:

- (35) a. Kaori-**sika doko-ni-mo** ik-ana-katta
 Kaori-EXCL *anywhere-to* go-NEG-PAST
 ‘Only Kaori went somewhere.’

- b. **doko-ni-mo** Kaori-**sika** ik-ana-katta
anywhere-to Kaori-EXCL go-NEG-PAST
 ‘Every place is such that only Kaori went there.’

(Shimoyama’s translation of (35b) seems too strong, at least for the Korean counterpart, as the interpretation of the *amwu*-phrase is not truly universal – see below.)

Given that such examples are acceptable, what I want to focus on in this section is that it seems that the position of *sika/pakkey* matters, so it makes sense to talk of the ‘scope’ of *sika/pakkey*. I illustrate first with Korean. What is important is the contrast in the interpretation of the NPI between (36a) and (36b):

- (36) a. Kaori-**pakkey amwu tey-to** ka-ci anh-ass-ta
 Kaori-EXCL *any place* go-COMP NEG-PAST-DECL
 ‘Except Kaori, no one went anywhere.’
 (≈‘Only Kaori went somewhere.’)
- b. **amwu tey-to** Kaori-**pakkey** ka-ci anh-ass-ta
any place Kaori-EXCL go-COMP NEG-PAST-DECL
 ‘Wherever it is, except Kaori, no one went there.’
 (≈‘Wherever it is, only Kaori went there.’)

The most salient appearance of the ‘universal’ aspect of the NPI interpretation is in examples like (36b). How does this emerge? And what is the difference between the examples in (36)?

Given that *sika/pakkey*-examples necessarily involve negation, from the overt negative component of meaning, polarity reversal on the predicate leads to the positive component. I will show the mechanism of this reversal with respect to the constituents in the examples, using Korean. The corresponding Japanese example is given right below the gloss.

Imagine that the components of the interpretation of (36a) are as shown by what follows the arrow. Replace the exclusive phrase by the corresponding NPI, then set up a second line which reverses the polarity, in a conditional:

- (36a) Kaori-**pakkey amwu tey-to** ka-ci anh-ass-ta
 Kaori-EXCL *any place* go-COMP NEG-PAST-DECL
 Kaori-**sika doko-ni-mo** ik-ana-katta
- **amwu-to amwu tey-to** ka-ci anh-ass-ta
 No one went anywhere
 and if anyone has the opposite property, it is Kaori

As the NPIs (in red) scope over negation, they can be informally translated as ‘for any *x* you pick’, etc. So, the negative component is:

1. For anyone x you pick and any place y you pick, x did not go to y .

And there is a positive component, based on reversing the predicate:

2. If anyone went anywhere, it is Kaori; and

3. Someone went somewhere.

The universal component of meaning comes from 1, while the existential component comes from the combination of 2 and 3. What these phrase do inherit from exceptives is the contribution that there **is an instantiation** of the positive part.

Now, the other example is crucially different, due to the different order of constituents. The position of *sika/pakkey* marks how much of the structure feeds into the positive and negative parts of the interpretation. In (36b) the order of NPI and *sika/pakkey*-phrase is reversed, and effectively the exclusive interpretation emerges **under** the scope of the NPI:

(36b) **amwu tey-to** Kaori-**pakkey** ka-ci anh-ass-ta
any place Kaori-EXCL go-COMP NEG-PAST-DECL
doko-ni-mo Kaori-**sika** ik-ana-katta

→ **amwu tey-to**
amwu-to ka-ci anh-ass-ta
and if anyone has the opposite property, it is Kaori

The negative component has two parts, 1 and 2:

1. For any place y you pick:

2. Then for any person x you pick, x did not go to y .

And there is a positive component, based on reversing the predicate:

3. If anyone went there, it is Kaori; and

4. Someone went somewhere.

The contributions 2–4 are effectively subordinated to 1; consequently the meaning of (36b) can be expressed this way:

5. For any place you pick, if anyone went there, it is Kaori (and someone went somewhere).

This meaning contrasts with the meaning of (36a), which is ‘If anyone went anywhere, it is Kaori’. Strictly speaking, this may not be a truth-conditional difference in meaning, but rather is related to the information structure properties of the initial phrase. Very roughly, we might say that (36a) is about who might have gone somewhere, while (36b) concerns a set of places and who, if anyone, went to any of those places.

5 Conclusion

From the observations above, I draw out some consequences for semantic accounts, to inform their further development.

- For the types of strong NPI considered here, they scope over negation. They have a universal(-like) interpretation which can actually be directly observed in examples like (36b).
- Due to the licensing properties of the NPIs, negation in J/K can both license an NPI and associate with focus (unlike English).
- The positive part of the meaning of *sika/pakkey*-clauses is existential in character – in common with true exceptives.
- The relative linear position of *sika/pakkey* matters for the overall interpretation. The existential component of the exclusive meaning emerges relative to where *sika/pakkey* is. This means that *sika/pakkey* cannot just be QR'ed out to take widest scope over an entire negated proposition, which is the most common semantic treatment.

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SECTION 2
Oral Papers

Part 1
Phonetics
Phonology
Morphology
Historical Linguistics

Why [s]? An Analogical Account of the Epenthetic Consonant Quality in Non-standard Korean*

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1 Introduction

While variation has been of great interest to phonologists, there has been an asymmetry in the amount of attention that different variants of suffixed forms of nouns have received in Korean. In Korean, it has been well-established

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that variation occurs when a vowel-initial suffix (e.g., *-i* nominative (NOM)) is attached to noun stems that end in a simplex consonant (C) or a consonant cluster (CC). First, output forms can be fully faithful to input forms, either simplex-final (1a) or complex-final (2a) stems. Second, as for noun stems ending in a consonant cluster, output forms can also be simplified via consonant deletion (2b). In addition, there is another yet relatively understudied form: [s] can appear after a consonant (1c, 2c) (Kim 2016, 2018, 2019). The consonant [s] is non-etymological and thus epenthetic since it does not have correspondence in input, either in noun stems (e.g., */paps/ ‘rice’, */talks/ ‘chicken’) or in vowel-initial suffixes (e.g., */si/ NOM).

- | | | |
|-------------------|--|---------------|
| (1) C-final stem | /pap-i/
a. [pa.p̥i]
b. N/A
c. [pap.si] | ‘rice-NOM’ |
| (2) CC-final stem | /tal̥k-i/
a. [tal̥.ki]
b. [ta.ki]
c. [tak.si] | ‘chicken-NOM’ |

[s]-epenthesis occurs consistently in nonstandard, colloquial Korean (1c, 2c), but it has been relatively less studied than the other two variants for suffixed forms of nouns in Korean (e.g., Kenstowicz 1996, Ko 2006, Yun 2008). In particular, it has been a puzzle as to what determines the quality of this epenthetic consonant [s]: why is [s] but not any other consonant epentheticized? [s] is distinct from other consonants that are known to be often epentheticized in the languages of the world, such as glottal stop or glides. This study shows that [s]-epenthesis in nonstandard Korean is a problem for previous approaches that deal with the quality of epenthetic consonants. This paper instead proposes an analogical account, expanding on Kim (2018, 2019).

This paper is organized as follows. Section 2 reviews previous approaches that deal with the quality of epenthetic consonants: two purely phonological markedness-based approaches (Section 2.1 and Section 2.2), a splitting account (Section 2.3), and a historical approach (Section 2.4). It also shows that [s]-epenthesis in nonstandard Korean cannot be consistently accounted for by any of the previous accounts. Section 3 provides an analogical account with two pieces of evidence that are observed in other parts of Korean: [s] is likely to be preserved from input /Ts/ clusters (where ‘T’ represents a stop) (Section 3.1), and [s] can be an output variant of input /h/ in onset position (Section 3.2), as an extension of Kim (2018, 2019). Section 4 concludes the paper.

(5) Application of a modified markedness hierarchy to [s]-epenthesis

/pap-i/ ‘rice-NOM’	*ʔ	*DORS	*LAB	*COR	*PHAR
a. [pap.ʔi]	*!				*!
● b. [pap.hi]					*!
c. [pap.ti]				*!	
⊖ d. [pap.si]				*!	

Since the context-free markedness hierarchy based on Place does not predict [s]-epenthesis in nonstandard Korean, one might argue that the hierarchy should be modified by considering various factors that are discussed in Section 2.2.

2.2 Markedness Hierarchy Based on Syllable Positions and Sonority

Uffmann (2007) proposes a more fine-tuned markedness hierarchy by taking syllable positions, such as syllable margins and peaks, and sonority into consideration (6). Syllable margins are onsets or codas, whereas syllable peaks are nuclei (Uffmann 2007: 459).

- (6) a. *Margin/V >> *Margin/r >> *Margin/l >> *Margin/nas >>
 *Margin/obs >> *Margin/lar
 b. *Peak/lar >> *Peak/obs >> *Peak/nas >> *Peak/l >> *Peak/r >>
 *Peak/V

For syllable margins (particularly onset), low-sonority sounds are preferred, which chooses glottal stop for the optimal epenthetic consonant (7a). For intervocalic position, in contrast, homorganic glides are inserted since higher-sonority sounds are preferred in peak position (7b, c).

- (7) a. [ʔ]orkan ‘hurricane’ German (Uffmann 2007: 457)
 b. si[j]awase ‘happiness’ Japanese (Uffmann 2007: 458)
 c. gu[w]ai ‘condition’ Japanese (Uffmann 2007: 458)

Uffmann’s hierarchy shows instances in which epenthetic qualities are context-dependent. However, it does not explain [s]-epenthesis in nonstandard Korean since a more fine-grained sonority scale suggests that stops are less sonorous than fricatives (Clements 1990) and that stops are more suitable for onset position (8).

- (8) Stops < Fricatives < Nasals < Liquids < Glides < Vowels

This then overpredicts [t] but not [s] to be inserted in onset position (9), but *[pap.ti] is not attested for /pap-i/ ‘rice-NOM’, even though there are no phonotactic violations with this form.

- (9) Application of a more fine-tuned context-dependent markedness hierarchy to [s]-epenthesis

/pap-i/ ‘rice-NOM’	*Margin/fricative	*Margin/stop
☛ a. [pap.ti]		*!
☹ b. [pap.si]	*!	

We have seen in Sections 2.1 and 2.2 that markedness hierarchies for epenthetic consonants, either context-free or context-dependent, do not account for [s]-epenthesis in nonstandard Korean. One might doubt at this point whether [s] is in fact an epenthetic consonant, which is explored in Section 2.3.

2.3 Splitting Account

Unlike the two previous epenthetic approaches discussed above, Staroverov (2014) claims that there is no insertion process and that a seemingly epenthetic consonant is in fact the outcome of feature splitting of an input vowel, at the expense of INTEGRITY (10) (Staroverov 2014: 3 following McCarthy & Prince 1995: 124), as illustrated in Figure 1.

- (10) INTEGRITY: assign a violation for every input segment that has multiple correspondents in the output

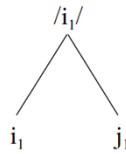


Figure 1. Illustration of splitting (Staroverov 2014: 6)

It is crucial that INTEGRITY is dominated by IDENT-F (11) (Staroverov 2014: 3 following McCarthy & Prince 1995).

- (11) IDENT-F: let α be a segment in the input and β be a correspondent of α in the output. Assign a violation if α is $[\gamma F]$, and β is not $[\gamma F]$.

The constraint ranking in which INTEGRITY is dominated by IDENT-F (for example, IDENT-[place]) accounts for homorganic glide formation via splitting: /i/ splits to [ij] (12a, 13a), and /u/ splits to [uw] (12b), as illustrated for Persian (Staroverov 2014: 135). Note that input and output segments that split share the same subscript.

- (12) a. /i₁/→[i₁j₁] /sep̚phi₁-ɔ₂n/ [sep̚phi₁j₁ɔ₂n] ‘soldiers’
 b. /u₁/→[u₁w₁] /ʔahu₁-i₂/ [ʔahu₁w₁i₂] ‘a deer’

(13) Splitting account

/sep̚phi ₁ -ɔ ₂ n/ ‘soldiers’	IDENT-[place]	INTEGRITY
☹ a. [se.pɔ.hi ₁ .j ₁ ɔ ₂ n]		*
b. [se.pɔ.hi ₁ .ʔ ₁ ɔ ₂ n]	*!	*

Splitting also accounts for the emergence of so-called marked segments. In Mongolian, for instance, dorsal consonants appear in intervocalic position (14).

- (14) a. /sana-iŋ/ [sanagiŋ] ‘thought-GEN’
 b. /xu:-iŋ/ [xu:giŋ] ‘boy-GEN’

The emergence of dorsal consonants is problematic to markedness-based approaches, particularly Lombardi (2002), since Dorsals are relatively more marked: *DORSAL, *LABIAL >> *CORONAL >> *PHARYNGEAL. Staroverov, on the contrary, argues that Dorsals share the same Place feature with all vowels under the assumption that all vowels are [dorsal]. This again supports Staroverov’s claim for splitting from an adjacent vowel.

However, the splitting analysis does not account for [s]-epenthesis in nonstandard Korean since there is no featural identity between vowels and the particular consonant [s]. In other words, if we assume that [s] splits from the vocalic part of any vowel-initial suffix in nonstandard Korean (e.g., -i NOM, -i/ ACC(usative), -e DAT(ive)), there will be a fatal violation of IDENT-[place] since [s] is coronal, whereas all vowels are dorsal (15b).² The ranking will then incorrectly predict [pap.ki] for /pap-i/ ‘rice-NOM’ since /k/ and vowels share the same Place feature, [dorsal] (15a).

(15) Application of the splitting account

/pap-i/ ‘rice-NOM’	IDENT-[place]	INTEGRITY
☹ a. [pap.ki]		*
☹ b. [pap.sii]	*!	*

We have seen in Sections 2.1, 2.2, and 2.3 that none of the synchronic approaches, whether markedness-based epenthetic approaches or splitting account, explains why [s] is epenthesized in nonstandard Korean. One might then pursue a diachronic approach, which is stated in Section 2.4.

² Some argue that front vowels are coronal (e.g., Clements 1991, Hume 1992).

2.4 Diachronic Account

Samuels & Vaux (2019) mainly focus on dorsal epenthesis in Mongolian and provide an analysis that is different from Staroverov's (2014). They claim that modern Mongolian epenthetic dorsal consonants trace back to historical lenition and deletion of intervocalic dorsal consonants. To be specific, it was intervocalic dorsal consonants that underwent spirantization and deletion, which in turn resulted in vowel hiatus (Samuels & Vaux 2019). Speakers of modern Mongolian reanalyze vowel hiatus as the site for dorsal re-insertion or epenthesis.

Similarly, Blevins (2004, 2008) accounts for phonologically opaque patterns of epenthesis in Land Dayak from a historical perspective, especially from an Evolutionary Phonology perspective (16) (Blevins 2008: 11).

- (16) Change (i): Final laryngeal epenthesis $\emptyset > ? / V_]_{PrWd}$
 Change (ii): Spirantization $? > x / u_$
 *batu_ > *bahtu? > batu[x] 'stone'

According to Lombardi's (2002) markedness hierarchy, [x] is not an unmarked consonant. Blevins claims that the emergence of [x] traces back to the two independent sound changes (i.e., Change (i) and Change (ii)). Without the consideration of diachronic changes, it seems that the epenthesis phenomenon is phonologically opaque.

Diachronic approaches are appealing to some extent since they account for the emergence of the so-called marked segment (i.e., dorsal), which would not otherwise be explained from a synchronic perspective. However, although it is successful for some cases that align well with the historical story involving multiple phonological processes as in Mongolian and in Land Dayak, it is insufficient for other cases. In particular, there is no historical evidence for the presence of underlying /s/ either in stem-final (e.g., */paps/ 'rice') or in suffix-initial position (e.g., */-si/ NOM) in the Korean case.

In Section 2, we have reviewed four previous accounts of (seemingly) consonant epenthesis in the world's languages. Three of them were synchronic approaches, either markedness-based epenthetic accounts or a splitting account. There was also a diachronic view. In sum, none of the previously proposed analyses fully accounts for the peculiar epenthetic quality involved with [s] in nonstandard Korean. In the following section, I provide an alternative based on an analogical approach and show that it accounts for the particular consonant [s] that is used as an epenthetic consonant in nonstandard Korean.

3 Analogical Approach

We have reviewed previous approaches to consonant epenthesis and seen that [s]-epenthesis in the suffixed forms of nouns in nonstandard Korean is not accounted for by any of the accounts. In agreement with this evaluation, Kim (2018, 2019) proposes a different approach: [s]-epenthesis is accounted for by an analogy with frequent patterns in Korean. That is, [s] is chosen to be epenthesized since it is a frequent consonant both in input and output forms in the language. First, in input forms, /s/ is a third most frequent consonant (11.7%) among 18 consonants that appear in initial position (17) (Shin 2010).

(17) /k/ (12.3%) > /c/ (12.0%) > /s/ (11.7%) > /h/ (10.2%) ...

Considering that the difference between [s] and the top two consonants (i.e., /k/ and /c/) is not large in input forms, it will be meaningful to examine how frequent [s] actually is in output forms.

For output forms, it is notable that various stem-final coronal obstruents /s, t, t^h, c, c^h/ are most likely to be realized as [s] when a vowel-initial suffix (e.g., -e DAT) is attached to noun stems (18) (Jun 2010).

(18) /so^h-e/ ‘pot-DAT’
a. [so.t^he]
~b. [so.te]
~c. [so.c^he]
~d. [so.se] (the most frequent form)

As an extension of Kim’s (2018, 2019) language-specific frequency-based analysis that considers both input and output forms, this paper provides two additional pieces of evidence for the analogical approach. Special attention is paid to the fact that /s/ tends to be preserved in the consonant clusters /ps/ and /ks/, and that it is syllabified in onset position (Section 3.1). Another supporting fact comes from the alternation between [h] and [s] in onset position in some regional varieties of Korean (Section 3.2). In other words, this paper proposes that having an epenthetic [s] in onset position in the suffixed forms of nouns in nonstandard Korean is due to the analogy of the frequent patterns that are observed in other phonological phenomena of the language.

3.1 [s]-preservation as Onset in /Ts/ Clusters

As shown in (2), when a vowel-initial suffix is attached to noun stems that end in a consonant cluster, output forms can be either fully faithful to the input form (2a), or simplified by deleting one of the two consonants (2b). Results of Kim’s (2016) production experiment show that among the four consonant clusters /ps/, /ks/, /lk/, /ls/ that appear in the stem-final position of

nouns, the /Ts/ clusters (i.e., /ps/ and /ks/) were much more likely to be realized in fully faithful forms than in simplified forms, compared to the non-/Ts/ clusters (i.e., /lk/ and /ls/). For example, [kap.si] (99%) and [sak.si] (81%) were much more frequently produced than [ka.pi] (1%) and [sa.ki] (19%) for /kaps-i/ ‘price-NOM’ and /saks-i/ ‘wage-NOM’, respectively, whereas the non-/Ts/ clusters showed the opposite pattern (i.e., the preference for simplified forms for /lk/ and /ls/) (Figure 2).

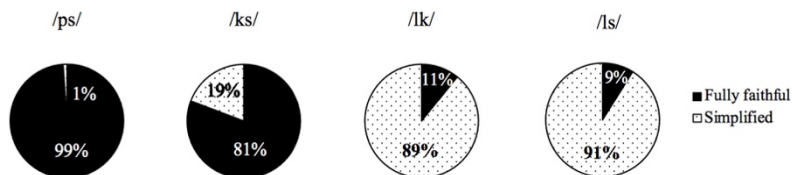


Figure 2. Percentages (%) of fully faithful forms and simplified forms by consonant clusters (Kim 2016)

The fully faithful forms maintain both input consonants by syllabifying the first one as coda and the second one as onset. Note that the second consonant in onset position is [s], which is followed by the vocalic part of the vowel-initial suffix. This means that the syllable structure [sV] is a frequent pattern (e.g., [si] in [kap.si] ‘price-NOM’ and [sak.si] ‘wage-NOM’). As speakers are exposed to the [sV] structure frequently, they may extend it even to non-etymological-/s/ contexts by inserting an [s] (1c, 2c). In addition, since the output forms where both consonants are preserved are standard forms, it is likely that speakers epenthesize [s] in other irrelevant contexts as a case of hypercorrection.

3.2 [s] as a Variant of /h/ in Onset

[s] is not only chosen for epenthesis but also as an alternative to /h/ before the high vowel /i/ in some regional dialects of spoken Korean, which is referred to as *h-to-s* alternation or *h-palatalization* (19) (Bae 2014: 41).

- (19) a. /him/ [him]~[sim] ‘power’
 b. /hjuŋ/ [hjuŋ]~[suŋ] ‘fault’

It is widely accepted that a less salient sound is more prone to deletion or alternation. Turkish /h/, for instance, undergoes optional deletion before sonorants (e.g., [fihrist] ~ [fi:rist] ‘index’; Mielke 2002: 385). Likewise, it is likely that Korean /h/ undergoes a sound change since it is a perceptually weak sound. I propose that the perceptually weak consonant /h/ in onset position in particular is replaced with the perceptually stronger consonant [s].

Based on the optional phonological rule that requires *h-to-s* alternation, native speakers of Korean may make an analogy and extend the knowledge of [s] even to the phenomena that are not necessarily relevant to *h-to-s* alternation. In other words, having an [s] in syllable onset position may have been applied to an excessive degree.

In this section, we have discussed the two pieces of evidence for the analogical approach to the quality of the epenthetic consonant [s]. They support the hypothesis that [s] is the optimal consonant that is epenthesized in onset position.

4 Conclusion

This paper has examined [s]-epenthesis in the suffixed forms of nouns in non-standard Korean, addressing the question of why [s] but not any other consonant is epenthesized. While there have been various accounts of epenthetic qualities in the world's languages, none of them predicts [s] as an epenthetic consonant. Following Kim (2018, 2019), this paper argues for an analogical approach and suggests that speakers of a language make an analogy with a consonant that is involved in productive alternations and frequent even in other parts of the language and choose to epenthesize it. The overall proposal of this study puts emphasis on and contributes to the role of frequent patterns and the robustness of analogy in determining the quality of the epenthetic consonant [s] in nonstandard Korean.

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Once Again on the Two *-k(-)yer-* in Old Japanese: Distribution, Semantics, Spelling¹

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1 Introduction

It has been repeatedly pointed out in the literature that the Old Japanese (OJ) modal (past) auxiliary (henceforth MP) *-kyer-* has a ‘perfect’ homonym *-k-yer-*, which is a contraction of the auxiliary verb *-ko-* ‘come’ in the infinitive form followed by the stative auxiliary verb *-ar-* (*-ki-ar-* > *-k-yer-*) (Kinoshita et al. 2003: 259; Frellesvig 2010: 75–6; Vovin 2020: 879).² As I have argued elsewhere (Kuznetsov 2021: 282–3), the two entities are in fact different stages of the same grammaticalisation path, with the ‘perfect’ usage diachronically preceding the MP one. An alternative hypothesis derives the MP *-kyer-* from the contraction of the simple past auxiliary *-ki* and the stative *-ar-*. However, this etymology appears unlikely for several reasons.

¹ I would like to thank the participants of the 29th Conference on Japanese/Korean linguistics as well as the 162nd Meeting of the Linguistic Society of Japan for their astute and thought-provoking questions. I also extend my sincere gratitude to Professors Yo Matsumoto, Bjarke Frellesvig, and Syuntaro Tida who have read and commented on the drafts of this article. Last but not least, a big thank you goes to my colleagues at the Institute for Linguistic Studies (Valeria Modina, Dmitry Gerasimov) and Kyoto University (Takamasa Iwasaki) who have advised me on various aspects of this research. Any remaining flaws are, of course, my sole responsibility. I dedicate this paper to the memory of Professor Alexander Vovin, whose work has always inspired me.

² For the first time, this idea was explicitly articulated in Frellesvig (2007: 248–50).

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Firstly, the order in which a tense marker precedes an aspect marker is not attested across languages, since it violates the relevance principle suggested by Bybee (1985). Secondly, the simple past *-ki* functions mainly as the final predication form³ and does not have an attested infinitive form (Vovin 2020: 880; Watanabe 2021: 103). Thirdly, *-kyer-* does not always refer to the past. Finally, Frellesvig (this volume) suggests that the *-ki* element in *-ki-ar-* is of copular origin. As for the semantics of the MP *-kyer-*, while there have been countless (and often controversial) suggestions, Frellesvig (2010: 76–8) has demonstrated that its main function is the expression of speaker commitment (‘I tell you’), often, though not necessarily, with reference to a past event.

Frellesvig argues that only the MP *-kyer-*, and not the ‘perfect’ *-k-yer-*, can combine with the perfective auxiliary *-t(e)-* ~ *-n-*, since ‘stative (*-yer-*) and perfective are paradigmatically opposed and do not combine’ (2010: 75–6). In this study, I examine how the two *-k(-)yer-*⁴ are used in the Man’yōshū. In the following sections, I propose further diagnostic environments where the MP *-kyer-* can be distinguished from the ‘perfect’ *-k-yer-* (Section 2) and vice versa (Section 3). I also demonstrate that what has been previously referred to as the ‘perfect’ *-k-yer-* is actually a cluster of at least three different functions. In Section 4, I argue for a statistically significant correlation between the degree of grammaticalisation of a linguistic unit and the way it is spelt in the Man’yōshū. In Section 5, the results of this research are considered from a typological perspective.

2 Distribution of the Modal (Past) *-kyer-*⁵

2.1 Perfective

Let us first have a closer look at the environments proposed by Frellesvig (2010), i.e. *-n-i-kyer-* and *-te-kyer-*, containing the perfective *-n-* ~ *-t(e)-*.⁶ The problem with this diagnostic test lies in the fact that there was a homonymous *-te(-)* in OJ which functioned as a gerund marker and served both as a subordinate verb form (Frellesvig 2010: 57) as well as to attach some auxiliary verbs including *-ko-* (Inoue 1962: 34–5). Kazuha Watanabe even argues that in OJ, both *-n-* and *-t(e)-* ‘had already lost the function of aspect markers in many contexts and were often used as connective particles’

³ The only exception is *-k-yem-*, where the conclusive form of the simple past *-ki* is followed by the conjunctive *-am-*, i.e. a modal marker, which is allowed by the relevance principle (Bybee 1985).

⁴ The bracketed hyphen in *-k(-)yer-* is used to indicate the ambiguous status of the marker.

⁵ For the examples of the MP *-kyer-* in the diagnostic environments, see Kuznetsov (2021), on which this section is based.

⁶ Here, I do not touch upon the problem of distribution between *-t(e)-* and *-n-*, because it appears irrelevant to the subject of this study (Frellesvig 2010: 67–8; Vovin 2020: 846).

(Watanabe 2021: 117).⁷ If this is correct, there should be no semantic clash between the perfective *-n- ~ -t(e)-* and the stative *-yer-*.

There are three cases of *-te-k(-)yer-* in the Man'yōshū (MYS 7.1132, 12.2855, and 20.4481) and for all of them both the perfective and the gerund interpretation of /te/ seems possible. Thus, *-te-k(-)yer-* in MYS 7.1132 is explicitly analysed as the 'perfect' construction by some authors (Kinoshita et. al 2003: 259), which implies the gerund interpretation of *-te-*. As for the connective *-n(-)i*, Watanabe claims that already in the Man'yōshū it expressed purposive semantics (Watanabe 2021: 117). This kind of analysis does not seem impossible for *-n(-)i(-)kyer-* in songs MYS 3.267, 14.3393, and 17.3892. With these six examples of *-te(-)k(-)yer-* and *-n(-)i(-)k(-)yer-* classified as ambiguous, the ultimate number of tokens which should be interpreted as *-n-i-kyer-* (PERF-INF-MP) amounts to 232. This constitutes 56 per cent (232/415) of all instances of *-k(-)yer-* in the Man'yōshū.

2.2 Statives

Another set of items that I consider incompatible with the 'perfect' *-k-yer-* are *-te ar-*, *-tar-*, and *-yer-*. All of them are analysed as statives by Frellesvig (2010: 68–9), with *-yer-* described as 'morphological' and *-te ar-/tar-* as 'periphrastic'. Vovin (2020: 793–803) convincingly demonstrates that *-yer-* can express either progressive or perfective⁸ semantics. The combination of these items with the 'perfect' *-k-yer-* would be redundant because in this case the stative *-yer-*, already contained in *-k-yer-*, would be unnecessarily duplicated. The same applies to the analytic form of the adjectival copula *-kar-* which is derived from the combination of the adjectival copula *-ku* and the stative auxiliary verb *ar-* (*-ku ar- > -kar-*).

A related question is whether the 'perfect' *-k-yer-* could be compatible with the lexical verb *ar-*. There are forty-eight tokens of *ar-i-k(-)yer-* in the Man'yōshū. At first sight, the combination of a stative verb with a stative auxiliary appears semantically redundant⁹, but we should not ignore the role

⁷ Watanabe appears to believe that the infinitives of the perfective *-n- ~ -t(e)-* are the grammaticalisation sources for the connective *-ni* and the gerund *-te(-)*, respectively. Conversely, Frellesvig (2001: 13–7) suggests that the latter two developed from proto-Japanese alternating copula roots **n-* and **t-*, respectively. Whichever view we adopt concerning the etymology of the gerund *-te(-)* and the connective *-ni* the fact remains that they coexisted with the infinitive forms of the perfective.

⁸ Here this function of *-yer-* is referred to as 'resultative/perfect' to avoid connotations with the term 'perfective' as it is understood in Comrie (1976: 21–4).

⁹ Cf., however, the English present perfect construction *I have had a lot of work this week*, where the stative verb combines with the etymologically related stative operator (Dmitry Gerasimov: p.c.). This being said, in OJ, *-yer-* is never formed on the inherently stative *r-*-irregular verbs to which *ar-* belongs (Frellesvig 2010: 68).

of the auxiliary verb *-ko-*, which functioned as a telic modifier.¹⁰ However, there are no instances of *ar-i-ko-* in the Man'yōshū, which strongly suggests that all the forty-eight tokens of *ar-i-k(-)yer-* mentioned above are indeed cases of the MP *-kyer-*.

2.3 Auxiliary Verbs of Translocative Motion

Another set of markers that, in my view, only allow for the MP interpretation of *-kyer-* are the auxiliary verbs of translocative motion *-yuk-* 'go' and *-in-* 'leave'. They specify spatial or temporal deixis of an action expressed by the main verb in such a way that the subject becomes ever more distant from the deictic centre in space or time. By contrast, *-ko-* denotes that the subject approaches the deictic centre in space or time. The reason why *-yuk-* and *-in-* should only allow for the MP interpretation of *-k(-)yer-* is because two auxiliary verbs with opposing deictic properties cannot combine within the same verb. As far as the Man'yōshū is concerned, *-yuk-* and *-in-*, when combined with *-kyer-*, are only used in their spatial function (see MYS 9.1809 for *-yuk-i-kyer-* and MYS 16.3815 for *-in-i-kyer-*¹¹).

2.4 Negative

There are no phonographic attestations of the stative *-yer-* being either preceded or followed by the negative *-(a)n-* ~ *-(a)z-* (or its analytic forms¹²) in the Man'yōshū. The question arises as to how such incompatibility could be accounted for in functional terms. Frellesvig (2010: 65) suggests that this opposition, at least diachronically, is a 'secondary one', probably assuming that the primary opposition is with the perfective, whose main function is 'to *assert* or *affirm* the state of affairs expressed by the verb' (ibid.: 66). While it is true that the perfective does not combine with the negative in OJ, it is not entirely clear how this should have affected *-yer-*, which, in its turn, is opposed to the perfective (ibid.). Furthermore, the opposition between the negative and the stative appears to be even controversial, since negated predicates behave similarly to states (see Kusumoto (2011) for evidence from Contemporary Japanese and English).

¹⁰ Cf. a perfectly grammatical Modern Japanese form *iki-te-k-ite-i-ru* live-CVB-COME-CVB-INCM-PRS 'have/has been living' or, more literally, 'came to have lived', where the incompleted *-i-* roughly corresponds to the OJ stative *-yer-*.

¹¹ This morphemic chain is found in the closing line of the tanka MYS 16.3815: *pi to mot-i-in-i-kyer-i* (man hold-INF-PERF-INF-MP '[another] man has taken [the pearl] away'). Note, however, that this seemingly hypermetrical line could in fact be a way of writing *mot-i-n-i-kyer-*, with the kanji 去 being used as a *kungana* for /ni/ (Bjarke Frellesvig: p.c.).

¹² The analytic form *-zar-* does not combine with *-yer-*, since, apart from being negative, it also etymologically contains the stative *-ar-*, similarly to the periphrastic *-tar-* discussed above.

Whatever the reason may be, the fact remains that *-yer-* does not combine with the negative in OJ. This suggests that *-kyer-az-* and *-(a)z-u-kyer-* should be interpreted as involving the MP *-kyer-* rather than the ‘perfect’ *-k-yer-*.¹³ Another argument in support of this suggestion is the fact that the auxiliary verb *-ko-* can only follow the infinitive form of the main verb, so that TAME and negative markers semantically related to this verb are attached to the auxiliary verb, e.g. *ime-ni mi-ye-ko-n-u* dream-LOC see-PASS-COME-NEG-ADN ‘does not appear in the dream’ (MYS 4.767). This grammaticalisation phenomenon has been described in various terms, including ‘reanalysis’, ‘surrogate conjugation’ or ‘decategorisation’.

3 ‘Perfect’ *-k-yer-*

3.1 Framing Construction

The very idea that the MP *-kyer-* has a ‘perfect’ homonym was inspired by the following example from the Man’yōshū (Frellesvig 2010: 75).

- (1) 神代 欲理 云伝久良久
*kamwiyo ywori ip-i-tute-k-ur-aku*¹⁴
 god.age ABL say-INF-transmit.INF-COME(DUR)-ADN-NML
 ... ‘REPORTED SPEECH’ ...
 等 加多利繼 伊比都賀比計理
to katar-i-tug-i ip-i-tugap-i-k-yer-i
 COMP tell-INF-continue-INF say-INF-continue-INF
COME(DUR)-STAT-FIN

‘It has been recounted down through time since the age of the gods that ... [thus] has it been passed on and recounted.’ (MYS 5.894)

(1) is said to be an example of the framing construction where reported speech is sandwiched between a reporting verb in the nominal form and a complementiser followed by the same, or a similar, verb (*ibid.*). This framing construction, which developed under Chinese influence through *kanbun-kun-doku* (*ibid.*: 272–3), is schematically represented in (2).

¹³ The songs containing *-kyer-az-* and *-(a)z-u-kyer-* are MYS 2.221, 5.817, 6.912, 8.1457, and 3.350, 4.589, 4.639, 6.960, 8.1548, 8.1652, 10.2123, 10.2316, 12.3009, 13.3308, 17.3980, 18.4049, respectively.

¹⁴ Frellesvig does not parse the nominal *-aku* forms as ‘not consistently describable by the *ka-tsuyōkei* system’ (2010: 113, 117). Here, I have adopted Vovin’s (2020: 687–8) analysis whereby *-aku* follows the adnominal form of all vowel verbs, e.g. *k-ur-aku* (*ko-*), and the stems of consonant verbs or suffixes, e.g. *-kyer-aku* (*-kyer-*), the latter ‘resulting from the expected loss of the attributive allomorph *-u* used after consonant verbs...’ (*ibid.*): *-kyer-u-aku* > *-kyer-aku*.

- (2) *ip-aku* ... ‘REPORTED SPEECH’ ... *to* *ip-*
 say-NML say-INF-REPORT COMP say-

The reason why *-k-yer-* in (1) is analysed as the ‘perfect’ construction rather than the MP auxiliary is because *-k-ur-aku*, introducing the reported speech, is the nominalised form of the auxiliary verb *-ko-*, and not of the MP *-kyer-*, which would be *-kyer-aku*’ (ibid.).¹⁵ We could assume that this framing construction, *mutatis mutandis*, can also help us separate cases of the MP *-kyer-*.

- (3) 神代欲里 伊比都芸家良久
kamwiywo-ywori ip-i-tug-i-k-yer-aku
 god.age-ABL say-INF-report-INF-COME(DUR)-STAT.NML
 ... ‘REPORTED SPEECH’ ...
 止 可久 佐末爾 伊比家流
to kaku sama n-i ip-i-k-yer-u....
 COMP be.thus way COP-INF say-INF-COME(DUR)-STAT-ADN
 ‘It has been transmitted from the age of deities that ... thus has it been recounted’. (MYS 18.4106)

Note that the lexical environments in (1) and (3) are almost identical, including the postpositional phrase *kamwiywo-ywori* ‘from the age of deities’ as well as the synonymous main verbs *ip-i-tute-* and *ip-i-tug-*, both of which mean ‘to pass on by word of mouth’. The only difference is between *-k-ur-aku* and *-k-yer-aku*. Since the ‘speaker commitment’ interpretation of *-k(-)yer-* in (3) appears somewhat forced, one should conclude that there is no semantic difference between *-k-ur-aku* and *-k-yer-aku* in these examples with both forms expressing durative semantics (see Section 3). This assumption is corroborated by Vovin (2016: 113) and most Japanese commentators (Omodaka 1984: 121, Yoshii 1988: 175, among others). It is also worth noting that, according to the periodisation given in Vovin (2009: 6–10), there is a chronological gap between (1) (Book 5, 724–733 AD) and (3) (Book 18, 748–750 AD). However, this variation might also be due to the fact that the two books were probably compiled by different authors: Yamanoue-no Okura (Book 5) and Otomo-no Yakamochi (Book 18) (ibid.).

¹⁵ There is another example of this construction in the *Senmyō* (SM 17.13). Here, unlike in (1), both *-k-ur-aku* and *-kyer-u* are spelt logo-phonographically as 来久 and 来流, respectively. Thus, in this case, the interpretation of 来久 as *-k-ur-aku* is no more than a philological convention, because we cannot rule out the possibility that 来久 represents *-k-yer-aku*.

3.2 Functions of *-k-yer-*

There are 415 instances¹⁶ of *-k(-)yer-* in the Man'yōshū, 327 (79 per cent) of them being found in the diagnostic environments which support the MP interpretation. Since the only diagnostic environment for the 'perfect' *-k-yer-* is the framing construction of reported speech, of which there are but 2 examples, cited in (1) and (3), this leaves us with 86 instances of *-k(-)yer-*, which, technically speaking, can be understood both ways. Therefore, the interpretation of *-k(-)yer-* as 'perfect' can only be based on semantic analysis rather than formal criteria. In order to fully grasp the meaning of the 'perfect' *-k-yer-* one should consider the functions the auxiliary verb *-ko-* fulfils in the Man'yōshū. According to Inoue (1962: 32), these are the following: I. Change is gradually gaining momentum (durative); II. A situation emerges (occurrence); III. A situation has been continuously developing (durative);¹⁷ IV. Motion preceded by an action (spatial deixis); V. Motion accompanied by an action (spatial deixis).¹⁸

Due to their semantic similarity, in my study, Inoue's functions I and III as well as IV and V are subsumed under the terms 'durative' and 'spatial deixis', respectively. With this classification in mind, I suggest that what has been previously referred to as the 'perfect' *-k-yer-* is actually a cluster of at least three different functions. To support this argument, I compare the examples of *-ko-* cited by Inoue (1962), on the one hand, and the songs in which *-k(-)yer-* follows the same verbs as *-ko-*, on the other. Whenever possible, I rely on the songs where both *-ko-* and *-k-yer-* are spelt phonographically to exclude the possibility of wrong philological (*kundoku*) interpretation. Thus, the interpretation of *-k(-)yer-* as the combination of the auxiliary verb *-ko-* and the stative *-yer-* is based on two criteria: 1) there must be an analogous example of the identical main verb followed by the auxiliary verb *-ko-* (cited via *cf.* in Tables 1a, 1b); 2) the example must allow for progressive and/or resultative interpretation of *-yer-*. The examples which only meet the second condition are classified as ambiguous¹⁹, while those which do not are classified as MP, even if they meet the first condition. There are

¹⁶ This includes the suppositional form *-kyer-ashi* which is sometimes treated as one unit, e.g. in the Corpus of Historical Japanese (National Institute for Japanese Language and Linguistics 2020). Note, however, that *k-yer-*, the stative form of the lexical verb *ko-*, is not counted here.

¹⁷ This function is also known by other names including *moving-world metaphor* (Hasegawa 1993: 59–61), *deictic time relation*, *continuation of process*. In Japanese, it is called *keizoku-sō*.

¹⁸ It should be noted that Inoue (1962) analyses functions of two auxiliary verbs, *-ko-* and *-yuk-*, so this classification is applicable to both of them. The translation and the short terms in the brackets are mine.

¹⁹ Note, that MYS 3.267, 7.1132, 12.2855, 14.3393, 17.3892, 20.4481 discussed in Section 2.1 are not mentioned in Tables 1a, 1b, since these instances of *-k(-)yer-* can only be analysed as the stative form of the lexical (*ko-*), but not the auxiliary verb (*-ko-*).

also several cases when an example meets both conditions but is still classified as ambiguous for other reasons. Thus, despite the availability of analogous examples, it is hard to interpret *-k(-)yer-* in MYS 7.1131 and 10.2161 as unambiguously ‘perfect’, because the relevant lines in these songs are extremely reminiscent of those in MYS 3.310, which unambiguously contains the MP *-kyer-*. The same point can be made for 16.3820, where *-kyer-* follows a different verb. If a song contains more than one instance of *-k(-)yer-* the verb form in question is indicated in brackets. Functions of the potentially analytic *-k-yer-* in the ambiguous category are indicated in brackets: d – durative, s – spatial deixis.

Modal (Past)	Occurrence	Spatial Deixis	Durative	Ambiguous
2.216	4.633	3.260	3.439 ²⁰	1.29 (d)
4.650	<i>cf.12.3128</i>	<i>cf.15.3646</i>	<i>cf.15.3761</i>	3.259 (d)
5.814	11.2754	3.383	6.1065	3.308
5.873	<i>id.</i>	<i>cf.2.213</i>	<i>cf.19.4147</i>	(<i>sum-</i>) (d)
6.977	12.2956	10.2111	7.1261 ²¹	3.476 (d)
6.1050	<i>id.</i>	<i>cf.8.1589</i>	(<i>wasure-</i>)	4.753 (d)
6.1051		13.3224	<i>cf.14.3362</i>	4.773 (d)
19.4211		<i>id.</i>	7.1261 (<i>nar-</i>)	6.907 (d)
19.4212		16.3791	<i>cf.15.3761</i>	6.1028 (d)
		<i>cf.20.4339</i>	9.1707 (<i>tir-</i>)	7.1131 (s)
			<i>cf.10.2325</i>	<i>cf.15.3608</i>
			9.1807	7.1270 (d)
			<i>cf.6.1034</i>	8.1430 (d)
			11.2415	9.1739 (s)
			<i>cf.10.2089</i>	10.2095 (d)
			13.3255	10.2161 (s)
			<i>cf.5.894</i>	<i>cf.11.2805</i>
			19.4160 (<i>tir-</i>)	11.2567 (d)
			<i>cf.10.2325</i>	13.3290 (d)
				16.3820 (s)
				<i>cf.17.3994</i>
				18.4111 (d)

Table 1a. Functions of *-k(-)yer-* beyond the diagnostic environments (logographic)

²⁰ In MYS 3.439, *-k-yer-* seems to be an example of the ‘moving-time metaphor’ (Hasegawa 1993: 61). MYS 15.3761 is classified as function I by Inoue (1962).

²¹ Both *wasure-k-yer-* and *nar-i-k-yer-* in 7.1261 could also be interpreted as instances of Inoue’s function I (Change is gradually gaining momentum).

Modal (Past)	Occurrence	Spatial Deixis	Durative	Ambiguous	
3.307	1.25 (2)	4.582	5.894	2.118 (s)	
8.1444	<i>cf.8.1647</i>	<i>cf.15.3608</i>	<i>cf.5.894</i>	3.442 (d)	
9.1740 <i>ip- cf.6.1034</i>	3.317 <i>id.</i>	7.1237 <i>cf.17.3994</i>	7.1261 <i>cf.14.3362</i>	4.507 (d)	
9.1740 (<i>sin-</i>)	3.318 <i>id.</i>	15.3772 <i>cf.15.3702</i>	11.2637 <i>cf.10.2089</i>	6.1061 (d)	
18.4078	3.320 <i>id.</i>	17.3977 (<i>kwopwi-</i>) <i>id.</i>	15.3695 <i>cf.6.1034</i>	9.1809 (s)	
				10.2104 (d)	
				10.2153 (d)	
				18.4094 (d)	
		4.724 <i>cf.12.3128</i>	17.3943 <i>cf.8.1589</i>	18.4106 (2) <i>cf.id. or 5.894</i>	18.4098 (d)
					19.4160 (d)
					(<i>mitikake-</i>)
					19.4211 (s)
	17.3977 (<i>mi-ye-</i>) <i>id.</i>	17.4023 <i>cf.20.4408</i>	19.4256 <i>cf.13.3324</i> or <i>20.4465</i>	20.4360 (s)	
				(<i>-tur-</i>)	
	17.3981 <i>id.</i>	20.4456 <i>cf.20.4471</i>		20.4360 (d)	
				(<i>pazime-</i>)	
				20.4465 (d)	
				20.4482 (d)	

Table 1b. Functions of *-k(-)yer-* beyond the diagnostic environments (phonographic)

Since the durative function has already been illustrated by examples (1) and (3), in the sections below I will discuss instances of the remaining two functions (spatial deixis and occurrence) as well as one ambiguous case.

3.2.1 Spatial Deixis

- (4) 静 母 岸 者 波 者 縁家留
siduke-ku mo kwisi-ni pa nami pa yose/ynori-k-yer-u
 quiet-INF TOP shore-DAT TOP wave TOP draw.close.INF-
COME(SD)-STAT-ADN
 香 此 屋 通 聞乍 居者
ka ko-no ipye topos-i kik-i-tutu wor-e-ba
 FOC this-ADN house let.through-INF listen-INF-CONT exist-
EXCL-PRV

‘Although [it] is quiet, the waves [must] be **coming** into the shore, because [I can] hear [them] through [the walls of] this house.’ (MYS 7.1237)

Even though there is some disagreement among commentators as to the exact reading of the main verb to which *-k-yer-* is attached in (4), this example is remarkably similar to MYS 17.3994, where the auxiliary verb *-ko-* follows *yose-*. Therefore, I suggest that *-k-yer-u* in (4) is the stative (progressive in function) form of the auxiliary verb *-ko-*. This interpretation is also corroborated by Tsuchiya (1976: 106-7). Indeed, the MP *-kyer-* would hardly fit into this context semantically: the ‘speaker commitment’ reading of *-k(-)yer-* is quite improbable since the relevant sentence is modified by the interrogative particle *ka*, which is considered to express ‘doubted identity’ (Frellesvig 2010: 252).²² There are other examples of motion verbs followed by *-k(-)yer-*, which some commentators interpret as the stative form of the auxiliary verb *-ko-*: a) phonographic MYS 15.3772, 17.3943, 20.4482; b) logographic 3.383, 6.1028, 8.1430, 10.2111, 13.3224 (Kinoshita et al. 2003: 259).

3.2.2 Occurrence

- (5) 安之 比奇 能 夜麻伎 敞奈里低
asi pikwi n-o yamaki pyenar-i-te
 foot low COP-ADN mountain be.separated-INF-CVB
 等保家騰母 許己呂 之 遊氣婆 伊米爾
topo-kye-domo kokoro si yuk-e-ba ime-ni
 be.far-EXCL-CONC heart RP go-EXCL-PRV dream-LOC
 美要家里
mi-ye-k-yer-i
 see-PASS-COME.OCC-STAT-FIN

‘Although [you] are far away, separated [from me] by mountains with low feet, [you] are appearing (lit. “coming up”) in [my] dreams, because [my] heart goes out [to you].’ (MYS 17.3981)

There are two songs in the Man’yōshū, where the line *ime-ni mi-ye-ko-* with the auxiliary verb *-ko-* can be found: MYS 4.767, 12.3128 (both logographic). Unlike in (4), interpretation of *-k(-)yer-* in (5) as the MP marker is not impossible in terms of modality. However, there is an extralinguistic argument in favour of the alternative interpretation. If we assume that *mi-ye-k-yer-* does contain the auxiliary verb *-ko-*, then we can observe a metaphorical contrast with the verb *yuk-*, appearing in the penultimate line: ‘because my heart goes out to you, you “come up” in my dreams’.

There is also a similar, if somewhat more problematic, example of this function.

²² There is only one song in the entire Man’yōshū (6.1059) where an unambiguously MP case of *-kyer-* (attached to the stative verb *ar-*) is followed by the interrogative particle *ka*.

(6) 幾許		思異目		鴨
<i>kokodaku</i>	<i>n-i</i>	<i>omop-i-k-yem-e</i>		<i>ka mo</i>
this.much	COP-INF	long.for-INF-PST-CJR-EXCL	FOC	TOP
敷細	之	枕	片去	
<i>sikitape</i>	<i>n-o</i>	<i>makura</i>	<i>katasar-u</i>	
bed.cloth	COP-ADN	pillow	approach.from.the.side-ADN	
夢所		見来[之]		
<i>ime-ni</i>		<i>mi-ye-k-yer-u</i> / <i>mi-ye-ko-shi</i>		
dream-LOC		see-PASS- COME(OCC)-STAT-ADN /		
see-PASS-COME(OCC)-PST.ADN				

‘Is it [because I] have been longing [for you] so much, [that you] are appearing/have appeared (lit. “**coming up**”) in [my] dream, [while I was sleeping] on [my] side of the pillow.’ (MYS 4.633)

It is not clear how the character 来 in the final line should be interpreted. *Kundoku* suggested by different commentators include *mi-ye-ko-shi*, *mi-ye-kur-u*, and *mi-ye-kyer-u* (Omodaka 1983: 371–2). The situation is further complicated by the fact that the character 之 is absent in the *Genryaku kōhon*, the oldest edition of the anthology, but is present in all subsequent editions (Kinoshita 1988: 264). Presuming that 来 conveys *-k(-)yer-*, it is possible that the appearance of 之 in later editions had to do with the grammaticalisation of the marker: as the ‘perfect’ *-k-yer-* developed the MP function, it began to be spelt with 之, which was also often used for the regular past marker *-ki*.

3.2.3 Ambiguous Cases

It has to be admitted that in certain cases it is impossible to determine which function of *-k(-)yer-* we are dealing with.

(7) 安麻	乎夫祢	波良々	尔	宇伎弓
<i>ama</i>	<i>wo-bune</i>	<i>parara</i>	<i>n-i</i>	<i>uk-i-te</i>
fisherman	DIM-boat	scattered	COP-INF	float-INF-GER
於保	美氣	尔	都加倍麻都流	等
<i>opo</i>	<i>mi-ke</i>	<i>n-i</i>	<i>tukape-matur-u</i>	<i>to</i>
great	HON-food	COP-INF	offer.INF-HUM-FIN	COP
乎知許知尔	伊射里	都利家理		
<i>woti-koti-ni</i>	<i>izar-i</i>	<i>tur-i-k(-)yer-i</i>		
there-here-LOC	angle-INF	fish-INF-(COME(SD)-STAT)/MP-FIN		

‘... small boats [of] fishermen are floating everywhere. Having angled here and there, having caught [fish], they are **coming** [to the Palace in Nanipa] in order to offer [fish] as Imperial food.’ (MYS 20.4360)

In the translation by Vovin *-k(-)yer-* is rendered as ‘it turns out that’, since ‘[t]he retrospective auxiliary *-kêr-* (in this paper *-kyer-*) in line forty-eight indicates not the recollection of a past event, but the sudden realization of a fact’ (2014: 112–6). By contrast, Kinoshita interprets this passage in the following way:

Here, *-k-yer-* not only describes an immediate event in a mirative manner but, similarly to the *-kyer-* in MYS 9.1707, is also used as an expression of a **durative** action, which has been recurring over and over from time immemorial. (1988: 132)

Omodaka’s translation into Modern Japanese suggests a progressive interpretation of *-k(-)yer-*: *achikochi-ni isari-o sh-ite tsut-te-i-ru* (Omodaka 1984: 89). In my view, here we are dealing with the analytic construction, where the auxiliary verb *-ko-* expresses spatial deixis: ‘fishermen, having angled here and there, are coming [to the Palace in Nanipa]’. This interpretation is supported by the shift of the deictic centre to the Nanipa Palace in the following lines. However, since there are no attestations of *tur-i-ko-* in the Man’yōshū (or other OJ texts), this example is classified as an ambiguous one.

Generally speaking, the abundance of ambiguous cases supports the argument that the ‘perfect’ *-k-yer-* was indeed the source of grammaticalisation for the MP *-kyer-*: as is well known, ambiguity (or ‘opacity’), wherein an old analysis ‘coexists’ with a new one, is quite typical of grammaticalisation paths involving reanalysis of a construction (Hopper & Traugott 2003: 52).

4 Spelling

There are two modes of writing used in the Man’yōshū: a logographic (semantographic) and a phonographic one. While the former employed the semantic value of Chinese characters, the latter, widely known as *man’yōgana*, allowed to spell an OJ syllable with a number of characters whose Early Middle Chinese (*ongana*) or native (*kungana*) pronunciation was homophonous to the OJ pronunciation of this syllable.

As I suggested earlier (Kuznetsov 2021: 287–8), it seems that in its less grammaticalised uses, i.e. as the lexical or the auxiliary verb, *(-)ko-* tends to be spelt logographically, whereas in its more grammaticalised uses, i.e. within the ‘perfect’ construction or the MP auxiliary, it is more often written phonographically. However, in my previous work, spellings of the MP *-kyer-* were compared to those of the verb *(-)ko-* (without distinguishing between its lexical and auxiliary variants), which could not count as direct evidence in favour of the suggested hypothesis.²³ In the present study, apart

²³ I would like to thank an anonymous reviewer for pointing this out.

from analysing lexical and auxiliary variants of (-)ko- separately, I also supplemented the data with the thirty-nine examples (see Tables 1a and 1b) likely to contain the analytic construction -k-*yer-*. The results are shown in Table 2.

	Phonographic		Logographic	
	Lexical verb <i>ko-</i>	88 (24%)	209 (29%)	280 (76%)
Auxiliary verb - <i>ko-</i> ²⁴	121 (34%)		236 (66%)	
‘Perfect’ construction - <i>k-yer-</i>	21 (54%)		18 (46%)	
MP auxiliary - <i>kyer-</i>	204 (74%)		73 (26%)	

Table 2. Spellings of *ko-*, -*ko-*, -*k-yer-* and -*kyer-*

Overall, the hypothesis described above appears to be correct: the further we go down the grammaticalisation path, the more apparent the tendency for phonographic spelling becomes. Pearson’s χ^2 test (with a residual analysis) has proved the differences between these units statistically significant: χ^2 (3, N = 1041) = 175.5, $p < .001$ (lexical *ko-* and auxiliary -*ko-* differentiated); χ^2 (2, N = 1041) = 168.07, $p < 0.001$ (lexical *ko-* and auxiliary -*ko-* combined).

It also turns out that the same point can be made for other cases of grammaticalisation. In particular, the hypothesis holds for such pairs as the lexical/auxiliary verb (-)*ar-* vs the stative suffix -*yer-* as well as the lexical/auxiliary verbs (-)*in-* vs the perfective suffix -*n-*, which is commonly believed to have grammaticalised from the former (Watanabe 2021: 107). All the differences discussed below are statistically significant.

	Phonographic		Logographic	
	Lexical verb <i>ar-</i>	284 (43%)	363 (37%)	378 (57%)
Auxiliary verb - <i>ar-</i>	79 (25%)		235 (75%)	
Stative auxiliary - <i>yer-</i>	338 (61%)		213 (39%)	

Table 3. Spellings of *ar-*, -*ar-*, and -*yer-*

Thus, the verb (-)*ar-* in its lexical and auxiliary variants tends to be spelt logographically, while for the stative marker -*yer-* phonographic spelling prevails. Contrary to the expectation, logographic spelling is more characteristic for the auxiliary verb -*ar-* (which includes V.INF-*ar-*, -*te-ar-*, -(a)z-*u-ar-*, -*ku-*[*mo*]-*ar-*, and -*tutu-*[*mo/pa/ya*]-*ar-*) rather than for the lexical verb *ar-*. This might indicate that some of these combinations are in fact biclausal constructions containing the lexical verb (e.g. V.INF *ar-* or -*te ar-*) (see also Section 2.1). In any event, the fact remains

²⁴ This includes both V.INF-*ko-* and V-*te-ko-*. It should be noticed, however, that some of these might actually be biclausal constructions containing the lexical verb: V.INF *ko-* and -*te ko-*. The same applies to the supposedly auxiliary verbs -*ar-* and -*in-* in Tables 3 and 4, respectively.

that (-)ar- (if we treat the lexical and auxiliary variants collectively) is spelt logographically significantly more often than the stative -yer-. As for the spellings of the lexical/auxiliary verb (-)in- vs the perfective suffix -n- (Table 4), the distribution is more reminiscent of the one we have seen in Table 2.

	Phonographic		Logographic	
Lexical verb <i>in-</i>	3 (20%)	24	12 (80%)	22
Auxiliary verb <i>-in-</i>	21 (68%)	(52%)	10 (32%)	(48%)
Perfective auxiliary <i>-n-</i>	854 (89%)		107 (11%)	

Table 4. Spellings of *in-*, *-in-*, and *-n-*

It should be admitted, however, that the Man'yōshū is rather heterogenic when it comes to modes of inscription, with some books written mostly phonographically and others mostly logographically. Therefore, the same unit, no matter how (under)grammaticalised it is, can be spelt differently from book to book. Nevertheless, the statistical correlation between the degree of grammaticalisation and the mode of writing is too strong to be attributed to a sheer coincidence.

5 Conclusion

From a typological perspective, the diachronic development of *-k(-)yer-* (resultative/perfect > modal past) is anything but rare. Similar grammaticalisation paths can be easily found in other languages. The most well-known cases are resultative/perfect constructions developing a past tense function in colloquial German and Romance languages. An even more similar case has been attested in Atchin where a verb meaning 'come' developed into a past tense marker via a perfect one (Bybee et al. 1994: 56, 82, 86). The fact that the 'perfect' functions of *-kyer-* continued to coexist with the newly developed modal one is in full accordance with the layering principle of grammaticalisation (Hopper & Traugott 2003: 124-6).

Abbreviations

ABL — ablative; ADN — adnominal; CNJ — conjectural; COME — venitive; COMP — complementiser; CONC — concessive; CONT — continuative; COP — copula; CVB — converb; DAT — dative; DIM — diminutive; DUR — durative; EXCL — exclamatory; FIN — conclusive; FOC — focus; GEN — genitive; GER — gerund; HON — honorific; HUM — humble; INCM — incomplete; INF — infinitive (*renyōkei*); LOC — locative; MP — modal past; MYS — Man'yōshū; NEG — negative; NML — nominaliser; OCC — occurrence; OJ — Old Japanese; PASS — passive; PERF — perfective; PRV — provisional; PRES — presumptive; PRS — present; PST — past; RP — restrictive particle; SD — spatial deixis; SM — Senmyō; STAT — stative; TOP — topic.

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Structural Restrictions on Sequential Voicing in Japanese N-V Compounds

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1 N-V Compounds and Sequential Voicing

This paper focuses mainly on N-V compounds in Japanese. Examples of Japanese N-V compounds are given in (1).

- (1) a. *Taro-ga mado-huki-o sita.*
Taro-NOM window-wipe-ACC did
'Taro did a window wiping.' [N_{argument}-V]
- b. *Taro-ga mizu-buki-o sita.*
Taro-NOM water-wipe-ACC did
'Taro did wiping with a damp cloth.' [N_{adjunct}-V]

As shown in (1), Japanese N-V compounds consist of a dependent noun stem (*mado*, *mizu*) and a verb stem that appears in its conjunctive form (*huki*, *buki*).

1.1 The Argument-adjunct Asymmetry in N-V Compounds

It has been observed that Japanese N-V compounds behave differently depending on types of noun stems (Okumura 1955, Kindaichi 1976, Sugioka 2002). In (1a) above, the noun stem is interpreted as an internal argument of the verb stem. In (1b), the noun stem is interpreted as an adjunct of the verb stem. What is important is that only in (1b), the first consonant of the verb

stem (*huki*) is voiced, as a result of sequential voicing (a.k.a *Rendaku*).

In (1a), the N-V compound containing an argument noun stem does not exhibit sequential voicing. However, this does not mean that $N_{\text{argument}}\text{-V}$ compounds always resist sequential voicing. As shown in (2), some $N_{\text{argument}}\text{-V}$ compounds allow sequence voicing (Kindaichi 1976).

- (2) $N_{\text{argument}}\text{-V}$ compounds with sequential voicing
- a. *atena-gaki* ‘address-write’ (*kaki - gaki*)
 - b. *inochi-goï* ‘life-ask’ (*koi - goï*)
 - c. *garasu-bari* ‘glass-cover’ (*hari - bari*)
 - d. *kuzi-biki* ‘lot-pull’ (*hiki - biki*)

Recently, Sato & Yokozawa (2018) report that they do not find any significant bias in $N_{\text{argument}}\text{-V}$ compounds regarding sequential voicing. The result of their survey is summarized in (3).

- (3) Sato & Yokozawa (2018): *Rendaku*-database
- a. N-V (N = Obj, Y = Voiced): 246/511 (48%)
X = kango:61, wago:180, gairaigo:2, wago/kango:3
 - b. N-V (N = Obj, Y = Voiceless): 261/511 (51%)
X = kango:58, wago:201, gairaigo:1, wago/kango:1
 - c. N-V (N = Obj, Y = Voiced or Voiceless): 4/511 (1%)
X = wago:2, kango:2

In contrast, $N_{\text{adjunct}}\text{-V}$ compounds generally show sequential voicing, with some few exceptions.¹ Following the previous studies, I assume that the pattern I in (4) is a property of Japanese N-V compounds.

¹ At first glance, it appears that there is a certain amount of $N_{\text{adjunct}}\text{-V}$ compounds without sequential voicing in Sato & Yokozawa’s database. The relevant data are given in (i).

- (i) Sato & Yokozawa (2018): *Rendaku*-database
- a. X+Y (X = non-Obj, Y = Voiced): 727/1067 (68%)
 - b. X+Y (X = non-Obj, Y = Voiceless): 326/1067 (31%)
 - c. X+Y (X = non-Obj, Voiced or Voiceless): 14/1067 (1%)

However, careful examination of the data shows that $N_{\text{adjunct}}\text{-V}$ compounds in (ib) include a significant number of *rendaku* immune elements like the numeral ‘one’. The fact that numerals generally block sequential voicing is observed by Nakagawa (1966). See Irwin (2012) for a recent study of these elements. Moreover, the database only distinguishes object noun stems from non-object ones. This means that (ib) contains N-V compounds where a noun stem functions as an argument of ergative/unaccusative verbs (e.g. *ame-huri* ‘rain-fall = raining’). Given these considerations, I assume (4) is still a correct description of N-V compounds.

(4) Property I

$N_{\text{adjunct}}\text{-V}$ compounds generally allow sequential voicing, whereas $N_{\text{argument}}\text{-V}$ compounds disallow sequence voicing in some cases.

There are several attempts to explain the property in (4). For example, Sugioka (1984) assumes that sequential voicing is a way of marking the head of a complex word. When a given N-V compound does not have an argument-predicate relation (e.g. $N_{\text{adjunct}}\text{-compound}$), it is not clear which is the head of the compound. In this case, sequential voicing is required to mark the head. Sugioka's analysis may be on the right track descriptively. However, we still need another analysis because $N_{\text{argument}}\text{-V}$ compounds do allow sequential voicing in a significant number of cases. Sugioka's headedness approach does not predict the property in (4).

1.2 The Verbal Use of N-V Compounds

We have seen that the argument-adjunct distinction affects the availability of sequential voicing in N-V compounds. Importantly, the availability of sequential voicing is an indicator of another property of N-V compounds. As shown in (5b) and (6b), some N-V compounds can be used as a verb followed by a tense morpheme.

- (5) a. *ne-biki* b. *ne-bik-u*
price-pull price-pull-PRES
'a discount' 'to discount' [$N_{\text{argument}}\text{-V}$]

- (6) a. *kara-buri* b. *kara-bur-u*
empty-swing empty-swing-PRES
'a swing and a miss' 'to get struck out swinging' [$N_{\text{adjunct}}\text{-V}$]

What is important is that there is a strong connection between the availability of sequential voicing and the verbal use of N-V compounds. My observation is given in (7).

(7) Property II

$N\text{-V}$ compounds without sequential voicing cannot be used as a verb.

I found that all the N-V compounds without sequential voicing in Sato & Yokozawa's database disallow the verbal use.² This indicates that (7) is strikingly robust. There is another piece of evidence for the property in (7). As shown in (8), the N-V compound containing *toru* 'take' optionality shows sequential voicing. However, only the compound with sequential voicing can be used as a verb, as in (9b). The contrast in (9) supports the property in (7).

²Note that there are 587 N-V compounds lacking sequential voicing in their database.

- (8) a. *zin-dori* ‘spot + take= encamping’
 b. *zin-tori* ‘spot + take = encamping’
- (9) a. *zin-dor-u* ‘spot + take-PRES = to encamp’
 b. **zin-tor-u* ‘spot + take-PRES = to encamp’

There are caveats about the property in (7). Firstly, it should be noted that the property in (7) only holds for N-V compounds. Other compounds in Japanese can be used as a verb even when they do not exhibit sequential voicing. For instance, there are V-V compounds that function as a verb but do not show sequential voicing, as shown in (10).

- (10) a. *si-harai* ‘do-pay = payment’
si-harau ‘do-pay = to pay’
- b. *mi-hari* ‘see-spread = a watch’
mi-haru ‘see-spread = to watch’
- c. *tobi-tati* ‘fly-stand = flying away’
tobi-tatsu ‘fly-stand = to fly away’

The contrast between N-V and V-V compounds in this respect does not depend on types of verb stems. As shown in (11), the same verb stem behaves differently in N-V and V-V compounds.³

- (11) a. V-V compounds as V
ikiri-tatu ‘get angry’, *uki-tatu* ‘cheer up’, *omoi-tatu* ‘come to mind’,
ori-tatu ‘get down’, *kiri-tatu* ‘precipitous’, *sosori-tatu* ‘rise’, *ture-*
datu ‘go together’, *nari-tatu* ‘hold up’, *moe-tatu* ‘flare up’, *waki-*
tatu ‘boil up’
- b. N-V compounds as V
awa-datu ‘foam’, *ukiasi-datu* ‘be upset’, *omote-datu* ‘become
 known’, *kiwa-datu* ‘stand out’, *keba-datu* ‘become fluffy’, *saki-*
datu ‘precede’, *sakki-datu* ‘seethe’, *su-datu* ‘leave the nest’, *tabi-*
datu ‘leave on a trip’ *tsumasaki-datu* ‘stand on tiptoe’

In (11a), the verb stem *tat-* ‘stand’ occurs in V-V compounds. In this case, the compounds do not exhibit sequential voicing. On the other hand, when the same verb stem occurs in N-V compounds, the verbal use generally involves sequential voicing as in (11b). The contrast in (11) indicates that (7) only holds for N-V compounds.

Secondly, I found two exceptions to (7); *koshi-kake* → *koshi-kakeru* ‘waist-sit = sit down’ and *azi-tuke* → *azi-tsukeru* ‘taste-add = season’. How-

³The examples here are taken from Sugioka (1984).

ever, as discussed by Kageyama (1982) and Sugioka (1984), these exceptions may not count as N-V compounds. In this paper, I assume that the exceptional cases are derived by pseudo noun incorporation observed in some languages such as Hindi, and Niuean. An example from Hindi is given in (12).⁴

(12) Hindi: Dayal (2011: 134)

anu-ne kitaab₁ paRhi. #vo₁ bahut acchii thii.

Anu book read-PFV it very good be-PST

‘Anu book-read (read a book). It was very good.’

In (12), the bare noun *kitaab* ‘book’ undergoes pseudo noun incorporation, and hence cannot be an antecedent of the pronoun *vo* ‘it’ in the second sentence. Following the previous researchers, I suggest that the exceptional N-V verbs are derived by pseudo noun incorporation, as shown in (13).

(13) *isu-ni koshi-o kakeru. ⇒ isu-ni [koshi kakeru].*

chair-to waist sit chair-to waist sit

The N-V verb in (13) then undergoes backformation, yielding the N-V noun *koshi-kake*. So far, I am implicitly assuming that N-V verbs are derived from corresponding N-V nouns, as in (14a). On this view, the property in (7) can be seen as a ban on a particular word formation process; N-V nouns without sequential voicing cannot become N-V verbs. The attested exceptions do not ruin (7) because they are derived in the opposite way as in (14b).

(14) a. N-V nouns \Rightarrow verbalization N-V verbs

b. N-V verbs \Rightarrow backformation N-V nouns

Yo Matsumoto (p.c.) has informed me that some N-V verbs do not have corresponding N-V nouns; *tema-doru* ‘take time’ vs. **tema-dori*, *te-gakeru* ‘deal with’ vs. **te-gake*. This indicates that the backformation process is not so productive in present-day Japanese. Notice that a similar backformation process has been assumed in English N-V compounds (e.g. *baby-sit*, *trouble-shoot*). English N-V compounds are not formed productively, and new ones often sound unnatural. The fact that there are only few exceptions to (7) can be seen as a piece of supporting evidence for the present analysis that they are derived by backformation.⁵

Lastly, it should be noted here that some researchers have assumed that

⁴ See Massam (2001) for a similar construction in Niuean.

⁵ One potential issue is how to determine whether a given N-V noun is derived by backformation or compounding. Given that there is a significant amount of N-V verbs that do not have corresponding N-V nouns, I assume here that (14a) is more productive than (14b). It would be desirable to investigate whether these two derivational patterns yield different properties of N-V compounds. I am indebted to Yo Matsumoto for bringing this issue to my attention.

N-V compounds are lexical words and syntactically opaque. Kageyama (2016) provides the example in (15) to show the lexical integrity of N-V compounds.⁶

- (15) Q. *ki-wa iro-zuki masi-ta ka?*
 tree-TOP color-attach POL-PAST Q
 ‘Have the tree leaves changes colors?’
- A. *hai, iro-zuki masi-ta. A’.*hai, Δ-tuki masi-ta.*
 yes color-attach POL-PAST yes -attach POL-PAST
 ‘Yes, they have.’ ‘Yes, they have.’

(15A) can be used as an answer to the question in (15Q), whereas (15A’), in which the first stem of the compound is missing, is infelicitous in the context. Kageyama (2016) attributes the unacceptability of (15A’) to the Lexical Integrity Hypothesis. He argues that syntactic deletion cannot take place in (15A’) because N-V compounds are lexical words.

The present paper does not argue against the assumption that N-V compounds are lexical words. I will argue instead that N-V compounds still have internal hierarchical structures that can affect their morphophonological properties. Specifically, I will propose in the next section that sequential voicing is blocked when a noun stem is generated in a position remote from a verb stem. Moreover, I will show that the proposed structural constraint on sequential voicing has other consequences for morphophonological behaviors of N-V compounds.

2 Proposal

In the previous section, I pointed out the following two peculiarities of Japanese N-V compounds in connection to sequential voicing.

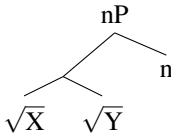
- (16) Property I
 N_{adjunct}-V compounds generally allow sequential voicing, whereas
 N_{argument}-V compounds disallow sequence voicing in some cases.

- (17) Property II
 N-V compounds without sequential voicing cannot be used as a verb.

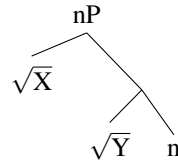
I argue that (16) and (17) can be explained by different internal structures of N-V compounds. I propose that there are two positions for a noun stem in N-V compounds, as shown in (18). (See Tatsumi (2016), Hasegawa & Oseki (2020), Nishiyama & Nagano (2020) for similar analysis of N-V compounds.)

⁶In (15), Δ stands for the deleted part of the compound.

(18) a.



b.



Adopting the framework of Distributed Morphology (Halle & Marantz 1993 and subsequent work), I take roots as bare lexical elements. In (18a), the root X occurs in the local position of the root Y, yielding a root compound. I propose that N-V compounds with sequential voicing have the structure in (18a). In (18b), on the other hand, the root Y combines with a nominalizer, and the dependent root X occurs in the non-local position of Y.

I assume that N-V compounds without sequential voicing have the structure in (18a) or (18b). However, when N-V compounds have the non-local structure in (18b), they cannot exhibit sequential voicing. Following Arad (2003), I assume that the nominalizer is a phase head. In (18b), X and Y are separated by an intervening phase head. Because of the intervening phrase head, there is no local compound that can be a target of sequence voicing in (18b), and hence sequential voicing cannot take place.

The pattern in (16) can be captured by assuming that adjuncts are base-generated in the local position of the verb stem, while arguments can appear either in the local position or in the non-local position. The (im)possible patterns are summarized in (19).

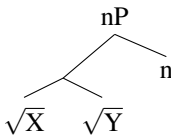
(19) a. $N_{\text{adjunct}}\text{-V}$ compounds: $^{\text{OK}}(18a)$, $^{*}(18b)$

b. $N_{\text{argument}}\text{-V}$ compounds: $^{\text{OK}}(18a)$, $^{\text{OK}}(18b)$

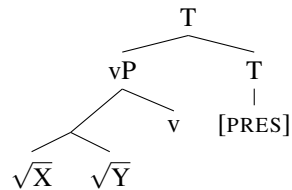
The proposed analysis is in accordance with the recent development of the constructivist approach to argument structure (Hake & Keyser 1993, Pylkkänen 2008, Marantz 2013). Under the constructivist approach, arguments are introduced by particular syntactic heads, and not always appear structurally close to a root. Given the constructivist tradition, it is not unreasonable to assume that $N_{\text{argument}}\text{-V}$ compounds have the structure in (18b).

The proposed analysis can also account for the pattern in (17). Under the current analysis, there are two structural sources of N-V compounds as in (18). The root compound in (18a) can be verbalized as shown in (20b).

(20) a. = (18a)

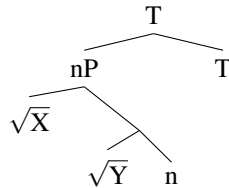


b.



On the other hand, the nominalizer head is indispensable in (18b) because it provides a position for the noun stem. (18b) thus yields the impossible structure given in (21), in which the T head combines directly with a nominalized phrase. (I assume that Japanese does not have a null verbalizer that triggers conversion from noun to verb.)

(21) Impossible structure



This problem does not arise for N-V compounds in which a noun stem occurs in the local position of a verb stem, as shown in (20).

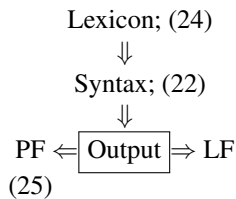
Before concluding this section, there are some points that need to be addressed. Notice that the present analysis summarized in (22) is a structural restriction on sequential voicing.

(22) Proposal: A structural restriction

- a. There are two types of N-V compounds; local compounds and non-local compounds.
- b. Sequential voicing is disallowed in non-local N-V compounds.

Sequential voicing of local N-V compounds may be blocked when some other non-structural restrictions are involved. In this paper, I adopt the single output model, as illustrated in (23).

(23) Single Output Syntax (Bobaljik 1995, 2002)



In this model, the proposed structural restriction on sequential voicing is at work only in the syntactic component. It has been argued that sequential voicing is subject to other constraints too. For instance, Rosen (2001) observes that some elements lexically hate sequential voicing (Rendaku-haters), while some others often exhibit sequential voicing (Rendaku-lovers). The availability of sequential voicing is also regulated by the vocabulary strata, as in (24) (Irwin 2005, 2011).

(24) Lexical restriction

- a. Native Japanese words (*wago*): *Rendaku*-lovers
- b. Sino Japanese words (*kango*): *Rendaku*-haters
- c. Foreign Japanese words (*gairaigo*): *Rendaku*-haters

These lexical restrictions may independently block sequential voicing of N-V compounds. Moreover, there is a well-known phonological restriction on sequential voicing as in (25) (Motoori-Lyman's Law).

(25) Phonological restriction: Motoori (1822), Lyman (1894)

- a. [[m1 ...] [m2 ... [-son, +voi] ...]]
- b. Motoori-Lyman's Law effect: SV is blocked in m2 in (25a).

The properties in (16) and (17) hold only when independent phonological constraints like Motoori-Lyman's Law are respected.⁷

Let me illustrate the idea by using an example of word-part ellipsis. In (26), two V-V compounds are coordinated by the disjunctive particle *ka* 'or'. As shown in (26), the first member of a V-V compound can be elided, without changing the meaning. In (26), Δ -*dasa-nai* is interpreted as *omoi-dasa-nai* 'think-extract-NEG'.⁸

- (26) *kare-ga watasi-no tanzyoobi-o*
he-NOM I-GEN birthday-ACC

[[*omoi-dasu*] *ka* [Δ -*dasa-nai*] *ka*]-*ga mondai da*.
think-extract or -extract-NEG or -NOM problem COP

'The problem is whether he remembers my birthday or not.'

⁷ One may consider Motoori-Lyman's Law is an instance of the OCP effect (Ito & Mester 2003). In fact, Sugito (1965) observed the pattern similar to the Lyman's Law, regarding to the alternation between /ta/ and /da/ in Japanese surnames, as shown in (i).

(i) When the first element ends with a mora containing a voiced obstruent, /da/ is not used in surname compounds. (e.g. *huku-da* vs. *hugu-ta* (#*hugu-da*))

If we assume that /da/ is derived from /ta/ via sequential voicing, Sugito's observation supports the claim that voiced obstruents block sequential voicing across a morpheme boundary. However, Sugito's observation does not hold for sequential voicing in N-V compounds. N-V compounds which contain a mora with a voiced obstruents can undergo sequential voicing, as in (ii).

(ii) *kuzi-biki* 'lot-pull' (*hiki* → *biki*), *nido-zuke* 'twice-soak' (*tuke* → *zuke*), *kazyou-gaki* 'item-write' (*kaki* → *gaki*), *siraga-zome* 'white.hair-dye' (*some* → *zome*), *sabi-dome* 'rust-stop' (*tome* → *dome*), *yado-gae* 'inn-change' (*kae* → *gae*), *suzi-gaki* 'plot-write' (*kaki* → *gaki*), *kooden-gaesu* 'funeral.gift-return' (*kaesi* → *gaesi*), *ude-damesi* 'arm-try' (*tamesi* → *damesi*),

Given the contrast between surnames and N-V compounds, I assume that different phonological constraints on sequential voicing are imposed, depending on the type of a given compound.

⁸ See Yatabe (2001) and Tatsumi (2019) for an analysis of this type of ellipsis.

As shown in (27), the noun stem in a N-V verb can be elided in the same construction.

- (27) *Akira-wa sekken-ga* [[*awa-datsu*] *ka*
 Akira-TOP soap-NOM bubble-stand or
 [Δ -*tata-nai*] *ka*]-*de uranai-o suru.*
 -stand-NEG or -by fortune.telling do.PRES
 ‘Akira do fortunetelling by seeing whether a soap bubbles or not.’

In (27), the elided compound Δ -*tata-nai* is interpreted as *awa-data-nai*. It should be noted that when the bare verb *tatsu* ‘stand’ takes the noun *sekken* as its argument, the resulting sentence receives a different reading from (27), as shown in (28).

- (28) *Akira-wa sekken-ga tata-nai.*
 Akira-TOP soap-NOM stand-NEG
 ‘Akira cannot make a soap stand.’

The difference between (27) and (28) can be captured by assuming that the elided part of (27) underlyingly contains the N-V compound *awa-data-nai*.

Since the N-V verb *awa-datsu* exhibits sequential voicing, the current analysis predicts that it has the structure in (18a). However, the elided N-V compound in the second conjunct in (27) does not show sequential voicing. The absence of sequential voicing in (27) is consistent with the current analysis, which adopts the single output model given in (23). Although the N-V compound structurally allows sequential voicing, it is blocked in (27) because of the phonological absence of the noun stem.

To recapitulate, I have argued in this section that the two properties in (16) and (17) can be explained by the two different structural sources of N-V compounds, as in (18). In the next section, I will argue that the proposed structural restriction has another consequence in light verb voicing.

3 Light Verb Voicing

The current analysis can be extended to another property of sequential voicing in s-irregular verbs (*sahen*-verbs). Some examples of s-irregular verbs are given in (29). The s-irregular verbs in (29) consist of a noun stem and the light verb *su* ‘do’.

- (29) a. *yuu-suru* = existence-do.PRES
 b. *huu-zuru* = seal-do.PRES

Tanomura (2001, 2009) observes that s-irregular verbs are in the process of being other verbal classes. His observation is summarized in (30)

(30) Morphological changes of N-*suru* compounds (Tanomura 2001, 2009)

- a. s-irregular:
bikkuri-suru ‘surprise-do = be surprised’,
zikkoo-suru ‘action-do = carry out’
- b. s-irregular → regular conjugation:
ai-suru ‘love-do = love’, *yuu-suru* ‘exist-do = possess’
- c. s-irregular → upper monograde conjugation:
ron-zuru ‘argument-do = argue’, *huu-zuru* ‘seal-do = seal’
- d. s-irregular → lower monograde conjugation:
sin-zuru ‘precede-do = give’, *mi-suru* ‘attract-do = attract’
 (only two examples in his sample)

As shown in (30b), some s-irregular verbs are acquiring the regular conjugation pattern. This morphological change is exemplified in the third row of Table 1. This kind of s-irregular verb can have the *sa* form with negation. Some other s-irregular verbs are changing into the upper monograde conjugation as in (30c). As shown in the fourth row of Table 1, these s-irregular verbs have the *zi* form in negative and conditional environments, unlike the typical s-irregular verbs.

	Present	Negation	Conditional
(30a)	su-ru	si-nai	su-reba
(30b)	yuu-su-ru	yuu- {si sa} -nai	yuu-su-reba
(30c)	huu- {zu zi} -ru	huu-zi-nai	huu- {zu zi} -reba

Table 1

What is important for the purposes of the present discussion is that the light verb *su* ‘do’ in the s-irregular verbs with the upper monograde conjugation generally exhibits sequential voicing. The observation is summarized in (31).

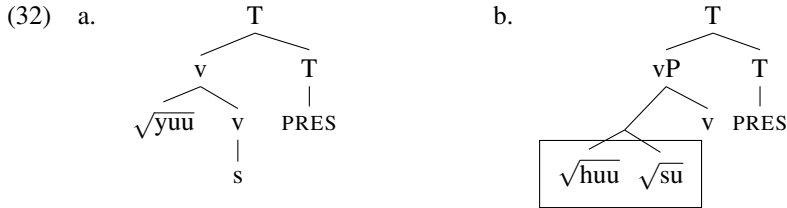
(31) Property III

Only s-irregular verbs containing the voiced *do*-verb can be changed into verbs with the upper monograde conjugation.

Tanomura (2001) reports that only two s-irregular verbs that have the upper monograde conjugation remain unvoiced. He further notices that those exceptional s-irregular verbs are on the verge of being lost. These data indicate that the property in (31) is robustly attested.

Following Kishimoto & Yu (2019), I assume that s-irregular verbs with the regular conjugation (e.g. *yuu-suru*) contain the verbalizer suffix *-s*, which is a grammaticalized form of the light verb *su*, as shown in (32a). In this structure, the verbalized root can be interpreted as a single verb, showing the

regular conjugation pattern. Regarding the *s*-irregular verbs with the upper monograde conjugation, I propose that they have the structure in (32b). Here, the light verb *su* is a root, and it forms a root compound together with a noun stem. The root compound then combines with a null verbalizer, yielding the N-V verb. Here, I hypothesize that *s*-irregular verbs appearing in the structure in (32b) show the upper monograde conjugation pattern.



Recall that I proposed that N-V compounds can exhibit sequential voicing only when they have the local structure given in (18a). The proposed analysis expects that the root compound in (32b) undergoes sequential voicing if other restrictions on sequential voicing are respected. (Compare (32b) with (20b) in the previous section.) The property in (31) can thus be handled in the present analysis without any further stipulation.

4 Summary

In this paper, I have argued that the following properties of N-V compounds can be accounted for by assuming the two different structures of N-V compounds; the local structure and the non-local structure.

- (33) Property I
 N_{adjunct}-V compounds generally allow sequential voicing, whereas N_{argument}-V compounds disallow sequence voicing in some cases.
- (34) Property II
 N-V compounds without sequential voicing cannot be used as a verb.
- (35) Property III
 Only *s*-irregular verbs containing the voiced *do*-verb can be changed into verbs with the upper monograde conjugation.

Adopting the single output model, I proposed that sequential voicing is structurally possible when a given N-V compound contains a root compound. As discussed in section 2, sequential voicing is subject to other restrictions like Motoori-Lyman's Law, in addition to the structural restriction proposed in the present paper. It is thus important to properly distinguish different types of restrictions, in order to investigate the nature of sequential voicing.

Acknowledgments

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SECTION 2

Oral Papers

Part 2

Syntax

Where is a Monster?: A Case Study of Indexical Shift in Japanese*

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1 Introduction

In some languages, indexicals in complement clauses of attitude predicates are interpreted with respect to the context of the attitude event, rather than to the utterance context, contrary to what Kaplan (1989) expects. This phenomenon is widely referred to as *indexical shift* (e.g. Anand & Nevins 2004,

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Anand 2006, Sudo 2012, Shklovsky & Sudo 2014, Deal 2020). For example, Uyghur is observed to show obligatory indexical shift (Sudo 2012, Shklovsky & Sudo 2014). In the Uyghur sentence in (1), the first person pronoun which appears as the embedded subject must refer to the matrix subject, which corresponds to the speaker of the reported clause; it cannot be interpreted as the utterance speaker.¹

- (1) Ahmet [**men** ket-tim] di-di.
 Ahmet 1SG leave-PAST.1SG say-PAST.3
 ‘Ahmet_i said that {he_i / *I} left.’ (Uyghur; Sudo 2012: 203)

One might claim that the shifted reading in (1) is obtained because the complement clause is a direct quote. This is not necessarily the case, however, given that shifted readings are obtained even if a complement clause is syntactically transparent. (2) shows, for example, that indexical shift still takes place when a *wh*-phrase in the complement clause takes matrix scope, ensuring that it is not syntactically opaque, i.e. not a direct quote.

- (2) Tursun [**men** kim-ni kör-dim] di-di?
 Tursun 1SG who-ACC see-PAST.1SG say-PAST.3
 ‘Who did Tursun_i say {he_i / *I} saw?’ (Uyghur; *ibid.*: 205)

The recent literature converges that indexical shift can be captured by positing an operator that overwrites the values of the context parameter. Following the literature, I call this operator a *monster operator*. Morphosyntactic aspects of monster operators, however, remain to be explored in more detail. One recent view regarding these aspects is that the availability of monster operators draws on how large the complement clause is. Deal (2020), for instance, argues that the availability of monster operators depends on the size of complement clauses which in turn depends on the type of matrix predicates. This paper refers to such an approach to the morphosyntax of monster operators as the *clause size approach*.

Against this backdrop, this paper aims to explore morphosyntactic aspects of indexical shift in Japanese (Sudo 2012). More specifically, I will argue that in Japanese, a monster operator is encoded in *Speech Act Phrase* (*SAP*, henceforth; e.g. Speas & Tenny 2003, Haegeman & Hill 2013). This adds support to the clause size approach.

¹ The following abbreviations are used: 1 = first person, 3 = third person, ACC = accusative, DAT = dative, NOM = nominative, PAST = past, MP = modal particle, POL = politeness marker, Q = question particle, SG = singular, REP = reportative complementizer, SFP = sentence final particle, TOP = topic particle

This paper is organized as follows: Section 2 illustrates how monster operators semantically function, mainly relying on Deal (2020). Section 3 gives an overview of indexical shift in Japanese, building on Sudo (2012). Section 4 discusses additional data on indexical shift in Japanese. Based on that discussion, Section 5 submits a proposal regarding the morphosyntax of monster operators in Japanese. Section 6 concludes the paper.

2 How a Monster Works

This section gives a brief overview of the semantic role of monster operators. For expository purposes, this paper basically adopts Deal’s (2020) theory of monster operators. To begin with, I assume that linguistic expressions are interpreted with respect to at least two parameters: context c and index i . I further assume that c and i consist of at least three coordinates: author a , hearer h , and world w . The semantic value of indexicals is directly determined by c (Kaplan 1989). For instance, the first and second person pronoun are interpreted as in (3).

- (3) a. $\llbracket \mathbf{I} \rrbracket^{c,g} = a_c$
 b. $\llbracket \mathbf{you} \rrbracket^{c,g} = h_c$

Attitude verbs quantify over all the coordinates of the index parameter i of the complement clause. For example, I assume that the attitude verb *say* is interpreted as in (4) (Deal 2020: 29).

- (4) $\llbracket \mathbf{say} \alpha \rrbracket^{c,g} = \lambda x. \forall i' \in R_{\text{say}}(x, i) \llbracket \alpha \rrbracket^{c,i'}$
 where $i' \in R_{\text{say}}(x, i)$ iff
 a. $w_{i'}$ is compatible with what x says in w_i
 b. $a_{i'}$ is an individual in $w_{i'}$ that x identifies at i as herself
 c. $h_{i'}$ is an individual in $w_{i'}$ that x identifies at i as her addressee

Importantly, in (4), the context parameter with respect to which the embedded clause is evaluated remains free. This is compatible with Kaplan’s (1989) view that the context values are invariable across clause boundaries. In the English example (5), for instance, the first person pronoun must refer to the speaker of the utterance context even though it appears in the complement clause of the attitude verb.

- (5) the speaker_i: Mary_j said [that John praised **me** _{i / g_j}].

This cannot be the full picture, however, given the possibility of indexical shift in some languages. See, for example, the Uyghur example in (1) repeated below, where the first person pronoun in the complement clause is construed to refer to the attitude holder, or the matrix subject.

- (1) Ahmet [men ket-tim] di-di.
 Ahmet 1SG leave-PAST.1SG say-PAST.3
 ‘Ahmet_i said that {he_i / *I} left.’ (Uyghur; *ibid*: 203)

What fills this gap is monster operators. This paper represents a monster operator as ☺ and, following Deal (2020), assumes (6) as its (syncategorematic) definition (Deal 2020: 31).

$$(6) \quad \llbracket \text{☺} \alpha \rrbracket^{c,i} = \llbracket \alpha \rrbracket^{i,i}$$

According to (6), the monster operator plays a role of replacing the values of c with those of i . With this assumption, for instance, the Uyghur example in (1) has the structure in (7), where the sentence is translated into English.

- (7) Ahmet said [☺ I left].

In (7), crucially, a monster operator appears in the complement clause. (7) is then interpreted as in (8).

- (8) a. $\llbracket \text{Ahmet said } [\text{☺} \text{ I left}] \rrbracket^{c,i,g} = 1$
 iff $\forall i' \in R_{\text{say}}(\text{Ahmet}, i) \llbracket \text{☺} \text{ I left} \rrbracket^{c,i',g}$
 b. $\llbracket \text{☺} \text{ I left} \rrbracket^{c,i',g} = \llbracket \text{I left} \rrbracket^{i',i',g}$
 c. $\llbracket \text{Ahmet said } [\text{☺} \text{ I left}] \rrbracket^{c,i,g} = 1$
 iff $\forall i' \in R_{\text{say}}(\text{Ahmet}, i)[a_{i'} \text{ left in } w_{i'}]$

Of importance here is that as a result of the monster operator overwriting the context parameter, the first person pronoun in the complement clause is interpreted with respect to the index parameter quantified over by the attitude verb *say*, namely i' , as shown in (8c). According to the semantics of *say* in (4), $a_{i'}$ in (8c) is construed as an individual that Ahmet identifies at i as himself, namely Ahmet, thus yielding the shifted interpretation.

3 Indexical Shift in Japanese: Sudo (2012)

This section provides an overview of indexical shift in Japanese, mainly based on the relevant previous work, Sudo (2012). Sudo points out that in

Japanese, indexical shift optionally takes place in complement clauses headed by the reportative complementizer *to* (*to*-clauses, henceforth), as exemplified in (9).²

- (9) Mary-wa [John-ga **watasi**-o hometa to] itta.
 Mary-TOP John-NOM I-ACC praised REP said
 ‘Mary_i said that John praised {me / her_i}.’

In (9), the first person pronoun *watasi* ‘I’ appears in the complement clause and can be interpreted as the speaker of the attitude event, namely Mary.

One might suspect at this point that the *to*-clause in (9) is a direct quote when the indexical in it receives the shifted interpretation. This doubt is particularly motivated by the fact that *to* can indeed introduce a direct quote, as well as a reported clause, as exemplified in (10).

- (10) Mary-wa [Yeah! to] itta.
 Mary-TOP REP said
 ‘Mary said “Yeah!”.’

However, this view is not necessarily correct, similarly to what we observed for Uyghur before; shifted readings are available even if the *to*-clause is syntactically transparent. For example, Sudo (2012) observes that an indexical can receive a shifted interpretation even when the *to*-clause involves a wh-phrase that takes a matrix scope, as shown in (11).^{3,4}

² Some previous works describe data that contrast with Sudo (2012), claiming that at least person indexicals cannot shift in Japanese (e.g., Kuno 1988, Yatsushiro & Sauerland 2014, H. Saito 2018). My own judgements align with Sudo’s, and the discussion in this paper pertains to the grammar of speakers who, like us, allow indexical shift to apply even to person indexicals. It is left open what causes the difference between the speakers who allow shifted readings of person indexicals and those who do not.

³ That the wh-question (11) is not an echo question can be ensured by the fact that that question is felicitous even if it is uttered at the outset of a conversation. The same holds true with the wh-questions in (17) and (19).

⁴ As pointed out by David Y. Oshima (p.c.), it is possible in Japanese to replace a part of proper nouns, such as movie titles, with a wh-phrase and make a matrix wh-question, as exemplified in (i). (Note that (i) can be interpreted as a non-echo question.)

(i) Mary-wa “Gojira baasasu nani”-o mita no?
 Mary-TOP Godzira versus what-ACC watched Q
 Lit. ‘Mary watched “Godzira vs. what?”’

Given that proper nouns arguably constitute syntactically opaque domains, the grammaticality of (i) might be taken to suggest that (11) does not ensure the syntactic transparency of the *to*-clause with the shifted interpretation. Crucially, however, the same pattern does not hold for *to*-clauses that are clearly interpreted as direct quotes. For example, in the ungrammatical sentence

- (11) Mary-wa [dare-ga **watasi-o** hometa to] itta no?
 Mary-TOP who-NOM I-ACC praised REP said Q
 ‘Who did Mary_i said (that) praised {me / her_i}?’

I additionally point out that a shifted reading is still available when an element in the *to*-clause undergoes scrambling to the matrix clause (i.e. long-distance scrambling), as shown in (12).⁵

- (12) Susan-ni Mary-wa [John-ga *t_i* **watasi-o** syookaisita to] itta
 Susan-to Mary-TOP John-NOM I-ACC introduced REP said

(iia), whose potential answer is (iib), a wh-phrase taking a matrix clause appears in a *to*-clause which is obviously construed as a direct quote.

- (ii) a. *Mary-wa [Yeah! Nani-ga owatta zo. to] itta no?
 Mary-TOP what-NOM ended SFP REP said Q
 Lit. ‘Mary said “Yeah! I’ve done what.”?’
 b. Mary-wa [Yeah! Syukudai-ga owatta zo. to] itta.
 Mary-TOP homework-NOM ended SFP REP said
 ‘Mary said “Yeah! I’ve done homework.”’

This observation itself ensures that the *to*-clause with the shifted interpretation in (11) is not a direct quote. The remaining question, then, is why the grammaticality difference arises between (i) and (iia). One possible approach is to assume that there is some mechanism (e.g. feature percolation) which allows a syntactically-opaque phrase containing a wh-phrase to be construed as the relevant wh-phrase in a wh-question (cf. pied-piping) and that this mechanism can apply to proper nouns but cannot to direct quotes. With this assumption, the mechanism in question applies to the proper noun in (i) and, as a result, the whole proper noun, rather than *nani* ‘what’ itself, is interpreted as the relevant wh-phrase. This accounts for the grammaticality of (i). On the other hand, the same mechanism cannot apply to the direct quote in (iia), whose grammaticality thus cannot be improved. I suggest that the different applicability of the mechanism in question might be ascribed to whether a relevant phrase is nominal (e.g. proper nouns) or clausal (e.g. direct quotes).

⁵ Note that in Japanese (texts, in particular), direct quotes can be (at least marginally) split into two parts with one of them placed in the sentence-initial position; see (ib), whose basic counterpart is (ia). I call this split *direct quote split*.

- (i) a. Mary-wa “Yosi! Sorejaa ohiru-o tabe-yooka.” to itta (hazuda).
 Mary-TOP OK then lunch-ACC eat-let’s REP said should
 “Mary (must have) said “OK! Then let’s have a lunch, shall we?”.”
 b. (?)“Yosi! Sorejaa,” Mary-wa “ohiru-o tabe-yooka.” to itta (*hazuda).
 OK then Mary-TOP lunch-ACC eat-let’s REP said should
 Lit. ““OK! Then,” Mary (must have) said, “let’s have a lunch, shall we?”.”

Given that, when an element in a *to*-clause appears in the matrix clause, it might result from direct quote split, rather than long-distance scrambling. Crucially, however, this split is not allowed when the modal verb *hazuda* ‘should’ appears in the matrix clause, as shown in (ib). Based on this fact, I add *hazuda* in the matrix clause of the examples where an element of a *to*-clause appears outside that clause (i.e. (12), (18), (20)), in order to ensure that the configuration results from long-distance scrambling rather than direct quote split.

hazuda.


should

Lit. '[To Susan]_i, Mary_j must have said that John introduced {me / her_j}
t_i.'

These facts thus indicate that indexical shift is possible in *to*-clauses that are not interpreted as direct quotes.⁶

To account for those shifted interpretations, Sudo (2012) argues that monster operators are available in Japanese. Under this assumption, the sentence (9), repeated below, is analyzed as having the structure in (13) when the first person pronoun receives a shifted interpretation.

- (9) Mary-wa [John-ga **watasi**-o hometa to] itta.
Mary-TOP John-NOM I-ACC praised REP said
'Mary_i said that John praised {me / her_i}.'

- (13) Mary-wa [ John-ga watasi-o hometa to] itta.
Mary-TOP John-NOM I-ACC praised REP said

(13) crucially includes a monster operator within the *to*-clause. As illustrated in Section 2, the operator overwrites the context parameter of the complement clause with the index parameter that is quantified over by the matrix attitude predicate (see (4)). Consequently, the first person pronoun in the *to*-clause is construed with respect to the reported context and thus refers to the attitude holder, or the matrix subject *Mary*.

This monster-operator-based analysis of Japanese indexical shift is indirectly supported by the fact that when two or more shiftable indexicals (e.g. *watashi* 'I', *anata* 'you') appear in a *to*-clause, either all of them receive the shifted interpretation, or none of them does (i.e. *Shift Together*; e.g. Anand & Nevins 2004, Anand 2006). This is observed in (14).

- (14) Mary-wa Bill-ni [watasi-wa(/-ga) anata-o kiratteiru to] itta.
Mary-TOP Bill-to I-TOP/-NOM you-ACC hate REP said
i. ✓ 'Mary_i said to Bill_j that she_i hates him_j.'
ii. ✓ 'Mary said to Bill that I hate you.'
iii. *'Mary_i said to Bill that she_i hates you.'
iv. *'Mary said to Bill_i that I hate him_i.'

⁶ See Sudo (2012) for other diagnostics for the syntactic transparency of *to*-clauses, which are based on *de re* interpretations and NPI licensing.

This pattern can be captured by positing a monster operator; given the assumption that the operator takes sentential scope, it affects every indexical in the complement clause.

Regarding morphosyntactic traits of indexical shift in Japanese, two observations by Sudo (2012) are relevant. First, as noted before, indexical shift in Japanese is optional, unlike the obligatory indexical shift in Uyghur (e.g. (1)); see (9), for example. Second, indexical shift is not observed in complement clauses other than *to*-clauses. (15) shows, for example, that shifted readings are not available in the embedded question headed by the question particle *ka* (15a) and the nominalized clause headed by *koto* ‘fact’ (15b).

- (15) a. Mary-wa [John-ga **watasi**-o hometa ka] {kiita / sitteita}.
 Mary-TOP John-NOM I-ACC praised Q asked/knew
 ‘Mary_i {asked / knew} whether John praised {me / *her_i}.’
- b. Mary-wa [John-ga **watasi**-o kiratteiru koto]-ni kiduita.
 Mary-TOP John-NOM I-ACC hate fact-DAT realized
 ‘Mary_i realized that John hates {me / *her_i}.’

From these observations, Sudo (2012) concludes that the monster operator can be licensed only in *to*-headed clauses, but he does not delve further into its morphosyntactic properties. Against this backdrop, the rest of the paper aims to dig further into the morphosyntax of indexical shift/monster operators in Japanese. We will turn back to the above two properties of Japanese indexical shift after submitting the proposal of this paper in Section 5.

4 More on Indexical Shift in Japanese

This section discusses additional data on indexical shift in Japanese and explores its morphosyntactic facets. To begin with, two relevant observations from the literature are in order. First, it has been observed in the traditional study of the Japanese language, i.e. *nihongogaku* (日本語学), that shifted interpretations are forced when a *to*-clause contains a sentence final particle (SFP, henceforth; e.g. *yo* in (16a)) or the politeness marker *-mas*; see, e.g., Fujita (2000) and Sunakawa (1989, 2003).⁷ The relevant data are shown in (16). (Note that SFPs and the politeness marker in *to*-clauses are interpreted only with respect to the reported context; in (16b), for example, the politeness marker indicates that the attitude holder, Mary, spoke politely to the addressee of the reported context.)

⁷ This observation is also made in the syntactic literature; for example, see Saito & Haraguchi (2012) for SFPs, and Miyagawa (2012) and Yoshimoto (2016) for the politeness marker.

- (16) a. Mary-wa [(kuruma-de) **watasi-ga**(/-wa) Tokyo-ni iku yo to] itta.
 Mary-TOP car-by I-NOM/-TOP Tokyo-to go SFP REP
 said
 ‘Mary_i said that {*I / she_i} went to Tokyo (by car).’
- b. Mary-wa [(kuruma-de) **watasi-ga**(/-wa) Tokyo-ni iki-masu to] itta.
 Mary-TOP car-by I-NOM/-TOP Tokyo-to go-POL REP
 said
 ‘Mary_i said that{*I / she_i} went to Tokyo (by car).’

Based on this observation, it has been argued in *nihongogaku* that *to*-clauses involving an SFP or the politeness marker are forced to be interpreted as direct quotes (e.g. Fujita 2000, Sunakawa 1989, 2003). This however is challenged by the second observation, made by Uchibori (2007) and Noguchi (2018): *to*-clauses involving an SFP (Noguchi 2018) or the politeness marker (Uchibori 2007) can be syntactically transparent. For instance, (17) shows that such clauses can contain a *wh*-phrase that takes matrix scope, while (18) shows that an element can undergo long-distance scrambling from within such a clause.

- (17) a. Mary-wa [(kuruma-de) dare-ga Tokyo-ni iku yo to] itta no?
 Mary-TOP car-by who-NOM Tokyo-to go SFP REP said Q
 ‘Who did Mary said would go to Tokyo (by car)?’
- b. Mary-wa [(kuruma-de) dare-ga Tokyo-ni iki-masu to] itta no?
 Mary-TOP car-by who-NOM Tokyo-to go-POL REP said Q
 ‘Who did Mary said would go to Tokyo (by car)?’
- (18) a. Tokyo-ni_i Mary-wa [(kuruma-de) John-ga *t_i* iku yo to] itta
 Tokyo-to Mary-TOP car-by John-NOM go SFP REP said
 hazuda.
 should
 Lit. ‘[To Tokyo]_i, Mary must have said that John would go *t_i* (by car).’
- b. Tokyo-ni_i Mary-wa [(kuruma-de) John-ga *t_i* iki-masu to] itta
 Tokyo-to Mary-TOP car-by John-NOM go-POL REP said
 hazuda.
 should
 Lit. ‘[To Tokyo]_i, Mary must have said that John would go *t_i* (by car).’

These data serve as counterarguments to the view in *nihongogaku* that *to*-clauses containing an SFP or the politeness marker are interpreted only as direct quotes.⁸

Now, I further point out that the above two observations are compatible with each other. That is, *to*-clauses involving an SFP or the politeness marker show syntactic transparency even if they include an indexical, which obligatorily receives a shifted interpretation; observe (19) for matrix *wh*-questions and (20) for long-distance scrambling.

- (19) a. Mary-wa [(kuruma-de) **watasi-ga**(/-wa) doko-ni iku yo to]
 Mary-TOP car-by I-NOM/-TOP where-to go SFP REP
 itta no?
 said Q
 ‘Where did Mary_i said that {*I / she_j} would go (by car)?’
- b. Mary-wa [(kuruma-de) **watasi-ga**(/-wa) doko-ni iki-masu to]
 Mary-TOP car-by I-NOM/-TOP where-to go-POL REP
 itta no?
 said Q
 ‘Where did Mary_i said that {*I / she_j} would go (by car)?’
- (20) a. Tokyo-ni; Mary-wa [(kuruma-de) **watasi-ga**(/-wa) *t_i* iku yo
 Tokyo-to Mary-TOP car-by I-NOM/-TOP go SFP
 to] itta hazuda.
 REP said should
 Lit. ‘[To Tokyo]_i, Mary_j must have said that {*I / she_j} would go *t_i*
 (by car).’
- b. Tokyo-ni; Mary-wa [(kuruma-de) **watasi-ga**(/-wa) *t_i* iki-masu
 Tokyo-to Mary-TOP car-by I-NOM/-TOP go-POL
 to] itta hazuda.
 REP said should
 Lit. ‘[To Tokyo]_i, Mary_j must have said that {*I / she_j} would go *t_i*
 (by car).’

With these observations together, I conclude that shifted interpretations are forced in *to*-clauses involving an SFP or the politeness marker even if they are not interpreted as direct quotes.

⁸ Uchibori (2007) and Noguchi (2018) do not take indexical shift into consideration; Uchibori (2007) shows data like (17b) and (18b) in order only to ensure the syntactic transparency of *to*-clauses involving the politeness marker, while Noguchi (2018) exhibits such data as in (17) and (18) to suggest the necessity of reconsidering the dichotomy between direct and indirect quotes proposed in *nihongogaku*.


5 Proposal

This section aims to put forth a proposal concerning the morphosyntax of monster operators in Japanese. In terms of the monster-operator-based analysis of indexical shift (see Section 3), the conclusion in the last section can be rephrased as follows: *to*-clauses that (i) involve an SFP or the politeness marker but (ii) are not interpreted as direct quotes, always involve a monster operator (unlike *to*-clauses without these elements, where shifted interpretations are optional). The immediate question, then, is why this is the case. Of crucial relevance here is that it has been argued in the syntactic literature that both SFPs and the politeness marker are associated with SAP, the topmost projection in the syntactic structure involving pragmatic notions such as *Speaker* and *Addressee* (Speas & Tenny 2003, Haegeman & Hill 2013, among others). Specifically, Saito & Haraguchi (2012) argue that Japanese SFPs correspond to the head of SAP (see also Kido 2015), while Miyagawa (2012) argues that the politeness marker is syntactically licensed by SAP through agreement (i.e. allocutive agreement).

Building on these findings, I propose that in Japanese, a monster operator is encoded in SAP. To illustrate my proposal, consider (16a), repeated below.

- (16) a. Mary-wa [(kuruma-de) **watasi-ga**(/-wa) Tokyo-ni iku yo to]
 Mary-TOP car-by I-NOM/-TOP Tokyo-to go SFP REP
 itta.
 said
 ‘Mary_i said that {*I / she_i} went to Tokyo (by car).’

I here assume that the reportative complementizer *to* heads ReportP (e.g. Saito 2012) and can take SAP as its complement. The non-direct-quote *to*-clause in (16a) is then analyzed as having the structure in (21).


- (21) [ReportP [SAP  [... [TP (kuruma-de) watasi-ga(-wa) Tokyo-ni iku]]
 car-by I-NOM/-TOP Tokyo-to go
 yo] to]
 SFP REP

Notice first that the presence of the SFP *yo* ensures that the *to*-clause involves SAP (Saito & Haraguchi 2012). It then follows under the current proposal that the non-direct-quote *to*-clause in (16a) necessarily involves a monster operator, which is encoded in SAP. This explains why indexical shift obligatorily takes place in (16a). The same reasoning holds for (16b).

With this proposal in place, let us finally turn back to the two properties of Japanese indexical shift observed by Sudo (2012), which are illustrated in Section 3. First, indexical shift in Japanese is optional (to the extent that the *to*-clause does not contain an SFP or the politeness marker), as shown in (9) repeated below.

- (9) Mary-wa [John-ga **watasi**-o hometa to] itta.
 Mary-TOP John-NOM I-ACC praised REP said
 ‘Mary_i said that John praised {me / her_i}.’

To capture this optionality with the current proposal, I assume that (i) the reportative complementizer *to* heads ReportP (e.g. Saito 2012), (ii) the head of SAP takes ForceP as its complement (e.g. Saito & Haraguchi 2012, Haegeman & Hill 2013), and (iii) the head of ReportP takes as its complement either SAP or ForceP. Then, under the proposed analysis, the optionality follows from the clause size of the complement clause. More specifically, indexical shift takes place when SAP is contained in the *to*-clause, while it does not when SAP is not involved, as illustrated in (22).

- (22) a. the configuration where indexical shift takes place:
 [ReportP [SAP  [ForceP ... (politeness marker) ...] (SFP)] *to*] V
 b. the configuration where indexical shift does not take place:
 [ReportP [ForceP ...] *to*] V

This view thus lends support to the clause size approach to the availability of monster operators, according to which the availability of monster operators draws on the size of the complement clause (e.g. Deal 2020).

Second, in Japanese, indexical shift does not take place in complement clauses other than *to*-clauses, such as embedded questions and nominalized clauses, as exemplified in (15) repeated below.

- (15) a. Mary-wa [John-ga **watasi**-o hometa ka] {kiita / sitteita}.
 Mary-TOP John-NOM I-ACC praised Q asked/knew
 ‘Mary_i {asked / knew} whether John praised {me / *her_i}.’
 b. Mary-wa [John-ga **watasi**-o kiratteiru koto]-ni kiduita.
 Mary-TOP John-NOM I-ACC hate fact-DAT realized
 ‘Mary_i realized that John hates {me / *her_i}.’

Crucially, these complement clauses cannot involve an SFP or the politeness marker, as shown below:

- (23) a. *Mary-wa [John-ga Bill-o {hometa ka ne / hometa ne ka
 Mary-TOP John-NOM Bill-ACC praised Q SFP praised SFP Q
 / home-masi-ta ka}] {kiita / sitteita}.
 praise-POL-PAST Q asked/knew
 ‘Mary {asked/knew} whether John praised Bill.’
- b. *Mary-wa [John-ga Bill-o {kiratteiru ne / kirattei-masu}
 Mary-TOP John-NOM Bill-ACC hate SFP hate-POL
 koto]-ni kiduita.
 Fact-DAT realized
 ‘Mary realized that John hate Bill.’

This indicates that SAP cannot appear in these complement clauses. Given that, the impossibility of indexical shift in those clauses is captured by the current proposal; indexical shift cannot take place in them because they cannot contain SAP, where a monster operator is encoded.⁹

6 Conclusion

This paper has explored morphosyntactic facets of indexical shift, or monster operators, in Japanese. In particular, building on the observation that indexical shift is obligatory when non-direct-quote *to*-clauses contain an SFP or the politeness marker, I have proposed that in Japanese a monster operator is en-

⁹ Magdalena Kaufmann (p.c.) points out that German modal particles (MPs, henceforth) like *ja* and *wohl* can appear in complement clauses of attitude verbs without invoking indexical shift, despite the fact that they are semantically similar to Japanese SFPs. A relevant example is shown in (i).

(i) Peter hat gesagt, [dass Sue **mich ja** angerufen hat].

Peter has said that Sue me MP called has

‘Peter, said that Sue called {*him_i / me} (as (according to him) is well-known).’

If MPs were licensed by SAP given their similarity to SFPs in Japanese, the embeddability of MPs would not be compatible with the proposed analysis. Note, however, that unlike Japanese SFPs, MPs can appear even in embedded questions and factive clauses (Magdalena Kaufmann p.c.), as shown in (ii); compare these data with (23).

(ii) a. Sue hat gefragt, [ob **ich wohl** auf die Party komme].

Sue has asked whether I MP to the party come

‘Sue asked if {*she / I} would be coming to the party.’

b. Sue hat erkannt, [dass **ich ja wohl** auf die Party kommen würde].

Sue has realized that I MP MP to the party come would

‘Sue realized that {*she / I} {would (as is well known) / would most likely} come to the party.’

Under the assumption that SAP cannot appear in environments like embedded questions and factive clauses (cf. (23)), (ii) indicates that MPs are licensed by some projection below SAP, unlike Japanese SFPs. Hence, the data (i) will not be problematic for the proposal of this paper.

coded in SAP. This serves as support for the clause size approach to the availability of monster operators (e.g. Deal 2020). It is left as a future task to investigate how the proposal could extend to indexical shift in other languages.¹⁰

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¹⁰ One remaining question concerns interjections such as *a* ‘oh’ and *etto* ‘well’. Even though they seem to be related to SAP, they can never appear in *to*-clauses with a shifted interpretation; *to*-clauses including interjections are obligatorily interpreted as direct quotes. A possible account of this fact would be to assume that interjections are licensed by a projection that never appears in embedded clauses (e.g. cP; Portner et al. 2019), rather than SAP. I leave this issue open for future study.

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The Size of the Complement – The Properties of the Embedded *-Yoo* in Japanese*

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1 Introduction

In this paper, we investigate one specific case of clausal complementation in Japanese, which has been argued to involve obligatory Control, namely, the one with the volitional modal *-yoo*, which expresses the speaker's will or determination, embedded (Fujii 2006, 2010; cf. Takano 2010, Uchibori 2000).¹ To be more specific, we are exclusively concerned with the two constructions Fujii analyzes as Subject Control (SC) and Split Control (SpC). Below, I show that his analysis is empirically inadequate in failing to capture the fact that the attitude holder of the embedded *-yoo* and the agent of the embedded verb can be different, and propose that apparent Control-like cases involving *-yoo* are derived by indexical shifting. I also show that the size of the embedded clause can be different in accordance with the selection of a matrix verb. That is, when a given matrix verb is proposition-taking, its embedded clause

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¹ In what follows, we will be concerned with obligatory Control but not nonobligatory Control. Whenever I use the term Control, I intend to refer to the former.

is full-fledged CP, but when the former is event-taking such as ‘try’, the latter can be as small as *vP*. This sort of semantic correlation between the size of a complement clause and the choice of a matrix verb is proposed by Wurmbrand and Lohninger (2019), who term it the Implicational Complementation Hierarchy (ICH), and I argue that this state of affairs also holds for the *-yoo* complementation in Japanese.

This paper is organized as follows. In Section 2, we go over the analysis of the alleged SC and SpC by Fujii (2006, 2010), raising some empirical issues of it. Then, in Section 3, I propose that the pertinent SC/SpC-like constructions are derived by indexical shifting of the lexically specified 1st-person feature of *-yoo*, giving a way to semantically compute the embedded *-yoo* complement, and Section 4 discusses the *-yoo* complementation in terms of the ICH, showing that the different sizes of complement clauses lead to several different syntactic/semantic behaviors of them. Section 5 concludes.

2 The Properties of (Embedding) the Modal *-Yoo*

2.1 Fujii (2006, 2010) – the Movement Theory of Control

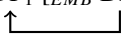
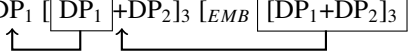
Let us start our discussion by looking at typical examples of the relevant two constructions rendered by embedding *-yoo*; (1a) exemplifies SC, and (1b), SpC. In (1), the embedded null arguments are given as *e*, which allows me to be theory-neutral.

- (1) a. Hirosi₁-wa [*e*₁ {??kare₁/zibun₁}-o hihan-si-yoo-to]
 Hiroshi-TOP he/self-ACC criticism-do-MOD-REP
 {omot-ta/kessin-si-ta}.
 think-PAST/determination-do-PAST
 ‘Hiroshi {thought of criticizing/decided to criticize} {??him/himself}.’
- b. Taroo₁-wa Hiroshi₂-ni [*e*₁₊₂ otagai-o
 Taro-TOP Hiroshi-DAT each.other-ACC
 sonkee-si-a-oo-to] {it-ta/teian-si-ta}.
 respect-do-RECIP-MOD-REP say-PAST/proposal-do-PAST
 Lit. ‘Taro₁ {said/proposed} to Hiroshi₂ that *e*₁₊₂ respect-*yoo* each other.’

(based on Fujii 2006, 102, 115)

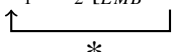
In (1a), *e*₁ corefers to the matrix subject, so that a Condition B effect is observed with a pronominal object, and Fujii (2006) contends that *e*₁ is bound by the matrix subject (but see discussion below on Condition B in Japanese). In (1b), the embedded verb is reciprocalized, and it thus requires a plural subject (see Fujii 2006, Ch. 3.2 for the detail of reciprocalization). Therefore, he also argues that *e*₁ is bound by the matrix subject and the matrix indirect object in a split fashion.

Adopting the Movement Theory of Control (MTC) (Hornstein 1999), Fujii (2006, 2010) proposes that (1a) and (1b) are derived as in (2a) and (2b), respectively.

- (2) a. $[_{MAT} DP_1 [_{EMB} DP_1 V\text{-MOD-REP}] V]$

 b. $[_{MAT} DP_1 [[DP_1 + DP_2]_3 [_{EMB} [DP_1 + DP_2]_3 V\text{-MOD-REP}] V]$


The matrix subject in (2a) is first merged as the agent argument of the embedded domain (*EMB*), and it is moved to the matrix domain (*MAT*), functioning as the matrix agent argument. Thus, it takes up two θ -roles (more precisely, checks two θ -features) in moving from the embedded domain to the matrix domain.² In principle, the same holds for (2b), but it involves a slightly more complex movement. As (2b) illustrates, the embedded agent starts out as the amalgam of two conjoined DPs, and it is “split up” en route to the final landing site (as the term “Split Control” alludes to), so that only DP_1 moves to check the matrix agent role.³

Then, what Fujii’s (2006) analysis predicts is that when there is an intervener between the base position of a moving DP to its final landing site, Control is excluded; that is, the configuration in (3) is predicted to be ungrammatical.

- (3) $[_{MAT} DP_1 DP_2 [_{EMB} DP_1 V\text{-MOD-REP}] V]$


In (3), DP_1 moves to the matrix domain by skipping DP_2 (which presumably is a dative goal), and this violates the locality/minimality of movement. For the impossibility of (3), Fujii (2006) gives the following:

²I am not concerned with the details of the relevant movement steps, which are orthogonal to the main discussion of this paper.

³This analysis brings up several issues, some of which Fujii (2006) is aware. I will not discuss them in detail since they are irrelevant to the purpose of this paper, and what is more, I do not adopt the MTC analysis in this paper. However, one potential challenge I point out at this juncture concerns the movement step of the conjoined DPs to the indirect object position, which Fujii assumes is motivated by θ -checking one of them (i.e. DP_2) against the goal role. If the entire $DP_1 + DP_2$ were to enter into such a θ -checking process, the predicted construal would mandate that DP_1 also be interpreted as part of the goal argument, contrary to fact. Then, he assumes that DP_1 does not get the goal role since it is moved alongside DP_2 via pied-piping. Then, whatever principle/structure would allow pied-piping of DP_1 , the entire $DP_1 + DP_2$, before movement, should have been merged to the embedded agent position (e.g. Spec-*vP*) in such a way that DP_1 is allowed not to be θ -checked against any θ role. Then, the question is why DP_1 must get the embedded agent role while it can avoid getting the matrix goal role. It seems that he does not provide any solutions to this issue.

- (4) a. *Taroo₁-wa Yooko-ni [*e*₁ kanozyo-o sonkei-si-yoo-to]
 Taroo-TOP Yoko-DAT she-ACC respect-do-MOD-REP
 it-ta.
 say-PAST
 Lit. ‘Taro₁ said to Yoko *e*₁ to respect her.’
- b. Taroo₁-wa [*e*₁ kanozyo-o sonkei-si-yoo-to] omot-ta.
 Taroo-TOP she-ACC respect-do-MOD-REP think-PAST
 Lit. ‘Taro₁ thought *e*₁ to respect her.’
 (based on Fujii 2006, 129)

Fujii takes (4a) as a case of (3). The grammatical judgment in (4a) is due to him, but I do not find its deviancy as severe as he observes; for me (and my language consultants), ? or ?? at worst. Since there is no use disputing over the different grammaticality judgments, I would like to point out one potential problem in (4a), which is irrelevant to Control. As Kuroda (1965) discusses, overt pronouns in Japanese are different from those in English. Observe:

- (5) Kesa Taroo-wa kinoo {*pro*?(?)}kare-ga} at-ta
 this.morning Taro-TOP yesterday *pro*/he-NOM see-PAST
 zyosee-ni {*pro*?(?)}kare-no} syokuba-de mata at-ta.
 woman-DAT *pro*/he-GEN workplace-in again see-PAST
 ‘This morning, Taro met the woman again in his workplace who he met yesterday.’

In (5), null pronouns are preferred to their overt counterparts, and overt pronouns behave like R-expressions as follows:

- (6) Kesa Taroo-wa kinoo ?(?)Taroo-ga} at-ta
 this.morning Taro-TOP yesterday Taro-nom see-PAST
 zyosee-ni ?(?)Taroo-no} syokuba-de mata at-ta.
 woman-DAT Taro-GEN workplace-in again see-PAST
 ‘This morning, Taro met the woman again in Taro’s workplace who Taro met yesterday.’

Given (5) and (6), only *pro* is functionally equivalent to pronouns in English. In this respect, it is also notable that overt pronouns in Japanese cannot be used as bound variables (Hoji 1985, 1991); Hoji (1991) claims that overt pronouns behave in the same way as demonstratives, which then explains why they cannot get bound variable interpretations. If he is on the right track, then overt pronouns like *kare* ‘he’ are construed like ‘this/that man’, so that the badness of (4a) is due to Condition C. Namely, *Yooko* and *kanozyo* cannot be co-indexed there. As I said, I find that it is not totally bad but only marginal, and this can be explained in terms of an unexpected state of affairs where

both *Yooko* and *kanozyo* accidentally refer to the same individual (without binding). Then, we predict that if an embedded object that is co-indexed with a matrix goal argument is *pro* (3) becomes implementable, which is the case:

- (7) a. Taroo₁-wa Yooko₂-ni [*e*₁ *pro*₂ sonkei-si-yoo-to] it-ta.
 Taroo-TOP Yoko-DAT *pro* respect-do-MOD-REP say-PAST
 Lit. ‘Taro₁ said to Yoko₂ *e*₁ to respect *pro*₂.’
- b. Taroo₁-wa Hanako₂-ni [*e*₁ *pro*₂ Kyooto-ni
 Taroo-TOP Hanko-DAT *pro* Kyoto-to
 turete-ik-oo-to] it-ta.
 take.CONJ-go-MOD-REP say-PAST
 Lit. ‘Taro₁ said to Hanako₂ *e*₁ to take *pro*₂ to Kyoto.’

I thus conclude that the SC configuration with a matrix goal argument is possible. If (3) is an option, the MTC-style analysis cannot be adopted as it is.

Before leaving the discussion on Fujii (2006, 2010), let us discuss two more properties he provides to support his claim that embedding *-yoo* is a case of Control. First, Fujii (2006) observes that the volitional content of the embedded clause in (8) must be interpreted as *de se* relative to the matrix subject, so that the given context is not compatible with (8).

- (8) CONTEXT: Hiroshi planned to go abroad. He had already got his passport and made a visa available recently. One day, he went to drinking and came home badly drunk. He found the passport on the table, without remembering that this was what he himself got from the embassy. Looking at the picture on the passport and the visa, he thinks, “I don’t know who this guy is, but he seems to be planning to go abroad soon. I wish I could!”

#Hiroshi₁-wa [*e*₁ gaikoku-ni ik-oo-to]
 Hiroshi-TOP foreign.country-to go-MOD-REP
 omot-te-i-ru.
 think-ASP-COP-PRES
 ‘Hiroshi thinks of going abroad.’ (Fujii 2006, 106)

(8) is a case of SC under Fujii’s analysis, and it is well known for the fact that it only allows the *de se* interpretation. Then, (8) can be taken as a piece of evidence that supports his Control analysis.

Second, associating the antecedent DP with its PRO (a moved trace in the MTC) in the Control configuration can only traverse one clause boundary:

- (9) *John thinks that it was expected PRO to shave himself. (Hornstein 1999, 73)

Then, concerning the ban on this sort of “long-distance” Control in Japanese, Fujii (2006) gives (10), where the highest subject cannot be the antecedent of the silent subject in the most embedded clause.

- (10) *Karera₁-wa [Hiroshi-ni [e₁ otagai-o
 they-TOP Hiroshi-DAT each.other-ACC
 naguri-a-oo-to] omow]-ase-ta.
 hit-RECIP-MOD-REP think -CAUS-PAST
 Intended ‘They₁ made Hiroshi think e₁ to hit each other.’ (Fujii 2006, 104)

This one-clause-up requirement can also be considered to constitute another piece of evidence for embedding *-yoo* to be a case of Control. Notwithstanding, as we will see below, these two facts, although *prima facie* supporting the Control analysis of the *-yoo* complementation, can be handled without Control if we adopt indexical shifting.

2.2 Severing the Attitude Holder from the Agent of the *-Yoo* Clause

Unlike infinitive complements, clauses with *-yoo* can appear as a matrix clause, expressing the actual speaker’s volition. Therefore, in its default interpretation, (11) expresses the volitional attitude of *-yoo* is ascribed to the speaker, who is also the agent of cleaning the classroom.

- (11) (Boku-wa) kyoositu-o soozu-si-yoo.
 I-TOP classroom-ACC cleaning-do-MOD
 ‘I will clean the classroom.’

However, this does not exhaust the patterns. Since we can have SpC via embedding *-yoo*, the plural agent including the speaker and the addressee is expected to be possible, and this is indeed the case. Note that in (12) the volitional attitude is only due to the speaker, so we do not know if the addressee is also willing to clean the classroom. Thus, the addressee can felicitously reply to (12) by saying ‘I don’t wanna do that’.

- (12) (Boku-tati-wa) kyoositu-o soozu-si-yoo.
 I-PL-TOP classroom-ACC cleaning-do-MOD
 ‘Let’s clean the classroom.’

In addition, the agent does not have to be the speaker. Suppose that the speaker is a teacher who can tell you or students to clean the classroom.⁴ With *kimi* ‘you’, the speaker tells you to clean the classroom. With *kono seeto* ‘this student’, the speaker can utter (13) as a soliloquy, probably when s/he is arrang-

⁴This is not as strong as an imperative, but only a suggestion.

ing the school-cleaning schedule alone. Thus, it is like a performative modal, meaning ‘I hereby decide that this student clean the classroom’.⁵ Note also that both the 2nd- and the 3rd-person subjects can be plural. Thus, to extent that the speaker expresses his or her volitional attitude, the agent interpretations can be diverse.

- (13) {Kimi/kono seeto}(-tati)-wa kyoositu-o soozi-si-yoo.
 you/this student-PL-TOP classroom-ACC cleaning-do-MOD
 ‘{You/You (pl.)/This student/These students} will clean the classroom.’

As expected, embedding *-yoo* exhibits these multiple interpretations for the embedded agent. Besides (1), we have a (partial-)Object-Control-like interpretation in (14a) as well as partial-Subject and partial-Split Control-like ones as in (14b) and (14c), respectively.

- (14) a. Tanaka-sensee-wa Taroo-ni₂ [*e*₂₍₊₎ dono kyoositu-o
 Tanaka-teacher-TOP Taro-DAT which classroom-ACC
 soozi-si-yoo-to] it-ta-no.
 cleaning-do-MOD-REP say-PAST-Q
 ‘Which classroom did Mr. Tanaka tell Taro (and other students) to clean?’
- b. Taroo-wa [taihen-na toki-koso *e*₁₊
 Taro-TOP difficulty-COP.ADN time-very
 tasuke-a-oo-to] kime-ta.
 help-RECIP-MOD-REP decide-PAST
 Lit. ‘It is in difficult times that Taro₁ decided *e*₁₊₂ help each other.’
- c. Taroo₁-wa Hanako₂-ni [*e*₁₊₂₊ pikunikku-ni ik-oo-to]
 Taro-TOP Hanako-DAT picnic-DAT go-MOD-REP
 it-ta.
 say-PAST
 Lit. ‘Taro₁ said to Hanako₂ *e*₁₊₂₊ to go on a picnic.’

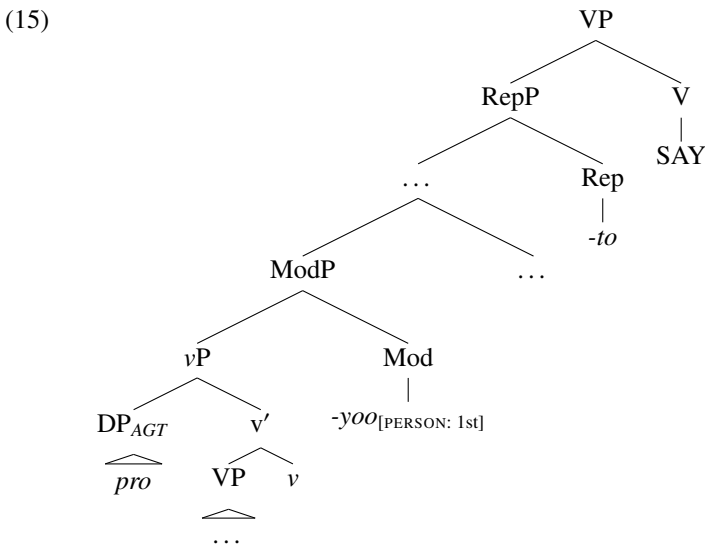
⁵This point can be reinforced by the fact that a propositional negation such as *sore-wa uso-da* ‘that’s a lie’ cannot be used to negate (13) (cf. Kaufmann 2012).

- (i) A: Kimi-wa kyoositu-o soozi-si-yoo.
 you-TOP classroom-ACC cleaning-do-MOD
 ‘You will clean the classroom.’
 B: Sore-wa uso-da.
 that-TOP lie-COP.PRES
 ‘That’s a lie’

Albeit the embedded agent can be interpreted multiply, the attitude of the embedded *-yoo* must be attributed to the matrix subject, so it is not like *-yoo* in the matrix setting, where the attitude holder is the actual speaker. Then, this indicates that the 1st-person parameter of *-yoo*, when embedded, is shifted in accordance with the context of the matrix subject. I thus claim that embedding *-yoo* does not involve Control but indexical shifting.

3 Deriving the *-Yoo* Complementation via Indexical Shifting

In this section, I lay out my idea regarding how *-yoo* is embedded and its 1st-person semantics is shifted. First, I propose the structure in (15), where I intentionally have the structure between ModP and RepP vague. However, (15) suffices to understand how indexical shifting of *-yoo* is carried out. Second, I assume with Shimamura (2018, 2019, 2022) that the quotative complement in Japanese involves a covert verb, SAY. Crosslinguistically, indexical shifting tends to be observed in the complement clauses that are introduced by complementizers originating from verbs meaning ‘say’ (Messick 2017); I assume that this covert SAY introduces a set of universally quantified new contexts that is compatible with the matrix subject’s SAYing content, and that SAY can be eventive or stative (cf. Major 2021). Then, I assume that the embedded clause is abstracted over contexts only when SAY is merged. Finally, I assume a simple semantics of *-yoo* given in (16), where *-yoo* encodes the information of its attitude holder as α_c (the actual speaker) in w_c (the actual world). It should be more complex, but since we are only concerned with the person-parameter shifting, this just serves the purpose of this paper.



$$(16) \quad \llbracket \text{-}yoo \rrbracket = \lambda p_{(st)}. \forall w' \text{ compatible with } \alpha_c \text{'s determination/will in } w_c : p(w')$$

When we combine (16) with vP whose agent is the speaker himself/herself as in (11), we get the semantics in (17).

$$(17) \quad \llbracket \text{I clean-}yoo \text{ the classroom} \rrbracket = \forall w' \text{ compatible with } \alpha_c \text{'s determination/will in } w_c : \alpha_c \text{ clean the classroom in } w'$$

Now, let us consider what semantically happens to (17) when it is embedded:⁶

$$(18) \quad \text{Boku-wa [} \textit{pro} \text{ kyoositu-o } \quad \textit{soozi-si-yoo-to} \quad \text{] omot-ta.}$$

I-TOP *pro* classroom-ACC cleaning-do-MOD-REP think-PAST
'I thought of cleaning the classroom.'

We ignore the semantic role of the reporting marker *-to*, simply taking it to be an identity function, so that the semantics of the entire RepP is the same as that of (17).⁷ Now, SAY is merged to RepP, and I assume with Shimamura (2022) that the semantics of SAY is (19), where SAY also introduces a source argument (Major 2021).⁸

$$(19) \quad \llbracket \text{SAY} \rrbracket = \lambda q. \lambda x. \lambda e. \text{SOURCE}(x)(e) \wedge e \text{ in } w_c \wedge \forall c' \in \text{CON}(e) : q(c')$$

In (19), the argument q type-semantically corresponds to RepP, but RepP can be semantically diverse, contingent on what Rep actually takes. In any case, let us focus our attention on the semantic composition of (17) and (19):

$$(20) \quad \llbracket \text{VP} \rrbracket = \lambda x. \lambda e. \text{SOURCE}(x)(e) \wedge e \text{ in } w_c \wedge \forall c' \in \text{CON}(e) : \llbracket \textit{pro} \text{ clean-}yoo \text{ the classroom} \rrbracket(c')$$

As I said above, lambda abstraction over contexts is possible inside the complement of SAY (or 'say' complementizers in general) (Messick 2017, Shimamura 2022), hence (21), where I assume that a newly introduced context c' is tripartite $\langle x, h_{c'}, w_{c'} \rangle$ (the speaker variable, the addressee, and the world). Therefore, SAY is monstrous (cf. Schlenker 2003).

$$(21) \quad \text{a. } \llbracket \text{VP} \rrbracket = \lambda x. \lambda e. \text{SOURCE}(x)(e) \wedge e \text{ in } w_c \wedge \forall c' \in \text{CON}(e) : (\lambda c' \llbracket \textit{pro} \text{ clean-}yoo \text{ the classroom} \rrbracket)(c')$$

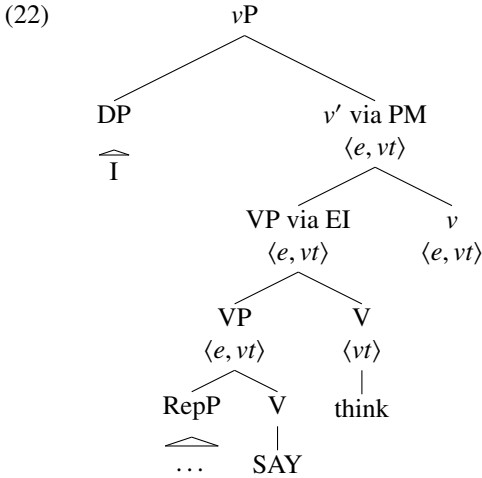
⁶For interpretation of *pro* in (18), I assume: $\llbracket \textit{pro}_1 \rrbracket^{c,g}$, where $g(1) = \alpha_c$, which is eventually indexical-shifted in (21).

⁷This is just for an expository purpose and due to the limited space. The reporting marker in Japanese is semantically significant in that it changes any semantic type into an utterance of type u (Shimamura 2022). We also ignore what the semantics of the ... part in (15) actually is.

⁸In (19), SAY has a set of contentful events/states in its denotation (Hacquard 2010), but it is not a set of worlds but a set of contexts.

- b. $\llbracket \text{VP} \rrbracket = \lambda x. \lambda e. \text{SOURCE}(x)(e) \wedge e \text{ in } w_c \wedge \forall c' \in \text{CON}(e) : \forall w' \text{ compatible with } x\text{'s determination/will in } w_c : x \text{ clean the classroom in } w'$

Then, I assume that when the entire VP projected by SAY is merged to the matrix verb ‘think’ the source argument is not saturated but passed up via Event Identification (Kratzer 1996), so when the matrix verb, which I take to be a set of events, and the matrix *v* are merged, we get (*v* = event type):

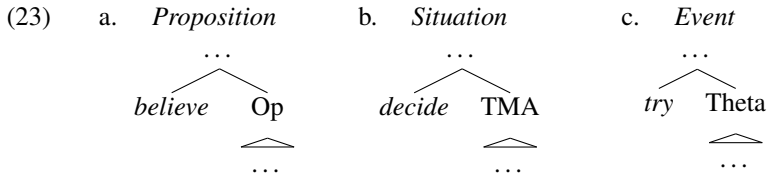


In this way, the source argument and the matrix agent argument are identified via Predicate Modification (PM) (cf. Heim and Kratzer 1998). Given this analysis, the attitude semantics is severed from lexical verbs like ‘think’ or ‘believe’ (Elliot 2018, Lohndal 2014, Shimamura 2019).

An immediate consequence of the proposed analysis is that the embedded agent can be anything since we have *pro* whose referent is independently determined, so it can accommodate the various agent interpretations, be *-yoo* used in the matrix domain or the embedded domain. Also, the obligatory *de se* interpretation and the one-clause-up requirement are now explained in terms of indexical shifting. That is, as pointed out in the literature, indexical shifting requires the matrix subject and the embedded subject to be *de-se*-associated (cf. Anand 2006); under our analysis, this is achieved with the matrix subject binding into the embedded *-yoo* clause. Also, the one-clause-up requirement is reduced to the locality of indexical shifting: in (10), the 1st-person feature of *-yoo* can only be shifted in the second embedded clause where *-to* and hence SAY are used. The proposed analysis can thus explain the relevant empirical facts without the PRO/MTC analysis.

4 The Size of the *-Yoo* Complement and the Implicational Complementation Hierarchy

Recently, Wurmbrand and Lohninger (2019) propose an intriguing correlation between the size of an embedded clause and the semantics of its selecting verb, namely the ICH. We cannot go into the details of it for the space limitation of this paper, but the gist is the following:⁹



In (23), the propositional complement given as the Op-domain is syntactically realized as CP, and the situation complement that covers the tense, modal and aspect (TMA) domain is structured at least as TP/IP. Finally, the event complement corresponds to vP or VP, hence the theta domain. Following Wurmbrand and Lohninger's (2019) classification, I argue the following:

(24) *The Size of the -Yoo Complement*

- omow-* 'think' / *iw-* 'say': [_{CP} [_{TP} [_{vP} DP_{AGT} VP] -yoo]]
- kime-* 'decide': [_{TP} [_{vP} DP_{AGT} VP] -yoo]
- su-* 'do/try'¹⁰: [_{vP} ___ VP] -yoo

Given (24), the part of the structure in (15) I intentionally had as ... is dependent on the choice of a matrix verb. For (24c), I assume that it is a sort of restructuring (Shimamura and Wurmbrand 2014, Wurmbrand and Shimamura 2017), and that *-yoo* needs to select vP without an agent argument. This then seems to require us to change the semantics of *-yoo* since as in (16) its argument is propositional (a set of worlds). However, I assume the same semantics while I take the mode of the semantic composition to be different. That is, following Jacobson (1990), vP without an agent and the relevant modal are combined via Function Composition.¹¹

⁹Note that the ICH is not an absolute generalization regarding the clause size, but it is only concerned with the minimal structure we need for each of the three structures in (24). For instance, we can structure an event complement as TP or CP, but we cannot have a propositional complement as vP.

¹⁰Another 'try' verb in Japanese is *kokoromi-*, and it seems to me that this verb behaves in the same way as *su-* for the empirical facts below, but the relevant judgements are tricky, so I do not include it here.

¹¹SAY can select (25b) for its semantically flexible nature (Shimamura 2022). However, the

- (25) a. Taroo-wa [heya-o soozi-si-yoo-to] si-ta.
 Taro-TOP room-ACC cleaning-do-MOD-REP do-PAST
 ‘Taro tried to clean the room.’
 b. *The Semantics of the Embedded Clause*
 $\lambda x.\forall w'$ compatible with α_c 's determination/will in w_c : x clean
 the room in w' (via $[-yoo] \circ [[vP]]$)

Notice at this point that for (24) to work out we need to assume that the reporting marker is not a complementizer. As I said above, I assume for a brevity's sake that it is an identity function and SAY is type-flexible (but see Shimamura 2018, 2019, 2022). Then, the size of the *-yoo* complement can be different under the ICH. First, only (24a) is compatible with an embedded Q-marker. If the Q-marker is located at C or moves to C (cf. Cable 2010, Hagstrom 1998), (26) and (27) show that (24a) is on the right track.

- (26) Taroo₁-wa [e_1 daigaku-o yame-yoo-ka-to]
 Taro-TOP university-ACC quit-MOD-Q-REP
 {omot/it/*kime/*si}-ta.
 think/say/decide/do-PAST
 ‘Taro {thought of/talked about} quitting the university.’
- (27) Taroo₁-wa [e_1 tugini nani-o si-yoo-ka-to]
 Taro-TOP next what-ACC do-MOD-Q-REP
 {omot/it/*kime/*si}-ta.
 think/say/decide/do-PAST
 ‘Taro {thought of/talked about} what he should do next.’

Another piece of evidence concerns the temporal interpretations. As in (28), (24a) and (24b) are compatible with two independent time adverbs. The impossibility of (29) then shows us that (24c) lacks the TMA domain.

- (28) Kyoo Taroo₁-wa [e_1 asu pikunikku-ni ik-oo-to]
 Today Taro-TOP tomorrow picnic-DAT go-MOD-REP
 {kime/omot}-ta.
 decide/think-PAST
 ‘Today, Taro {decided to go/thought of going} on a picnic tomorrow.’
- (29) Kyoo Taroo₁-wa [e_1 (*asu) pikunikku-ni ik-oo-to]
 Today Taro-TOP tomorrow picnic-DAT go-MOD-REP
 si-ta.
 do-PAST
 ‘Today, Taro tried to go on a picnic (*tomorrow).’

content of SAY is not a proposition but a property (a set of individuals who will clean the room in the embedded context).

The complement size of *su-* ‘do/try’ is very small in that it only projects the theta domain (without an agent). This is diagnosed by licensing a negative concord item, which requires a clausemate negation:

- (30) Taro₀₁-wa [*e*₁₊ dare-ni-mo aw-oo-to]
 Taro-TOP who-DAT-also see-MOD-REP
 {si/*kime/*iwa}-nakat-ta.
 do/decide/say-NEG-PAST
 ‘Taro didn’t try to meet anyone.’

Furthermore, since (24c) lacks the embedded agent *pro*, it does not allow a partial-Control-like reading:

- (31) Taro₀₁-wa [*e*₁₊ kyoositu-o soozi-si-yoo-to]
 Taro-TOP classroom-ACC cleaning-do-MOD-REP
 {omot/it/kime/*si}-ta.
 think/say/decide/do-PAST
 Lit. ‘Taro₀₁ {thought of /talked about/decided} *e*₁₊ {cleaning/to clean} the classroom.’

Finally, long passivization is possible for (24c) but not for (24a) and (24b) as (32) shows (cf. Wurmbrand 2001).

- (32) Sin’yaku-ga sono kenkyuusya-niyotte umidas-oo-to
 new.medicine-NOM that researcher-by create-MOD-REP
 {s-are/*kime-rare/*omow-are/*iw-are}-te-i-ta.
 do-PASS/decide-PASS/think-PASS/say-PASS-ASP-COP-PAST
 Lit. ‘A new medicine was being tried to create by the researcher.’

Since the embedded clause lacks the external argument, *v* cannot assign an accusative case as Shimamura and Wurmbrand (2014) and Wurmbrand and Shimamura (2017) claim.

Before concluding this paper, let us discuss one more potential issue of the proposed analysis concerning the ICH in light of SAY, by which we have severed the argument-selecting property from the matrix attitude predicate. This semantic move may be problematic to the ICH, since this generalization concerns the relationship between the semantics of the attitude verb and the size of its complement clause. Under the analysis given here, what introduces the embedded clause is SAY, so that there is no direct selectional relationship between the matrix attitude verb and its complement clause. I thus assume that SAY and the matrix attitude verb are syntactically combined via head movement, forming a complex predicate, and the resulting amalgamated verb counts as one predicate to select the complement clause. In this respect, also

noteworthy is that *su-* that literally means ‘do’ is not an attitude verb. However, it can appear with a quotative clause with *-to*. Under our analysis, this is possible because there is a covert verb, SAY, and VP headed by SAY and *do* are semantically composed just like (22). Then, the combination of SAY and *su-* creates an idiomatic interpretation of the latter as ‘try’.

5 Conclusion

I have proposed a non-Control approach to embedding *-yoo*, which Fujii (2006, 2010) argues to instantiate SC and SpC. However, in view of the distributions of the embedded agent construal and the dissociation of the attitude holder from the agent, any Control analysis (either PRO or the MTC) will have difficulty in explaining the data presented in this paper, at least without any modifications, and such modifications will call for additional (probably ad hoc) assumptions. I have also contended that the size of the complement clause can vary in accordance with the semantics of the matrix predicate, and showed that the different sizes of complement clauses result in several different syntactic/semantic behaviors of them such as long passivization and negative concord item licensing.

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Multiple Argument Ellipsis in Japanese: A Case Study in Idiomatic Argument Ellipsis*

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1 Introduction

One of the long-standing and on-going research questions involving Argument Ellipsis (AE) in Japanese is: *How to derive AE in Japanese?* Following are the representative and competing analyses.

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- (1) a. LF-copying
(Oku 1998, et. seq., Saito 2007, Sakamoto 2014, et. seq., a.o.)
- b. PF-deletion
(Fujiwara 2019, 2020, Takahashi 2020, a.o.)
- c. Verb-stranding VP Ellipsis (VVPE)
(Otani and Whitman 1991, Funakoshi 2016, Abe 2019, a.o.)
- d. *pro*
(Kuroda 1965, Hoji 1998, a.o.)
- e. “semantics”
(Kurafuji 2019)
- f. Question under Discussion (QuD)
(Tanabe and Hara 2021 and Tanabe and Kobayashi 2021)

This paper discusses a related question, but to the best my knowledge, one that has never been asked: *How to derive multiple AE in Japanese?* Extending the phonological/prosodic analysis of multiple scrambling in Japanese by Agbayani, Golston, and Ishii (AGI) 2015 (which is already extended to multiple right dislocation (Ishii 2019), multiple cleft (Ishii and Agbayani 2020, Agbayani and Ishii 2021a), and multiple sluicing (Agbayani and Ishii 2021b, c)), I argue that multiple AE in Japanese *can* be derived via phonological operation – Phonological Deletion –, targeting a phonological constituent, which is referred to as a complex phonological phrase.^{1, 2} I show this by showing the otherwise impossible AE involving idiomatic and figurative expressions becomes possible when it is executed as multiple AE.

The organization of this paper is as follows. First, in Section 2, I will introduce crucial sets of examples involving impossible idiomatic AE and its account by the LF-copying analysis entertained in Sato 2020. Then, in Section 3, I will introduce novel sets of examples involving otherwise impossible idiomatic AE becomes possible under multiple AE which shows that the existing analyses fails to account for and provide its account by proposing Phonological Deletion. In Section 4, I will discuss the clause-mate condition on multiple AE which is derived from Phonological Deletion. Section 5 is a conclusion.

¹ A complex phonological phrase is equivalent to a Major Phrase (MaP) in the classic/traditional terminology, yet it is the one that contains two or more MaP which do not dominate each other.

² I do not exclude the possibility that multiple AE can undergo two (or more) applications of the same operation when idiomatic AE is not involved.

2 Idiomatic Arguments Cannot Undergo AE

2.1 Data

Sato (2020) observes that, although AE is in principle readily possible in Japanese, idiomatic and figurative expressions (hereafter, for the sake of exposition, I will simply call these as idioms, and use ‘iXP’ as ‘idiomatic argument XP’ when necessary) cannot undergo AE.³ Two representative examples based on Sato 2020 are introduced here.^{4, 5}

- (2) * [Kato-san-wa ukkari kooshoo-aite-ni
 K.-TIT-TOP inadvertently negotiating-partner-to
 te-no-uchi-o mise-te-shimatta]-shi,
 palm.of.hand-ACC show-TE-ended.up-and
 [Sato-kun-wa raibaru-tasha-ni e_{IDP} mise-te-shimatta].
 S.-TIT-TOP competitor-company-to show-TE-ended.up
 ‘[Ms. Kato inadvertently ended up showing his secret plan to his negotiating partner], and [Mr. Sato ended up showing her secret

³ Idiomatic argument is only one of the cases which fails to undergo AE. See, for example, Oku 2013, 2016 and references cited therein, for other arguments that resist AE in Japanese.

⁴ All the Japanese examples are transcribed in the *Hepburn (Hebon)* system Romanization, except for long vowels where vowels are reduplicated when necessary. The translations in single quotes are not always meant to be the correct English translations and are sometimes intended to give the (rough) structure and/or meaning of the examples.

⁵ Essentially the same observation can be found in Tanaka 2001: 575, fn.18, which is credited to an anonymous reviewer, although the intended idiomatic AE (notated here as an ‘e_{IDP}’) was referred to as a pro.

- | | |
|---|---|
| (i) a. Mai-ga hara-o tateta-no?
M.-NOM stomach-ACC set.up-Q
‘Did Mai get angry?’ | (ii) a. Dare-ga hara-o tateta-no?
who-NOM stomach-ACC set.up-Q
‘Who got angry?’ |
| b. * Iie, Ken-ga e _{IDP} tateta(-n-desu)-yo.
no K.-NOM set.up-COP-POL-SFP
‘No, Ken did.’ | b. * Ken-ga e _{IDP} tateta(-n-desu)-yo.
K.-NOM set.up-COP-POL-SFP
‘Ken did.’ |
| c. * Iie, Mai-wa e _{IDP} tate-nakat-ta(-desu)-yo.
no M.-TOP set.up-NEG-TNS-COP-SFP
‘No, Mai didn’t.’ | |
| d. * Hai, Mai-ga e _{IDP} tateta(-n-desu)-yo.
yes M.-NOM set.up-COP-POL-SFP
‘Yes, Mai did.’ | |
- (*hara-o tate-ru*; (literal, but gibberish) ‘to set up one’s stomach’ /
 (idiom) ‘to get angry.’)
 ((i)a–b are based on Tanaka 1998: 575, fn.18, (i), with a minor modification.)

These examples may be a potential challenge to the QuD-based analysis, given that it shows idiomatic AE is impossible in the Q&A context. I will leave a detailed discussion in this paper, but see footnote 6 for a related discussion.

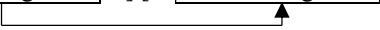
plan to his competitor company].’
(te-no-uchi-o mise-ru; (literal) ‘to show one’s palm of hand’ /
 (idiom) ‘to reveal one’s strategy/true intention/secret.’)
 (Based on Sato 2020: 269, (19), with a minor modification.)

- (3) * [Kato-kachoo-ni-wa buka-ni hana-o motaseru-dake
 K.-TIT-DAT-TOP subordinate-to flower-ACC let.have-degree
 -no doryoo-ga aru]-ga, [Sato-kachoo-ni-wa
 -GEN generosity-NOM exist-but S.-TIT-DAT-TOP
 buka-ni _{e_{iDP}} motaseru-dake-no doryoo-ga nai].
 sub.-to let.have-deg.-GEN gene.-NOM not
 ‘[Kato, the manager, have the generosity to let his subordinates take
 the credit], but [Sato, the manager, does not have the generosity to
 let his subordinates take the credit].’
(hana-o mot-ase-ru: (literal) ‘to let (someone) have flowers’ /
 (idiom) ‘to let someone take credit (for a success).’)
 (Based on Sato 2020: 275, (24), with modifications.)

2.2 Analysis

Sato (2020) argues in detail that impossibility of applying AE to idiomatic argument supports the LF-copy analysis over the PF-deletion/VVPE/pro alternatives. The gist of his analysis, which is extremely simplified and radically distorted here, is that there are semantic/compositional reasons that makes it impossible the application of LF-copying to the idiomatic argument to the exclusion of verb it selects to yield an idiomatic interpretation at LF.

- (4) Schematic LF-copying Derivation:
 [... idiomatic argument V] [... idiomatic argument V]


 LF-copying is not possible due to semantic/compositional reasons.

3 Idiomatic Arguments Can Undergo Multiple AE

3.1 Data

What had gone unnoticed is that the otherwise impossible AE of idiomatic argument becomes possible when it is executed as a multiple AE. Thus when

(2) and (3) are modified to involve multiple AE, idiomatic argument can undergo AE. In the following two examples, non-idiomatic PP and idiomatic DP undergo multiple AE.⁶

- (5) [Kato-san-wa ukkari kooshoo-aite-ni
 K.-TIT-TOP inadvertently negotiating-partner-to
 te-no-uchi-o mise-te-shimatta]-shi,
 palm.of.hand-ACC show-TE-ended.up-and
 [Sato-kun-mo omowazu e_{PP} e_{IDP} mise-te-shimatta].
 S.-TIT-also unintentionally show-TE-ended.up
 ‘[Ms. Kato inadvertently ended up showing his secret plan to his negotiating partner], and [Mr. Sato also unintentionally ended up showing her secret plan to his negotiating partner].’
- (6) [Kato-kachoo-ni-wa buka-ni hana-o motaseru-dake
 K.-TIT-DAT-TOP subordinate-to flower-ACC let.have-degree
 -no doryoo-ga aru]-ga,
 -GEN generosity-NOM exist-but
 [Sato-kachoo-ni-wa e_{PP} e_{IDP} motaseru-dake-no doryoo-ga nai].
 S.-TIT-DAT-TOP let.have-deg.-GEN gene.-NOM not
 ‘(Same as (3))’

I should hasten to note here that it is not the case that the presence of licit AE somehow saves the otherwise illicit AE of idiomatic argument, along the line of the Principle of Minimal Compliance (Richards 1998). This can be shown by a case involving two idiomatic arguments. When anteceded by (7)a, applying AE to only one of idiomatic arguments is totally ungrammatical as shown in (7)b and (7)c; however, multiple AE is grammatical as in (7)d.

- (7) a. [Ken-wa itosezu hi-ni abura-o sosoi-de-shimatta]
 K.-TOP unintentionally fire-to oil-ACC pour-TE-ended.up
 -dake-da-ga,
 -only-COP-but

⁶ Recall footnote 5 where I introduced idiomatic AE is impossible in the Q&A context. The deviance is lifted when multiple AE is involved, as shown in (i)b–c below. This further confirms that multiple AE behaves differently than that of single AE.

- (i) a. Mai-ga hara-o tateta-no?
 M.-NOM stomach-ACC set.up-Q
 ‘Did Mai get angry?’
 b. Iie, e_{SUB} e_{IDP} tate-nakat-ta(-desu)-yo. c. Hai, e_{SUB} e_{IDP} tateta(-n-desu)-yo.
 no set.up-NEG-TNS-POL-SFP yes set.up-COP-POL-SFP
 ‘No, (Mai) didn’t.’ ‘Yes, (Mai) did.’

- b. * [Mai-wa itoteki-ni e_{IPP} abura-o sosogi-yagatta].
 M.-TOP intentionally oil-ACC pour-‘hell’ed
- c. * [Mai-wa itoteki-ni hi-ni e_{IDP} sosogi-yagatta].
 M.-TOP intentionally fire-to pour-‘hell’ed
- d. [Mai-wa itoteki-ni e_{IPP} e_{IDP} sosogi-yagatta].
 M.-TOP intentionally pour-‘hell’ed
 ‘[Ken unintentionally ended up making a bad situation worse], but
 [Mai intentionally made a bad situation worse].’
 (*hi-ni abura-o sosog-u*; (literal) ‘to pour oil into fire’ /
 (idiom) ‘to make bad situation worse.’)

Note that this licit multiple AE targeting two idiomatic arguments indicates that two independent applications of AE, be it LF-copying or any other ways (recall the analyses introduced in (1)), to *hi-ni* and *abura-o* should not (if not, cannot) derive (7)d since AE of idiomatic argument is impossible to begin with. One exception is VVPE, which can target two internal idiomatic arguments with a single application, as shown in (8).

(8) (Simplified) Derivation of (7)d under VVPE:

..., [... [~~v_P hi-ni abura-o t_v~~] sosogi-yagattav].

However, VVPE cannot cover cases like (9)c, (10)e, and (10)f where multiple AE targets subject and one of the internal idiomatic arguments but not the other internal argument.⁷ First case, i.e., (9)c, shows that a moved idiomatic DP can undergo AE when (non-idiomatic) subject undergoes AE as well. This should be contrasted with the ungrammatical (9)b which involves impossible AE of idiomatic DP.

- (9) a. [Tanaka-buchoo-wa [jibun-no buka-ga te-no-uchi-o;
 T.-TIT-TOP self-GEN sub.-NOM palm.of.hand-ACC
 kooshoo-aite-ni t_j mise-te-shimatta-koto-o] nageita]-dake-da
 nego.partner-to show-TE-ended.up-fact-ACC grieved-only-COP
 -ga,
 -while
- b. * [Nakata-buchoo-wa [jibun-no buka-ga e_{IDP};
 N.-TIT-TOP self-GEN sub.-NOM
 kooshoo-aite-ni t_j mise-te-shimatta-koto-o] (nagekazuni)
 nego.-partner-to show-TE-ended.up-fact-ACC grieved.not
 sakate-ni totta].
 backhand-DAT got

⁷ Not all idiomatic argument can undergo movement, however. See Sakamoto 2014, 2016, 2017, Sato 2020, and references cited therein.

- c. ? [Nakata-buchoo-wa [_{eSUB} N.-TIT-TOP _{eIDPj} kooshoo-aite-ni _{tj} mise-te-shimatta-koto-o] (nagekazuni) nego.-partner-to show-TE-ended.up-fact-ACC grieved.not sakate-ni totta].
backhand-DAT got
'While [Tanaka, the general manager, grieved [the fact that self's subordinate showed their secret plan to their negotiating partner]], [Nakata, the general manager, (didn't grieve but) exploited [the fact that self's subordinate showed their secret plan to their negotiating partner]].'

Second case, i.e., (10)e and (10)f, involves multiple idioms where one of idiomatic XP can undergo AE when non-idiomatic subject undergoes AE as well but leaves the other idiomatic XP unelided under multiple AE. These should be contrasted with the ungrammatical (10)b and (10)c which involves impossible AE of one of the idiomatic XP.

- (10) a. [Itosezu jibun-no kodomo-ga hi-ni abura-o unintentionally self-GEN child-NOM fire-to oil-ACC sosoi-de-shimatta-to] [Ken-wa _{tj} nageita]-ga, pour-TE-ended.up-C K.-TOP grieved-but [{b./c./d./e./f.} sosogi-yagatta-to] _{ij} Mai(-ni)-wa _{tj} wakatta].
pour-'hell'ed-C M.(-DAT)-TOP knew
- b. * itoteki-ni jibun-no kodomo-ga _{eIPP} abura-o intentionally self-GEN child-NOM oil-ACC
- c. * itoteki-ni jibun-no kodomo-ga hi-ni _{eIDP} intentionally self-GEN child-NOM fire-to
- d. itoteki-ni jibun-no kodomo-ga _{eIPP} _{eIDP} intentionally self-GEN child-NOM
- e. ? itoteki-ni _{eSUB} _{eIPP} abura-o intentionally oil-ACC
- f. ? itoteki-ni _{eSUB} hi-ni _{eIDP} intentionally fire-to
'[Ken grieved [that his child unintentionally ended up making a bad situation worse]], but [Mai knew [that her child intentionally made a bad situation worse]].'

Under the VVPE, there is no way to form "vP/VP" that includes, for example, only subject and scrambled idiomatic direct object yielding (9)c and it would end up in a non-constituent deletion, as represented in (11).

(11) (Simplified) Derivation of (9)c under VVPE:

..., [... [_{VP} SUB [_{VP} ~~te-no~~ uchi-_o PP _{t_j}-_{t_v}]] sosogi-yagatta_v].

To sum up so far, multiple AE involving idiomatic argument challenges essentially all the existing analyses listed in (1), including the LF-copying analysis which Sato (2020) argued to be responsible for why idiomatic AE is impossible.⁸

3.2 Analysis

In order to account for why the multiple AE involving idiomatic arguments is possible, I propose that such multiple AE in Japanese *can* be derived via phonological operation – Phonological Deletion –, targeting a phonological constituent, which is referred to as a complex phonological phrase (cΦ) in the phonological component/PF, extending the phonological/prosodic analysis for multiple scrambling (AGI 2015), multiple right dislocation (Ishii 2019a, b), multiple cleft (Ishii and Agbayani 2020, Agbayani and Ishii 2021a), multiple sluicing (Agbayani and Ishii 2021b, c), assuming a liberal phonological phrasing (Ishihara 2007) in addition to recursive phonological phrasing (Itô and Mester 2013). To be specific, I propose (12) and (13).^{9, 10}

- (12) a. Material for AE is targeted within syntax and is elided either in syntax or phonology.
b. Material targeted for AE must be
i. non-predicative, ii. maximal, and iii. contained in a single (syntactic or phonological/prosodic) constituent.
- (13) a. If the targeted material is a syntactic XP, then it undergoes Syntactic AE (via LF-copying).
b. If the targeted material is not a syntactic XP, then that material is packed into a prosodic constituent in the phonology resulting in a complex phonological phrase (cΦ) and undergoes Prosodic AE, i.e., Phonological Deletion.

⁸ Also recall counterarguments for VVPE and pro offered by Sakamoto (2014, 2016, 2017), and Sato (2020). As for the “semantic” analysis (e.g., choice function), as far as I can tell, it cannot account for the single vs. multiple AE patterns shown in (7), which involves multiple idioms.

⁹ One possibility I will not pursue here is whether Phonological Deletion always applies after the phonological/prosodic constituent has undergone phonological/prosodic movement.

¹⁰ Note that under the proposed analysis, a single AE and a multiple AE can be derived in a completely different way. While the former always targets syntactic constituent in an antecedent clause and copies it onto an elliptical clause, the latter can target and delete phonological constituent in an elliptical clause.

Under the Phonological Deletion, the derivation of multiple AE, for example (7)d which involve two idiomatic arguments, proceeds as follows:

- (14) Derivation of (7)d:
- a. Materials targeted for multiple AE (indicated by double underline):
..., [... [PP hi-ni] [DP abura-o] sosoida]].
 - b. Phonological phrasing (indicated by (Φ xxx)):
..., (... (Φ hi-ni) (Φ (Φ abura-o) (Φ sosoida))).
 - c. Phonological rephrasing (indicated by single underline) resulting in a complex phonological phrase (cΦ):
..., (... (cΦ (Φ hi-ni)(Φ abura-o)) (Φ sosoida)).
 - d. Phonological Deletion (indicated by ~~strike through~~) in the PF targeting cΦ:
..., (... (~~cΦ (Φ hi-ni)(Φ abura-o)~~) (Φ sosoida)).

Multiple AE involving subject and idiomatic argument (9)c proceeds in a similar fashion:

- (15) Derivation of (9)c:
- a. Materials targeted for multiple AE:
..., [[DP SUB] [DP te-no-uchi-o]_j [DP kooshoo-aite-ni] t_j V] ...
 - b. Phonological phrasing:
..., ((Φ SUB) (Φ te-no-uchi-o) (Φ (Φ kooshoo-aite-ni) (Φ V)))
 - c. Phonological rephrasing:
..., ((cΦ (Φ SUB) (Φ te-no-uchi-o)) (Φ (Φ kooshoo-aite-ni) (Φ V)))
 - d. Phonological Deletion in the PF targeting cΦ:
..., (~~cΦ (Φ SUB) (Φ te-no-uchi-o)~~) (Φ (Φ kooshoo-aite-ni) (Φ V)))

Multiple AE in (10)e and (10)f proceeds in an essentially similar fashion as well, yet the latter example involves more option depending on the movement involved before the application of multiple AE:

- (16) (Simplified) Derivation of (10)e:
- a. Phonological (re-)phrasing:
..., ((cΦ (Φ SUB) (Φ hi-ni)) (Φ (Φ abura-o) (Φ sosoida))) ...
 - b. Phonological Deletion in the PF targeting cΦ:
..., (~~cΦ (Φ SUB) (Φ hi-ni)~~) (Φ (Φ abura-o) (Φ sosoida))) ...
- (17) (Simplified) Derivation of (10)f (Possible Derivation 1):
- a. Phonological (re-)phrasing after single syntactic scrambling of idiomatic argument *hi-ni*:
..., (... (Φ hi-ni) (cΦ (Φ SUB)(Φ abura-o)) (Φ sosoida))

- b. Phonological Deletion in the PF targeting $c\Phi$:
 ..., (... (Φ hi-ni) (~~$c\Phi$ (Φ SUB) (Φ abura-o)~~) (Φ sosoida))

(18) (Simplified) Sample Derivation of (10)f (Possible Derivation 2):

- a. Phonological (re-)phrasing after multiple prosodic scrambling of idiomatic arguments:
 ..., (... ($c\Phi$ (Φ hi-ni) (Φ abura-o)) (Φ SUB) (Φ sosoida))
- b. Phonological (re-)phrasing:
 ..., (... (Φ hi-ni) (~~$c\Phi$ (Φ abura-o) (Φ SUB)~~) (Φ sosoida))
- c. Phonological Deletion in the PF targeting $c\Phi$:
 ..., (... (Φ hi-ni) (~~$c\Phi$ (Φ abura-o) (Φ SUB)~~) (Φ sosoida))

4 Multiple AE and the Clause-mate Condition

Before concluding, I would like to discuss an issue regarding the nature of multiple AE involving idiomatic argument, i.e., it is subject to a clause-mate condition.¹¹ As the following case, where the intended multiple AE applies to the matrix non-idiomatic argument *jooshi-ni* and the scrambled embedded idiomatic argument *te-no-uchi-o*, indicates, it is not possible to yield licit multiple AE via Phonological Deletion.

- (19) a. [Tanaka-buchoo-wa jooshi-ni [te-no-uchi-o;
 T.-TIT-TOP boss-to palm.of.hand-ACC
 jibun-no buka-ga kooshoo-aite-ni t_j mise-te-shimatta-koto
 self-GEN sub.-NOM nego.-partner-to show-TE-ended.up-fact
 -o] tsutaeta]-shi,
 -ACC told-and
- b. * [Nakata-buchoo-mo e_{pp} [_{iDP_j}
 N.-TIT-also
 jibun-no buka-ga kooshoo-aite-ni t_j mise-te-shimatta-koto
 self-GEN sub.-NOM nego.-partner-to show-TE-ended.up-fact
 -o] tsutaeta].
 -ACC told
 ‘[Tanaka, the general manager, told the boss [the fact that self’s subordinate showed their secret plan to their negotiating partner]], and [Nakata, the general manager, also told the boss [the fact that self’s subordinate showed their secret plan to their negotiating partner].’

¹¹ I would like to thank Koji Shimamura for reminding me this issue.

But this is what is expected under the Phonological Deletion analysis because it is not possible to form a complex phonological phrase consisting of (ϕ jooshi-ni) and (ϕ te-no-uchi-o) yielding ($_{c\phi}$ (ϕ jooshi-ni) (ϕ te-no-uchi-o)), since such phonological (re-)phrasing is blocked by a clause boundary (CP)/intonation (t) phrase boundary.¹² Because of this, multiple AE in (19)b is forced to involve two independent applications of AE via LF-copying, and the idiomatic AE of *te-no-uchi-o* yields the ungrammaticality along the line of Sato's (2020) analysis. This clause-mate condition on multiple AE is in fact shared with (20) multiple scrambling (Hiraiwa 2010), (21) multiple right dislocation, and (22) multiple cleft (see Koizumi 1995, 2000, Takano 2002, a.o.)^{13, 14}, and it can be attributed to whatever mechanism that prevents the formation of a complex phonological phrase that crosses a clause/intonation (t) phrase boundary¹⁵:

- (20) a. [_{CP} [$_{c\phi}$ (ϕ Mai-ni_(i)) (ϕ mame-o_(i))] [_{CP} Yui-ga Gen-kara
M.-DAT bean-ACC Y.-NOM G.-from
[_{CP} Ken-ga [t_i] [t_i] ageta-to] kiita]].
K.-NOM gave-C heard
'[To Mai a bean] [Yui heard from Gen [that Ken gave]].'
b. * [_{CP} ($_{c\phi}$ (ϕ Gen-kara_(i)) (ϕ mame-o_(i))] [_{CP} Yui-ga [t_i]
G.-from bean-ACC Y.-NOM
[_{CP} Ken-ga Mai-ni [t_i] ageta-to] kiita]].
K.-NOM M.-DAT gave-C heard
'[From Gen a bean] [Yui heard [that Ken gave to Mai]].'
(20)a is based on AGI 2015: 48, (3)a, with modifications)

¹² One confounding issue here is, contrary to the standard assumption that clause boundary (i.e., CP), is mapped to the intonation (t) phrase boundary, Ishihara (2021) has recently argued that such mapping is not guaranteed. But to the best of my knowledge, a cross-clausal phonological phrasing that packs the matrix and embedded XPs is in general not attested. So, it is not unreasonable to assume a mechanism that prohibits such phonological phrasing.

¹³ Although multiple cleft is indeed known to exhibit the clause-mate condition (Koizumi 1995, 2000, Takano 2002, a.o.), there are some exceptions (Hiraiwa and Ishihara 2002, 2012, Takano 2002, et. seq., a.o.). I note two cases here. First case is where the multiple cleft bears focus prosody, as observed by Hiraiwa and Ishihara (2002: Sec. 4, 2012: Sec. 6). Second case is where the multiple cleft involves more than two elements and when phonological/prosodic phrasing is taken into consideration, as observed by Takano (2020: Sec. 4.3.). It is beyond the scope of this paper to deal with these exceptional cases, and I will leave it for future research.

¹⁴ The clause-mate condition involving multiple sluicing is subject to obvious speaker variations; for example, while Takahashi (1994) and Abe (2015) find the effect, Nishigauchi (1998) and Hiraiwa and Ishihara (2002, 2012) do not. Due to this reason, I refrain from discussing it.

¹⁵ The segment of interest is indicated by t_i .

- (21) a. [CP Yui-ga Gen-kara [CP Ken-ga (t_i) (t_j) ageta-to]
 Y.-NOM G.-from K.-NOM gave-C
 kiita-yo], $\overline{(\text{c}\Phi(\Phi \text{ Mai-ni}_{(i)}) (\Phi \text{ mame-o}_{(j)}))}$.
 heard-SFP M.-DAT bean-ACC
 ‘[Yui heard from Gen [that Ken gave]], [to Mai a bean].’
- b. * [CP Yui-ga (t_i) [CP Ken-ga Mai-ni (t_j) ageta-to]
 Y.-NOM K.-NOM M.-DAT gave-C
 kiita-yo], $\overline{(\text{c}\Phi(\Phi \text{ Gen-kara}_{(i)}) (\Phi \text{ mame-o}_{(j)})}$.
 heard-SFP G.-from bean-ACC
 ‘[Yui heard [that Ken gave to Mai]], [from Gen a bean].’
- (22) a. [CP Yui-ga Gen-kara [CP Ken-ga (t_i) (t_j) ageta-to]
 Y.-NOM G.-from K.-NOM gave-C
 kiita-no-wa] $\overline{(\text{c}\Phi(\Phi \text{ Mai-ni}_{(i)}) (\Phi \text{ mame-o}_{(j)})}$ -da.
 heard-C-TOP M.-DAT bean-ACC-COP
 ‘It is [to Mai a bean] [that Yui heard from Gen [that Ken gave]].’
- b. * [CP Yui-ga (t_i) [CP Ken-ga Mai-ni (t_j) ageta-to]
 Y.-NOM K.-NOM M.-DAT gave-C
 kiita-no-wa] $\overline{(\text{c}\Phi(\Phi \text{ Gen-kara}_{(i)}) (\Phi \text{ mame-o}_{(j)})}$ -da.
 heard-C-TOP G.-from bean-ACC-COP
 ‘It is [from Gen a bean] [that Yui heard [that Ken gave to Mai]].’

5 Conclusion

In this paper, I presented a hitherto unnoticed observation that the otherwise impossible argument ellipsis (AE) of idiomatic argument becomes possible when it is executed as multiple AE. Based on this observation, I proposed that multiple AE in Japanese *can* be derived via phonological operation – Phonological Deletion –, targeting a phonological constituent, which is referred to as a complex phonological phrase (cΦ) in the phonological component/PF, extending the phonological/prosodic analysis for multiple scrambling (AGI 2015), multiple right dislocation (Ishii 2019a, b), multiple cleft (Ishii and Agbayani 2020, Agbayani and Ishii 2021a), multiple sluicing (Agbayani and Ishii 2021b, c), assuming a liberal phonological phrasing (Ishihara 2007) in addition to recursive phonological phrasing (Itô and Mester 2013). Although there are remaining questions regarding multiple AE,¹⁶ I hope to have shown that investigations into multiple AE may shed new light on the nature of AE.

¹⁶ For example, not every AE-resistant XPs (e.g., Wh-phrase) can be rescued by multiple AE.

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SECTION 2
Oral Papers

Part 3
Formal Semantics
Pragmatics

A Semantic Analysis for Korean Echo Questions

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1 Introduction

Echo questions (henceforth, *EQs*) are sentences that require and partially repeat (“echo”) a previously uttered sentence and convey a question whose answer needs confirming or repeating what has been previously said (cf. Banfield 1982; Comorovski 1996; Dayal 1996; Noh 1998; Artstein 2002; Sudo 2010; Beck and Reis 2018, a.o.). For instance, if Speaker A utters the declarative sentence in (1-a) and stumbles over the object nominal *candy* making it hard for Speaker B to understand (as marked by the smaller font), Speaker B can reply with (1-b).

- (1) a. Speaker A: Mina bought candy.
b. Speaker B: Mina bought what?
c. Speaker A: (Mina bought) candy.

Although (1-b) looks syntactically identical to (1-a), except for the *wh*-word *what* replacing *candy*, it is uttered with rising intonation rather than falling and is interpreted as a question rather than a statement. In fact, Speaker A is expected to answer to (1-b) with something like (1-c). (1-b) is an example of an EQ in English, while (1-a) is the declarative clause acting as the discourse antecedent of the EQ.

EQs have received less attention in the literature than ordinary inter-

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rogative sentences. This is the case for the most studied Indo-European languages, let alone a language like Korean. In this paper, we provide what is, to the best of our knowledge, the first formal semantic analysis of Korean EQs. We believe that the nature of EQs is more transparently revealed in Korean than in other languages by the special clause-type marking that characterizes Korean EQs and clearly distinguishes them from ordinary declarative or interrogative clauses. We argue that this property of Korean EQs cannot be easily accounted for by existing analyses for EQs in other languages. Therefore, the study of Korean EQs may shed new light on EQs in general.

The present paper is structured as follows. Section 2 introduces the main morphosyntactic properties of Korean EQs with special emphasis on the Korean rich clause-typing system. Section 3 proposes a compositional semantic analysis of Korean EQs. Section 4 provides an overview of existing semantic analyses of EQs for English and similar languages, highlighting how they are not fully adequate for Korean EQs. Section 5 concludes.

2 Clause-type Markers and Echo Questions in Korean

In this section, we introduce some basic aspects of the Korean clause-typing system to then show why clause-type markers are relevant to uniquely characterize Korean EQs.

Korean is an SOV language with a rich system of clause-type markers (often labeled as *final endings* in Korean grammars¹). Clause-type markers are required in both matrix and embedded clauses, mark clause types and speech levels, and appear clause-final as the right-most verbal suffix (Sohn 2020). For the purpose of our investigation, we focus on three clause-type markers. The marker *ta* obligatorily marks plain-register matrix declarative clauses, as shown in (2-a). The marker *ni*, instead, uniquely and necessarily characterizes plain-register matrix polar/*wh*-interrogative clauses (*polar/wh-INTs*, henceforth), as shown in (2-b) and (2-c).²

- (2) a. Mina-ka sathang-ul sa-ss-*(**ta**). (declarative)
 Mina-NOM candy-ACC buy-PST-DEC
 ‘Mina bought candy.’³

¹ The precise syntactic status of *final endings* in Korean has triggered significant discussion (Cho 1995; Choe 2003; Lee et al. 2016; Suh 2016; Ceong 2019, a.o.).

² Some clause-type markers don’t mark clause type, but only discourse register, e.g., the markers *e* and *yo*, signaling intimacy and politeness, respectively.

³ This paper uses the Yale romanization system to transcribe Korean examples. The acceptability of each Korean example is judged by the first author and non-linguist consultants, who are native speakers of Korean. Abbreviations: ACC = Accusative; C = Complementizer; DEC = Declarative; EQ = Echo Question; EXH = Exhortative; IMP = Imperative; INT = Interrogative; NOM = Nominative; PRES = Present Tense; PST = Past Tense; QT = Quotative;

- b. Mina-ka sathang-ul sa-ss-*(**ni**)↑? (polar-INT)
 Mina-NOM candy-ACC buy-PST-INT
 ‘Did Mina buy candy?’
- c. Mina-ka mwue-lul sa-ss-*(**ni**)? (wh-INT)
 Mina-NOM what-ACC buy-PST-INT
 ‘What did Mina buy?’⁴

Although characterizing different clause types, both *ta* and *ni* signal the same discourse register, which we labelled “plain register” following Sohn (2020): the speaker uttering (2) conveys an informal, non-intimate, non-deferential attitude towards the addressee. Polar interrogative clauses like (2-b) involve an obligatory rising final intonation (high boundary tone, marked with an upward arrow ↑), while declarative clauses and *wh*-interrogative clauses involve falling final intonation (Jun 2005), which we leave unmarked. Korean is a *wh*-in-situ language, as can be seen by comparing (2-a) and (2-c): the *wh*-word for ‘what’ in (2-c) occurs in the same syntactic position as the regular nominal object ‘candy’ in (2-a). Thus, the main morphosyntactic difference between declarative and interrogative clauses lies in the clause-type marker and the intonation.

The third and last clause-type marker we focus on is the one that uniquely characterizes EQs: *tako*↑ (sometimes Romanized as *dago*) with an obligatory rising final intonation (high boundary tone, marked with the already familiar upward arrow ↑). The marker *tako*↑ characterizes a polar EQ, as in (3-b), a single-*wh* EQ with just one *wh*-expression⁵, as in (4-b), or a multiple-*wh* EQ with more than one *wh*-expression, as in (5-b).

- (3) a. Mina-ka sathang-ul sa-ss-ta.
 Mina-NOM candy-ACC buy-DEC
 ‘Mina bought candy.’
- b. Mina-ka sathang-ul sa-ss-**tako**↑? (polar-EQ)
 Mina-NOM candy-ACC buy-EQ
 ‘Mina bought CANDY?’
- (4) a. Mina-ka sathang-ul sa-ss-ta.
 Mina-NOM candy-ACC buy-DEC
 ‘Mina bought candy.’
- b. Mina-ka mwue-lul sa-ss-**tako**↑?(single-*wh* EQ)
 Mina-NOM what/something-ACC buy-PST-EQ
 Reading 1: ‘Mina bought WHAT?’
 Reading 2: ‘Mina bought SOMETHING?’

VOC = Vocative.

⁴ If the clause-type marker *ni* is replaced by *ni*↑ (with rising final intonation), then the *wh*-expression is likely to be interpreted as an indefinite and the whole clause as a polar interrogative ‘Did Mina buy something?’

⁵ We use ‘*wh*-expression’ as a cover term for both ‘*wh*-word’ (e.g., *who*) and ‘*wh*-phrase’ (e.g., *which new book*).

- (5) a. Mina-ka sathang-ul sa-ss-ta.
 Mina-NOM candy-ACC buy-PST-DEC
 ‘Mina bought candy.’
- b. Nwuka mwue-lul
 who/someone.NOM what/something-ACC
 sa-ss-**tako**↑? (multiple-*wh* EQ)
 buy-PST-EQ
 Reading 1: ‘WHO bought WHAT?’
 Reading 2: ‘SOMEONE bought SOMETHING?’
 Reading 3: ‘WHO bought SOMETHING?’
 Reading 4: ‘SOMEONE bought WHAT?’

(3-a) shows a declarative sentence that is uttered without any particular mispronunciation or mumbling and, therefore, can act as the antecedent of the polar EQ in (3-b). Speaker B utters the EQ in (3-b) to convey their surprise about (3-a) and ask Speaker A to confirm its truth. (4-a), instead, can be an appropriate antecedent for (4-b), since the object ‘candy’ is uttered in a way to make it difficult for Speaker B to understand it. Finally, (5-a) can be the antecedent of (5-b) since Speaker A mumbles both its subject and its object.

As highlighted by the different translations, the EQ in (4-b) allows for two readings and the EQ in (5-b) for four because of the two interpretations that are available for each Korean *wh*-expression in general, not just in EQs: either as a plain “interrogative” *wh*-expression, along the line of a *wh*-expression in an interrogative clause or an EQ in English, or like an indefinite.⁶ To the best of our knowledge, there has been no study that has precisely looked at the difference between the two possible readings of *wh*-expressions in EQs. We leave this open issue to further investigation. From now on, we focus on EQs with an “interrogative” interpretation of their *wh*-expressions, as in English.

2.1 On the Morphosyntactic Status of *Tako*↑

We have assumed that *tako*↑ is the monomorphemic clause-type marker characterizing EQs in Korean without further internal morphosyntactic structure nor semantic composition. In this section, we briefly touch upon two other possible analyses, argue against one, and tentatively conclude that the other is viable and deserves further investigation.

⁶ Korean *wh*-indefinites are formed by attaching an indefinite-forming suffix *nka* to *wh*-words (e.g., *mwue* ‘what’ - *mwue-nka* ‘something’, *nwukwu* ‘who’ - *nwukwu-nka* ‘someone’). However, bare *wh*-words can be interpreted as *wh*-indefinites depending on the context and/or intonation. Interrogative clauses involving one or more bare *wh*-words are interpreted as polar-INTs with *wh*-indefinite reading when accompanied with sharp rising final intonation (Lee 1997). When accompanied with falling final intonation (as ordinary *wh*-INTs), prosodic properties on each *wh*-word (such as pitch and phrase boundaries) are taken into consideration in distinguishing the reading, although under debate (for an overview, see Yun (2019)).

The first alternative analysis treats *tako* in EQs as the same as homophonous clause-type marker/complementizer introducing declarative clauses embedded under a verb like ‘say’ and analyzes EQs as embedded declarative clauses with a silent/elided ‘say’ matrix predicate. Such an analysis has been pursued by Noh (1995) and H. Lee (2010) and is the predominant one. Its main support comes from the fact that the marker *tako*↑ looks morphosyntactically identical to the combination of the declarative clause-type marker *ta* we mentioned in the previous section with the marker *ko*. This latter marker exhibits at least three different uses in Korean: (i) as the clause-final marker of a matrix or a subordinate clause, (ii) as the conjunction connecting two clauses or two smaller phrases, and (iii) as the indirect quotation marker immediately following to the right of the declarative marker/complementizer *ta* on the embedded declarative clause acting as the indirect quotation. This third use is the one that has inspired the predominant view of *tako*↑ in EQs. The core idea is that EQs are a type of indirect speech: the quotative particle *ko* attaches to the declarative marker/complementizer *ta* of the embedded (quoted or reported) clause, while the matrix verb (some kind of verb of saying) is omitted or silent. The examples in (6), inspired by H. Lee (2010: ex. 22) illustrate this view: (6-a) is the plain declarative clause acting as the antecedent of the EQ in (6-b), while (6-c) is the interrogative sentence with the matrix predicate ‘say’ introducing a clausal complement that looks identical to the EQ in (6-b).

- (6) a. Mary-ka John-ul salangha-n-ta.
 Mary-NOM John-ACC love-PRES-DEC
 ‘Mary loves John.’
- b. Mary-ka nwukwu-lul salangha-n-**ta-ko**↑? (EQ)
 Mary-NOM who-ACC love-PRES-DEC-**QT**
 ‘Mary loves WHO?’
- c. Mary-ka nwukwu-lul salangha-n-**ta-ko**
 Mary-NOM who-ACC love-PRES-DEC-**QT**
malha-yss-ni? (INT with an indirect quotation)
say-PST-INT
 ‘Did you say Mary loves who?’

According to this approach to EQs, (6-b) is just the same as (6-c): they look the same, except for having a silent ‘say’ as its matrix predicate rather than an overt one as in (6-c)⁷, and they mean the same, as shown by the fact that they both license the same true short constituent answer (‘John’).

We find this analysis unsatisfactory since it cannot account for important differences in intonation, interpretation, and use between EQs and ‘say that’ sentences. An EQ with the marker *tako*↑ as (6-b) is character-

⁷ Korean is a subject pro-drop language with no subject agreement on the verb; so person information is not morphosyntactically marked in (6-c) either.

ized by obligatory rising intonation, only allows for a constituent answer (e.g., ‘John’), and requires a previously-uttered declarative sentence as its antecedent (e.g., 6-a). On the other hand, rising intonation is absent on the indirect quotation marker *tako*, as in (6-c).⁸ As for the whole sentence in (6-c), it is interpreted as conveying a constituent question whose answer can be ‘John’ only if the sentence clause-type marker *ni* is accompanied by falling—not rising—intonation. If rising intonation is used, instead, then the whole sentence can only be interpreted as conveying a polar question like ‘did you say Mary loves someone?’. Finally, while EQs like (6-b) always require a discourse antecedent like (6-a), sentences with an indirect quotation like (6-c) can be uttered out of the blue. In sum, since intonational, semantic, and pragmatic features of EQs are different from those of interrogative sentences with an indirect quotation, the proposal that EQs should be equated to a kind of interrogative sentences with an indirect quotation is problematic.⁹

Moreover, if a matrix predicate like ‘say’ can be silent/omitted, this option should not be limited to EQs, but should be attested in other constructions as well. This prediction does not seem to be borne out. For instance, a declarative sentence like (7-b), uttered as a negative reaction to the question conveyed by (7-a), should be derivable from (8), which contains matrix ‘say’ predicate and what looks like (7-b) as its complement clause, and (7-b) and (8) should convey the same meaning. (7-b) and (8) receive two very different interpretations, instead. The *wh*-word (‘what’) in object position can only be interpreted as the negative quantificational NP ‘nothing’ in (7-b) (another intriguing fact deserving further investigation), while it can only be interpreted as the indefinite NP ‘something’ in (8).

- (7) a. Mina-ka sathang-ul sa-ss-ni?
 Mina-NOM candy-ACC buy-PST-INT
 ‘Did Mina buy candy?’
 b. Mina-ka mwue-lul sa-ss-**ta-ko**.
 Mina-NOM what-ACC buy-PST-DEC-**QT**
 ‘Mina bought nothing. (*lit.* Mina bought what.)’¹⁰
- (8) Mina-ka mwue-lul sa-ss-**ta-ko malha-yss-ta**.
 Mina-NOM what-ACC buy-PST-DEC-**QT say-PST-DEC**
 ‘(I/you/they/etc.) said that Mina bought something.’

⁸ The rising intonation on *tako* in (6-c, as *tako*↑) would indicate that a sentence has ended there, splitting (6-c) into two separate sentences (‘Mary loves WHO? Did you just say something?’).

⁹ P. Lee (1993) has already argued that the difference in the answers to *tako*-final questions such as (6-b) and sentences with an indirect quotation that involve the string *tako* and a matrix predicate such as (6-c) implies that the function and the meaning of EQs and sentences with an indirect quotation are not the same. We agree with this claim.

¹⁰ Even though the string *tako* occurs, the EQ reading is never possible in sentences like (7-b) due to the falling final intonation.

Thus, the view that EQs are derived from omitting the matrix predicate in a sentence with a quoted embedded clause is unwarranted, for it overlooks intonational, semantic, and pragmatic differences between EQs and quoted clauses.

The other alternative analysis of *tako*↑ would treat it as a complex string resulting from the combination of two functional elements: the declarative clause-type marker *ta* and *ko*↑, a specialized operator (different from the three homophonous ones mentioned above) that takes a declarative clause and turns into an EQ. In order to evaluate the plausibility of this approach, it would be necessary to check how productive this alleged EQ marker *ko*↑ is in forming EQs with discourse antecedent other than declarative clauses (e.g., interrogative clauses, imperative clauses, etc.). We are currently pursuing this investigation, and we do not discuss it further and continue with our initial analysis of *tako*↑ as a monomorphemic clause-type marker characterizing Korean EQs.

To summarize, we have established that Korean EQs have the following properties: (i) they require the existence of a previously uttered sentence (antecedent) and (ii) they must be introduced by the specialized clause-type marker *tako*↑. Property (i) is also common to English and all the other languages whose EQs have been studied. Property (ii), instead, is peculiar of Korean and characterizes Korean EQs morphosyntactically as well, on top of their semantic and pragmatic properties.

3 A Compositional Analysis of the Meaning of Korean Echo Questions

In this section, we present a compositional semantic analysis for Korean EQs. As shown in the previous section, Korean EQs look like interrogative clauses morphosyntactically, except for their clause-type marker and their intonation. At the semantic/pragmatic level, they behave like matrix interrogative clauses as well, by requiring an answer and by imposing the same constraints of the nature of their (short) answers (e.g., yes/no vs. constituent, single vs. pair, single pair vs. pair list). Unlike ordinary matrix interrogative clauses, though, EQs require a discourse antecedent in order to be uttered felicitously. Our basic idea to capture these similarities and differences is to analyze EQs in Korean as sentences sharing the core morphosyntax and semantics of ordinary interrogative sentences, but enriched with an EQ pragmatic operator, denoted by *tako*↑, that marks the clause type and adds to the pragmatic content. Both ordinary interrogative clauses and EQs denote sets of propositions—the set of their possible answers. The EQ operator applies to this set of propositions to return the very same set iff a presupposition is satisfied—that at least one proposition in the set has already been introduced in the discourse.

Let us look at concrete examples. (9-a) shows a declarative sentence in Korean acting like the antecedent of the *wh*-EQ in (9-c). (9-b), instead, shows the corresponding ordinary (non-echo) *wh*-interrogative sentence.

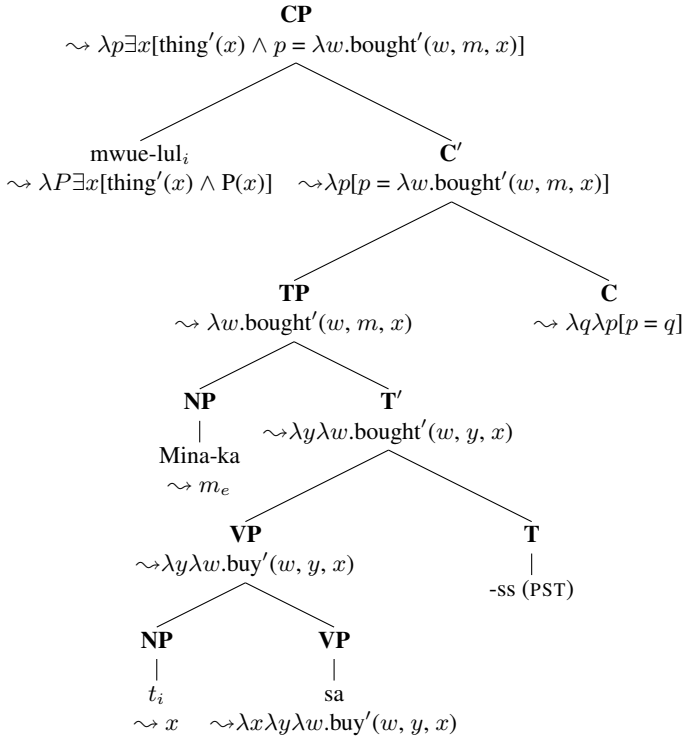
The bottom line of each example provides its logical translation.

- (9) a. Mina-ka sathang-ul sa-ss-ta. (EQ antecedent)
 Mina-NOM candy-ACC buy-PST-DEC
 ‘Mina bought candy.’
 $\rightsquigarrow \lambda w_{<s>}.bought'(w, m, c)$
- b. Mina-ka mwue-lul sa-ss-ni? (*wh*-INT)
 Mina-NOM what-ACC buy-PST-INT
 ‘What did Mina buy?’
 $\rightsquigarrow \lambda p_{<st>}\exists x_{<e>}[\mathbf{thing}'(x) \wedge p = \lambda w.bought'(w, m, x)]$
- c. Mina-ka mwue-lul sa-ss-tako↑? (*wh*-EQ)
 Mina-NOM what-ACC buy-PST-EQ
 ‘Mina bought WHAT?!’
 $\rightsquigarrow \lambda p:\exists q_{<st>}[\mathbf{uttered}'_{<st,t>}(q) \wedge$
 $\exists x[\mathbf{thing}'(x) \wedge q = \lambda w.bought'(w, m, x)].$
 $\exists x[\mathbf{thing}'(x) \wedge p = \lambda w.bought'(w, m, x)]$

(9-a) denotes a proposition, as expected from a regular declarative sentence. The ordinary *wh*-interrogative sentence in (9-b), instead, denotes a set of propositions, along the line of Hamblin’s (1973) and Karttunen’s (1977) seminal proposals and subsequent works. We propose that the *wh*-EQ in (9-c) denotes the same set of propositions as the ordinary *wh*-interrogative sentence in (9-b). The only difference is that the EQ in (9-c) also triggers presuppositional content, highlighted in bold in the logical translation. In particular, (9-c) presupposes that at least one of the propositions in the denotation of the EQ is the proposition denoted by a sentence uttered soon before the EQ.

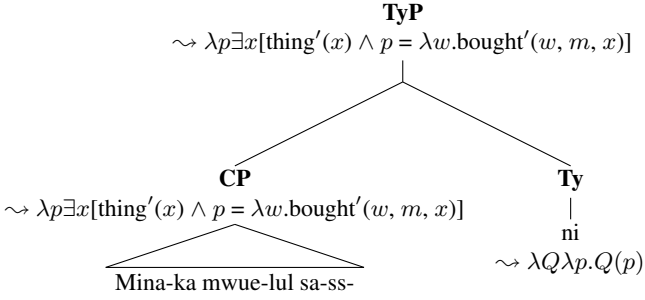
Since (9-b) and (9-c) are morphosyntactically identical except for their clause-type markers and intonations, we assume that the combination of those two elements (clause-type marker and intonation) form a unit which is responsible for the difference in content and use between (9-b) and (9-c) in particular, and between ordinary interrogative sentences and EQs in general. Specifically, we propose that the two kinds of sentences share the same syntactic structure and the same semantic derivation all the way up to the projection where *wh*-expressions move, as shown in (10).

(10)

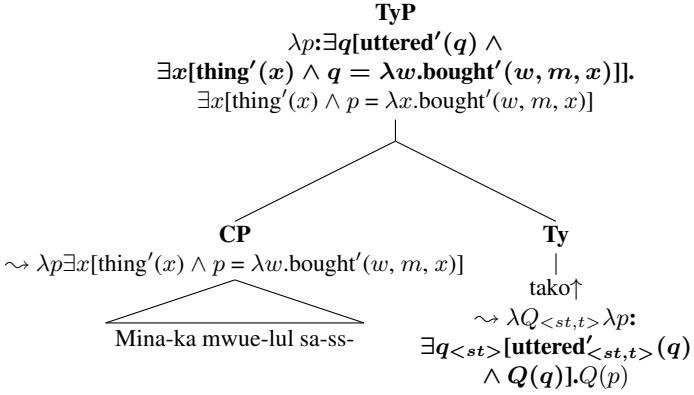


As shown in (10), we assume that *wh*-movement to Spec,CP does occur in Korean as well, but covertly (after spell-out), in order for a *wh*-expression to be semantically combined with the remainder of its sentence. Next, we assume that the three clause-type markers we have focused on are heads of a functional projection right above CP, which we call **TyP** (for clause-type phrase). The interrogative clause-type marker *ni* is truth-conditionally and presuppositionally inert: it applies to a set of propositions and just returns the very same set, as shown in (11). The EQ marker *tako*↑, instead, adds the presupposition that at least one of the propositions in the set needs to have been previously uttered, as shown in (12) with the presuppositional content in bold.

- (11) Logical translation of the *wh*-INT in (9b) ('What did Mina buy?')



- (12) Logical translation of the *wh*-EQ in (9c) ('Mina bought WHAT?!')



4 Problems with Previous Analyses of Echo Questions

In this section, we briefly touch on previous analyses of EQs in languages other than Korean that have inspired our investigation to conclude that they are not fully suitable for Korean. Previous studies have focused on the fact that *wh*-expressions in EQs in languages like English do not undergo *wh*-movement, unlike those in ordinary interrogative clauses (e.g., Dayal 1996; Sobin 2010; Sudo 2010; Beck and Reis 2018). This and other differences have been taken as evidence that EQs are completely different constructions from ordinary interrogative clauses.

EQs have been analyzed as *wh*-clauses with a phonologically null functional head denoting an EQ operator that combines with a CP complement and triggers an EQ interpretation (Dayal 1996; Sudo 2010). *Wh*-expressions in EQs have been assumed to denote different semantic objects from those in ordinary interrogative clauses (Dayal 1996; Beck and Reis 2018). In particular, Dayal (1996) argues for an EQ operator with a variable semantic type, which occurs as the head of a higher func-

tional projection dominating CP. Dayal (1996) also assumes that *wh*-expressions in EQs introduce free variables that are bound by the EQ operator, while ordinary (non-echo) *wh*-expressions introduce existentially bound variables.

Sudo (2010), instead, adopts a metalinguistic approach and proposes two different phonologically null complementizers/operators for polar-EQs and *wh*-EQs, which relate the meaning in an EQ to its antecedent and restricts possible answers. The difference between the two EQ operators is that the polar EQ operator restricts the answer set to a proposition and its negation, while the *wh*-EQ operator does not (Sudo 2010, 9–10).

Beck and Reis (2018), instead, focus on distinct intonational properties of *wh*-expressions in EQs to argue that, while *wh*-expressions in ordinary interrogative clauses trigger a set of alternatives that in the end produces a set of propositions as the denotation of the whole *wh*-clause, *wh*-expressions in EQs denote a free variable *z* that can only be deictically/anaphorically interpreted as referring to a unique contextually salient entity.

These proposals are partially at odds with the core properties of Korean EQs. First of all, Korean does not provide any straightforward evidence that EQs and ordinary interrogative clauses are separate constructions: they are morphosyntactically the same all the way to their TP/CP level—the different clause-type markers occur as the head of higher functional projections (above the TP/CP layers), which, we argue, does not affect the semantic content (but only the presuppositional one).

Second, all the *wh*-expressions that occur in EQs are attested in ordinary interrogative clauses and vice versa in Korean, including *wh*-expressions in multiple-*wh* EQs and multiple-*wh* interrogative clauses (see ex. 5-b with Reading 1). This would be unexpected and purely accidental if the two constructions were unrelated. Our proposal, instead, assumes that they are the same all the way up to CP included. It follows that their *wh*-expressions must be the same as well.

Third, *wh*-expressions in EQs and ordinary *wh*-interrogative clauses exhibit the same intonational profile, without the prosodic differences attested in English and German according to Beck and Reis (2018). A strong accent on *wh*-expressions is not a necessary feature that distinguishes EQs from ordinary interrogative clauses in Korean. Although *wh*-expressions in EQs often involve higher amplitude than those in ordinary interrogative clauses, *wh*-expressions with such higher amplitude seem to be easily perceived as ordinary *wh*-expressions (Jun and Oh 1996). Thus, the prosody of Korean *wh*-expressions doesn't bring evidence in support for different lexical meanings between *wh*-expressions in EQs and those in ordinary interrogative clauses. Our proposal captures this fact by assigning identical meanings to the morphosyntactically identical *wh*-expressions in both constructions.

Fourth, generalizations about EQs in English and German in Beck and Reis (2018) do not hold in Korean. For instance, rising final intonation is

obligatory in Korean, while Beck and Reis (2018) argue that it is optional in English and German. Also, Korean EQs do not need “echoing” the adjacent (immediately preceding) utterance but can pick their discourse antecedent further away, unlike English and German (according to Beck and Reis (2018)). (13), inspired by Beck and Reis (2018), shows that Korean EQs do not have to “echo” the immediately preceding utterance.

- (13) a. A: thom-i wuli taythonglyeng-ul nayil pam
 A: Tom-NOM our president-ACC tomorrow night
 cenyek siksa-ey chotay.ha-ess-e.
 dinner-to invite.do-PST-DEC
 ‘Tom invited our president for dinner tomorrow night.’
- b. B: cenyek siksa chotay — thom-un phyengso-ey
 B: dinner invitation — thom-TOP usually-at
 cengmal cceycey.ha-e! (**kuntey**) **thom-i nwukwu-lul**
 so stingy.be-DEC (**but**) **Tom-NOM who-ACC**
chotay.ha-ess-tako↑?
invite.do-PST-EQ
 ‘A dinner invitation — usually Tom is so stingy! (But) Tom invited WHO?’

Although the EQ ‘Tom invited WHO?’ is not immediately adjacent to the antecedent, it is fully felicitous in Korean, as shown in (13-b). Korean EQs are even allowed to “echo” what has been said in previous discourse, say, several days or months ago. Let us imagine a scenario where Mina once told her father that she would be traveling to Nagoya in the summer. A couple of months later, Mina’s father suddenly realizes that he has forgotten the name of the city where his daughter will be traveling in the summer, because he lacks familiarity with the names of Japanese cities. Under this scenario, he can ask Mina the following EQ, out of the blue:

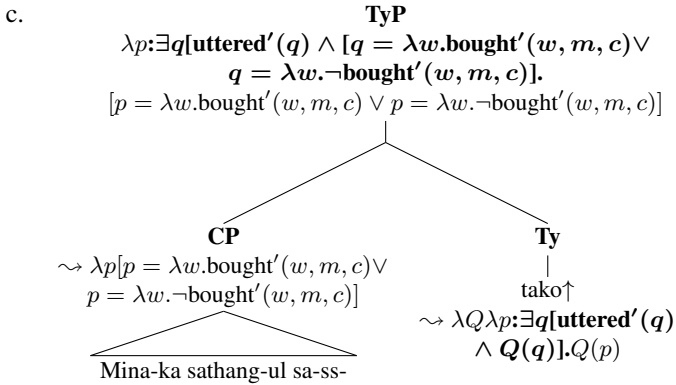
- (14) ne yelum-ey eti ka-n-tako
- you summer-in where go-IND-EQ
- ‘You’re going WHERE in the summer?’

Mina can remind her father of the name of the city with a short constituent answer—‘Nagoya.’ To the best of our knowledge, no language has been reported to allow an EQ to “echo” an antecedent outside the current discourse. Although further investigation is needed in order to understand how far away an EQ is allowed to be from its antecedent in Korean, the current version of our proposal only requires a previously uttered sentence to act as the antecedent of an EQ without further specifying how close to the EQ it has to have been uttered.

Fifth, Korean makes use of the same clause-type marker for polar and *wh*-EQs, which doesn’t support Sudo’s (2010) proposal of a different operator for each kind of EQ. On the other hand, our proposal treats polar and *wh*-EQ in the same way once they reach the CP level, at which both

denote a set of propositions. The derivation of the polar EQ in (15-b) according to our proposal is given in (15-c), with (15-a) being its antecedent.

- (15) a. Mina-ka sathang-ul sa-ss-ta.
 Mina-NOM candy-ACC buy-PST-DEC
 ‘Mina bought candy.’
 b. Mina-ka sathang-ul sa-ss-tako↑?
 Mina-NOM candy-ACC buy-PST-EQ
 ‘Mina bought CANDY?!’



To sum up, existing analyses of EQs in languages other than Korean cannot be extended to Korean EQs straightforwardly, since they build on morphosyntactic and prosodic differences between EQs and ordinary interrogative clauses that are not attested in Korean.

5 Conclusion and Future Work

We have argued that Korean provides evidence that EQs are morphosyntactically and semantically close to ordinary interrogative sentences. Their main difference is in their higher functional heads that mark clause type and denote two different operators: the EQ marker *tako*↑ adds presuppositional content to the meaning of the sentence, while the interrogative marker *ni* does not. Our analysis doesn't need to make any special assumption about the semantic contribution of *wh*-expressions nor the way their meaning is combined with the remainder of the sentence in which they occur.

In future work, we are planning to discuss further similarities between EQs and interrogative sentences like the availability of both single-pair and pair-list readings in both constructions when they contain two *wh*-expressions, contra the common assumption that pair-list readings are not available in EQs (e.g., Dayal 2016; Chernova 2017).

We are also planning to investigate EQs with discourse antecedents

other than declarative clauses and show how our analyses can be extended to those. In Korean, there is a total of four types of EQs, based on the clause-type markers that characterize them, which in turn correlates with the clause type of the antecedent of the EQ. On top of the now familiar marker *tako*↑ occurring in EQs with a declarative clause as their antecedent, there are three more markers: *nyako*↑, which characterizes EQs with an interrogative sentence as their antecedent, as shown in (16), *lako*↑, which occurs in EQs with an imperative clause as their antecedent, as shown in (17), and *cako*↑, which occurs in EQs with an exhortative (propositive) sentence as their antecedent, as shown in (19).

- (16) a. Mina-ka _{sathang-ul} sa-ss-ni? (interrogative)
 Mina-NOM candy-ACC buy-PST-INT
 ‘Did Mina buy candy?’
 b. Mina-ka mwue-lul sa-ss-nyako↑?
 Mina-NOM what-ACC buy-PST-EQ
 ‘Did Mina buy WHAT?!’
- (17) a. Mina-ya, _{sathang-ul} sa-la. (imperative)
 Mina-VOC candy-ACC buy-IMP
 ‘Mina, buy candy.’
 b. mwue-lul sa-lako↑?
 what-ACC buy-EQ
 ‘Buy WHAT?!’
- (18) a. Mina-ya, _{sathang-ul} sa-ca. (exhortative)
 Mina-VOC candy-ACC buy-EXH
 ‘Mina, let’s buy candy.’
 b. mwue-lul sa-cako↑?
 what-ACC buy-EQ
 ‘Let’s buy WHAT?!’

In work that we are currently developing, we show how the analysis we presented here can be extended to these types of EQs as well.

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Copula, Additive, and Wh-indeterminates

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1 Introduction

Since Kuroda (1965, Ch. 3–4), it has been widely known that in the Japanese language, interrogative pronouns (known as *wh-indeterminates*) are the hubs of various quantificational and interrogative expressions, focus-sensitive operators being the spokes. This chapter will focus on a particular combination of *wh-indeterminates* and their associating operators. *Dare-mo-ga* ‘everyone’ is a universal quantifier, as demonstrated below (1). *Mo* is known as an additive and a scalar additive marker, as in *Tarō-mo ki-ta* ‘Taro also came / Even Taro came’. However, the universal reading is not universal across different types of *wh-indeterminates*, as pointed out by Kobuchi-Philip (2010) and Oda (2012). When *mo* associated with *nan-CL* (how.many-CL), the resulting quantificational force is much weaker than what one expects from a universal quantifier.¹ As shown in (2), *nan-nin-mo(-ga)* (how.many-CL.people-MO-NOM)² means ‘many people’ rather than ‘every people’, ‘the largest number of people’ or ‘every number of people’. It is by no means universal, but exists

¹ List of non-obvious abbreviations: CL = classifier, NOM = nominative, TOP = topic, ACC = accusative, NEG = negation.

² The parenthesized nominative case marker (*-ga*) indicates that it is droppable. The nominative marker *-ga* in *dare-mo-ga*, on the other hand, is harder to omit though not impossible.

tential.

- (1) zyū-min-wa dare-mo-ga raizyō si-ta.
resident-TOP who-MO-NOM attendance do-PAST
(lit.) ‘As for the residents, all of them attended.’
- (2) zyū-min-wa nan-nin-mo-ga raizyō sita.
how.many-CL.people-MO-NOM
(lit.) ‘As for the residents, many of them attended.’

To add to the complication, when the two *wh*-elements meet another focus-sensitive operator, *-de-mo(-ga)*, both of them end up with universal quantification. In (3), all of the residents came;³ in (4), for all numbers of people there is a possible situation that they came.⁴

- (3) zyū-min-wa dare-de-mo-ga raizyō si-ta.
who-be-MO-NOM
(lit.) ‘As for the residents, any of them attended.’
- (4) zyū-min-wa nan-nin-de-mo(??-ga) raizyō si-ta.
how.many-CL.people-be-MO-NOM
(lit.) ‘As for the residents, any of them attended.’

The apparent quantificational inconsistency between the various instances of *wh+mo* invites two immediate questions: (i) What makes the differences between *dare-mo* (1) and *nan-nin-mo* (2)? Can we maintain a uniform *mo* despite the different quantificational outcomes? (ii) What is the effect of *-de* in *-de-mo*, which neutralizes the quantificational forces between (3) and (4) and as a consequence highlights the idiosyncrasy of *nan-nin-mo* (2)?

To answer the first question, this chapter will utilize one particular difference between the alternative sets generated by individuals and numerals. Individual alternatives make a lattice in terms of (generalized) entailment, while numeral alternatives “line up.” I will propose a particular meaning-strengthening mechanism sensitive to this logical distinction. That is comparable to, but simpler than and superior to, grammatical exhaustification approaches (Fox, 2007; Chierchia, 2013). As for the second question, I endorse the decompositional view that *-de* in *-de-mo* is the adverbial form of

Nan-nin-mo(-ga) will be used hereafter to refer to the numeral *wh-mo* (how.many-CL-MO-NOM) in general.

³ Contra Oda (2021, 298, (50)), *-de-mo-ga* is attested at least 96 times in the BCCWJ corpus, including the example *dare-de-mo-ga tate-sō-na hōsoku* ‘a principle that anyone could formulate’ (LBc7.00033: 5840).

⁴ In fact, (4) is not the best exemplar of *nan-nin-de-mo(-ga)*. It usually occurs in modal environments such as *Kē-ki-wa nan-ko-de-mo tabe-rare-masu* ‘You can eat any number of cakes’ (vs. *nan-ko-mo tabe-rare-masu* ‘You can eat a lot of cakes’).

the copula *da / de-arū* (Numata, 2007; Nakanishi, 2021, 1026; inter alia). This chapter will sketch an analysis utilizing the exactness nature proffered by the copula *-de* (Rhie, 2010). Exactness, or exhaustivity in general, changes entailment-based structures between alternatives and thus remolds both individual and number alternative sets to the same type of structures.

The discussion will proceed in the following way. Facts about *wh+mo*, in particular their quantificational forces, are examined in §2. Previous studies will be reviewed in §3, highlighting the lack of resolution of the first question. §§4–5 offer our analysis and predictions. Lastly, several theoretical consequences are digested in §6.

2 Establishing Facts

The observational statement that *nan-nin-mo* (2) is uniquely existential unlike the others (1, 3, 4) is not well founded until it passes the scrutiny of linguistic criteria. §2.1 applies the tests of monotonicity (Barwise and Cooper, 1981, §4.7). §2.2 further verifies the different quantificational forces with adversative conjunction.⁵ These observations will further corroborate Oda (2012)’s argumentation that *nan-nin-mo* must be a quantifier with a genuine existential force.

2.1 Monotonicity

A generalized quantifier G is upward monotonic with regard to its restrictor iff for any restrictor P , nucleus Q , and any P' such that for all $x \in D_e$ such that $P(x) \models P'(x)$, $G(P)(Q) \models G(P')(Q)$. G is downward monotonic with regard to its restrictor iff $G(P')(Q) \models G(P)(Q)$. Upward and downward monotonicity suffice to distinguish quantifiers with universal force and those with existential force.⁶

The individual *wh+mo* such as *dare-mo-ga* (1) is downward monotonic with regard to the restrictor. In (5), *sannensē* ‘juniors (in a college, lit. Grade 3 students)’ is a hyponym of *gakusē* ‘students’. Thus for all $x \in D_e$, *junior*(x) \models *student*(x). However, the inference pattern (5c) shows contravariance: *dare-mo*(*junior*)(*run*) does not entail, but is entailed by, *dare-mo*(*student*)(*run*). This fact validates the universal quantificational force of *dare-mo-ga*.

⁵ Unmentioned at the time of the presentation, *hotondo* ‘almost’ can also distinguish the universal *dare-mo-ga* and the existential *nan-nin-mo(-ga)* (Oda 2021, 287; see also references therein).

⁶ In alignment with Kobuchi-Philip (2009), this chapter assumes that every floating quantifier-like construction represents a dislocated restrictor/nucleus pair. This schema can be represented as “NP_{*i*} ... FQ_{*i*} ...” Many other genuine floating quantifiers as well as *dare-mo-ga* endorse this reasonable assumption, e.g. *gakusē_{*i*}-wa kinō* { *san-nin / takusan / taijū / zen'in* }_{*i*} *taiho sare-ta* ‘for the students, { three / a lot / most / all } of them got arrested yesterday’. See also Kobuchi-Philip (2008a) for relevant discussions.

- (5) a. sannensē-wa dare-mo-ga hasit-ta.
 junior-TOP who-MO-NOM run-PAST
 ‘All of the juniors (in the college) ran.’
- b. gakusē-wa dare-mo-ga hasit-ta.
 ‘All of the students ran.’
- c. (a) $\not\models$ (b); rather, (b) \models (a)

On the other hand, *nan-nin-mo(-ga)* (2) is not universal. When a crowd of students ran, there may well be no junior runners. The entailment pattern (b) \models (a) would not fail if *nan-nin-mo(-ga)* were purely universal.

- (6) a. sannensē-wa nan-nin-mo(-ga) hasit-ta.
 junior-TOP who-MO-NOM run-PAST
 ‘Many juniors (in the college) ran.’
- b. gakusē-wa nan-nin-mo(-ga) hasit-ta.
 ‘Many students ran.’
- c. (a) \models (b); (b) $\not\models$ (a)

That the entailment relation between (a) and (b) goes the other way around⁷ further indicates that *nan-nin-mo(-ga)* is unlikely to be a proportional quantifier like *most*. If many juniors ran, there are many students who ran, but if most of the juniors ran, there is no guarantee that they account for the majority of the students.⁸

Finally, both *dare-de-mo(-ga)* (3) and *nan-nin-de-mo(-ga)* (4) are judged to be downward monotonic with regard to restrictors (see (7) and (8)). Considering their free choice meanings, it is safe to conclude that their quantificational forces are universal.

- (7) a. Kanto-no hon-wa nan-de-mo yon-da.
 Kant-GEN book-TOP what-be-MO.ACC read-PAST
 ‘I read any books written by Kant.’
- b. tetugakusya-no hon-wa nan-de-mo yon-da.
 ‘I read any books written by philosophers.’
- c. (a) $\not\models$ (b); (b) \models (a)

⁷ Contra proportional quantifiers (e.g. *most* and *ōku-no* ‘most of’), there is a way of reading to fix the relevant threshold θ so that (a) \models (b) holds.

⁸ That *nan-nin-mo(-ga)* is a weak quantifier (or at least has a weak variant; Milsark, 1974; Barwise and Cooper, 1981) is further supported by the fact that it appears in various existential constructions including the possessive construction: *Tarō-ni kodomo-ga* { *nan-nin-mo* / # *hotondo* } *i-ru* ‘Taro has { many / # most } children.’

‘(S)he read a lot of works by Goethe { and / but } didn’t read *Faust*.’

Dare-de-mo(-ga) (3) and *nan-nin-de-mo(-ga)* (4) both align to the case of *dare-mo-ga* (1). Space limitation prohibits detailed demonstration, but the facts can be easily reproduced.

3 Previous Studies

The last section established that *nan-nin-mo(-ga)* (2) is unique in that its quantificational force is existential. In fact, the observation that *nan-nin-mo(-ga)* is peculiarly existential is by no means a novel discovery. To the contrary, it is no more than a reiteration of what Kobuchi-Philip (2010, §3.2) presented and Oda (2012) thoroughly investigated.

That Kobuchi-Philip (2010)’s first stab on this issue proves to be not so successful is explicated by Oda (2012, §3.2; for details, refer to the literature). However, her alternative proposal is in fact still not quite satisfactory.¹² As she admits, neither does infinity invalidate a universal reading of *wh+mo*, nor does its absence facilitate it. (10) attributes the generic property *iki-o su-u* ‘breathe’ to all people of all time, where the number of human entities is arguably infinite. However, the infinity does not prevent *dare-mo-ga* from acquiring a universal force.

- (10) Ningen-wa dare-mo-ga iki-o su-u.
human-TOP who-MO-NOM breath-ACC intake-NonPAST
‘All humans breathe.’

Further recall (9b) in the previous section, where the finiteness of the number of Goethe’s works does not make *nan-satu-mo* universal. It is thus clear that there must be another factor that distinguishes *nan-nin-mo* and the others.¹³

¹² (iia) is her formulation, which is followed by her hedges (iib).

- (ii) a. *Mo* is an existential quantifier when its sister denotes a set of scalar alternatives. Otherwise, it is a universal quantifier. (Oda, 2012, 311, (78))
- b. [...] this might be because it is hard to obtain a situation where [the agent’s] reading every number of [the patient] is true, or it could be [...] nonsense. [It] could be also related to potentially undefined semantics when a universal quantifier quantifies into a set of scalar alternatives. [...] However, this is a very weak argument, since domains are usually restricted by context, and such a contextually defined upper limit would prevent such undefined meaning. (Oda, 2012, 311)

¹³ See also Mohri (2017) for other shortcomings of the existential analysis of the *nan-nin-mo* series in terms of (i) the **hitori-mo(-ga)* (one.person-MO) ‘even one’ constraint and (ii) the lexical vs. scope controversy on the semantics of scalar additive in general.

4 Another Path

So, how else can we tease apart the individual / numeral discrepancy? Whatever remains, however improbable, might be of help.

Fortunately, there is a difference between individuals and numerals that seems to be helpful. Let $p :: e \rightarrow t$ be an arbitrary predicate, $i_1, i_2 :: e$ be individuals, and $q_1, q_2 :: (e \rightarrow t) \rightarrow t$ be numeral quantifiers in the one-sided lower-bound reading.¹⁴ There are some i_1, i_2 such that $p(i_1)$ and $p(i_2)$ do not entail each other. On the other hand, no q_1, q_2 can be so picked up that $q_1(p)$ and $q_2(p)$ are mutually independent. This means that alternative sets of individuals make a more sophisticated structure (either a sparse or a lattice structure) than those of numeral quantifiers (necessarily scalar or totally ordered). A way to take advantage of this property is to (i) assume an existential-based semantics for *mo* and (ii) somehow replicate its semantic effect only on sparse or lattice structures. To be precise, for any alternative set A and its subsets A' , if there are some elements $a, b \in A'$ which are logically independent, we want to duplicate the effect of *mo* by applying *mo* to all such alternative sets, and if not, we do nothing. This manipulation can be encapsulated in a SAT (for “saturation”) operator (11):

- (11) Let O be a focus-sensitive operator, (a, A) an NP denotation (see (13) below) and its alternative set, and p, q fragments that together restore the predicate applied to a .
- $$\text{SAT}(O)(a, A)(q)(p)$$
- $$\stackrel{\text{def}}{=} O(a, A)(q)(p) \wedge \forall A' \subseteq A. \text{th} (p \circ q, A') \rightarrow O(a, A')(q)(p),$$
- where $\text{th} (r, A')$
- $$\stackrel{\text{def}}{=} \exists x, y \in A'. [r(x, A') \not\equiv r(y, A')] \wedge [r(y, A') \not\equiv r(x, A')].$$

What comes as the alternative set A depends on the type of the NP. A natural assumption is as below:

¹⁴This chapter assumes that numerals in *nan-nin-mo(-ga)* and its non-wh counterpart *n-nin-mo(-ga)* have a lower-bounded, or “at-least” quantificational semantics. For arbitrary number n , *n-nin-mo(-ga)* is interpreted as a generalized quantifier $\lambda P_{e \rightarrow t}. \exists x_e, P(x) \wedge |x| = n$, where e is mereologically understood. (Note: this semantics can be derived from the predicative denotation using Partee’s type-lifting maneuvers.)

Here are two remarks in favor of this “at-least” treatment. First, the mirativity of *n-nin-mo(-ga)* must concern the largeness of the number but not anything else (smallness, evenness, etc.). Thus *n-nin-mo(-ga)* cannot be used in expressing propositions such as # *kono tippu-no gē-to-haba-wa go-miri-mo aru* ‘the gate pitch of this microchip is as much as 5mm’ (when emphasizing excellence in chip manufacturing processes, in which narrower is better) and # *gosityūgi-wa yonsen'en-mo at-ta* ‘the amount of the wedding gift is as much as 4,000 JPY’ (mirativity is intended on the breach of a commonsense among Japanese people that even numbers must be avoided for wedding gifts). Entailment naturally fits in the role of confining interpretations. Second, a close variant of *n-nin-mo(-ga)*, i.e. *n-nin-mo(*-ga)* ‘(no) more than’, is negation-sensitive. Numeral expressions in the “exact” reading (or those of the predicative variant) fail to facilitate the correct semantic output in negative environments (cf. the numeral+*de-mo* cases in Footnote 18).

- (12) a. For individual NPs, $A = D_e = \{\text{john, mary, } \dots\}$.
 b. For numeral NPs,

$$A = D_\sigma = \left\{ \begin{array}{l} \lambda p_{e \rightarrow t}. \exists D' \subseteq D_e. \\ |D'| = n \wedge \forall i \in D'. p(i) \end{array} \middle| \begin{array}{l} n \in \mathbb{N}, \\ n \leq |D_e| \end{array} \right\}.$$

The standard semantics of *mo* is a focus-sensitive one (Nakanishi, 2006) with an existential presupposition (ExistsP) and a scalar presupposition (ScalarP). Here is an opinionated implementation:¹⁵

- (13) For any individual or numeral NP α , $\llbracket \alpha \rrbracket^{M,w,g} = (a, A)$, where a is the content of the NP (either of type e or type $(e \rightarrow t) \rightarrow t$) and A is its (contextually determined) alternative set.
- (14) Let V be some degree predicate and θ a contextually given threshold.

$$\llbracket [\beta \dots \alpha_i \dots] \text{-mo}_i \rrbracket^{M,w,g}$$

$$= \llbracket \text{-mo} \rrbracket (\llbracket \alpha \rrbracket^{M,w,g})(q := \lambda x. \llbracket [\beta \dots g(i) \dots] \rrbracket^{M,w,g[i \rightarrow x]}) = \lambda p.$$
 - $(p \circ q)(a)(w)$ (prejacent)
 - $\wedge \exists b \in A. (p \circ q)(b)(w) \wedge [(p \circ q)(b) \neq (p \circ q)(a)]$ (ExistP)
 - $\wedge V((p \circ q)(a)) > \theta$ (ScalarP)

When *mo* is fed to SAT, the semantic effect of *mo* is duplicated over \uparrow -compliant subsets of alternatives. As to the question of where to locate SAT, I take a lexicalist stand and attribute it to wh-indeterminates because the universality / existentiality discrepancy happens just in cases of wh-indeterminates.

Wh-indeterminates, translated to a tuple $(\star, (A^\uparrow)^{\vee \wedge})$, will play a double role: (i) the SAT effect abovementioned and (ii) an underspecificational \star that

¹⁵ Our ExistP and ScalarP in (14) are remote from Karttunen and Peters (1979) and its application to *mo* (Nakanishi, 2006). Instead of expatiating my intention, which would require many pages, I will briefly mention three considerations that support this analysis. First, an explicit degree semantics using V and θ in the ScalarP better reflects its nature that the threshold θ is contextually determined and consistent throughout discourse segments (cf. Greenberg 2019). Second, *mo* does not require any mirativity of the antecedent. Suppose that Rafael Nadal and Noam Chomsky (and nobody else) won prizes in some tennis tournament. It is fine to utter *Ty-omusukī-mo nyūsyō sita-noka!* ‘Even Chomsky won a prize!’ (counted as a pure additive with optional mirativity) without any surprise at Nadal’s winning a prize. The same point is shown by *ringo-o gohyaku-ikko-mo syūkaku sita* ‘harvested as many as 501 apples’ in situations where harvesting 500 apples were below one’s expectation. Hence, antecedency conditions must be tangibly separated from mirativity ones (contra Greenberg, 2017, §2.2). Finally, non-equality (or logical independence) between the focus a and the antecedent alternative b is insufficient to account for the numeral+*mo* case. **Hitori-mo(-ga)* (one.people-MO-GA) is unacceptable (unless it is taken as a minimizer, with a flat accent pattern), but its ungrammaticality must hinge on the fact that it is the weakest in terms of entailment. Hence, it cannot be the case that antecedent \models focus. Consideration must also be made that no entailment relation is available for the pure additive *mo* for obvious reasons. Therefore, the appropriate formulation is antecedent \neq focus. (A final note: (14) does not need separate compositional dimensions for ExistP and ScalarP. The continuative or type-lifting λp takes on projective jobs instead.)

can be incarnated as anything in the type-raised and $\vee\wedge$ -closed alternative set

$$(A^\dagger)^{\vee\wedge} \stackrel{\text{def}}{=} \left\{ \lambda q, p. \bigwedge_{a' \in A'} (p \circ q)(a') \mid A' \subseteq (A^\dagger)^\vee \right\}$$

where

$$(A^\dagger)^\vee \stackrel{\text{def}}{=} \left\{ \lambda q, p. \bigvee_{a' \in A'} (p \circ q)(a') \mid A' \subseteq A \right\}.$$

Candidates for \star will be filtered out after the semantic derivation if they result in semantic anomaly.

$$(15) \quad \llbracket \text{wh} \rrbracket^{M,w,g} = \lambda O. \text{SAT}(O)(\star, (A^\dagger)^{\vee\wedge})$$

5 Predictions

5.1 The Individual Wh+mo

(1) zyū-min-wa dare-mo-ga raizyō si-ta.

(lit.) ‘As for the residents, all of them attended.’

$$\begin{aligned} & \overset{M,w,g}{\rightsquigarrow} \text{SAT}(\llbracket \text{-mo} \rrbracket)(\star, (D_e^\dagger)^{\vee\wedge})(\text{id})(\lambda(a, _). \text{attend}(a)(w)) \\ & = \llbracket \text{-mo} \rrbracket(\star, (D_e^\dagger)^{\vee\wedge})(\text{id})(\lambda(a, _). \text{att}(a)(w)) \quad \dots\dots (A) \\ & \quad \wedge \forall A' \subseteq (D_e^\dagger)^{\vee\wedge}. \\ & \quad \quad \uparrow ((\lambda(a, _). (\text{att} \circ \text{id})(a)(w)), A') \\ & \quad \rightarrow \llbracket \text{-mo} \rrbracket(\star, A')(\text{id})(\lambda(a, _). \text{att}(a)(w)) \quad \dots\dots (B) \end{aligned}$$

SAT retains the original semantic contribution of *-mo* (14) as the (A) part and at the same time multiplies this contribution over \uparrow -compliant subsets of the individual alternative set $(D_e^\dagger)^{\vee\wedge}$ (the (B) part). Below is the result of the application and expansion of SAT and $\llbracket \text{-mo} \rrbracket$ in each part.

$$(A) = \star (\text{att})(w) \wedge \exists b \in (D_e^\dagger)^{\vee\wedge}. b(\text{att})(w) \wedge [b(\text{att}) \not\models \star(\text{att})] \quad \dots (\text{ExistP})$$

$$\wedge V(\star(\text{att})) > \theta \quad \dots\dots (\text{ScalarP})$$

$$(B) = \text{For any } \uparrow\text{-compliant subset } A',$$

$$\star (\text{att})(w) \wedge \exists b \in A'. b(\text{att})(w) \wedge [b(\text{att}) \not\models \star(\text{att})] \quad \dots (\text{ExistP})$$

$$\wedge V(\star(\text{att})) > \theta \quad \dots\dots (\text{ScalarP})$$

It can be shown that the underspecification \star is eventually identified as \forall .¹⁶

¹⁶ **Proposition:** Let α and β be an arbitrary type, $A :: \text{Set}(\alpha), |A| \geq 2, \star \in (A^\dagger)^{\vee\wedge}, p :: \beta \rightarrow t$, and $q :: \alpha \rightarrow \beta$. Licit candidates of \star in $\text{SAT}(\llbracket \text{-mo} \rrbracket)(\star, (A^\dagger)^{\vee\wedge})(q)(p)$ must be either $\lambda q, p. \bigwedge_{y \in A} (p \circ q)(y)$ or $\lambda q, p. \bigwedge_{y \in A \setminus \{x\}} (p \circ q)(y)$ for an arbitrary $x \in A$.

Proof: Harrison et al. (2015, 23) guarantee that disjunctive normal forms can be made of infinitary propositions, assuming that the number of arguments m is finitely bounded and that the size

5.2 The Numeral Wh+mo

(2) zyū-min-wa nan-nin-mo-ga raizyō sita.

(lit.) ‘As for the residents, many of them attended.’

$$\begin{aligned}
 & M_{\rightsquigarrow}^{w,g} \text{SAT}(\llbracket \text{-mo} \rrbracket)(\star, (D_\sigma^\dagger)^{\vee\wedge})(\text{id})(\lambda(a, _). \text{att}(a)(w)) \\
 & = \llbracket \text{-mo} \rrbracket(\star, (D_\sigma^\dagger)^{\vee\wedge})(\text{id})(\lambda(a, _). \text{att}(a)(w)) \quad \dots\dots (A) \\
 & \quad \wedge \forall A' \subseteq (D_\sigma^\dagger)^{\vee\wedge}. \\
 & \quad \quad \uparrow ((\lambda(a, _). (\text{att} \circ \text{id})(a)(w)), A') \\
 & \quad \rightarrow \llbracket \text{-mo} \rrbracket(\star, A')(\text{id})(\lambda(a, _). \text{att}(a)(w)) \quad \dots\dots (B)
 \end{aligned}$$

The idiosyncratic existentiality of *nan-nin-mo(-ga)* comes from the fact that no \uparrow -compliant subset can be obtained from $(D_\sigma^\dagger)^{\vee\wedge}$. For any two distinct numbers n and m and an arbitrary predicate p , either $[\exists D' \subseteq D_e. |D'| = n \wedge \forall i \in D'. p(i)] \models [\exists D' \subseteq D_e. |D'| = m \wedge \forall i \in D'. p(i)]$ or vice versa, and crucially, this time, the $\vee\wedge$ -closure does not append any substantial higher-order alternatives. As a result, the (B) part is vacuous and the underspecificational \star can be anything as long as the (A) part satisfies other constraints. Among these are ExistP (14b), which excludes the number one (thus **hitori-mo-ga* (1-MO-NOM)), and the mirative interpretation, which is obligatorily evoked in the case of numeral+mo, arguably for good reasons.¹⁷

of propositional signatures is at most $\sum_{i=0}^m (|D_{e^i \rightarrow t}| \cdot |D_e|^i)$. The proposition $\star(p \circ q)$ will fall on the set \mathcal{F}_1 .

[The case $\star = \lambda q, p. (\bigwedge_i (p \circ q)(x_i)) \vee (\bigwedge_i (p \circ q)(y_i))$ for arbitrary $x_i, y_i \in A$] The sub-alternative set $A' = \{\bigwedge_i (p \circ q)(x_i), \bigwedge_i (p \circ q)(y_i)\}$ satisfies $\uparrow (p \circ q, _)$ (if not, one of the disjuncts in \star can be eliminated and \star is reduced to the next, simpler case). Neither $\bigwedge_i (p \circ q)(x_i)$ nor $\bigwedge_i (p \circ q)(y_i)$ can satisfy ExistP in (14b) since $\bigwedge_i (p \circ q)(x_i) \models \star(p \circ q)$ and $\bigwedge_i (p \circ q)(y_i) \models \star(p \circ q)$. Thus the whole proposition ends up being contradictory.

[The case $\star = \lambda q, p. \bigwedge_{y \in X} (p \circ q)(y)$ where there are distinct $z_1, z_2 \in A$ such that $z_1, z_2 \notin X$ and $(p \circ q)(z_1)$ and $(p \circ q)(z_2)$ are logically independent] One of the spoiling sub-alternative sets is $\{z_1 \wedge \bigwedge_{y \in X} (p \circ q)(y), z_2 \wedge \bigwedge_{y \in X} (p \circ q)(y)\}$. \square

An unfortunate fact is that $\lambda q, p. \bigwedge_{y \in A \setminus \{x\}} (p \circ q)(y)$ (for an arbitrary $x \in A$) is not ruled out since no spoiling sub-alternative set that is \uparrow -compliant can be found. To avoid this “last one mile” problem, it is inevitable to resort to some kind of quantificational simplicity such as the monotonicity in Steinert-Threlkeld and Szymanik (2019).

¹⁷ Kobuchi-Philip (2008b, 501–502) follows Nakanishi (2006, 151) and Nakanishi (2009) which suggest that “being in terms of entailment is a sufficient condition for being less likely”. In our settings (14), some constraints need to be postulated to disallow vacuous V in ScalarP whenever the antecedency of ExistsP can be vacuously met (“avoid vacuity”). This complication is destined since we advocate a unified treatment of individual+ and numeral+mo and the particular lexical analysis (14) (with the argumentations in Footnote 15), in which ScalarP is totally severed from additive antecedents.

5.3 The *-de-mo* Cases

With the assumptions that *-de* is the adverbial form of the copula *da / de-aru* and that both individuals and numerals are exhausted at the adjacent position of that copula,¹⁸ our theory makes the correct prediction that the quantificational forces in (3) and (4) are both universal.¹⁹

Limitations of space allow us to only demonstrate the semantics of *nan-nin-de-mo(-ga)* (4); but in fact the yield from (3) is essentially no different from this.

- (4) zyū-min-wa nan-nin-de-mo(??-ga) raizyō si-ta.
(lit.) ‘As for the residents, any of them attended.’

$$\begin{aligned}
 & \overset{M,w,g}{\rightsquigarrow} \text{SAT}(\llbracket \text{-mo} \rrbracket)(\star, D_\sigma)(\lambda(a, A). \text{exact}(a, A; \text{BE}(a)(x'))) \\
 & \quad \left(\begin{array}{l} \lambda \mathcal{Q}. \mathcal{M} \\ (\lambda(w', x'). w' \in \text{Best}_{w, \text{OS}, \text{MBU}\{\mathcal{Q}\}}) \\ (\lambda(w', x'). \text{att}(x')(w')) \end{array} \right) \\
 & = \llbracket \text{-mo} \rrbracket(\star, D_\sigma)(\lambda(a, A). \dots)(\lambda \mathcal{Q}. \mathcal{M}(\dots)(\dots)) \quad \dots \dots \text{(A)} \\
 & \quad \wedge \forall A' \subseteq D_\sigma. \text{th}((\lambda(a, A). \mathcal{M}(\dots)(\dots)), A') \\
 & \quad \rightarrow \llbracket \text{-mo} \rrbracket(\lambda(a, A). \dots)(\lambda \mathcal{Q}. \mathcal{M}(\dots)(\dots)) \quad \dots \dots \text{(B)}
 \end{aligned}$$

where $\text{exact}(a, A; p) \stackrel{\text{def}}{=} p(a) \wedge \forall a' \in A. [p(a) \not\equiv p(a')] \rightarrow \neg p(a')$,
 $\text{BE}(q := \lambda P, w'. \exists x'. |x'| =_{w'} n \wedge P(x')(w'))(x)(w)$
 $\stackrel{\text{def}}{=} [q(\lambda x'', w''. x'' =_{w''} x)(w)] = [|x| =_w n]$, and \mathcal{M} is some modal operator determined by the given sentence. If there is none available

¹⁸ The strategy here is to begin with an “at-least” type quantificational semantics of numerals, which are to be exhausted by the exact operator later in the course of composition (for the facts, refer to Rhie (2010, 53, §4.2)). A quick note should be added that the exact operator is different from scalar implicature (or the Foxian / Chierchian grammaticalized *exh*) in that (i) the effect is two-sided, as in *gakuse-wa go-nin-da* ‘The number of the students is exactly five (rather than six or four)’, and that (ii) the effect survives in downward environments, as in *gakusei-wa go-nin-zya-nai* ‘The number of the students is not five (may be six or four)’ (answering one of the referees).

Admittedly, there is a much more promising alternative in which numerals followed by a copula are the basic form of (all) numeral expressions, whose semantics is predicative $(\lambda x, w. |x| =_w n)$. If this is the case, the mutual non-entailment of two numeral “predicates” comes for free. Our fundamental ideas are still alive; instead of the (non-)existence of the exact operator, we can attribute the difference of *nan-nin-mo(-ga)* and *nan-nin-de-mo(-ga)* to their different overall semantic gain, the former of which is logically totally ordered while the latter is mutually independent.

¹⁹ In particular, this chapter adopts the idea of Oda (2021), Nakanishi (2021), and Hiraiwa and Nakanishi (2021) that *-de-mo* is in fact a phonetically contracted unconditional. Instead of Oda (2021, 303, (61))’s E-type analysis using free variables, this chapter implements donkey anaphora in a more structural way, treating them as a collateral λ -abstraction that depends upon world-variable abstractions.

(i.e. the sentence is episodic), a cover modal operator fills in.²⁰ OS, MB, and Best stand for an ordering source, a modal base, and the operator yielding best worlds, respectively.

Crucially, for any two numbers n and m , the propositions made of n -*nin-de-mo* and of m -*nin-de-mo* do not entail each other. Hence, SAT comes to require that \star be logically non-weaker than either of them. Among the simple quantifiers, the only candidate for \star is $\lambda P, w. \forall n \in \mathbb{N}. P(\lambda P', w'. \exists x'. |x'| =_{w'} n \wedge P'(x')(w'))$. This means that for *every* number n , in every (or some) optimal world w' where there is some residents x' of size n , x' attended. This outcome renders *nan-nin-de-mo(-ga)* universal.

6 Conceptual Remarks

The proposal made here is novel and unique in the following three respects. First, the semantic uniformity of *-mo* (arguably including the pure additive) as an existential is maintained.²¹ Second, wh-elements here are more sophisticated than many previous studies.²² Third, the schema $\exists b \in A. \dots \wedge p(b) \not\models \star(p)$ (14b) is a revival of Gil (1995, 341–342) and Kobuchi-Philip (2009, 11), but this time with an extension to the case of the numeral+*mo*.

The anti-scale condition $\uparrow (p, A)$ in SAT (11) has an inquisitive connection (Ciardelli et al., 2019). Our claim can be paraphrased as: Universality obtains only if the relevant alternative set is inquisitive. This reminds us of Fox (2007)’s innocent exclusion²³ and the licensing condition of mention-

²⁰ The flavor of the filling-in modal \mathcal{M} in episodic propositions can be, for example, conceptual dependencies that cannot be reduced to factual information (Jayez and Tovena, 2005, 43–) or causality (Panaitescu, 2018). Whichever choice it is, it is necessary that \mathcal{M} have some ingredients that make commitments on the actual world. Thus \mathcal{M} must be based on the following template: $\mathcal{M}(p_1)(p_2) = \exists x. p_2(x)(w) \wedge \mathcal{M}'(p_1)(p_2)$, where \mathcal{M}' is either a possibility or a necessity modal operator. Cf. von Stechow (2000)’s Analysis I, in which ιx is used instead of $\exists x$.

²¹ This existential standpoint is in accordance with Xiang (2020, 197–) (and references therein), where *even* is treated as an \exists , but goes against Shimoyama (2006, 523–) and Ohno (1989, (30)) among others.

²² In other studies, wh-elements are mere variables (Nishigauchi, 1990 inter alia) pointed sets (Kratzer and Shimoyama, 2002 inter alia), reduced conjunctions (Numata, 2009, 154–155), Lahirian predicates (weakest predicates; Kuno, 2010), and Fox-Chierchian underlyings (\exists + covert D-exh; Mitrović, 2014, 267–; Balusu, 2017, §3.2; Erlewine, 2019). A particular problem of postulating \exists for wh-elements is that (i) it leaves no way to address the universal nature of the NPI *dare-mo(*-ga)* (Shimoyama, 2011). Besides, (ii) these studies say few things about the cases of numeral+*mo* and numeral+*de-mo*, and (iii) they obscure the possibility that *mo*, being an additive (“not only but also”), reveals the double exhaustification $\text{exh} \circ \text{exh}$ in an overt way.

²³ Among Sauerland alternatives $\{A, B, A \wedge B\}$, IE excludes only $A \wedge B$ after collecting all the subsets of the alternative set that can be all negated away (safely) and then taking an intersection out of the qualified sets. Apparently, the qualified subsets $\{A, A \wedge B\}$ and $\{B, A \wedge B\}$ are inquisitive together.

some questions (Xiang, 2016, Ch. 2–3).²⁴

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²⁴Mention-some questions allow non-maximal answers, and these answers are inquisitive together (e.g. *Where can you buy newspapers?* — { *At the kiosk. / From this guy over there. / ...* }). Interestingly, no mention-some answer is allowed to the question *How fast can you drive on this highway?* (Fox, 2013, (22b)), in which the wh-expression is a numeral and its alternatives fail to be inquisitive.

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Rising Declaratives in Japanese

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1 Introduction

Rising intonation is often tied to question formation in many languages, while some languages also use a syntactic strategy to mark an interrogative sentence. This arouses the question about a sentence called a rising declarative, such as *It's raining?*, which keeps the syntax of a declarative, but uses rising intonation to add a question-like impression (Gunlogson, 2001, Jeong, 2018, Rudin, 2017). In a language such as Japanese, it is not obvious whether a rising declarative like that in English exists because no syntactic operation is used to form an interrogative sentence. This paper introduces what we can call rising declaratives in Japanese, which are sentences accompanying rising intonation but cannot license a weak NPI that can be licensed in an interrogative sentence. In this paper, as a concrete example, I take a declarative with a sentence-final *yo* and rising intonation and propose an analysis that can capture the commonality of the contribution of rising intonation between English and Japanese. Specifically, I argue that rising intonation has a special discourse effect (Farkas and Roelofsen, 2017), which indicates that the speaker is not making a direct commitment to the sentence radical.

The rest of the paper is structured as follows: In the next section, I provide some background data with which I claim that Japanese does have what we can call rising declaratives. This paper mainly explores assertions with a particle *yo* with rising and falling intonation, and the analysis in the previ-

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ous literature and its potential problems are introduced. Section 2 illustrates my proposal and introduces the framework used to build the analysis and its ingredients. The hands-on analyses of rising and falling *yo* assertions are provided in Section 3. Section 4 summarizes this paper, and possible future directions are stated.

2 Background

One natural way to mark an interrogative sentence in Japanese is to use rising intonation, which is shown by a question mark at the end of the sentence in (1a). The semantic contribution can be seen by the comparison between (1a–b), both of which contain a weak NPI *soko made* ‘to that extent.’ This minimal pair shows that this weak NPI can be licensed in an interrogative sentence.¹

- (1) a. Sore, soko-made omosiroi?
 that to that extent interesting
 ‘Is that that interesting?’
 b. ?? Sore, soko-made omosiroi.
 that to that extent interesting
 ‘(Intended:) This is interesting to that extent.’

Although rising intonation typically forms an interrogative as shown above, it is not the only contribution of this intonation pattern. (2a) is minimally different from (1a) in that (2a) has a sentence-final particle *yo* at the end. Notwithstanding that it accompanies rising intonation, the sentence is degraded. Note that when there is a negation *nai* as in (2b), *yo* can be used with both intonation contours, which shows that the infelicity of (2a) does not come from the incompatibility of *sokomade* with *yo*. This indicates that the rising intonation in (2a) is doing something different from the question-forming operation. These observations suggest that (2a) is not syntactically or semantically interrogative. If (2a) is not an interrogative, the most plausible candidate is a declarative; (2a) without *sokomade* is what we can call a rising declarative in Japanese.

- (2) a. ?? Sore, soko-made omosiroi yo?
 that to that extent interesting YO
 ‘Is that that interesting?’
 b. Sore, soko-made omosiroku nai yo?/.
 that to that extent interesting not YO

¹ The licensing conditions of these weak NPIs are not simple. See Ido et al. (2021) for the full picture. They also use the table model of Farkas and Bruce (2010) in their analysis, and thus far, I see no incompatibility of the analysis of rising intonation given in this paper and their analysis of *sonnani*, whose distribution and meaning are similar to *soko made*.

‘That is not that interesting?/.’

In fact, the literature on this particular particle, *yo*, treats a *yo*-sentence with rising intonation as a declarative. For instance, Davis (2009) assigns two different semantics to two intonation contours accompanying *yo*, as shown in (3). Specifically, note that the semantics of rising intonation, (3a), has nothing to do with the semantics of questions. Rather, it maintains the same force type, which means that (2a) is treated as an assertion. Falling intonation, on the other hand, has something extra, known as a downgrade operation, indicated as \downarrow in (3b). This is necessary to capture the empirical fact that the *yo* assertion with falling intonation signals that there is a conflict between the speaker and the addressee. For example, when the speaker tries to correct something, only the falling *yo* assertion is felicitous: (4b). In this case, the *yo* assertion with falling intonation signals that the addressee first has to downgrade their public belief asserted as (4a) with a different proposition *q*, which is a contextually available proposition and is identified with the proposition *COVID is just a cold* in this case.

- (3) a. $\llbracket \uparrow \rrbracket = \lambda F \lambda p \lambda c. F(p)(\text{PB}_{addr}(c)+p)$
 b. $\llbracket \downarrow \rrbracket = \lambda F \lambda p \lambda c. F(p)((\text{PB}_{addr}(c)\downarrow q)+p)$
 where *F* is a variable over the force heads, of type $\langle st, \langle C, C \rangle \rangle$.
- (4) a. Korona-wa tada-no kaze da.
 covid-TOP just-GEN cold COP
 ‘COVID is just a cold.’
 b. Iya, tigua yo \downarrow /# \uparrow
 nope wrong YO
 ‘Nope, that’s not the case.’

Giving specific semantics to rising intonation co-occurring with *yo* can provide a result that can explain the behavior of (2a) as an assertion. However, given that rising intonation can be used with other particles to make an apparent rising declarative, a more general analysis of rising intonation is favorable. For instance, Japanese outer negation questions do not allow a weak NPI, either, as in (5).

- (5) ?? Sore, soko-made **omosiroku**-nai?
 that to that extent interesting-NEG
 ‘(Intended:) That is to that extent interesting, isn’t it?’

Note that some Japanese negative questions are ambiguous, but in (5), bias toward a positive proposition can be obtained when phonological focus is placed on the predicate, *omosiroku* ‘interesting.’ Once the negation part has phonological stress, (5) becomes felicitous as an inner negation question

(*That is not interesting that much, is it?*). Even though an outer negation question such as (5) has been treated as a biased “question” in the literature (Ito and Oshima, 2014, Sudo, 2013), the behavior of a weak NPI with this sentence suggests that they should be treated as rising declaratives.

This paper aims to explain the contributions of rising intonation in rising declaratives in Japanese, comparing them to rising declaratives in English, primarily focusing on *yo* declaratives.

3 Proposal and Ingredients of the Analysis

I propose a pragmatics-based analysis of *yo* declaratives with rising/falling intonation, combining the discourse effects of the particle *yo* and intonation contour. In this analysis, rising intonation is not treated as a semantic operator but as a discourse effect modifier. Furthermore, an assertion with *yo* is marked and hence considered a special assertion that accompanies special discourse effects. The empirical facts about *yo* assertions can be explained by combining the discourse effects of each component compositionally (cf. Hirayama (2019)).

In my analysis, I use the discourse model of Farkas and Bruce (2010). Let us examine the discourse effect of a bare assertion using the discourse model. Assume that there are only two discourse participants, **A** and **B**. Table 1 shows the output obtained after **A** makes an assertion p using a bare declarative (i.e., without any particles). The basic discourse effects of an assertion by a bare declarative argued in Farkas and Bruce (2010) are as follows: First, it updates the discourse commitment of **A**, DC_A with p . Second, a singleton proposition $\{p\}$ is placed on the Table, which handles what is at issue in the immediate discourse or the immediate Questions under Discussion (QuDs) (Roberts, 2012). What is put on the Table awaits **B**’s acceptance to be included in the common ground. The projected set indicates the future common ground — in this case, once **B** accepts the proposition on the Table, a new common ground is to be made by taking the union of the common ground, which is the mutual knowledge of discourse participants (Stalnaker, 1978) at the time of utterance (s_1) and a set of worlds where p is true.

A	Table	B
$DC_A: p$	$\{p\}$	$DC_B:$
Common Ground: s_1	Projected Set: $PS_1 = \{s_1 \cup \{p\}\}$	

Table 1: An output discourse of a bare assertion

Note that **B** does not have to explicitly respond to **A**’s assertion. In other words, **B**’s acceptance can be realized as silence. In an assertion (crucially with falling intonation), **A**’s discourse commitment is also conveyed as part

of the discourse effects of this sentence type. B’s silence can be interpreted as having no objection to the proposition on the Table. Consequently, it is not always the case that A needs a response from B. Sharing new information with discourse participants, which is part of the basic discourse effects of a declarative, can be achieved without explicit acknowledgment.

Let us compare this to the output discourse of a polar question, which is illustrated in Table 2. Imagine that A asks B whether it is raining.

A	Table	B
DC _A :	{ <i>p</i> , ¬ <i>p</i> }	DC _B :
Common Ground: <i>s</i> ₁	Projected Set: PS ₁ ={ <i>s</i> ₁ ∪ { <i>p</i> }, <i>s</i> ₁ ∪ {¬ <i>p</i> }}	

Table 2: An output discourse of a polar question

Three differences are found in the table. The first is in the discourse commitment of A, DC_A, which is now empty. Because A asks a question, they do not have any commitment toward either of the propositions, *p*: *It is raining* or ¬*p*: *It is not raining*. Because both possibilities are available, the Table has two propositions: *p* and ¬*p*. Accordingly, the Projected Set has two possibilities, as well. Depending on B’s answer, the common ground is extended such that it includes either *p* or ¬*p*.

From the three differences found between the two tables, it is possible to derive one more notable difference between assertion and question. That is, asking questions by nature requests an answer from the addressee. In Table 2, A does not make any commitment toward either of the possibilities on the Table. Without any response from discourse participants, in our case, B, the discourse can no longer move forward. B can certainly say, ‘I don’t know.’ if they have no ideas, but silence is not usually tolerated. This is one of the key differences between assertions and questions; we will come back to this shortly.

3.1 Ingredient 1: Intonation Contour

First, following Rudin (2017), I claim that intonation contours affect discourse effects in Japanese, as in (6).

- (6) Discourse effects of intonation contour (Rudin, 2017)
 Falling intonation adds the speaker’s commitment while rising intonation does not

Specifically, intonation operates over the speaker’s commitment. In other words, rising intonation is not supposed to be a semantic operator such as INT, which turns a declarative into an interrogative. Thus, it is possible to avoid rising intonation’s assigning the interrogative semantics unconditionally. Even though rising intonation does not change the semantics of the

sentence, this special discourse effect can also bring a question-like flavor, namely, rising intonation signals that the speaker wants an answer from the addressee. This is done by combining the basic discourse effect of the declarative and the discourse effect modified by intonation, as shown in Table 3.

A	Table	B
DC _A :	{ <i>p</i> }	DC _B :
Common Ground: <i>s</i> ₁	Projected Set: PS ₁ = $\{s_1 \cup \{p\}\}$	

Table 3: An output discourse after *p* ↑

Table 3 is different from Tables 1 and 2. First, it is different from Table 2, which shows the output discourse of a polar interrogative in that it is a singleton proposition that is placed on the Table. This is because rising intonation does not affect the semantics of the sentence per se. In English, such a semantic operation is realized as peculiar word order of the interrogative sentence that differs from that of the declarative sentence.

Even though rising declarative is “declarative,” Table 3 is also different from Table 1, which shows discourse effects of a default assertion, namely, a “falling” declarative. The only difference between Table 1 and this table is that the discourse commitment of A is empty in Table 3. This is due to the effect of the rising intonation. There is only one proposition on the Table, but it lacks support from A. Namely, the proposition is put on the Table since A considered it to be relevant to the current discourse, but no commitment is made.² Under this condition, B has no option to be silent. B must either accept that *p* is relevant or reject it. In any case, in terms of the common ground, *p* is included as the shared knowledge of discourse participants. The key point here is rising intonation: Even with assertion the addressee cannot be silent and must show some reaction.

3.2 Ingredient 2: Special Discourse Effects of *Yo*

In addition, I adopt the authority-based analysis of *yo* by Northrup (2014): *Yo* is a relative authority marker. Specifically, *yo* is a marker of maximal speaker authority and has not-at-issue content, as in (7). In (7), *E* is an evidential base, a set of propositions that support a commitment. In words, the speaker has the strongest authority for ϕ , which means that, by default, others must accept ϕ

²Saying “no commitment is made” might be too strong. There are cases in which the speaker is quite certain about the truth of the proposition, even when rising intonation accompanies the assertion. What is meant here is that the speaker is not making any commitment about whether the proposition on the Table is relevant in the immediate discourse. At this moment, it is not clear whether it is necessary to distinguish two types of speaker’s commitment in the discourse table (regarding the truth of the proposition and the relevance of the proposition). I will leave this for my future research.

on their word.

- (7) *Not-at-issue content of* $\llbracket yo(\phi) \rrbracket$ (Northrup, 2014, 112):
Any commitment to ϕ is conditioned on a base E_{MAX} such that:
 $E_{MAX} = \{q | \forall X \in D : AUTH_X(q) \leq AUTH_{Sp}(q)\}$

This analysis of *yo* as a relative authority marker is based on the fact that it is not natural to use *n* ‘yes’ to respond to the assertion with *yo* because using *yes* indicates that the addressee themselves can be a source of commitment (Gunlogson, 2008). Example (8) illustrates that English *yes* requires that this speaker be an independent source of proposition *p*, *The server is down*. On the other hand, when the speaker uses *Oh*, they can be dependent on another person as a source for the truth of the proposition.

- (8) A: The server is down.
B: # Yes, I didn’t know that. / # Yes, is it? / Oh, I didn’t know that.

A similar contrast can also be observed in Japanese, as shown in (9).

- (9) a. Saabaa-ga ochite-ru yo.
server-NOM down-PRES YO
‘The server is down.’
b. # N, sira-nakat-ta. / Soo ka siranakat-ta.
yes know-NEG-PAST oh know-NEG-PAST
‘Yes, I didn’t know that. / Oh, I didn’t know that.’

In the case of (9), *yo* indicates that it is the speaker who has the maximal authority over the truth of the proposition. Hence, it is impossible to use *yes* to accept the proposition because using *yes* indicates that the addressee has another source of information regarding the proposition. This conflicts with the not-at-issue content of *yo*.

Furthermore, I assume that *yo* has a selectional restriction on the type of sentence that it can take as its argument. For our current purpose, it is sufficient to say that *yo* can take a declarative but not an interrogative.³

4 Analysis

The previous section provided a sketch of the proposal and description of the ingredients of the analysis. In this section, I show how combining the discourse effects of intonation contour and *yo* can explain the empirical facts of falling and rising declaratives with this particle.

³ Strictly speaking, *yo* can appear with interrogative sentences, which involve *wh*-phrases or a question marker *ka*. However, such questions are interpreted as rhetorical questions, and they are infelicitous as information-seeking questions.

4.1 Yo Assertion with Falling Intonation

I analyze a *yo* declarative as a marked declarative, which has special discourse effects in addition to the default discourse effects: *Yo* declaratives signal that the speaker has the strongest authority among discourse participants. Let us assume that A used $yo(\phi)$ with falling intonation (\downarrow). The update made by A is presented in Table 4. In this case, we have a combined effect of (7) and falling intonation, that is, A is committed to p ($DC_A: p$), and also that commitment is based on an evidential base such that they have the strongest authority about it, as shown in the third row.

A	Table	B
$DC_A: p$	$\{p\}$	$DC_B:$
$AUTH_B \leq AUTH_A$		
Common	Projected Set:	
Ground: s_1	$PS_1 = \{(s_1 - \{q\}) \cup \{p\}\}$	

Table 4: An output discourse of $yo(\phi)\downarrow$

Notice that the projected set in the table above is more complex than that seen earlier. The projected set now has a union of the proposition on the Table and the result of shrinking the previous common ground by q , which is incompatible with the discourse commitment of the speaker, who has the maximum authority in the discourse. This part reflects the downdating operation in Davis (2009), and I argue that the combination of indicating the speaker’s authority over a certain proposition and making a commitment toward the proposition is tied to the downdating effect. Remember that the semantics of *yo* with falling intonation in Davis (2009), (3b), involves downdating the addressee’s public belief with a contextually supplied proposition q . In other words, *yo* manipulates the common ground so as not to include q . For instance, in the COVID example, which I repeat here as (10), by using *yo*, the speaker directs the addressee not to believe the proposition q , which is identified with the proposition, *COVID is just a cold*.

- (10) a. Korona-wa tada-no kaze da.
 covid-TOP just-GEN cold COP
 ‘COVID is just a cold.’
- b. Iya, tigua $yo\downarrow/\#\uparrow$
 nope wrong YO
 ‘Nope, that’s not the case.’

In contrast to the analysis of Davis (2009), which encodes this downdating operation into semantics, I argue that this is the result of the combination of the speaker’s commitment, authority, and pragmatic competition. By showing the speaker’s authority by using *yo*, which is not conveyed in discourse effects

of a bare declarative, and indicating their commitment to the proposition on the Table by falling intonation, a falling declarative with *yo* signals that there is a good reason for the speaker's thinking that updating the public belief of the addressee is difficult without explicitly telling them to downgrade their public belief with some contextually available proposition. In other words, a speaker who uses a declarative with *yo* indicates that using a bare declarative is not sufficient for them to update the addressee's public belief and make a new common ground due to a conflict.

4.2 *Yo* Assertion with Rising Intonation

When *yo* is used with rising intonation, there is no commitment of the speaker involved, as shown in Table 5, where DC_A is empty.

A	Table	B
DC_A :	$\{p\}$	DC_B :
$AUTH_B \leq AUTH_A$		
Common Ground: s_1	Projected Set: $PS_1 = \{s_1 \cup \{p\}\}$	

Table 5: An output discourse of $yo(\phi)\uparrow$

Recall that rising intonation is not treated as a question operator here, and *yo* selects a declarative. Therefore, the basic discourse effects of the declarative are carried out. As a result, a singleton proposition is placed on the Table. Since the authority marking, which is part of the discourse effects of the particle, is not affected by the intonation, the third row is not different from what we saw in a *yo*-sentence with falling intonation (Table 4). As a whole, the speaker's authority is shown, and a proposition awaits the addressee's acceptance to be included in the common ground.

Looking at the projected set part, the bottom right section of the table, it can be seen that there is no downdating involved; without the commitment of the speaker on *p*, they cannot direct the addressee to downgrade their private belief and then update the common ground. In other words, the speaker merely puts a proposition on the Table to call for the addressee's attention to the proposition. The overall discourse effects are in accordance with the standard usage of this particle, which is attention-calling. This property is a result of the combination of the more authoritative status of the speaker and a lack of commitment. The speaker is informing the addressee of the information based on the assumption that it could be relevant to the addressee, and the speaker is in a position to be more authoritative about it.

The difference between *yo*-assertions with two intonation contours indicates that the speaker's maximal authority is not sufficient to make the addressee give up their previous public belief, and showing the speaker's commitment is also necessary. In fact, a continuation that shows the speaker's un-

certainty about the proposition put on the Table goes well with a *yo*-assertion with rising intonation, but not with that with falling intonation, as shown in (11).

- (11) *Context:* A and B are traveling and now at the platform, waiting for the train. A planned the entire itinerary, and B did not know the plan. A is reading a book and does not pay attention to the incoming trains. B notices that a train is approaching. B says to A:

Nee, densya, kiteru yo↑/# ↓ Are noru yatu?
hey train approaching YO that we take one

‘Hey, a train is approaching. Is that the one we are going to take?’

In this context, the use of rising intonation is more natural. Here, what B is doing is trying to direct A’s attention to an approaching train. Since B is not sure it is “the” train they are supposed to take, it is more natural for B not to make a commitment to it. In the immediate context, B is just more authoritative than A in terms of the fact that B is now paying more attention to the surroundings than A, who is now concentrating on reading. If the first sentence is read with the final falling intonation, *densya* is interpreted as “the” train, and following up with a question that asks if the train is what they are waiting for is less natural. This is presumably because the uncertainty shown by the question contradicts the speaker’s commitment, as shown by the falling intonation.

5 Conclusion and Future Research

In this paper, I showed that Japanese has what we can call rising declaratives, which have sentence-final rising intonation but do not license a weak NPI. Since there are a few such constructions, I propose an analysis of a rising declarative that makes use of the discourse effects of intonation contours rather than assigning them different semantic denotations depending on which particles each intonation occurs with. A *yo*-declarative with rising intonation is analyzed as an assertion indicating the speaker’s authority without commitment, which is intended to call the attention of the discourse participants.

This paper only considered two types of intonation contours: rising and falling. However, this is an oversimplification. As Oshima (2013) and the references therein indicate, there are more subtypes in intonation contours. Furthermore, this is also the case in English, as shown by experimental results (Jeong, 2018). As pointed out in the question-and-answer period during the talk, there are also dialectal differences in the use of intonation contours. More research is needed to explore whether a unified analysis of rising intonation is possible across and within languages.

The next direction is to apply this approach to another sentence type, and one potential candidate is the imperative. *Yo* can be used with imperatives and occurs with both falling intonation and rising intonation, as shown in (12). The difference between the two intonation contours is that an imperative with rising intonation is perceived as a request, while that with falling intonation sounds more like an order. Taking up the example in (12), when the speaker uses the falling intonation, it gives the impression that the addressee often forgets to wash their hands. With rising intonation, there is no such implication, and it can be perceived as general advice. Davis (2009) analyzes this by replacing public belief in (3) with public intention. To see if the proposed analysis can be applied to imperatives, it is necessary to identify the discourse effect of imperatives itself.

- (12) Kaet-tara te arae yo↑ / ↓
 return-if hands wash.IMP YO
 ‘Wash your hands once you get home.’

The first problem that the proposed analysis faces with explaining imperatives is that bare imperatives in Japanese do not allow rising intonation. That is, without *yo*, (12) should be uttered with a falling intonation. Interestingly, this contrasts with the rising imperatives in English. English imperatives do allow rising intonation, and Rudin (2018) analyze them using the idea in (6) and expanding the discourse model of Farkas and Bruce (2010) to include the teleological context set, which is similar to the analysis of Davis (2009). The difference between imperatives in English and Japanese might be a clue to understanding more cross-linguistic differences in imperatives and the discourse effects brought by particles and intonation contours.

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The Semantics of Iconic Gesture in Ideophones*

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1 Introduction

Linguistic communication is frequently accompanied by gestures. Abercrombie (1968) points out that co-speech gestures are ‘paralinguistic,’ i.e., dependent on their linguistic context to varying degrees. As the term ‘paralinguistic’ indicates, it is not easy to consider co-speech gestures as genuine lexical items that can be analyzed in terms of a linguistic mechanism. On the other hand, it is fairly evident that co-speech gestures contribute to some meanings that can be described by certain semantic devices. The purpose of this paper is to focus on the co-speech gestures that accompany ideophones to show that they are supplemental and can be considered as a type of conventional implicature that is frequently discussed in the linguistic literature. Ideophones tend to be expressive and are frequently accompanied by gestures. Both ideophones and accompanying gestures are iconic and represent the same semantic con-

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tent through different modes; the former is an auditory manifestation and the latter is a visual manifestation. Accompanying gestures are ideally supplemental and achieve a synergistic effect. A consequence of this paper is that co-speech gestures can function as linguistic items if they can participate in either syntactic or semantic composition. The organization of this paper is as follows. Section 2 introduces the properties of ideophones and gestures and Section 3 briefly discusses supplemental meanings. Based on these properties and meanings, Section 4 analyzes the semantics of co-speech gestures and Section 5 comments on contextual effects using supplemental materials. Finally, Section 6 concludes the research.

2 Ideophones and Gestures

Ideophones, a cover term for *onomatopoeia* or *mimetics*, are sound-symbolic words and a class of referential words that evoke a vivid, sensational feeling (Kita, 1997; Akita and Dingemanse, 2019; Akita and Pardeshi, 2019; Dingemanse, 2015; Dingemanse and Akita, 2017; Dingemanse, 2018). It is well-known that ideophones are often accompanied by prominent intonation, ‘intonational foregrounding’, marked phonation, ‘phonational foregrounding’, and co-speech iconic gestures, which are attributed to the semiotic status of ideophones, i.e., depiction (Dingemanse, 2015). The ideophone *gatʃagatʃa:t-to* in (1a) from Dingemanse and Akita (2017, 503) is prominent and is accompanied by the gesture G1, which describes how the gesture is visualized, while *girigiri* in (1b) is not.

- (1) a. Sonoutʃi kawara-ga gatʃagatʃa:t-to otʃi-te kuɾu.
soon tile-NOM IDPH-QUOT(G1) fall-CONJ come
‘Then, the roofing tiles drop down on us *with a loud clattering noise*.’
G1: Both hands loosely open, palms down, slightly moving up and down in front of the speaker’s chest, synchronised with the production of the ideophone
- b. Mo: bo:hate: girigiri-desu.
already breakwater IDPH-COP
‘[The sea level] was already almost reaching the breakwater.’

Dingemanse (2015, 950) argues that “depictions are typically iconic, representing what they stand for in terms of structural resemblances between form and meaning.” Thus, iconic gesture is “a visual manifestation of the depictive representation of the scenes that is shared with ideophones (Akita and Dingemanse, 2019, 231)”. My view regarding gestures is that they are a visual manifestation of the mind. This is influenced by the gesture-for-conceptualization hypothesis, in which gestures activate, manipulate, package

and explore spatio-motoric representations for the purposes of speaking and thinking, and gestures schematize information; this schematization process shapes these four functions (Kita et al., 2017). According to this view, gestures are a reflection of our minds and are derived from a cognitive system as well as language (McNeill, 1992; Kendon, 2004; Streeck, 2009). If gestures are somehow conceptualized, it follows that they are a factor in expressive features. Expressiveness is somehow measured by intonational foregrounding, expressive morphology and gestures, by which expressiveness can be calculated based on how rapid and exaggerated it is. Dingemanse and Akita (2017) suggest that the expressiveness of linguistic signs can be defined as the degree to which they are foregrounded as distinct from other items. Under the analysis, *gatfagatfa:t-to* in (1a) is high in expressiveness because it has expressive morphology that is realized by the long vowel preceding the quotative particle *to* and that it is accompanied by the gesture G1. In contrast, *girigiri* in (1b) is not expressive since the morphological structure is unmarked, it is not foregrounded in intonation and it is not accompanied by a gesture.

I assume that both gestures and language are subtypes of signs. The difference lies in how they are realized. While gestures are a visual manifestation of the mind as well as a sign language, oral language is an auditory manifestation of the mind. There are many types of gestures, and according to McNeill (1992), several classes of them are as follows:

- (2) a. Iconic gestures depict action, events and shapes in an analog way. Metaphoric gestures are possible.
- b. Deictic gestures point to a referent by means of spatiotemporal contiguity.
- c. Beat gestures are a small bi-directional movement.
- d. Emblem gestures are a conventionalized gesture that manifests an arbitrary form-meaning relationship like *thumbs up* sign.

McNeill (1992) and Kendon (2004) suggest that there is a hierarchical structure among gestures with respect to their degree of independence. The most independent gesture is sign language, which can stand alone as a highly conventionalized system of language. The opposite end of this is “gesticulation” or “idiosyncratic spontaneous movements of the hands and arms accompanying speech”. Conventionalized gestures, such as “emblems” and “pantomime”, are placed in between. Since sign language is an established system of language, it can be investigated via semantic analyses (Davidson, 2015; Schlenker and Lamberton, 2019). However, whether gesticulation or idiosyncratic movements can be a target of semantic analysis is controversial. Regarding the intermediate or conventionalized gestures, I argue that they can

be analyzed in terms of semantics because they will participate in the semantic composition that can be evaluated by truth-conditions.

Assuming that gestures are a type of sign, the classification above can be partially incorporated into Peirce's theory of signs (<https://plato.stanford.edu/entries/peirce-semiotics/>):

- (3) a. Icon: A mode in which the signifier is conceived as resembling or imitating the signified object. The relation between them is somehow similar. (e.g. portraits, cartoons, imitative gestures)
- b. Index: A mode in which the signifier is not arbitrary. Signifier is directly connected to the signified object. (e.g. signals, pointers, indexical words)
- c. Symbol: A mode in which the signifier does not resemble the signified object. The relation between them is fundamentally arbitrary or conventional. (e.g. language, numbers, morse code, traffic light)

According to this theory, iconic gestures are a type of icon, deictic gestures are a type of index, and emblem gestures are a type of symbol. This distinction can be applied to language; ideophones are a type of icon, deixis is a type of index, and unmarked lexical items are a type of symbol.

Under the multimodal view of language, language is realized in a variety of patterns, including speech, lips, hands, body, eyes, face etc (Macuch Silva et al., 2020; Özyürek, 2021). I define this view as language in a broad sense because it includes a variety of factors. In contrast, under dominant approaches to language, linguistic factors are arbitrary, categorical or discrete, linear or uni-channel. Therefore, analog or gradient, multichannel factors are neglected. I define this dominant view as language in a narrow sense, which is a subset of language in a broad sense. The analysis to be provided in this paper is to adopt language in a broad sense. However, it is relatively modest; multimodal factors can function as language if they participate in either syntactic or semantic composition. Other factors are extralinguistic.

Dingemans (2015) points out that 'normal' or unmarked lexical items are auditory, arbitrary or descriptive and categorical or discrete, while ideophones are auditory, iconic or depictive and analog or gradient. An important aspect of the gestures that accompany ideophones is that they are deemed to be iconic, except for some impromptu unrecognizable gestures, because accompanying gestures are a visual manifestation of their host ideophones, which are iconic by definition. Hence, symbolic or emblem gestures usually do not accompany ideophones. Gesture 1 in (1a) is typically iconic because, by accompanying *gatʃagatʃa:t-to*, it expresses that tiles were falling down one after another by moving the hands up and down repeatedly.

As has been pointed out by Dingemanse and Akita (2017), expressive ideophones tend to be accompanied by iconic gestures in addition to intonational foregrounding as in (4).

- (4) a. ϕ une-ga \uparrow guruuguruu \uparrow -to-**TURNING**(gesture)
 ship-NOM IDPH-QUOT
 mawat-te
 turn.around-CONJ
 ‘The ship turned *around and around*.’
- b. Sinzo: \uparrow bakkubaku \uparrow -**POUNDING**(gesture).
 heart IDPH
 ‘My heart is *pounding*.’

The main argument by Dingemanse and Akita (2017) is that there is an inverse relation between grammatical integration and expressiveness. The degree of grammatical integration is measured by the degree of integration in the morphosyntactic structure. According to them, a holophrastic, independent use and an adjunct are less grammatically integrated, while obligatory items such as heads or complements are more grammatically integrated. The adverbial uses of ideophones followed by a quotative particle in (1a) and (4a) are typically grammatically unintegrated and the existence of the gestures naturally follow. Normally, the inverse relation holds true but the predicative use of ideophones with a bare or non-case marked argument can also be expressive as shown in (4b). Notably, the light verb *suru* does not follow the ideophone in (4b) unlike (1b).¹ The semantic composition of iconic gestures in both cases will be discussed in Section 4.

I propose that co-speech gestures are supplemental, i.e., they are a type of conventional implicatures (CIs) following Potts (2005). The next section introduces the multidimensional analysis of CIs by Potts (2005).

3 Supplemental Meanings

Conventional implicatures (CIs) (Grice, 1975) are the conventional meanings of words and they are not part of ‘what is said’; therefore, they are distinct from ‘normal’ or at-issue meanings. CIs are part of the conventional meanings of words and entailments; they are distinct from conversational implicatures, which are dependent on contexts. Based on Grice’s proposal of conventional implicatures, Potts (2005) claims that expressives or supplementals do not

¹ I assume this is based on a rudimentary grammar or a fossilized ‘pidgin’ grammar and thus will not be a counterexample for Dingemanse and Akita (2017), because this does not participate in ‘usual’ grammatical integration. The incompatibility of the light verb *suru* is also due to its grammatically unintegratedness.

contribute to at-issue contents but to CIs, which are also distinct from Grice's conventional implicatures. The properties of CIs are summarized as follows:

- (5) a. CIs are part of the conventional meanings of words.
- b. CIs are commitments, and thus give rise to entailments.
- c. These commitments are made by the speaker of the utterance 'by virtue of the meaning of' the words he or she chooses.
- d. CIs are logically and compositionally independent of 'what is said (in the favored sense)', i.e., independent of the at-issue entailments.

Expressives and appositives are typical examples of CIs. Below, the underlined constituents demonstrate the properties listed in (5).

- (6) a. I have to mow the damn lawn. (expressive)
- b. Lance Armstrong, the cyclist, battled cancer. (appositive)

Since CIs are part of the meanings of words and give rise to entailments, the cancelation of the CI contents is not possible.

- (7) a. I have to mow the damn lawn, #but actually I love the lawn.
- b. Lance Armstrong, the cyclist, battled cancer, #but actually he is not a cyclist.

Second, the CI contents are independent of at-issue contents, whereby their presence does not affect the truth value of a whole sentence. This is supported by the fact that the denial "No, that's false," cannot target the CI part of (6). Third, CIs are scopeless, i.e., they always take a higher scope than other scopal elements. In (8) the CIs take scope over negation. The speaker of (8a) does not have a good impression of the lawn and the fact that Lance Armstrong is a cyclist is not denied in (8b).

- (8) a. It's not true that I have to mow the damn lawn.
- b. It's not true that Lance Armstrong, the cyclist, battled cancer.

Finally, CIs are speaker-oriented even when they are embedded under an attitude predicate. In (9a) it is the speaker who does not have a good impression of the lawn, not Sue. In (9b), the speaker knows that Lance Armstrong is a cyclist, not Sue.

- (9) a. Sue believes that I have to mow the damn lawn.
- b. Sue believes that Lance Armstrong, the cyclist, battled cancer.

Accompanying gestures show the supplemental meanings or they can be considered as a type of CI.

4 Proposal

CIs and presuppositional meanings are assumed to participate in semantic composition, whereby they compose linguistic systems at least in the Conceptual-Intentional system. This is one strategy to detect what are linguistic meanings and what are not. Based on truth-conditional semantics, I assume linguistic meanings can be evaluated by truth-conditional conditions. Otherwise, they should be part of pragmatics or extralinguistic factors. I show that iconic gestures accompanying ideophones can be considered as a type of CI and argue that they are part of the linguistic component. Following Potts’s (2005) analysis of CI application, a CI meaning applies to an at-issue meaning to return a CI meaning. According to this analysis, α takes β and returns a CI meaning of τ . Since β is passed on to the mother node, it is used twice. The metaological device represented by \bullet separates independent lambda expressions.

(10)

$$\begin{array}{c}
 \beta:\sigma^a \\
 \bullet \\
 \alpha(\beta):\tau^c \\
 \swarrow \quad \searrow \\
 \alpha: < \sigma^a, \tau^c > \quad \beta:\sigma^a
 \end{array}$$

I assume that gradable ideophones denote relations between individuals and degrees and also assume that the abstract degree morpheme *pos* relates the degree argument of the ideophone to a standard of comparison (Kennedy and McNally, 2005).² According to the system, the meaning of the ideophone *bakubaku* will be (11a).

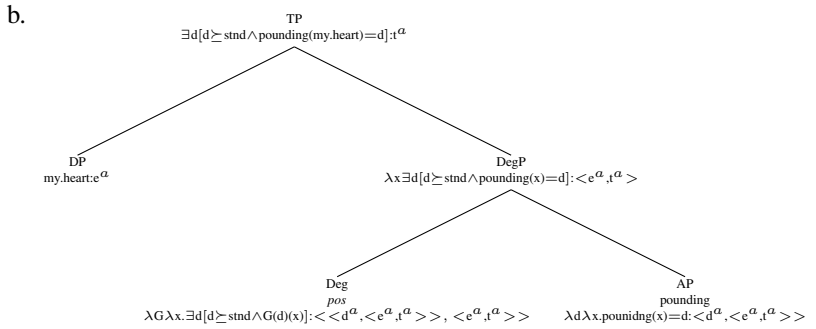
(11) a. $[[\text{bakubaku}]] = \lambda d \lambda x. \text{bakubaku}(x) = d$
 b. $[[\text{pos}]] = \lambda G \lambda x. \exists d [d \succeq \text{std} \wedge G(d)(x)]$

The semantic composition of the sentence that contains a predicative ideophone can be shown as follows:³

(12) a. *Sinzo:-ga bakubaku-suruu.*
 heart-NOM IDPH-do
 “My heart is *pounding*.”

² Since ideophones are incorporated into semantic composition, it follows that they are ‘genuine’ or normal lexical items. In this sense, ideophones are not peculiar.

³ The nonexpressive predicative ideophone participates in grammatical composition, i.e., it takes a case-marked subject, and it is followed by the light verb *-suruu*. Compare the expressive counterpart in (4b). For the syntactic composition of predicative ideophones, see Kawahara (2020).



All gradable ideophones can be modified by the intensifier *totemo* ‘very’, which modifies gradable adjectives and adverbs with an open scale.

- (13) a. *totemo guruguru-to*
 b. *totemo baku-baku*

Since their scalar structure is open, there is no endpoint with respect to the ideophone’s degree. This is indicated by the following statements, where the intensifier *motto* ‘much’, indicates that their degrees exceed the preceding emphasized degrees.

- (14) a. Kino: *ϕune-ga totemo guruguru-to mawat-ta*
 yesterday ship-NOM very IDPH-QUOT turn.around-PAST
kedo kjo:-wa motto guruguru-to mawat-ta.
 but today-top much IDPH-QUOT turn.around-PAST
 ‘Yesterday, the ship turned *around and around*, but today it turned *around and around* even harder.’
- b. Zenkai *sinzo:-ga totemo baku-baku-sita kedo*
 last.time heart-NOM very IDPH-do but
konkai-wa motto baku-baku-siteiru.
 this.time-TOP much IDPH-do
 ‘Last time, my heart was *pounding* very hard, but this time it is *pounding* even harder.’

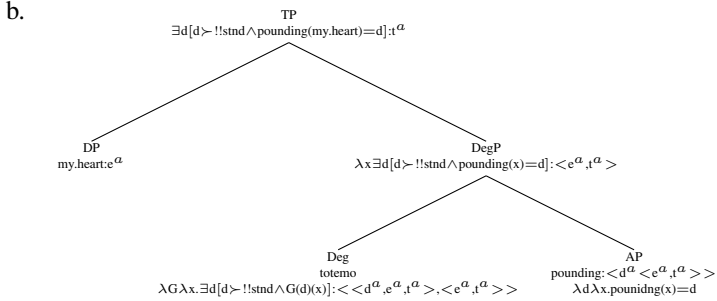
Following Sawada (2018), I assume that *totemo* denotes a degree that is much greater than a standard. This greater degree is indicated by !!.⁴

- (15) [[*totemo*]] = $\lambda G\lambda x.\exists d[d \succ !!\text{stnd} \wedge G(d)(x)]$

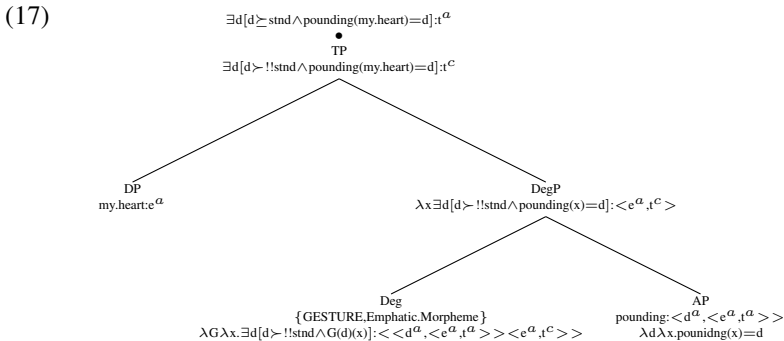
⁴ Alternatively, it is possible to hypothesize that *totemo* is a counterpart of *very* that exceeds a degree that absolutely counts as true in the context of utterance (Kennedy and McNally, 2005). I adopt the former view for the descriptive purposes.

By combining *totemo*, the meaning of the intensified predicative ideophone will be as follows:

- (16) a. Sinzo:-ga *totemo baku**baku*-suruu.
 heart-NOM very IDPH-do
 “My heart is *pounding* very [hard].”



I assume that expressiveness can be reflected either by morphophonologically emphasized forms or accompanying gestures. Notably, the difference in modes is not mutually exclusive but supplementary. Morphologically emphasized forms tend to be accompanied by gestures. Under this assumption, emphasized forms and accompanying gestures are kinds of ‘allomorphs’ that are not complementary. The strong degree of expressiveness contributes to a CI content and thus the difference between the intensified ideophone *totemo baku* and the emphatic form of *baku**baku* lies in their different semantic compositions. I propose that expressiveness, as instantiated in a co-speech gesture in (4b), is an intensifier that takes the degree argument of the ideophone, returning an extreme degree and adding supplementary meanings to the at-issue content, whereby the degree of expressiveness can be typically measured by the existence of an iconic gesture (Ebert and Ebert, 2016; Tieu et al., 2017; Espivova, 2019; Schlenker, 2018b,a, 2019; Zlogar and Davidson, 2018).



depending on the speaker. Similarly, the truth value for (4b) is variable depending on the speaker (e.g. non-indexical perspective dependence (Kennedy and Willer, 2016, 2017)).

Second, accompanying gestures do not affect a truth value but they nevertheless express the speaker's strong feelings in (4a) and (4b). This is also a typical property of CIs. Notably, the denial of the utterance cannot target the content of the gesture (Ebert and Ebert, 2016; Tieu et al., 2017; Espivova, 2019; Schlenker, 2018b,a, 2019; Zlogar and Davidson, 2018). The awkwardness of (21b) reflects this.

- (21) a. John brought a [bottle of wine] **LARGE**(gesture).
 b. ...#No, it was small.
 c. ...Yeah, but it was a small one.
 d. ...Yeah, and it was huge, you're right!

This applies to accompanying gestures in ideophones.

- (22) a. ϕ une-ga \uparrow gurugururu \uparrow -to-**TURNING**(gesture)
 ship-NOM IDPH-QUOT
 mawat-ta. #Ija, mawatte-nai.
 turn.around-PAST no turn-NEG
 'The ship turned *around and around*. No, it was not turning around and around.'
 b. Sinzo: \uparrow bakkubaku \uparrow -**POUNDING**(gesture). #Iya, sore-wa
 heart IDPH no that-TOP
 nai.
 NEG
 'My heart is *pounding*. No, it was not true.'

Third, iconic gestures do not receive an interpretation under the scope of negation; only a meta-linguistic negation is somehow possible (Kita, 1997). In fact, emphatic ideophones are generally weird in negation in general.

- (23) a. # ϕ une-ga \uparrow gurugururu \uparrow -to-**TURNING**(gesture)
 ship-NOM IDPH-QUOT
 mawara-nai-de
 turn.around-NEG-CONJ
 'The ship did not turn *around and around*.'
 b. # Sinzo: \uparrow bakkubaku \uparrow -**POUNDING**(gesture)d3a-nai.
 heart IDPH-COP-NEG
 'My heart is not *pounding*.'

Fourth, antibackgrounding effects can be found in accompanying gestures. Iconic gestures offer information that is not part of the common ground in the context of an utterance (Potts, 2005; Schlenker, 2018b,a, 2019).

Fifth, iconic gestures comment on an asserted content, contributing a new proposition that is separable from the main clause (Ebert and Ebert, 2016; Tieu et al., 2017; Espivova, 2019; Schlenker, 2018b,a, 2019; Zlogar and Davidson, 2018). This is clearly expressed by introducing the multidimensional analysis of CIs.

Finally, the semantic function of accompanying gestures is to strengthen the degree in the at-issue content, thereby often evoking others' sympathy. This is the typical function of co-speech gestures, and these kind of strong feelings can be vividly expressed by co-speech gestures.

5 Co-speech gestures in context

Supplemental meanings or CIs are expected to display contextual effects but Zlogar and Davidson (2018) have shown that co-speech gestures are not degraded even if they are trivial and that they can be entailed by their preceding context. Below, the underlined section comprises a non-restrictive relative clause, which is typically supplemental or a CI. The relative clause in (24a) is trivial, because it repeats the information in the preceding clause, leading to awkwardness. In contrast, the relative clause in (24b) is not trivial, because it adds new information about Jill's character. This is an example of contextual effects:

- (24) a. # My friend Jill lost her phone on her flight from Ithaca to New York yesterday. Jill , who lost something on the flight from Ithaca to New York, likes to travel by train.
- b. My friend Jill lost her phone on her flight from Ithaca to New York yesterday. Jill, who frequently travels from Ithaca to New York, likes to travel by train.

Zlogar and Davidson (2018) point out that although supplements are less acceptable if they are trivial, speech cues facilitate the acceptability of gestures. In the next example, the co-speech gesture in (25a) is expected to be accepted, because the gesture is not trivial. In contrast, the co-speech gesture in (25b) is trivial, because the meaning of "big" is literally or linguistically represented by the adjective *big*. The co-speech gesture in (25b) is, however, readily acceptable, because the meaning of *big* is instantiated in different modes: first, *big* is an auditory manifestation; second, the gesture is a visual manifestation.

- (25) a. Sandy just got [a dog].**BIG** yesterday, and I hear it's quite the handful!

- b. Sandy just got [a **big** dog]_BIG yesterday, and I hear it's quite the handful!

I have shown that co-speech gestures are supplemental and thus it might be expected that co-speech gestures are degraded when they are trivial. However, I claim that a different linguistic mode does not cause a contextual effect, even if the same content is expressed. Rather, it literally supplements an at-issue content. All the co-speech gestures that accompany ideophones are trivial, because all the gestures that accompany ideophones reflect the same semantic content. The acceptability of the iconic gestures in this paper affirms that a difference in modes will not cause contextual effects. The frequency of iconic gestures indicates that ideophones and accompanying gestures are not exclusive, but supplementary, even if they are a reflection of the same psychological reality.

A difference in a speech mode will not be relevant to triviality either. Kita (1997) points out that ideophones are not redundant even when they are trivial. It is assumed that *sutasuta-to* is an idiophonic counterpart of *isogi-asi de* 'with hurried-feet'. Both can modify a quick walking event as shown in (26a) and (26b). The adverb *isogi-asi de* leads to redundancy in (26c), because it is rendered trivial by the expression *haja-artuki-o suruu* '(lit.) do a hasty walk'. The ideophone *sutasuta-to* is not awkward in (26c), because ideophones express their linguistic meaning in a different speech mode according to Kita (1997). Thus, I speculate that ideophones tend to be expressive and will therefore be supplementary even when they are not accompanied by gestures.

- (26) a. Taro-wa isogi-asi de artui-ta.
Taro-TOP hurried-feet with walk-PAST
'Taro walked hurriedly.'
- b. Taro-wa *sutasuta-to* artui-ta.
Taro-TOP IDPH-QUOT walk-PAST
'Taro walked hurriedly.'
- c. Taro-wa {#isogi-asi de, *sutasuta-to*} haja-artuki-o
Taro-TOP hurried-feet with IDPH-QUOT haste-walk-ACC
si-ta.
do-PAST
'Taro walked hastily [and] hurriedly.'

6 Conclusion

I have shown that co-speech gestures are supplemental and should be considered as a CI item that is a target of semantic composition. This indicates that co-speech gestures are a type of linguistic expression that participates in

composition at the syntactic level, the semantic level, or both under the assumption that linguistic items are a building block in the system of language. I have also shown that different speech modes do not lead to redundant information. The peculiarity of co-speech gestures is that it is a visual manifestation of language that is not assumed to be a target of composition by oral language. Introducing a linguistic item to another different mode is also made possible by a special device, such as *like* in English (e.g. Bob saw the spider and was like “ahh! [in a scared voice].” (Davidson, 2015)). Similarly, the quotative particle *to* in Japanese turns an iconic ideophone into a symbolic lexical item that will be a target of Merge and thus it frequently follows ideophones (Kawahara, 2022). This paper contributes to the discussion of the combinatorial possibility of different modes in a system of language.

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SECTION 2

Oral Papers

Part 4

Discourse

Functional Approaches

Question Design in a Korean Congressional Hearing: An Examination of *-cyo* and *-ci anh supnikka*

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1 Introduction

Question and response are fundamental actions in communication (Levinson, 2013b). Analyzing questions can reveal whether the knowledgeability between interlocutors and recipients is congruent or not. This incongruence between the participants' epistemic statuses brings about diverse compositional forms of question-response sequences at a turn. The current study addresses how questions used with the suffix *-ci* in Korean are connected to the speaker's fine-tuning of epistemic gaps and relevant pragmatic forces through the methodological framework of conversation analysis (CA).

In general, speakers indicate assimilated stances about shared issues or information through their usage of the suffix *-ci* (Chang, 1985). Though previous studies agree with this definition, there is no absolute consensus on the meaning of the suffix *-ci*. Another representation of *-ci* involves the term 'committal', which relays the speaker's commitment toward the truth of the proposition in a question (H. Lee, 1999). According to this viewpoint, the use of *-ci* in the long negation form, *-ci anh* exudes 'specific and predictable' meanings in a context (H. Lee, 1999:264).

When the suffix *-ci* is used in interrogative constructions, greater diversity in pragmatic functions is observed because of its distinct nature. An

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interesting point of question formulation is raised with the suffix *-ci* in terms of relevant modal expressions that carry one's stance, which has been analyzed within the specific context of a Korean congressional hearing for the current study.

Speakers may modify epistemic gradients to test recipients' knowledge and take their own stance toward shared issues or information by formulating their questions with the suffix *-ci*. This study examines types of questions conjugated with the suffix *-ci*: *-cyo* (*-ci* with polite ender-*yo*) and *-ci anh supnikka* (*-ci* in the long negation form with the deferential ending form *-supnikka*). Focusing on these two grammatical forms, the current study elucidates types of questions as they occur in their sequential environment, including responsive actions to see how respondents manage questioning constraints for a turn¹.

The findings indicate that questions constructed with *-cyo* and *-ci anh supnikka* serve a key role to test participants' knowledge of the topic by calibrating epistemic gradients. Responses to each question displayed in subsequent turns are proved the relationship between question form and certain actions such as evasion, refutation, and acceptance, etc. As a result, the scope of interpretation for the suffix *-ci* as implemented for questioning actions are expanded, which ultimately implicates what participants are doing moment-by-moment in institutional forms of talk-in-interaction such as congressional hearings.

2 Data and Methodology

The current study used congressional hearings from the investigation of scandals within the Park Geun-hye administration, specifically involving a well-known confidante of the South Korean president, Choi Soon-Sil. Due to its significant role in bringing about the impeachment of President Park, the 4th assembly hearing was utilized as the focal data source².

¹ Before comparing the different uses of *-cyo* and *-ci anh supnikka* within the later part of the political hearing data, this study points out that even simply studying the usages in interrogative contexts is worthwhile. Even though there are different syntactic structures which do not necessarily compare the comparison of *-cyo* and *-ci anh supnikka* accurately, it would still alter perspectives in the field of pragmatics and conversation analysis of Korean.

² Additionally, executives of well-known Korean conglomerates had also participated as witnesses, which garnered even more public interest. The hearing proceeded with the underlying implication that corporations had provided slush funds to Choi Soon-Sil, resulting in these circumstances being dubbed "Soon-Sil gate."

The analysis time for this research was approximately 1 hour and 57 minutes and the hearing took place on November 30, 2016. The live hearing had 1 moderator and 28 participants (18 questioners and 10 respondents). The participants were all native Korean speakers. In the transcribed conversations, there were a total of 31,650 words, with 185 occurrences of *-cyo* and 31 occurrences of *-ci anh supnikka*. This study examined two types of questions (pseudo-tag questions and negative interrogative questions) formatted with both sentence enders (*-cyo* and *-ci anh supnikka*).

Previous studies have demonstrated the suitability of applying CA concepts to political interviews and debates (Clayman & Heritage, 2002a, 2002b), which this study uses to situate *-cyo* and *-ci anh supnikka* as formulation components in question-response sequences.

3 Findings

3.1 Occurrences of Questions Formulated with Two Forms

There were 185 occurrences of *-cyo* and 31 occurrences of *-ci anh supnikka*. *-cyo* could be formulated with different linguistic components for different question constructions such as tag questions and wh-questions as in Table 1.

	Number of Occurrences	Frequency
Tag Question	179	96.7%
Wh-Question	6	3.24%

Table 1. Question with *-cyo*

The most frequent question formed with *-cyo* were tag questions, which and it has performed the function of asking confirmation about shared knowledge/issues as in example (1).

- (1) Q: ponpwucang-ul manna-sye-ss-**cyo**?
 GENERAL.MANAGER-ACC MEET-SH-PST-COMM:POL
 ‘You met the general manager, didn’t you?’

However, *-ci anh supnikka* could not take various question types because of its syntactic structure. *-ci anh* could only occur in negative interrogative constructions as in example (2), functioning as a tag question.

- (2) Q: klueh-**ci** **anh-supnikka**?
 BE:SO-COMM NEG-Q:DEF
 ‘Isn’t it so?’

3.2 Respondents' Answer Types

Question recipients have several possible formulations to choose from when they provide a response. This research used three types of answers for analysis: type-conforming, non-type conforming and not answering. Type conforming means that the respondent adheres to the prescriptive yes or no answer format demanded by the structural form of polar questions (Raymond, 2003). Nonconforming responses consist of an element of resistance while still providing some answer (Raymond, 2003). Lastly, non-answering is defined as when the speaker claims ignorance intentionally or unintentionally by using phrases such as “I do not know/remember.”

The relative frequencies for each type of response were distinct. The most frequent type of responses was type-conforming, with a frequency of 40.5%. On the other hand, the most frequent response constructed with *-ci anh supnikka* was non-answering formulations as seen in Table 2.

This finding possibly implies that conversational interlocuters employ different types of questions according to their own specific goals and interactional considerations. The following section demonstrates how two question forms project different action formations while tuning the epistemic status among participants.

	Occurrences of <i>-cyo</i>	Frequency	Occurrences of - <i>ci anh supnikka</i>	Frequency
Type-Conforming	95	51.3%	2	6.25%
Non-Conforming	58	31.3%	12	37.5%
Not Answering	32	17.2%	17	56.2%

Table 2. Type of Answer with Two Forms

3.3 Sequential Environments and Social Actions of Two Forms

3.3.1 Questions Constructed with *-cyo*

The main pragmatic function of questions formulated with *-cyo* are observed to be itemized fact-checking inquiries within a sort of “tug-of-war” interactional exchange that is prevalent in political talks.

Questions formulated with *-cyo* demonstrate two functions that are indicative of the structure of the sequences within which they occurred. First, unpacking of the main issue allowed for the main question to be asked in a way that constrained the respondent somewhat by relegating the answer to a positionally vulnerable point in the pre-sequence of the turn.

Second, the question formulated with *-cyo* initiates extended talk on a given topic by asking for the respondent's confirmation as part of an expanded series of relevant questions. By doing so, a questioner embodies his/her positive expectation to get answers from the respondents.

In Example (3), the interlocuter asks for confirmation about a past incident. The respondent is being questioned because his corporation contributed 7 billion KRW to Choi Soon-sil's foundation.

- (3) Question with *-cyo* for Unpacking the Main Issue
Q: Choi Kyo-il A: Shin Dong-bin

01 Q: *lostey chuk-ey(.) mwut-keyss-supnita.*
LOTTE COMPANY-AT ASK-I.WILL-DC:DEF
'I will ask Lotte'

02 *lostey-to? milu-wa K suphochu=caytan-ey=*
LOTTE-ALSO COMPANY-WITH K SPORT-FOUNDATION-TO
'Your company also the K sport foundation and the company Mi-r'

03 → *chwulyen-ul ha-sye-ss-cyo?*
CONTRIBUTION-ACC DO-SH-PST-COMM:POL
'Your company also contributed to, right?'

04 **ney**, *kuleh-supnita.*
YES LIKE THAT-DC:DEF
'Yes, we did'

05 *ku oye-y pyeltolo 70-ek-ul tto=*
THE BESIDE-TO ADDITIONAL 7-BILLION-ACC AGAIN
'You supported with an additional 7 billion'

06 → *ceykong-ul ha-sye-ss-cyo?*
SUPPORT-ACC DO-SH-PST-COMM:POL
'right?'

07 A: **ney.**
Yes.
'Yes'

((omitted...))

13 → Q: *iinwen pwuhoycang-kkeyse tolaka-sy-ess-cyo?*
NAME VICE:PRESIDENT-NOM:HON PASS:AWAY-SH-PST-COMM:POL
'The vice-president, Lee passed away, right'

- 14 A: **ney.**
 Yes.
 ‘Yes’

The questions marked with *-cyo* in line 03, 06, 13 display the speaker’s familiarity with the details about a given topic and serve as a vehicle for itemized fact-checking. These itemized enquiries encoded with *-cyo* provide relevant knowledge and background to the audience, which then can serve as a launching pad for the upcoming main question sequence. In addition, this type of questioning narrows the scope of the relevant answer, with respondents expected to answer yes or no. In other words, respondents face a choice of either providing a relevant answer and accepting the presupposition of the question or providing a type-conforming response to the question while simultaneously resisting its presuppositions by not answering directly, i.e., being ‘evasive’ (Hayano, 2013). In this case, the questioner’s epistemic knowledge is congruent, ([K+]) relative to the respondent’s.

Let us consider the respondent’s answer. By producing “yes” tokens in lines 04, 07, and 14, the respondent conforms to the questioner’s itemized fact checking format of inquisition. The frequency of type-conforming answers to *-cyo* questions (51.3%) is found to be higher than that of non type-conforming answers. Questions marked with *-cyo* impose tighter constraints on respondents that compels them to conform to the ways in which mutually familiar issues are framed.

The next example shows a case in which respondents do not conform to the ongoing question format and resist answering. In this conversation, the questioner asks the respondent whether the Samsung Group spent 19 billion KRW to purchase a horse from Germany for Choi Soon-sil’s daughter. Because Choi Soon-sil is exposed as a key stakeholder and decision maker in the Park Administration, it became problematic that Samsung Group had helped her daughter. The respondent keeps feigning ignorance about the issue by withholding a relevant answer. Thus, the questioner pursues a more adversarial line of questioning as indicated by confrontational word choices and direct, un-hedged linguistic expressions. Such questions marked with *-cyo* would be heard as more assertive and aggressive.

(4) Question with *-cyo* for getting confirmation

Q: Anh Min-seok A: Lee Jae-yong

01 Q: *ecce-l swu eps-nun saceng-i=*
 NO:WAY CAN BE NOT:EXIST-RL CIRCUMSTANCE-NOM

02 *mwe-nya-nun mal-i-pnita*
 WHAT-QT-RL WORD-BE-DC:DEF
 ‘What about your extenuating circumstances?’

- 03 ku yayki-lul way mos-hay-yo?
 THE SAYING-ACC WHY CAN:NOT-DO:POL
 ‘Why couldn’t you say so?’
- 04 ku yayki-hakey toy-myen noymwulcoy-lo kelli-ki=
 THE SAYING-DO BE-IF BRIBERY-AS TAKE-NOM
 ‘Is it because the law concerning bribery?’
- 05 ttaymwuney mos-ha-nun kes ani-pnikka?=
 BECAUSE CAN:NOT-RL THING BE NOT-Q:DEF
 ‘would be an obstacle?’
- 06→ mac-cyo?
 CORRECT-COMM:POL
 ‘correct’
- 07 A: hayethun (.) kwukmin yelepwn-tul-kkey cengmal
 ANYWAY THE:PUBLIC EVERYONE-PL-NOM REALLY
 ‘Anyway’
- 08 manhun silmang-ul (.) [sikhye-tuli-n cem]
 A:LOT DISAPPOINTMENT-ACC MAKE-GIVE-RL POINT
 ‘because I disappointed the public on this point’
- 09→ Q:[sa-cwu-ki-nun] sa-cwe-ss-cyo?=
 BUY-GIVE-NOM-TOP BUY-GIVE-PST-COMM:POL
 ‘You did buy it though, right?’
- 10→ sa-cwu-ki-nun sa-cwe-ss-cyo?
 BUY-GIVE-NOM-TOP BUY-GIVE-PST-COMM-Q:POL
 ‘You did buy it though, right?’
- 11→ 19 ekc-cali sa-cwu-ki-nun sa-cw-ess-cyo?=
 1.9 BILLION-WORTH BUY-GIVE-NOM-TOP BUY-GIVE-PST-COMM:POL
- 12 samseng-i?
 SAMSUNG-NOM
 ‘Samsung purchased a 1.9 billion horse, right?’
- 13 A: cey-ka cenghwakha-n(.) kes-un tasi hwakin-hayse.
 I-NOM EXACT-RL THING-TOP AGAIN CONFIRM-AND
- 14 (.) malssum-tuli-keyss-supnita-manun-
 WORD:HON.-GIVE:HON-I.WILL-DC:DEF-BUT
 ‘I will notify you after checking the exact details but’

Questions raised by the interlocutor in the excerpt above are exemplars of a type of content question that imposes specific parameters on the respondent's answer. Here it is used to pose “what” (in line 02) and “why” questions (in line 03). This question is produced in varying phrasal forms with their respective responses displayed as clausal phrases that reject the presumptive notions of the question (Fox and Thompson, 2010).

Such non-conforming responses affect the design of turn-sequences. Non-conforming displays engender longer turn-sequences than type-conforming ones. As these extended question-response sequences are commonly found in the midst of a “tug of war” interaction that takes place between participants in politically-charged assembly hearings, question design serves as an important conversational tool to expose witnesses being either complicit or directly involved in committing corporate crimes. Questions marked with *-cyo* can be used to expand one's turn as seen in line 06.

The sequential environments of *-cyo* questions are similar to the question-response sequences previously shown in Example (3). *-cyo* is used to constrain the scope of answers and to check past actions, as seen in line 06, 09, 10 and 11. By repeating questions formulated with *-cyo*, the speaker increases the amount of pressure on the respondent to provide satisfactory answers.

However, questions formulated with *-cyo* cannot always guarantee success in obtaining a relevant answer from the respondent. As seen in the excerpt, the respondent continually resists the upshot of the question by providing irrelevant answers during the cross-examination (in line 07 and 12). By doing so, the respondents claim that he has more epistemic authority over commonly well-known issues.

Comparing the sequential environments of *-cyo* and *-ci anh supnikka* reveals their interactional utility for fact-checking and testing the hearer's knowledge. Their differences are clearly illustrated in the turn-by-turn contexts illustrated in the excerpts thus far. The next example addresses how questions formulated with *-ci anh supnikka* construct different sequential environments with relevant social actions.

3.3.2 Questions Constructed with *-ci anh supnikka*

A question constructed with *-ci anh supnikka* carries a different pragmatic force due to its specific location within the question itself. Rather than serving as a device for itemized fact-checking and unpacking shared information in *-cyo* formulated questions, *-ci anh supnikka* formulated questions appear in the middle or end of questioning sequences, carrying a distinct discursive force. In these circumstances, the negative interrogative construction *-ci anh supnikka* can be understood to position the speaker in a [K-] position, or at least an equivalently knowledgeable position comparing with *-cyo*.

The following example concerns the Lotte Group's illegal contributions of property among several corporations. The questioner suspects the respondent is involved in an illegal funding scheme.

(5) Question with *-ci anh supnikka* for seeking affirmation
 Q: Lee Man-hee A: Shin Dong-bin

01 Q: lostey sintongpin hoychang-kkey mwut-keyss-supnita.
 LOTTE NAME CHAIRMAN-NOM ASK-I.WILL-DC:DEF
'I will ask Lottee Chariman Shin Dong-bin'

02 cinan 3-wel 14-ilnal hoychangnim-kkeyse-nun=
 LAST MARCH 14- CL CHAIRMAN-NOM-TOP
'Last March 14th, you'

03→ taythonglyeng-ul toktayha-n sasil-i iss-cyo?
 PRESIDENT-ACC MEET-RL FACT-NOM BE-COMM:POL
'You met the president in person, right?'

04 A: ney, iss-supnita.
 YES BE-DC:DEF
'Yes, I did'

05 Q: ku naying-un kemchal-uy kongsocang-ey=
 THE CONTENT-TOP PROSECUTOR-GEN DOCUMENT-AT
'It was stated in the official papers'

06 ceksi-toye iss-nun naying-intey.
 WRITE-BE BE-RL CONTENT-GIVEN.THAT
'It was stated in the official papers, but'

07 cenhye kule-n sasil-i eps-supnikka?
 NOT:AT:ALL SUCH-RL FACT-NOM NOT:EXIST-Q:DEF
'Such a fact was never true?'

08 A: kongsocang cey-ka cikcep po-n cek-i eps-ko
 THE:DOCUMENT I-NOM DIRECT SEE-RL THING-NOM NOT:EXIST-AND
'I did not see the document in person'

09 ettehkey sse iss-nunci cey-ka cal molu-pnita.
 HOW WRITE BE-OQ I-NOM WELL DO:NOT:KNOW-DC:DEF
'I do not know how the document is written'

10 Q: losteykulwup-eyse-nun kak kyeyyelsa-eyse=
 COMPANY-AT-TOP EACH BRANCH-AT
'in Lotte company, each affiliate'

- 11 5-wel 25-il-pwuthe 5-wel 31-il-ey kelchy-ese=
MAY 25-CL-FROM MAY 31-CL-AT OVER-AND
'From the time from May 31st to May 25th'
- 12 chong 70-ek wen-ul K-suphochu-caytan-ey =
TOTAL 7-BILLION-ACC K-SPORT-FOUNDATION-AT
'A total 7 billion'
- 13 chwuka-lo chwulyen-ul hay-ss-supnita.
ADDITIONAL-BY CONTRIBUTION-ACC DO-PST-DC:DEF
'was additionally contributed to K-sport Corporation'
- 14 i sasil-ey tayhayse chwulyen cen-i-na?
THIS FACT-TO ABOUT CONTRIBUTION BEFORE-COP-OR
'In regard to this fact, before the contribution'
- 15 chwulyen ihwuey poko-lul pat-un sasil-i iss-supnikka?
CONTRIBUTION AFTER REPORT-ACC RECEIVE-RL FACT-NOM BE-Q:DEF
'or after the contribution, was it reported to you?'
- 16 A: cey-ka choykuney wa-se,
I-NOM RECENT COME-AND
'Recently'
- 17 10-wel mal-i-na 11 wel cho-ey.
OCTOBER. END-COP-OR NOVEMBER BEGINNING-AT
'at the end of October or the beginning of November'
- 18 cey-ka (.) kulen poko-lul pat-ass-supnita.
I-NOM SUCH REPORT-ACC RECEIVE-PST-DC:DEF
'I had received such a report'
- 19 Q: sacenpoko-nun pat-ci mos-ha-yss-tanun=
PRE:REPORT-TOP RECEIVE-COMM NOT-DO-PST-QT
'You didn't get a preliminary report?'
- 20 malssum-i-si-pnikka?
WORD:HON.-BE-SH-Q:DEF
'You mean'
- 21 A: ney, mac-supnita.
YES CORRECT-DC:DEF
'Yes, correct'

((omitted...))

- 24 Q: 70-ekey tayhayse-nun cenhye=
7-BILLION ABOUT-TOP NOT:AT:ALL
'about the 7 billion KRW'
- 25 a-si-nun pa-ka eps-tanun kes-i-cyo?
KNOW-SH-RL THING-NOM NOT: EXSIST-QT-RL THING-BE-COMM:POL
'You don't know anything about the 7 billion KRW, right?'
- 26 kule-myen ilen chwuka chwulyen-i.
THEN-IF LIKE:THIS ADDITION CONTRIBUTION-NOM
'Then, this additional contribution'
- 27 2015-nyento 11wel-ey thallakha-n
2015-YEAR NOVEMBER-AT DROP-RL
'in November of 2015'
- 28 losteyweltuthawe myenseycem thukhekwen=
COMPANY TAX.FREE.STORE PATENT
'and the Lotte Tower or its bid'
- 29 sinkyu palkup-kwa kwanlyen-hayse.
NEW RELEASE-WITH RELATION-AND
'or duty-free are they not related?'
- 30 yemtwu-ey twu-ko mith-ey iss-nun sacang kulwup-tul-i=
THINK-AT PUT-AT UNDER-AT BE-TOP CEO GROUP-PL-NOM
'the subsidiaries made this contribution with this presupposition'
- 31→ hay-ss-tako-nun sayngkakra-c*ci* anh-usi-pnikka?
DO-PST-QT-TOP THINK-COMM NEG-SH-Q:DEF
'Don't you think?'
- 32 A: kuleh-key sayngkakra-ci-nun anh-supnita.
LIKE-THAT THINK-COMM-TOP NEG-DC:DEF
'I don't think so'

This excerpt confirms the pragmatic force of questions formulated with *-cyo* that has been mentioned in earlier sections. Locating the pre-sequence at a turn, the question unpacks shared information among participants and at the same time allows the questioner to engage in fact-checking while revealing his epistemic primacy on the topic (in line 03). The questioner then raises

another issue about the written form of arraignment in line 07. The respondent disconfirms the questioner's assumptions by stating that he did not have a chance to see the document in line 09. With the respondent's several denials up to this point, the questioner tries to raise background issues to allude to and impel an answer concerning illegal funds.

After several turns are taken to discuss the same issue, the interlocutor re-formulates the question with *-ci anh* in line 31. The questioner's use of the predicate *sayngkakhata* 'think' with the negative interrogative displays his epistemic status as [K-] because the epistemic gap is widened through his insertion of the negation marker *-ci anh*. Rather than soliciting information, this type of question is cautiously seeking affirmation. As this case demonstrates, this form tends to be situated after a series of questions encoded with *-cyo* and it represents the interlocutor's subjective opinion rather than claiming epistemic primacy toward facts of a matter.

Another sequential environment within which *-ci anh supnikka* occurs allows it to function as a device for stance-taking in the assembly hearing. The following segment exemplifies how a speaker formulates a question with *-ci anh supnikka* for delivering the speaker's subjective opinion and how hostile presuppositions in questions can be embedded. In example (6), the questioner and respondent talk about Hyundai Motors' funding for Choi Soon-sil's company. As the interlocutor poses adversarial questions based on factual evidence, the respondent avoids answering.

- (6) Question with *-ci anh supnikka* for unpacking speaker's stance
 Q: Park Beom Key, A: Chung Mong Koo

01 Q: kongsocang-ey hyentaycatongcha kulwup-kwa kwanlyen-hayse.
 DOCUMENT-IN HYUNDAI: MOTORS GROUP-WITH RELATION-AND
 'In the subpoena, about the Hyundai Motor Group'

02 ton ttut-ki-n key-eyyo?
 MONEY EXTORT-PAS-RL THING-Q:POL
 'Was company money extorted?'

03 A: kuke-n ce-nun molu-cyo.
 THE:THING-TOP I-TOP DO:NOT:KNOW-COMM:POL
 'I don't know such a thing'

04 Q: kongsocang-ey kulehkey nao-pnita?
 OFFICIAL:DOCUMENT-AT LIKE THAT COME-DC:DEF
 'In the official document, there was a description'

05 → changphiha-ci **anh**-usey-yo?
 SHAME-COMM NEG-SH-Q:POL
 ‘Aren’t you ashamed?’

06 A: kongsocang-ey-nun-
 OFFICIAL:DOCUMNET-AT-TOP
 ‘In the written document’

The speaker uses *-ci anh supnikka* to form a rhetorical interrogative in line 05 which functions as a negative assertion toward the answer about illegal funding. The speaker’s stance lead confronts the hearer’s non-answer and highlights this moment by mentioning the shameful nature of the addressee’s behavior as a chairman of a conglomerate. In the next turn, the answerer does not respond towards the moral insinuations posed by the questioner’s utterance/stance. Compared to *-cyo* questions that appear in the same environment where respondents reject to answer, *-ci anh supnikka* is more assertive and hostile because it formulates a negation with claims to a [K+] epistemic stance.

The following example shows how the sequential environment within which *-cyo* occurs allows it to function as a device for stance-taking in the assembly hearing. In previous scenes, the questioner raises the same question on how much the respondent has paid for estate tax or inheritance tax three times, but the respondent gives evasive answers.

Thus, the questioner puts forth more hostile presuppositions by using *-cyo* in line 05. Questions formulated with *-cyo* present a stance lead that invokes a sense of incongruity between the questioner’s expectations and the actual facts of a situation, thus engendering a strong sense of bias that is reflexive of the speaker’s subjective opinion on shared pieces of information on a public event or scandal.

(7) Question with *-cyo* for unpacking speaker’s stance
 Q: Park Young-sun, A: Lee Jae-yong

01 Q: cey-ka al-ki-lonun 16 ek nay-sye-ss-supnita.
 I-NOM KNOW-NOM-AS:FAR:AS 1.6 BILLION PAY- SH-PST-DC:DEF
 ‘As far as I know, you paid 1.6 billion KRW’

02 ca. apeci-lopwuthe 60 ek pat-ase=
 WELL FATHER-FROM 6 BILLION RECEIVE-AND.THEN
 ‘You received 6 billion KRW’

03 ku tangsi-ey 16 ek nay-ko.
 THE TIME-AT 1.6 BILLION PAY-AND
 ‘paid 1.6 billion in tax’

04 8 co-uy caysan-ul ilkwe-ss-supnita.
8 TRILLION-GEN ASSET-ACC EARN-PST-DC:DEF
'You earned 8 trillion since then'

05 → koyngcanghi sengkongha-sy-ess-**cyo**?
INCREDIBLY SUCCESS-SH-PST-COMM:POL
'You've been incredibly successful, right?'

06 A: (2.0) cey-ka te aphulo kiek kyenyeng-ul
I-NOM MORE FORWARD COMPANY MANAGEMENT-ACC
'I will manage my company'

07 =yelsimhi. hayse:
DILIGENTLY DO-AND
'more diligently and'

4 Conclusion

Employing conversation analysis as an analytic framework, this study clarifies interactional and environmental sequences of *-cyo* and *-ci anh supnikka*. First, a question encoded with *-cyo* delivers three functions. First, the suffix *-cyo* can perform a function of unpacking main concerns selected by speakers while listing enquiries for fact-checking in pre-sequence locations. Second, *-cyo* presupposes that the speaker is aligned with the hearer's epistemic gradient. Questions with *-cyo* narrow the scope of answers and cannot be evaded by respondents. If the respondents avoid answering, this serves as explicit evidence of strategic evasion. Third, *-cyo* serves as a prolific vehicle for introducing stance-leads, especially in adversarial contexts where the questioner utilizes questions marked with *-cyo* to project a biased and negative predisposition. This aspect serves as an interactional obstacle for respondents. A key feature of the environments within which *-cyo* appears is the presence of larger gaps between a questioner's expectation and the actual answers that are provided. Meanwhile, negative interrogatives encoded with *-ci anh supnikka* perform two pragmatic functions. The first can best be described as a fact-checking device. However, its discourse force does not claim a strong degree of epistemic certainty since the high frequency of *-ci anh supnikka* is correlated with rhetorical questions that do not require a specific answer. Second, *-ci anh supnikka* is also used as a stance-taking device that presents the speaker's biased stance towards issues. Thus, questions marked with *-ci anh supnikka* will be heard as assertions rather than genuine requests for information. In terms of sequential positioning, *-ci anh supnikka* questions appear after sequences in which

there is a strong denial from the respondent and also after pre-sequences where *-cyo* has been used.

Overall, this study highlights question formulations as a spotlight for speaker's epistemic knowledge and stance toward a given topic. In terms of daily social interaction, language itself can mold and initiate a certain social action deeply intertwined in speakers' epistemic statuses.

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Im/Politeness Variations in Digital Japanese-Korean Comfort Women Discourses*

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1 Introduction

When one encounters the term ‘grandmother,’ especially in a Japanese/Korean language context, a system based on honorifics and respect for elders is invoked. However, in these two social contexts there is also a strong historical evocation: Comfort Women. ‘Officially’ known as *ianfu* in Japanese and *wianbu* in Korean, ‘Comfort Women’ are often referred to in the digital discourses of netizens as ‘Comfort Women Grandmother(s)’ or just ‘Grandmother(s)’. However, owing to the honorific system in both languages, as

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well as the affordance of digital Computer Mediated Communication¹ (here after CMC) for nonstandard spellings², the noun referent honorific ‘Grandmother’ presents a plethora of “im/politeness variations” from both morphological and pragmatic perspectives.

Of the identified ‘secondary’ meanings of Japanese honorific forms, referent honorifics (Brown, 2008:370) *-san* and *o-*, two of the most common honorific affixes found in conjunction with ‘Grandmother’, prescriptively fall within the category of respect (*sonkei*) and convey a compliance with politeness maxims (e.g. Leech, 1983). While the counterpart to *-san* in Korean is *-ssi*, there is said to be no prefix counterpart for *o-* nor a Japanese suffix equivalent for *-nim* (Brown, 2008:376). Yet, *-nim* is structurally similar to *-san* in that it attaches to title-conveying nouns.

Politeness research in East Asian languages has long focused on the principal of universality (e.g. Ide, 1982; Pan, 2011). Impoliteness has received much less attention, especially with regards to referent honorifics- an understudied aspect of im/politeness research (Cook, 2011:3656). Some notable exceptions are Cook (2011) and Brown (2013). However, most referent honorific im/politeness research heavily focuses on verbs as this is the lexical item on which most honorific marking is found. This narrow focus in existing literature raises empirical questions for other lexical categories such as nouns which are vital components of reference chains³, e.g., series of expressions referring to the same referents, and textual cohesion. That is, with respect to honorifically marked nouns, “politeness” becomes pragmatically challenged when ‘respectful’ referential forms such as *obaasan* and *halmonim* (both ‘Grandmother’) appear in the same coreference chain as derogatory lexical items such as *moto ianfu* ‘former Comfort Woman’ and *noinne* ‘senile’ respectively. With a focus on digital Comfort Women Discourses, this preliminary paper focusses on what variants of ‘Grandmother’ exist, a question

¹ CMC “is a broad field, encompassing psychological, sociological, organizational science, communication, computer science, and information science perspectives” (Fussell & Setlock, 2014:2). CMC generally refers to any communication which involves the use of computers and the Internet with social media being a primary site of research focus. Computer technology has extensively contributed to 21st century language change as a result of the affordances that is has introduced (i.e. nonstandard spellings).

² Androutsopoulos (2000:514) defines nonstandard spellings as “spellings that diverge from standard (codified) orthography and/or do not occur in formal writing” which includes “the transfer of spoken language features to writing, and formal modifications of a sign” not related to spoken language norms.

³ Federzoni, Ho-Dac, and Fabre (2021) define (co)reference chains as “discourse structures that group together several clauses around a common referent.” As a property of cohesion, coreference occurs “in chains and lexical networks in texts” and can be realized by personal or possessive pronouns, as well as person-morphology in verbs (McArthur, Lam-McArthur, Fontaine, 2018).

which has implications for the second stage of the study which focuses on their functions for politeness and identity construction (see Section 4.0 below).

To emphasize, this study is not concerned with the debates re: Comfort Women definition, history, and/or origin. Rather, this study is an investigation into the observable everyday language practices of Japanese and Korean netizens and how the Comfort Women are remembered/discussed about in groups where im/politeness paradigms manifest in the respective constructed identities of the Comfort Women.

Thus, the analysis presented here is concerned with one of two layers of im/politeness (see Section 4 for more): the discursive Macro layer morphologically marked as reflected in the absence and/or presence of honorific suffix and/or a prefix components (i.e. お- and -さん rendering variants like おばあさん *obaasan* ‘Grandmother’ / ばあさん *baasan* ‘Grandmother’ in Japanese; -님 rendering variants like 할머니 *halmonim* ‘Grandmother’ / 할머니 *halmoni* ‘Grandmother’ in Korean), along with nonstandard spellings/derogatory replacements (e.g. ばば, ババア, BBA (all variants of grandmother); 할매 ‘Grandmother (Busan dialect), 할마시 ‘Grandma’, 할망구 ‘Grandmother hag’). That is, the current paper reports on the quantitative portion of the project as the qualitative portion is still underway (see Section 4.0).

2 Methodology

This section explains the data origin, corpus composition, and methodological approaches taken in the study. Specifically, Section 2.1 focuses on the primary sourcing platform *Kaikaihanno*, including how it is structured and how the data was selected; Section 2.2. introduces the two primary Korean netizen community sources ILBE and Naver News, including the data allocation in each; Section 2.3 introduces the Japanese netizen community, including the data allocation; Section 2.4 introduces the particulars of the main corpus followed by those of the subcorpora used for the work-in-progress analysis presented in this paper; and Section 2.5 introduces the analytical frameworks used and the research focus.

2.1 Corpus Construction: *Kaikaihanno*

The corpus for this study is referred to as the *Digital Comfort Women Discourses Corpus* and was constructed in January 2020 using *Kaikaihanno* (a translation blog dedicated to reacting to Korea) as a primary source. *Kaikaihanno* is thus a platform (presumably) run by Japanese language users which acts as an ‘information broker’ between Japanese netizens and Korean lan-

guage content originally produced for the Korean language audience. Administrators of the *Kaikaihanno* select Korean news articles or posting from Korean Internet outlets such as Naver News (see Section 2.2 below) and translate not only the content of the articles, but also a selection of the comments made by Korean netizens on those very same articles, into Japanese. These Japanese translations of article contents and comments, together with URL links to the original Korean sources, are then posted as entries on *Kaikaihanno* for circulation to the Japanese audience. Each entry is assigned a theme tag which helps organize the content and also helps users more easily locate content in which they are interested. The collection of tags used for entry categorization across *Kaikaihanno* is featured on the right side-bar in a wordcloud format under ‘Popular Topics’: the hotter a topic is the larger its lettering will appear. In order to obtain the data for this study, the blog’s ‘Comfort Women’ tag was clicked on January 14, 2020, and all entries tagged at the time were saved in PDF format and stored offline in aggregate.

2.2 Corpus Construction: Korean Data

The Korean data for the *Digital Comfort Women Discourses* corpus consists of 82 Korean news articles and a collective total of 19,555 comments. The articles come from various news outlets, the two most prominent being ILBE (n=35), a notorious alt-right platform, and Naver News (n=40), an online news portal. Naver News is South Korea’s largest online news portal which consists of original and republished material governed by other media outlets (e.g. Yonhap news, SBS, JTBS, Hankook Ilbo, Kukmin Ilbo, etc.). Of the remaining articles, four are from Blue House petitions, and one each of Korean Liberty News, Ruliweb, and Press Asian. In terms of comments, all but 44 come from either Naver News or ILBE.

2.3 Corpus Construction: Japanese Data

The Japanese data for the *Digital Comfort Women Discourses* corpus consists of 77 Japanese blog entries made on the translation blog *Kaikaihanno* and tagged ‘Comfort Women.’ In addition, the Japanese data also consists of comments from two sources: (1) 39,283 comments presumably made by Japanese language users, and (2) 2,948 comments which are Japanese translations of Korean netizens’ comments made on the Korean news articles on external Internet platforms. It is important to note that the study presented here focuses on original netizen comments and thus only original comments are examined and not the blog entries themselves which contain the translated comments.

2.4 Corpus Construction: *Digital Comfort Women Discourses Corpus* and subcorpora

Following the discussions in Section 2.2 and 2.3 above, the *Digital Comfort Women Discourses* corpus collectively consists of 159 texts (77 Japanese blog entries; 82 Korean news articles) and roughly 61,750 comments. Whereupon comment data is comprised of Japanese comments (n=39,283), Korean comments (n=19,555), and Korean comments translated into Japanese which comprises some of the content of the 77 Japanese blog entries (n=2,948). A comprehensive overview of the corpus is shown in Table 2.1 below which also reflects the Korean, Japanese, and Translation subcorpora.

Korean Data						Japanese Data	
Ilbe		Naver		Other		Kaikaihanno	
Articles	Comments	Articles	Comments	Articles	Comments	Entries	Comments
35	6,597	40	12,914	7	44	77	39,283
					Total Articles		
					82		
					Total Comments		
					19,555		
Translated Comment Data							
1,556		1,308		84		Total Translated Comments	
						2,948	

Table 2.1 Digital Comfort Women Discourses Corpus Composition

A visual representation of the specific subcorpus composition used in this study is presented in Figure 2.1 below which highlights the origin of each data component⁴. For ease of access, Figure 2.1 only explicitly visualizes the details of two prominent Korean communities (i.e. ILBE and Naver News).

⁴ The quantitative findings presented in this paper for this study are preliminary and based on only a portion of the subcorpus outlined here as initial coding is still in progress.

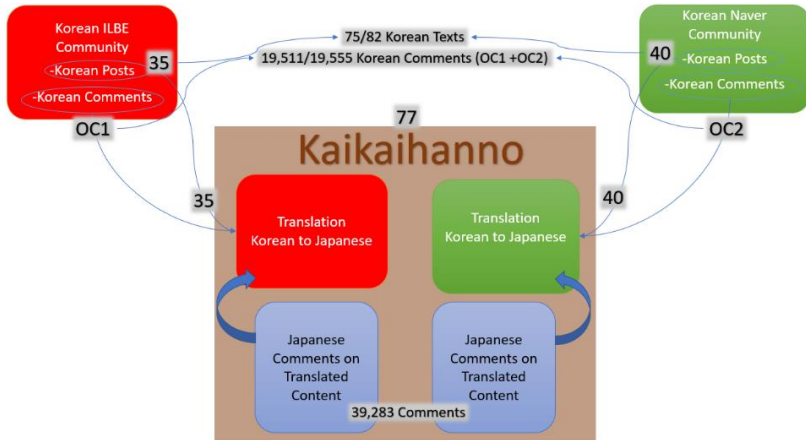


Figure 2.1 Digital Comfort Women Discourses Corpus Visualizer

As can be seen in the figure, only ‘native’ Korean and Japanese comment data are objects of examination ($n = 19,555$ and $n = 39,283$ respectively). The abbreviation “OC” in the figures stands for ‘Original Comment’, i.e. ‘native’ comment, and the number marks the community source with 1 being ILBE and 2 being Naver News. This is since translation itself is a social act, its own form of discourse, which may embody the attitude of the translator (Kedari, 2021:79) and may be used to achieve certain affective responses in target readers via translation techniques such as textual manipulation. Consequently, the translated comment data is not included in this study and is instead under examination as a linked study involving the Othering and Identity construction of Comfort Women in digital discourses (see Sluchinski, 2021).

2.5 Methodological Frameworks and Research Focus

Adopting a mixed methods approach combining quantitative Corpus Linguistics and qualitative Discourse Analysis (e.g. Martin and Rose, 2007; Martin and White, 2005), this study focusses specifically on the variations, in terms of both morphology and spelling, of ‘Grandmother’ noun referent honorifics in Japanese and Korean comments. As a primarily descriptive study, there is no hypothesis per se and the analysis is driven by an inductive bottom-up approach.

2.5.1 Coding Software and Database Management

The study used Atlas.ti, a computer-assisted qualitative data analysis software, to code the data for all variants of the term ‘Grandmother’ as well as to annotate the various anaphoric and cataphoric reference chains between all the ‘Grandmother’ variants and other third person lexical items. Much of the coding process was carried out manually. The coreference chains were further logged into an Access database managed by variant, detailing each connected instance of reference. As outlined in Section 1, the qualitative portion which uses the reference chains to explore the pragmatic role(s) they play in politeness and the identity construction of Comfort Women is still underway and thus not presented in this paper.

2.5.2 Politeness Ranking Scale

The politeness ranking scale used in the study was generated using combined top-down and bottom-up approaches. The politeness ranking scale was obtained to have an initial view of how these expressions (or a variety of expressions) are understood by everyday language users in terms of politeness. Initially, I generated a list of possible ‘Grandmother’ variants in Korean, as well as one in Japanese, based on prescriptively occurring terms in line with the respective honorific systems. Following this, I then ranked the terms from most to least polite making intuitive judgements based on prescriptive definitions and experience.

To incorporate a bottom-up approach, I then carried out initial coding of the data to capture variants used by everyday language users and added any variants that were missing to the respective lists. With the lists constructed from both bottom-up and top-down approaches, I sought intercoder reliability with native speaking volunteers⁵. For both Korean and Japanese lists, I asked two native speakers to rank each term from most to least polite. There was no disagreement between native speakers on the rankings, and little-to-no disagreement between native speaker rankings and my own. The lists verified by the native speakers were used as the final politeness ranking scales employed in the Macro layer of the quantitative analysis (see Section 3 below).

3 Macro Research Focus (Quantitative)

This section introduces the preliminary quantitative findings which address the question of what ‘Grandmother’ variants exist. Subsection 3.1 introduces

⁵ It is important to note that, due to the sensitive nature of the topic, I did not tell the volunteers what the list was for or where the terms had come from. They were simply presented with my ranking of various ‘Grandmother’ variants and asked to arrange it from most to least polite.

the categories of the ‘Grandmother’ variants while the politeness rankings are presented in 3.2.

3.1 Variant Categories

Four distinct categories of ‘Grandmother’ variants were identified in the corpus: 1) Morphologically Marked: Present/Absent Suffix (see 3.1.1 below) ; 2) Morphologically Marked: Present/Absent Prefix (see 3.1.2 below); 3) Nonstandard Spellings (see 3.1.3. below); and 4) Derogatory Replacements (see 3.1.4. below).

In order to understand these categories, a brief discussion of the Japanese and Korean writing systems is in order. The Japanese writing system has access to four different scripts: *kanji* (Chinese characters), *katakana* syllabary (generally understood to be used for foreign words, emphasis and other purposes), *hiragana* syllabary (generally understood to be used when there is no Chinese character available) and *romaji* (Roman alphabet like the Korean writing system’s various Roman alphabet Romanization Systems, the most recent being the Revised Romanization system implemented by the government in 2000). In contrast, the Korean writing system is heavily reliant on *Hangul* (the Korean alphabet of 24 basic letters and 27 complex letters arranged in syllabic blocks) while also having access to two additional script systems relevant for CMC, namely *Hanja* (the traditional writing system consisting mainly of Chinese characters) and the previously mentioned Roman script.

Given the difference in affordances allowed by the Japanese writing and honorific systems and vs the Korean ones, several of the four categories are language specific. Specifically, the Korean writing system does not easily allow for nonstandard spellings given the syllabic block structure. Consequently, thus far, Nonstandard Spellings have only been found in the Japanese language data. In addition to the writing systems, the honorific systems have also played a role in category exclusivity. Specifically, in Japanese it is possible to have prefix honorifics where such is not the case in Korean, resulting in the Morphologically Marked: Present/Absent Prefix also being exclusively composed of Japanese language data.

The complexity of the Japanese writing system further presents implications for the identified categories given that a given variant, for example おばあさん *obaasan* ‘Grandmother’, can belong to multiple categories. In おばあさん (*obaasan*), presence of prefix お- (*o-*) allows it to fall under category (2), presence of suffix -さん (*-san*) allows it to fall under category (1), and the nonstandard component ばあ (*baa*) which exhibits use of a smaller font allows it to fall under category (3). It is for these reason that the following

subsections present only exemplars of each category to facilitate understanding and do not include quantitative representations. Instead, quantitative aspects are presented by language variant in the ultimate politeness ranking lists of Section 3.2.

3.1.1 Morphologically Marked: Present/Absent Suffix

This first category has both Japanese and Korean ‘Grandmother’ variants where the main noun is marked by either the presence of a suffix honorific marker (see green underlined circles in Figure 3.1 below) or the absence of a suffix honorific marker (see red underlined circles in Figure 3.1 below). In the case of Japanese, this means the presence or absence of *-さん(-san)*, *-ちゃん(-chan)*, *-様(-sama)*, etc. and in Korean the presence or absence of *-님(-nim)*.

婆さん <i>baa-san</i> ‘Grandmother’	婆 <i>baa/baba</i> ‘Grandmother’(‘hag’)
할머니 <i>Halmönim</i> ‘Grandmother’ (polite, honorific)	할머니 <i>Halmöni</i> ‘Grandmother’ (polite, standard)

Figure 3.1 Type 1 Grandmother Variant Morphologically Marked: Present/Absent Suffix

3.1.2 Morphologically Marked: Present/Absent Prefix

This second category has exclusively Japanese ‘Grandmother’ variants where the main noun is marked by either the presence of a prefix honorific marker (see green underlined circles in Figure 3.2 below) or the absence of a prefix honorific marker (see red underlined circles in Figure 3.2 below). In the case of Japanese, this means the presence or absence of *お-(o-)*.

①おばあさん <i>ō-baa-san</i> ‘Grandmother’	②ばあさん <i>baa-san</i> ‘Grandmother’
---	--

Figure 3.2 Type 2 Grandmother Variant Morphologically Marked: Present/Absent Prefix

3.1.3 Nonstandard Spelling

This third category has exclusively Japanese ‘Grandmother’ variants where the scripts are flouted to achieve pragmatic and visual effects. Scholars such as Sebba (2011: 27) have noted that the deliberate choice of script in a singular writing system can be seen as a purposeful social action. Comparative standard vs nonstandard variants are shown in Figure 3.3 below with the red underline marking the nonstandard features.

おばあちゃん <i>O-baa-chan</i> ‘Grandmother’	オバーちゃん <u><i>O-baa-chan</i></u> ‘Grandmother’
おばあさん <i>O-baa-san</i> ‘Grandmother’	をばあさん <u><i>O-baa-san</i></u> ‘Grandmother’

Figure 3.3 Type 3 Grandmother Variant Nonstandard Spelling

3.1.4 Derogatory Replacements

This fourth category has both Japanese and Korean ‘Grandmother’ variants. In the case of Japanese, neither honorific suffixes or prefixes are present, leaving what may be termed as the “*babaa* stem”⁶ (see green underline in the left box of Figure 3.4 below) which may be combined with derogatory suffix *-domo*, or the whole word is replaced with something else (i.e. ‘Grandmother’ in Korean pronunciation and stylized in *katakana*). See the right box of The Japanese entry in Figure 3.4 below). In the case of Korean, the honorific suffix is absent and the *할* ‘*hal*’ syllabic block is combined with other derogatory syllabic blocks and/or compound nouns (see Figure 3.4 below).

ババア共 <u><i>ba-baa</i></u> - <i>domo</i> ‘Grandmother’	ハルモニたち <i>ha-ru-mo-ni-tachi</i> ‘Grandmother’ (Korean)
할망구 <u><i>Hal</i></u> <i>manggu</i> ‘hag’	할마시 <u><i>Hal</i></u> <i>masi</i> ‘not as bad as hag’

Figure 3.4 Type 4 Grandmother Variant Derogatory Replacement

⁶ The term “*babaa* stem” is coined as such because *babaa* is the most common form and listed in dictionaries. Other variants of phonetic similarity, such as *baba*, are less common shorter variants or independent forms. With *babaa* as the starting point, shortened forms can be considered as examples of nonstandard spelling/writing.

3.2 Politeness Rankings

Quantitatively, 14 core Korean ‘Grandmother’ variants (see Table 3.1 below) and 32 core Japanese ‘Grandmother’ variants (See Table 3.2 below) were found in the corpus. By core variant, I refer to the singular form of the variant with the corresponding quantitative number encompassing both singular and plural forms, with allocation distinction in brackets. The data is presented this way was due to the relatively low occurrence of plural, and the grammatical difference being reflected in both languages via suffixation.

With regards to the Korean variants, a total of 1,773 tokens were identified. Within this number, almost 76% were the standard, plain 할머니(들) *halmeoni(deul)* ‘grandmother(s)’, which ranked as the third most polite variant overall. Of the 1,345 tokens, 728 were singular and 617 were plural. The second most frequent variant was the Busan dialect variant: 할매(들) *halmae(deul)* ‘grandmother(s)’ ranked fourth most polite with a collective of 238 tokens, while the utmost polite form 할머니님(들) *halmeonim(deul)* ‘grandmother(s)’ was the third most frequent at 4.5% and a collective total of 80 tokens. The most frequent derogatory variant was 6) 할망구 *halmanggu* ‘grandmother hag’ at only 1.5% and 27 tokens. Some variants tied in terms of their politeness ranking; this is reflected in the numbers to the left of the respective variant entries. The last two entries were difficult for speakers to rank and thus have an XX ranking.

TERM	ROMANIZATION	(N)	(% WITHIN/1,773)
1) 할머니님(들)	halmeonim(deul)	63(17) = 80	4.5%
2) 할머니분(들)	halmeonibun(deul)	0 (4) = 4	0.2%
3) 할머니(들)	halmeoni(deul)	728 (617) = 1,345	75.9%
4) 할매(들)	halmae(deul)	217 (66) = 283	16.0%
4) 할마시(들)	halmasi	9 (6) = 15	0.8%
5) 할마씨(들)	halmassi(deul)	4 (1) = 5	0.3%
6) 할망	halmang	0 (1) = 1	0.06%
6) 할망구	halmanggu	26 (1) = 27	1.5%
7) 할때미	halmaemi	8 = 8	0.5%
8) 할때치곤(들)	halmaechigon(deul)	1 (0) = 1	0.06%
9) 할때년(들)	halmaeyeon(deul)	1 (0) = 1	0.06%
10) 할때새끼(들)	halmaesaekki(deul)	0 (1) = 1	0.06%
XX) 할애(들)	harae(deul)	0 (1) = 1	0.06%
XX) 할무이	halmui	1 = 1	0.06%

Table 3.1 Korean Grandmother Variant Politeness Ranking

With regards to the Japanese variants, a total of 112 tokens were identified (see Table 3.2). The Japanese data is unique in that there are three politeness tiers, reflected in gradient colour coding. Dark green represents the utmost polite tier where a variant has either a prefix honorific, suffix honorific, or both and houses rankings 1-5 (see Table 3.2). In the rankings, 1, 1A, and 1B are of equal politeness according to native speakers and A and B are categorized under 1 because they are nonstandard spellings of the standard form. The quantitative total for Tier 1 is 52 tokens, a total of 46.4%. Light green represents a progression into impoliteness and houses rankings 6-12; as the rankings move farther away from 1 the more impolite they were deemed to be (see Table 3.2). The quantitative total for Tier 2 is 11 tokens, a total of 9.8%. Red represents the utmost impolite tier, i.e. derogatory variants of the *babaa* stem (see Table 3.2). There are several things to note about Tier 3: 1) all *babaa* stems are ranked as equally impolite regardless of orthographic variation (i.e., 13A-13N); 2) Tier 3 houses a total of 49 tokens which amounts to 43.8% of all Japanese tokens. Taken holistically, the Japanese ‘Grandmother’ variants lean towards being more impolite and derogatory (9.8% + 43.8% = 53.6%) than being standard or polite (i.e., 46.4%).

TERM	ROMANIZATION	(N)	(% WITHIN /112)
1)おばあさん(たち)	obāsan (tachi)	17(1) = 18	16.1 %
1A)おばあさん	oba asan	1 = 1	0.9 %
1B)をばあさん	obāsan	1 = 1	0.9 %
2)お婆さん	obāsan	9 = 9	8.0 %
3)おばあちゃん	o bāchan	4 = 4	3.6 %
3)オバーチャン	obāchan	1 = 1	0.9 %
4)おばさん(たち)	obasan (tachi)	2 (1) = 3	2.7 %
5)婆さん(達)	bāsan (tachi)	10 (5) = 15	13.4 %
6)ばあさん(たち)	bāsan (tachi)	1 (0) = 1	0.9 %
7)バアサン	bāsan	1 = 1	0.9 %
8)ばーさん(たち)	ba san (tachi)	0 (1) = 1	0.9 %
9)バーさん	bā san	1 = 1	0.9 %
10)バアさん(たち)	bā san (tachi)	0 (1) = 1	0.9 %
11) 婆ちゃん(達)	bāchan (tachi)	1 (2) = 3	2.7 %
12) ばあちゃん	bāchan	3 = 3	2.7 %
13A) ばばあ(達)	baba a (tachi)	2 (1) = 3	2.7 %
13B) ババア (達)	babā (tachi)	0 (1) = 1	0.9 %
13C) ババア(たち)	babā (tachi)	11 (1) = 12	10.7 %
13D) ババア	baba a	3 = 3	2.7 %
13E) ババア	babā	3 = 3	2.7 %
13F) 婆(達)	baba tachi	7 (1) = 8	7.1 %
13G) ババ	baba	2 = 2	1.8 %
13H) 婆婆	baba baba	1 = 1	0.9 %
13I) 婆あ	baba a	1 = 1	0.9 %
13J) バアア	bāa	1 = 1	0.9 %
13K) BAA	BAA	1 = 1	0.9 %
13L) BBA (ども)	BBA domo	9 (1) = 10	8.9 %
13M) ババアども	baba a domo	1 = 1	0.9 %
13N) ババア共	baba a domo	1 = 1	0.9 %
14) ハルモニたち	harumoni tachi	1 = 1	0.9 %

Table 3.2 Japanese Grandmother Variant Politeness Ranking

4 Conclusion

The current paper has reported on the quantitative portion of the project (i.e. the first research stage at the Macro layer). In general, the preliminary quantitative results presented in this working paper suggest that in the Korean communities Comfort Women are referred to neutrally, with a tendency to be more polite than impolite, whereas in the Japanese community they tend to be referred to in a derogatory manner. Strategies that contribute to this derogatory reference are lack of honorific affixes, nonstandard spellings, and vulgar word replacements. Furthermore, in terms of Grandmother variants, Japanese presents much more variation than Korean as a result of the available scripts, syntactic-morphological honorific structure, and affordances allowed by the CMC environment.

The quantitative research focus outlined thus far unites with the currently underway second stage of the study, the qualitative research focus, which relies on Discourse Analysis to ask what implications these ‘Grandmother’ variants have for im/politeness in digital Comfort Women discourses. That is, while the quantitative portion is a descriptive survey at the discursive Macro layer, the qualitative portion targets pragmatic usage at the discursive Micro layer. This Micro layer is formed by the pragmatic usage of the Grandmother variants in rhetorical contexts to achieve various pragmatic functions (e.g. a reference chain of おばあさん *obaasan* ‘Grandmother’(honorific) and 売春婦 *baishunpu* ‘prostitute’). These two research focuses then wholistically unite to address the following research questions in progress: 1) What ‘Grandmother’ variants exist, and 2) What reference chains exist among the variants and what are their implications for rhetorical politeness and the identity construction of Comfort Women.

The politeness scales outlined in Section 2.5.2 are also being used in the Micro layer pragmatic analysis of reference chains in cases of rhetorical usage to help explain why a reference chain of おばあさん *obaasan* ‘Grandmother’(honorific) and 売春婦 *baishunpu* ‘prostitute’ can be seen in the data.

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SECTION 2

Oral Papers

Part 5

Psycholinguistics

Acquisition

A Postnominal Preference in Japanese Numeral Classifier Phrases

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1 Introduction

Numerals in Japanese appear with a classifier when quantizing a noun, as in other classifier languages common in Asia. Despite a general prenominal pattern for other noun modifiers in the language, this article reports on a postnominal preference in Japanese numeral classifier phrases, found in the performance data of two substantial corpora. An explanation is offered with reference to two efficiency principles from the performance theory of Hawkins (2014). The postnominal numeral classifier is proposed to enhance sentence processing without challenging the status of the head in the head-final Japanese. There is therefore a processing motivation for the anomalous postnominal placement of the classifier.

Word order variation of the constituents in a noun phrase often does not seem to follow or correspond to the apparent headedness of the language. There is a general non-correlation between numeral–noun order and head direction (Dryer, 1992), but little is said of the role that numeral classifiers plays in the matter. The postnominal order for the numeral is considerably widespread in the major classifier languages in Asia. In languages that permit both the prenominal and postnominal orders (as in SVO languages like Vietnamese and Chinese, and SOV languages like Japanese and Korean), the

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postnominal order is often assumed as an alternative in certain situations to the possibly more common prenominal order. But this may be an assumption that we want to rethink while addressing word order variations in one of these classifier language, or across the languages.

This article reports on two studies of Japanese performance data, which find a postnominal preference in the numeral classifier phrase. Japanese is a numeral-classifier language where the use of classifiers is obligatory in most expressions of quantity. The numeral and the classifier occur together as a single uninterrupted sequence, as is common in other languages (Greenberg, 1975). There are different views on the construction types to be identified, with the number ranging from five to nine (Martin, 1988; Kim, 1995; Downing, 1996; Amazaki, 2006). (1) shows the five commonly identified constructions, adopting the refined classification in Kim (1995). The unmarked case is widely taken to be when the numeral classifier phrase appears in a prenominal position, with an *attributive* property given by the addition of adnominal *no* ‘GEN’ suffixed to the numeral classifier phrase (1a). Cases such as (1e) have also been studied under the terminology of adverbialization (Martin, 1988) or (quantifier) floating (Downing, 1996; Amazaki, 2006). Kim (1995) is conservative in naming this position only “locally” external, but the adverbial nature of the numeral classifier phrase is widely accepted in the literature (Fukushima, 1991; Gunji and Hasida, 1999). A case marker is included in the examples to indicate the boundary of the noun phrase.

- (1) a. *Prenominal, attributive, NP-internal*
 niman ken no tenpo de
 twenty.thousand CLF GEN store INS
 ‘by twenty thousand stores’
- b. *Prenominal, non-attributive, NP-internal*
 guntai ik ko syootai ga
 army one CLF platoon NOM
 ‘a platoon of the army’
- c. *Postnominal, attributive, NP-internal*
 hooseki no hito-tu o hazusi
 jewel GEN one-CLF ACC remove
 ‘remove one jewel’
- d. *Postnominal, non-attributive, NP-internal*
 sobaten yonzyuugo tenpo o
 soba.restaurant forty.five store ACC
 ‘forty five soba restaurants’
- e. *Postnominal, (locally) external*

nakama ga go nin atumari
fellow NOM five CLF gather
'five fellows gather'

The construction types differ not only by constituent orders but also by formal structures such as the introduction of a genitive marker in the attributive constructions, as in (1a) and (1c), analogous to the structural change between the *s*-genitive and *of*-genitive constructions in English, which also display two distinct constituent orders between the possessor and possessum. Whereas English quantifier constructions in the structure of [(Det) N of (Det) N], such as *two pounds of coffee*, are considered to be a subtype of genitive constructions (Lehrer, 1986), the prenominal attributive construction in Japanese does not suggest such an analysis. Adnominal *no* helps to bind a wide range of associations in the noun phrase.

The choice of classifier is determined partially by the semantics, and it serves to specify the measured unit or boundedness of the lexical item, whether the quantity is expressed by means of a specific numeral or by less specific quantitative expressions such as 'several' (Dixon, 1982; Downing, 1996). The classifiers fill an obligatory slot in the numeral–noun construction often with redundancy of information (Croft, 2001). When placed in the adverbial position, the numeral classifier enters a measuring relation with the verb, while maintaining to be a compatible match with the noun (Levy and Oshima, 2003).

2 The Construction Types

The classifier in Japanese is bound to the numeral that precedes it, more than to the noun. Many studies (e.g. Kim, 1995; Amazaki, 2006) prefer to treat the two constituents as a single syntactic unit, as formalised in (2). The compound behaves similarly to a quantifier, hence the shorthand Q in the rest of this article. The phonological assimilation between the numeral and the classifier in Japanese also supports the analysis, as a phenomenon that only takes place in lexical compounds. For example, *iti* 'one' and *hon* 'long slender object' combine to form *ip-pon* 'one-CLF'.

(2) [Numeral Classifier]_Q

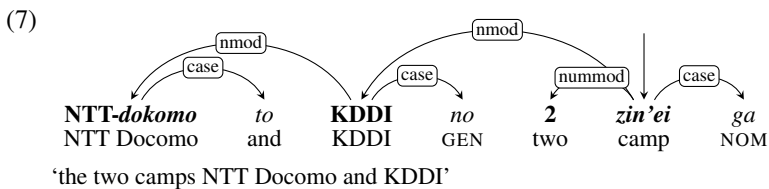
In some other classifier languages, for example in the numeral classifier literature of Mandarin (e.g. Li, 1999), the classifier is considered to be bound to the noun. The different assumptions may lead to significant consequences. Explicit argumentation is not always given but the assumptions made are fairly consistent in the literature within a single language.

- (5) zyookyaku hyaku yonzyuu go nin, zyooiin hati nin
 passenger hundred forty five CLF crew eight CLF
 ‘a hundred and forty five passengers, eight crew members’

A relevant case regarding the role of processing efficiency in the choice of constituent order is when the numeral appears with a noun containing prenominal modifiers containing other numbers, as in (6). In this particular case, there is no ambiguity even if the numeral classifier phrase *kyuu mai* ‘nine CLF’ is placed at the front, but the current order should be easier to process.

- (6) san gyoo san retu no paneru kyuu mai
 three row three column GEN panel nine CLF
 ‘nine panels of three rows by three columns’

Structural analyses of the postnominal constructions vary greatly in the literature. If we consider those that are widely adopted in large-scale studies involving corpora with cross-linguistic comparability, such as the Tübingen treebank referenced in the previous section or the GSD Japanese treebank (Asahara et al., 2018), the preferred analysis is to maintain a left-branching structure in Japanese, by identifying the classifier as the head. (7) shows a dependency grammar analysis provided by the GSD treebank. This example also demonstrates the summative function often found in the postnominal constructions. The noun is an enumeration list that can be summarized by the numeral classifier phrase.



2.3 The Adverbial Construction

While the adverbial construction is very frequently postnominal, it is seldom grouped into the postnominal constructions, except when the order affects the possible readings. Amazaki (2006) claims that the order follows the sequence of domain setting by the noun and instantiation of quantity by the numeral classifier phrase, but example (8) taken from the same work shows how the semantic information also affects the readings given the same constituent order. The specificity of the instantiation domain is partially drawn from world knowledge. There are other scope interactions when the adverbial phrase measures for different semantic roles (Gunji and Hasida, 1999), or with multiple numeral classifier phrases measuring different dimensions (Levy and Oshima, 2003), but it will not be discussed here.

- (8) a. Unagi o san biki katta.
 eel ACC three CLF bought
 ‘(I) bought three eels.’
- b. Hakusen o san bon kesita.
 white.line ACC three CLF erased
 ‘(I) erased three of (the) white lines.’

It is easy to find instances in the adverbial construction with a long noun phrase heavily adnominalized, as in (9). The adverbial numeral classifier phrase is syntactically farther away from the noun, as compared with the NP-internal postnominal constructions. But if the contrast is drawn with the prenominal constructions, the adverbial position is able to address the competing needs for adjacency to the noun between the numeral classifier phrase and other noun modifiers. This supports an efficiency proposal to explain the postnominal order.

- (9) Netto no naka ni hait-teru saabisu ken o nizyuu mai atumeru.
 net GEN inside LOC enter-GER service ticket ACC twenty CLF collect
 ‘(I) collect twenty service tickets that entered the net.’

3 A Postnominal Preference in Corpus Studies

3.1 Previous Studies

This article is not the first to note a postnominal preference in Japanese numeral classifier phrases. In his survey of the distributions of selected classifier constructions, Amazaki (2006) notes a prenominal inclination for the general classifier *tu*, the inanimate, generic classifier, but frequent postnominal appearance for the human classifier *nin*, which is a classifier with more semantic content. The main contributor for the difference is suggested to be their semantic values, as testified across two genres: newspaper articles (Saga), and Japanese literature (Aozora).

The corpus study of Tojo (2014) surveyed the distribution of “quasi-classifiers”, which are defined as nominal classifiers that can be used with the question word *nan* ‘how many’. Quasi-classifiers are more often used as nouns proper, and may even receive their own classifiers, e.g. *tenpo* ‘store’ in (1d, cf. 1a, with *tenpo* as the noun). It may not be immediately relevant to our case, but the study suggests an interesting relation between the high productivity of the postnominal position and the level of semantic information of the numeral classifier.

3.2 Study 1: GSD Treebank

I will first report my survey of the distribution of the numeral classifier constructions in the GSD Japanese treebank (Asahara et al., 2018), which is an accessible corpus with structural analysis. The results are presented in the

grouping of prenominal and postnominal, regardless of adverbialization, as given in Table 1. *Tu* and *nin* are the most frequent numeral classifiers, here and in other studies (e.g. Downing, 1996), so they are identified in separate rows. The prenominal preference is testified with the general classifier *tu*, which appears prenominal in 64% of occurrences that conform to any of our target constructions. However, with *nin* and other numeral classifiers, their positions are predominantly postnominal.

	% Prenominal	% Postnominal	Total
<i>tu</i>	64%	36%	78
<i>nin</i>	33%	67%	83
Other numeral classifiers	37%	63%	226
Nominal classifiers	27%	73%	41
Total	40%	60%	428

TABLE 1: Distribution of numeral classifier constructions with *tu*, *nin*, and other classifiers

Lexical items which participate in numeral classifier constructions but are tagged as nouns were categorized into nominal classifiers, and their percentage for postnominal constructions are even higher (79%). The situation sums to a general postnominal preference of 60%.

3.3 Study 2: BCCWJ

It has been noted more than once that the semantic content affects the distributions between prenominal and postnominal constructions. The next study picks two frequent numeral classifiers for further investigations using the Balanced Corpus of Contemporary Written Japanese, BCCWJ (Maekawa et al., 2014). The general classifier *tu* gives way to the next most frequent classifiers, the human classifier *nin* and the flat-object classifier *mai*. The data is further narrowed down to examples in the accusative case.

For ease of reading, the construction types in the results appear in abbreviations where Q denotes the numeral classifier phrase, *no* ‘GEN’, N the Noun, and C the case marker. Table 2 shows the correspondence to the classification system in Kim (1995), which has been presented earlier in (1). Prenominal adverbial construction is excluded for its scarcity.

Instances of *nin* and *mai* are extracted, and categorized for the five construction types in question. Results presented in Table 3 are divided into a prenominal group with the constructions *QnoNC* and *QNC*, and a postnominal group with the constructions *NnoQC* and *NQC*, as well as the adverbial construction *NCQ*.

#	Construction type	Description
1	<i>Qno</i> NC	Prenominal, attributive, NP-internal
2	QNC	Prenominal, non-attributive, NP-internal
3	<i>Nno</i> QC	Postnominal, attributive, NP-internal
4	NQC	Postnominal, non-attributive, NP-internal
5	NCQ	Postnominal, NP-external

TABLE 2: Constructions of interest

Type	<i>nin</i>	%	<i>mai</i>	%
<i>Qno</i> NC	1165	55.9%	567	40.3%
QNC	30	1.4%	75	5.3%
			57%	46%
<i>Nno</i> QC	66	3.2%	17	1.2%
NQC	676	32.4%	194	13.8%
NCQ	148	7.1%	554	39.4%
			43%	54%
Total	2085	100%	1407	100%

TABLE 3: Distribution of the five constructions with *nin* and *mai* in BCCWJ (Maekawa et al., 2014)

The difference between the prenominal group and the postnominal group is not as dramatic as in the study with the GSD Japanese treebank, but again, a postnominal preference is noted next to the prenominal group. Semantic factors add to the minor variations between *nin* and *mai*.

It was noted in (9) that when a noun phrase is heavily adnominalized, the adverbial construction is able to balance the competition for adjacency with the head by placing the numeral classifier phrase in a postnominal position. This motivates the next step in this study. Further statistics concerning the lengths of NP and Q are presented separately for the two selected classifiers. Table 4 shows the results for the human classifier *nin*. Lengths are measured in morae as a phonological processing unit. For a fair comparison between NP-internal and -external constructions, what is meant by “length of NP” in subsequent text is actually the segment of the NP after removing Q(-*no*). Modifiers of Q are also removed.

The maximum length of NP goes up to sixty five morae in the *Nno*QC construction. The maximum length of Q is thirty three morae in the NQC construction, which is just a few morae longer than the maximum in the pre-

	n	Length of Q				Length of NP			
		Mean	SD	Min	Max	Mean	SD	Min	Max
<i>QnoNC</i>	1165	5.92	2.73	3	29	4.32	2.13	1	18
<i>QNC</i>	30	5.90	2.09	3	11	3.53	1.48	2	9
<i>NnoQC</i>	66	4.42	1.95	3	12	19.70	15.31	3	65
<i>NQC</i>	676	6.17	2.88	3	31	10.81	9.20	2	56
<i>NCQ</i>	148	5.32	1.82	3	12	9.25	6.52	2	33

TABLE 4: Statistics of Q and NP lengths for the five constructions with *nin*

nominal construction *QnoNC* at twenty nine morae. On average for all constructions, the length of Q is about five or six morae. The most significant difference between the prenominal group of constructions with *QnoNC* and *QNC* and the postnominal group of constructions with *NnoQC*, *NQC*, and *NCQ* lies in the lengths of NP. The average NP length in the prenominal group is around four morae, which is smaller than the mean Q length. In the postnominal group, the mean NP length exceeds that of Q by a large portion, and goes up to 19.7 morae for the *NnoQC* construction, with a wide standard deviation of 15.31. This suggests a correlation between the length of NP and the choice of numeral classifier position.

Similar statistics are shown in Table 5 for the flat-object classifier *mai*. The maximum length of NP goes up to only forty morae in the *NQC* construction, closely followed by other postnominal constructions. The maximum length of Q is much shorter than that of *nin*, topping at fourteen morae in the *QnoNC* construction. The Q length is also on average shorter, at four or five morae for all constructions. This difference in average lengths is related to the magnitude of the numerals that are used with the two classifiers, as a larger number occupies more phonological units. The maximum NP length with the prenominal group is dramatically short and not exceeding eight morae. Similar to the case of *nin*, the average NP length in the postnominal group is much longer than the prenominal group, by almost four times.

	n	Length of Q				Length of NP			
		Mean	SD	Min	Max	Mean	SD	Min	Max
<i>QnoNC</i>	567	4.34	1.53	3	14	3.17	1.24	1	8
<i>QNC</i>	75	5.05	1.56	3	11	3.08	1.06	1	7
<i>NnoQC</i>	17	3.94	0.24	3	4	12.35	7.39	2	32
<i>NQC</i>	194	4.31	1.32	3	11	8.20	7.07	1	40
<i>NCQ</i>	554	4.18	1.10	3	11	6.91	4.73	1	36

TABLE 5: Statistics of Q and NP lengths for the five constructions with *mai*

The counts of the five constructions for the human classifier *nin* and the flat-object classifier *mai* did not show any preference for either prenominal or postnominal constructions, but when we look at the length distributions, we confirm that the choice of constituent order correlates with the constituent lengths.

3.4 Discussion

The postnominal numeral classifier constructions are seldom considered on equal terms with the prenominal constructions in Japanese, but their high frequencies as found in the two studies call for more attention. This may be able to reveal a processing motivation concerning the apparent non-correlation between numeral–noun order and head direction. At the least, classifier languages may need to be treated as a special subgroup in the discussion of numeral–noun order. I expect studies of other classifier languages to be confirmatory.

The length of the NP, whether measured in full or with Q removed, varies in magnitudes between the prenominal construction groups with *QnoNC* and *QNC*, and in the postnominal construction groups with *NnoQC*, *NQC*, and *NCQ*. Currently the survey of length and order correlation is performed superficially, regardless of the structural difference especially between the NP-internal and -external constructions. Even so, this implementation dividing Q from the rest of the NP will enable us to work toward a general long-before-short preference when ordering two constituents in Japanese (Yamashita and Chang, 2001), as predicted by the performance theory of processing efficiency (Hawkins, 1994, 2004, 2014). Supports may need to be sought in directions that affirms the numeral classifier as a processing cue of comparable status with the noun.

The performance theory has been successful in explaining many asymmetrical word order alternations. With due respect of the status of the noun as the head in the postnominal constructions, the inefficiency of the broken left-branching structure is overcome by the long-before-short preference. This illustrates the competition between different efficiency tendencies, rather than challenging the omnipresent tendency for processing efficiency in general.

4 A Processing Efficiency Account

The efficiency principles from the performance theory provide neat predictions for asymmetrical word order variations (Hawkins, 1994, 2004, 2014). In a greater context, the theory predicts grammatical patterns from the influence of performance data. It will be beneficial to consider our case of Japanese numeral classifier position in the context of the numeral classifier class in general, and its relation to the noun class with shared semantic contents. In particular, the open status of Japanese classifier class is related to the possibility of the numeral classifier phrase to adverbialize into a postnominal position.

4.1 The Numeral Classifier Class

It is generally accepted that numeral classifiers are the products of grammaticalization from full nouns (Bisang, 1993; Aikhenvald, 2000). Downing's (1996) inventories of numeral classifiers sum to seventy four. Other studies maintain lists that go up to 360, with the inclusion of many nouns that can also serve as numeral classifiers. This is suggestive of the openness of the classifier class, with unending grammaticalization based on the class of nouns.

The corpus study of Tojo (2014) surveyed the distribution of quasi-classifiers, as a sub-class of nominal classifiers that can be used with the question word *nan* 'how many'. It is considered a standard behavior for fully grammaticalized numeral classifiers. The list of quasi-classifiers includes items that are often used for unitization in non-classifier languages, such as *syurui* 'type' and *guruupu* 'group'. Frequencies are listed by four possible constructions, which are a subset of the five constructions given in Table 2, with the absence of QNC. I aggregate the frequencies into Table 6, which shows type and token counts of the quasi-classifiers in decreasing number of possible constructions.

These quasi-classifiers, or nominal classifiers, may demonstrate a very different distribution from true classifiers that have reached completion in grammaticalization. Nonetheless, a hierarchy of construction types (10) is noted by the percentage of quasi-classifier types that can occur in each construction. Postnominal constructions appear on both ends of the hierarchy, with the highest number of membership in the NP-internal constructions, and the lowest number in the adverbial construction.

(10) NQC (77%) > NnoQC (69%) > QnoNC (38%) > NCQ (17%)

More insights in the matter may be drawn from the distribution of case particles used with NP-internal and -external constructions, as presented in Table 7 (Downing, 1984: 212). The NP-external construction presupposes NCQ only, as the prenominal adverbial construction is not addressed in Downing (1984). The percentages sum to 100 for each row. The dominant cases are highlighted in bold. In this survey with five modern works of fiction, the NP-external construction is dominant in the basic case of intransitive subject (suffixed by *ga*, in bold) and with the topic marker *wa*.

In the accusative case (suffixed by *o*, also in bold), the NP-internal and -external types are as frequent. It strikes a resemblance with our second study with accusative instances in BCCWJ. But if we consider that in Table 7, the NP-internal case may be prenominal or postnominal, while the NP-external case is exclusively postnominal, we see a different picture. Other than these, the external construction is not possible only other case markers except *no* 'gen', but it is difficult to judge given the small numbers for other cases.

Synthesizing the two studies, there is a postnominal preference for both

No. of possible constructions	Construction				Type	Token
	NQC	NnoQC	QnoNC	NCQ		
4	Y	Y	Y	Y	9	881
3	Y	Y	Y	–	21	402
	Y	Y	–	Y	3	37
	–	Y	Y	Y	2	34
	Y	–	Y	Y	1	7
2	Y	Y	–	–	39	430
	Y	–	Y	–	8	35
	Y	–	–	Y	2	15
	–	–	Y	Y	2	12
	–	Y	Y	–	2	4
	–	Y	–	Y	1	2
1	Y	–	–	–	20	57
	–	Y	–	–	15	23
	–	–	Y	–	6	18
	–	–	–	Y	3	10
Type	103	92	51	23	134	
%	77%	69%	38%	17%	100%	
Token	889	539	452	77		1967
%	46%	27%	23%	4%		100%

TABLE 6: Type and token count of quasi-classifier constructions (reanalysed from Tojo 2014)

Type	Intr. ga	Tr. ga	o	<i>ni</i>	<i>de</i>	<i>to</i>	<i>no</i>	<i>wa</i>	<i>mo</i>	Total
Internal	32	1	21	3	2	7	5	3	1	75
%	43%	3%	28%	4%	3%	9%	7%	4%	1%	100%
External	65	3	25				1	10		104
%	63%	3%	24%				1%	10%		100%
Total	97	4	46	3	2	7	6	13	1	179

TABLE 7: Distribution of noun particles used in introductory mentions involving NP-internal and -external constructions (Downing, 1984)

nominal classifiers and fully grammaticalized numeral classifiers, the latter of which still contains considerable semantic content. The difference between the two classes lies in their ability to adverbialize.

4.2 Interaction of MiD and MaOP Principles

Various studies presented in this article point to an efficiency motivation for the postnominal position of Japanese numeral classifiers, as predicted by the Minimize Domains (MiD) principle discussed in Hawkins (1994, 2004, 2014). It prefers a short distance between a nominal element with a semantic role and the verb.

A particular case that requires further explanation is when the postnominal Q appears with only a short N in front. I propose it to be a tug-of-war involving another efficiency principle, the Maximize Online Processing (MaOP) principle. It favors the early appearance of a nominal element to avoid mis-/unassignment of semantic roles, whereas the MiD principle prefers a later appearance of the host noun or a copy of it, for closer proximity with the strictly sentence-final verb in Japanese. When the classifier can supply semantic information in a close position to the verb, the host noun responds to a pull to an earlier position.

A very long numeral as illustrated in (11) supplies measurement information without interrupting the relation between the noun and the numeral classifier. It may serve as a bonding glue between the two constituents being pulled to different directions by the distinct efficiency principles.

- (11) MaOP ←—————→ MiD
- | | | | | |
|----------------|-------------------------------|------------|----------|-------------------|
| <i>sidooin</i> | <i>sen-kyuuhyaku-zyoo-iti</i> | <i>nin</i> | <i>o</i> | <i>haiti-suru</i> |
| instructor | thousand-nine.hundred-ten-one | CLF | ACC | station-do |
- ‘to station a thousand nine hundred and eleven instructors’

In the structure such as (11), we propose that the numeral classifier serves to be a reduced copy of N, and it facilitates sentence processing. This proposal may have implications for classifier languages to be treated as a special subgroup in studies of word order variations.

5 Conclusion

This article reported two studies using performance data, both showing that the postnominal numeral classifier constructions are far from being a minority in Japanese. At times internal to the noun phrase or adverbialized, postnominal numeral classifier phrases are the majority in some cases. The main reason that they are preferred is proposed to be the general long-before-short preference in Japanese under the Minimize Domains principle.

These results have implications for the processing of noun phrases in Japanese and possibly other classifier languages. The semantic content provided by the classifier contributes to the placement problem of the numeral closely related to it. The position of the numeral receives special attention with the relative orders of other two modifiers of the noun, namely the demonstratives and adjectives. This study may be able to reveal a processing motivation con-

cerning the apparent non-correlation between numeral–noun order and head direction.

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NPI Licensing and Intrusion Effect in Korean

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1 Introduction

Human cognition has been shown to be subject to illusions of various types. Language is no exception. Linguistic illusions in sentence processing are cases where speakers appear to accept ill-formed sentences during the early processing stages. One example is the so-called Negative Polarity Item (NPI) licensing illusion. While processing the sentences containing NPIs such as

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ever as in (1), speakers tend to be tricked by the illicit negation *no student* and often judge the ungrammatical sentence as grammatical.

- (1) * The professor that no student liked *ever* finished a class on time.

Linguistic illusions involving NPI licensing have recently drawn a lot of attention among psycholinguists. The growing body of studies have provided insight into understanding the underlying cognitive mechanisms of human sentence processing. This study intends to join the discussion by providing new empirical data from the case study of Korean NPI licensing illusions.

This paper is structured as follows. Section 2 briefly sketches the properties of NPI licensing and illusion in Korean. Section 3 presents the experiment, illustrating the details of its design and summarizing the results. Section 4 discusses the results of the experiment that pose a challenge to the existing accounts and proposes a new account on NPI illusions in Korean. Section 5 concludes the paper.

2 Background

In this section, we overview previous studies on NPI illusion first and then present the distinctive properties of NPI licensing constructions in Korean.

2.1 NPI Licensing Illusion

NPIs (e.g., *ever*, *any*, or *at all* in English) are lexical items that are required to occur within the scope of an appropriate licenser, typically a negator. As in (2), the English NPI *ever* can be licensed by the negatively quantified NP *no professors* in (2a), but the lack of the negative quantifier in (2b) induces ungrammaticality of the sentence.

- (2) a. *No professors* that the students liked *ever* finished a class on time.
b. * The professors that the students liked *ever* finished a class on time.
c. * The professors that *no students* liked *ever* finished a class on time.

In addition, the licensing must also satisfy structural constraints, namely, a c-command relation between an NPI and its licenser. The negatively quantified NP in (2a) is in a position that c-commands *ever*. If the potential licenser *no students*, however, fails to c-command the NPI as in (2c), this leads to ungrammaticality.

Numerous online processing studies using various measures (e.g. ERP, eye-tracking, speeded acceptability judgment, and self-paced reading) have

reported that even though the potential licenser as in (2c) is not in a structurally accessible position, speakers often accept the sentence (Drernhaus et al. 2006, Vasissth et al. 2008, Xiang et al. 2009, Parker & Phillips 2016, Yanilmaz & Drury 2018). This phenomenon is called an *illusion effect* because the effect is cursory. When enough reflection time is given, the readers easily judge sentences like (2c) as unacceptable (Parker and Phillips 2016).

2.2 Selectivity of NPI Illusion

Previous studies in English and German have shown that it is not the case that all classes of NPI and NPI licensers are susceptible to the illusion phenomenon (Parker & Phillips 2016, Dios-Flores et al. 2017, Mendia et al. 2018).

- (3) English
- a. * The professors [that *no students* liked] *ever* finished a class on time. (Illusion)
 - b. * The professors [that *no students* liked] finished *any* class on time. (No illusion)
 - c. * The professors [that the students did *not* like] *ever* finished a class on time. (No illusion)

As shown in (3), NPI licensing illusions are extremely selective on the type of NPIs and NPI licensers. The NPI *ever* in (3a) elicits an illusion, but *any* in (3b) does not. Also, the combination of quantificational negation *no* and a noun phrase elicits an NPI illusion, but sentential negation *not* does not, as shown in the comparison between (3a) and (3c).

However, this selectivity is not crosslinguistic. In Turkish (Yanilmaz & Drury 2018) and Korean (Yun et al. 2018), which have a considerably different syntactic construction from English and German, the NPI *any* and sentential negation cause an NPI illusion effect as in (4).

- (4) Korean
- | | | |
|---|--|------------------------------|
| [_{Matrix} <i>Amwuto</i>
anyone
<i>kaci-ahn-ass-tako</i>] | [_{Embedded} <i>Cenguni-ka</i>
Cengun-NOM
<i>malha-yss-ta</i>] | <i>Seoul-ey</i>
Seoul-LOC |
| gO-NEG ⁻ PAST-DEC | say-PAST-DEC | |
| (Lit.) ‘Anyone said that Cengun didn’t go to Seoul.’ (Illusion) | | |

In the next section, the details of NPI constructions in Korean will be discussed.

2.3 Korean NPI Licensing Conditions and Illusion

The syntactic constraints on building NPI constructions in Korean and the mechanism for processing them are very different from those in languages like English or German where previous investigations of such illusions have focused.

First, Korean allows very restricted NPI licensors. In English, NPIs are allowed in non-negative constructions such as interrogative constructions or conditional constructions as in (5).

- (5) a. Has the student *ever* finished his syntax assignment?
 b. If *anyone* comes to the conference room, I will leave.

Korean NPIs, however, cannot appear in those contexts without negation as seen in (6).

- (6) a. * *Cenhye Seoul-ey ka-poncekiss-ni?*
ever Seoul-LOC go-Present perfect- Question
 ‘Have you ever been to Seoul?’
 b. * *Amwuto o-myen ttena-lke-ta*
anyone come-if leave-will-DEC
 ‘If anyone comes, I will leave.’

Note that negative determiners such as *no* in English do not exist in Korean, so sentential negation is required for proper NPI licensing.

In addition, as shown in (7) and (8), while embedded NPIs can be licensed under the scope of a matrix negation in English, Korean NPIs are licensed only by the licensors in the same clause (“clause-mate condition” of H. Choe (1988) and Kuno (1998)).

- (7) a. *No professors* said [that *anyone* finished the assignment.]
 b. The professor *didn’t* say [that *anyone* finished the assignment.]

- (8) a. [_{Matrix} *Cenguni-ka* [_{Embedded} *amwudo* *Seoul-ey*
Cengun-NOM anyone Seoul-LOC
kaci-ahn-ass-tako] *malha-yss-ta*]
go-NEG -PAST-DEC say-PAST-DEC
 ‘Cengun said that no one went to Seoul.’
 b. * [_{Matrix} *Cenguni-ka* [_{Embedded} *amwudo* *Seoul-ey*
Cengun-NOM anyone Seoul-LOC
ka-ss-tako] *malhaci-ahn-ass-ta*]
go-PAST-DEC say-NEG-PAST-DEC
 ‘Cengun didn’t say that anyone went to Seoul.’

Therefore, the potential licenser in matrix in (8b) presumably causes an illusion effect. The constructions where NPI illusions can be caused in Korean are configured in (9).

- (9) a. * [Matrix NPI [Embedded NEG-V] ... ∅ -V]
 b. * [Matrix ... [Embedded NPI ... ∅ -V] ... NEG-V]

The direction of NPI Licensing in Korean is also very different from English or German.

- (10) English
No students has *ever* finished the assignment on time.



As illustrated in (10), when NPIs are encountered in these languages, processing mechanisms need to inspect the previous context to check if there is an appropriate NPI licenser. This kind of NPI licensing exemplifies a typical retrospective dependency. In Korean, on the other hand, since an NPI linearly appears earlier than a NPI licenser, as in (11), the encountered NPI *amwudo* predicts an upcoming licenser *ahn*.

- (11) *Amwuto* *Seoul-ey* *kaci-ahn-ass-ta*
anyone Seoul-LOC GO-NEG -PAST-DEC



Thus, in Korean, an NPI and a licenser form a prospective dependency.

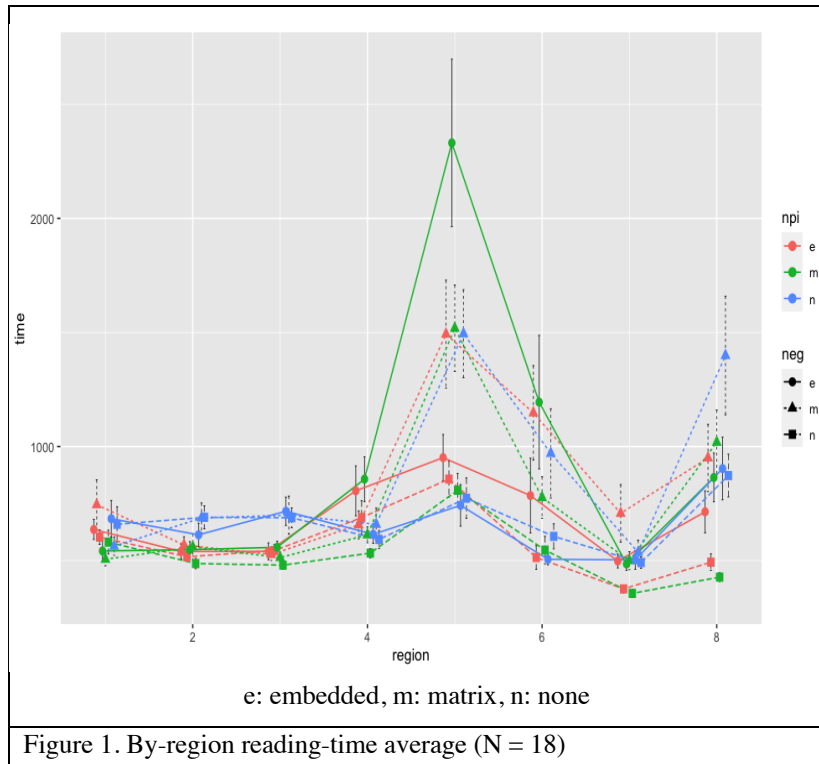
Once again, most of the previous works on NPI processing are based on a typologically limited set of languages like English and German, where NPI-licenser dependencies are retrospective. To the best of our knowledge, there are only a few Korean NPI illusion studies, and they are all based on offline processing. With that in mind, this study considers the case of Korean, where NPI licensing happens prospectively, and aims to investigate the online processing profile of NPI licensing and intrusion in Korean.

3 Experiment

In order to examine whether NPI licensing illusions occur in online processing in Korean and what the processing profile of NPI licensing and intrusion is, we conducted a self-paced reading experiment.

3.3 Results

Even though 21 Korean native speakers participated in this experiment, the responses from 3 participants were excluded in the analysis because their answers were deemed unreliable.¹ The overall results from 18 participants are in figure 1.



The target regions of the analysis are region 4 (embedded verbs) and region 5 (matrix verbs), where the negation appears.

First, let us consider the results of the embedded NPI conditions. Figure 2 shows the average reading times for sentences with embedded NPIs and sentences without NPIs. The red solid line indicates a grammatical condition, the blue line indicates an ungrammatical condition, and the green solid line indicates an intrusive condition. The dotted lines are baselines. There is no significant reading time difference in the illusion condition in region 5, which

¹ They rejected all sentences including grammatical filler sentences that must be easy to process.

shows that the typical NPI illusion effect is not attested in this online processing. Interestingly, we found that negation has an effect on region 4. When there is a negation on the embedded verb, both the sentence with an NPI and the sentence without an NPI are grammatical. The NPI condition, however, was significantly slower than the non-NPI condition (linear mixed effect model: $p < 0.01$). We conjecture that this slow reading time is caused by licensing cost.

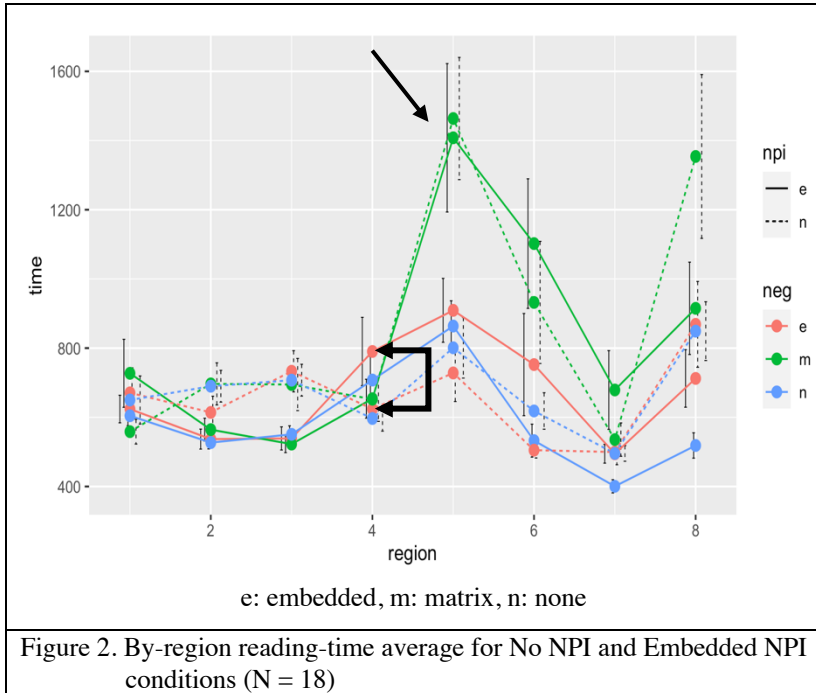
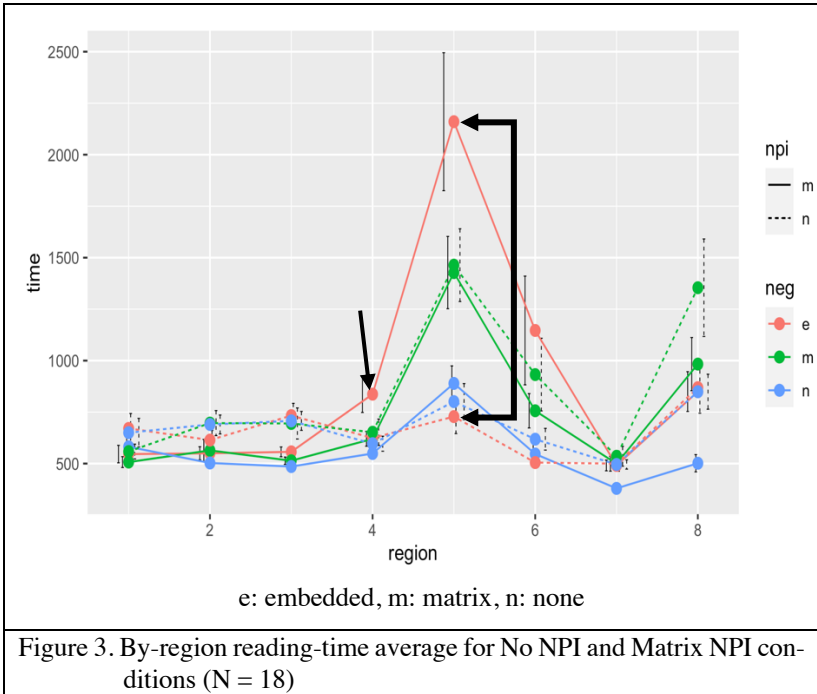
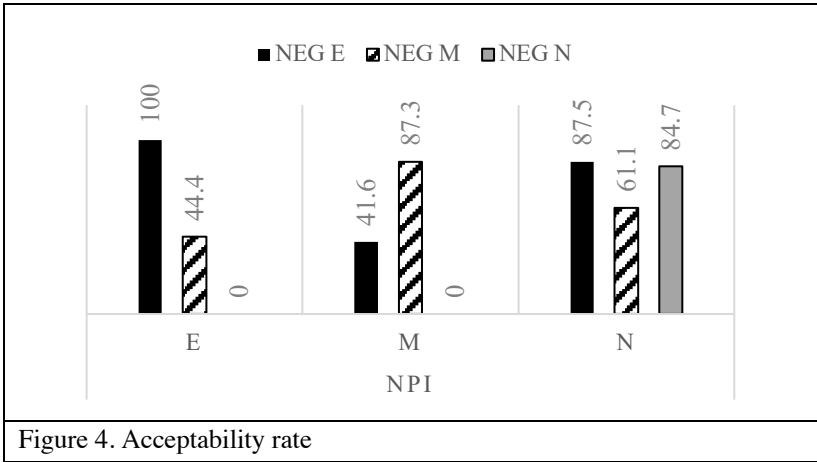


Figure 2. By-region reading-time average for No NPI and Embedded NPI conditions (N = 18)

Figure 3 below shows the average word-by-word reading times for sentences with matrix NPIs and sentences without NPIs. Here, with the NPI in a matrix clause, the green line indicates a grammatical condition, the red line indicates intrusive condition, and the blue line indicates an ungrammatical condition. We found a significant slowdown in region 5 for the intrusion condition but not for the grammatical or ungrammatical conditions. Contrary to the cases where NPIs appeared in an embedded clause, an illusion effect was found when NPIs appeared in a matrix clause. We found the negation effect in region 4 again. We conjecture that this may be related to the strong expectation of upcoming negation.



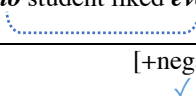
Finally, the results of acceptability judgment tasks are summarized in figure 4. The results conform to those of the previous study (Yun et al. 2018), which reported the illusion effect in Korean for offline processing with no time limit.



4 Discussion

There have been three main approaches to account for NPI illusions. To wit: memory retrieval partial syntactic feature checking (Vasishth et al. 2008), pragmatic inference (Xiang et al. 2009), and frequency expectation (de Dios Flores et al. 2017).

The memory retrieval account proposes that NPI illusions occur when syntactic requirements are partially matched. An NPI requires a licensor that bears a [+negative] feature and is in a c-commanding position. But in online processing, simply having a potential licensor with a [+negative] feature is enough to satisfy the parser, even if it's not in a c-commanding position as in (14).

(14)	* The professor that <i>no</i> student liked <i>ever</i> finished a class on
	time. [+negative, c-commanding]
	

This is an intuitive and simple account, and it has the added benefit that we can use the same explanation for other kinds of linguistic illusions, such as agreement illusions (e.g. subject-verb number feature agreement). However, the problem is that sentences like (15) are known to show an NPI licensing illusion because of the licensor ‘only’, but obviously the lexical item ‘only’ itself does not bear [+negative] feature.

- (15) The documentaries that *only* network TV stations have played during prime time have *ever* been very controversial

Another suggested account for the NPI licensing mechanism, particularly for apparent non-negative licensors, is that a pragmatic inference, or implicature, can create a negative context.

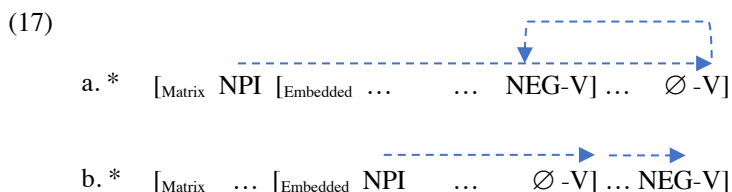
- (16) a. The students [who had studied more than 10 hours a week] passed the exam.
 b. The students [who had studied 10 or fewer hours a week] did not pass the exam.

The proposition in (16a) implies the one in (16b), demonstrating that restrictive relative clauses generally induce inferences about a contrastive set of referents. According to Xiang et al. (2009), this contrast can lead to an erroneous pragmatic inference that causes NPI illusions. However, this account is also problematic in that it cannot explain selective NPI illusion phenomena

either. Furthermore, since Korean has very restricted NPI licensing context, it is not applicable to Korean data.

Lastly, we have the frequency and expectation approach. A corpus study by de Dios Flores et al. (2017) shows that contexts with a negative quantifier *no* were six times more likely to also contain *ever* than were contexts with sentential negation *not*, leading them to claim that the illusion effect with quantificational negation is caused by the expectation of NPI-negation dependency. However, as discussed in section 2, Korean NPI licensing is prospective. Since NPIs precede licensors in Korean, the dependency is predicted as soon as an NPI is encountered, which creates a strong expectation for NPI-negation dependency. This account therefore cannot explain the fact that illusion effects are a function of NPI position in Korean.

None of the previous approaches can account for the results of our study. That being the case, how are the results to be interpreted, particularly the results that vary as a function of NPI positions in Korean? We propose that the fact that NPI illusion effects only appear in a matrix NPI intrusive condition is caused by expectation and memory retrieval.



As shown in (17a), when an NPI is in the matrix clause, the parser will wait until encountering the matrix clause verb for licensing. After failing to license the NPI, a memory retrieval happens to seek for the potential licensor; the effort required for this corresponds to the very slow reading time in region 5 in our experiment. However, in (17b), even though the embedded NPI is not licensed on the embedded verb, the parser will keep predicting an upcoming negation. Thus, we observe no significant slow-down on the matrix clause verb including the potential licensor.

5 Conclusion

In this study, we have highlighted an asymmetry between NPI intrusive profiles of online processing and offline processing. In offline processing, we see a strong intrusion effect regardless of the position of NPI. In online processing, we find an illusion effect when an NPI is in a matrix clause but no illusion effect when an NPI is in an embedded clause. The illusion effect in Korean seems related to the strong expectation of upcoming negation and

retrieval processing. In sum, this study provides new empirical data demonstrating a sensitivity to syntactic position in the online processing of NPI sentences and shows that the illusion effect of Korean NPI licensing is potentially related to memory retrieval.

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L2 Reconstruction Effects in Negated Disjunction under Pseudoclefts*

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1 Introduction

Languages differ as to how disjunction is interpreted in negated sentences (Szabolsci 2002). For example, English disjunction *or* is assigned a conjunctive reading in a negated sentence while the Japanese counterpart with *-ka* is not, as in (1):

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- (1) a. John does *not* speak German *or* French.
 b. John-wa doitugo-*ka* furansugo-o hanasa-*nai*.
 John-TOP German-or French-ACC speak-NEG
Lit. ‘John does not speak German or French.’

The statement in (1a) is true in a situation where John does not speak German AND John does not speak French, a reading with the conjunction of two negated propositions. In this case, negation takes scope over disjunction (NOT > OR). The conjunctive interpretation of disjunction in negated sentences conforms to one of de Morgan’s laws of propositional logic: $\neg(A \vee B) = \neg A \wedge \neg B$, where the symbols \neg , \vee and \wedge represent, respectively, negation, disjunction and conjunction.

Japanese differs from English in the way that disjunction *-ka* is interpreted under negation, as in (1b), it being the Japanese translation of (1a). In (1b), disjunction takes scope over negation (OR > NOT), so that the sentence means that John does not speak German OR John does not speak French, not both.

The surface order of negation and disjunction may appear to determine the scope interpretations in (1), such that a logical expression (*not*, *or*, *-ka*, *-nai*) that comes first in sentences takes scope over the one that comes later: In (1a) *not* precedes *or*, generating the scope interpretation of NOT > OR, while in (1b), by contrast, *-ka* precedes *-nai*, and the interpretation is OR > NOT. However, surface linearity cannot be the explanation; rather, it is the c-command relation between negation and disjunction that is determinative, as illustrated in (2):

- (2) a. The girl who stayed up late will *not* get a dime *or* a jewel.
 b. The girl who *didn’t* go to sleep will get a dime *or* a jewel.
 (Crain, Gardner, Gualmini & Rabbin 2002: 88)

The negator *not* precedes *or* in both sentences; but only in (2a) does the former c-command the latter, yielding a conjunctive interpretation: The girl who stayed up late will not get a dime AND the girl who stayed up late will not get a jewel. In (2b), *not* precedes but does not c-command *or*, resulting in a disjunctive reading: The girl who didn’t go to sleep will get a dime OR the girl who didn’t go to sleep will get a jewel.

Surface linearity among logical expressions, i.e., “isomorphism,” has also been called upon to explain first language (L1) development (Musolino 1998). This isomorphism account, however, fails in regard to children’s acquisition of Japanese, predicting that they will assign the disjunctive reading (OR > NOT) to negated disjunction sentences. Research by Goro and Akiba (2004) looking at interactions between disjunction and negation revealed that L1 Japanese-acquiring children,

unlike L1 Japanese adults, initially allow (virtually only) the conjunctive reading (NOT > OR).

As for second language (L2) acquisition, Grüter, Lieberman and Gualmini (2010) found evidence of initial L1 transfer in L1-Japanese L2 learners of English (JLEs): Unlike native English-speaking controls, they overwhelmingly had the disjunctive interpretation in English negated disjunction sentences. The question that arises is: Can more advanced JLEs routinely come to have (only) the conjunctive reading in English?

To that end, this JLE study examines reconstruction effects in the interpretations of negated disjunction in specificational pseudoclefts. Reconstruction effects exhibit a mismatch between the surface syntactic structure and the associated semantic interpretation, making them of key import to theorizing in both linguistics (Sportiche 2006) and language acquisition (Crain 2012). Reconstruction or connectivity effects refer to phenomena where a ‘displaced’ phrase in overt syntax is interpreted as if it were in its original base/merged position.¹ Specifically, this study asks whether JLEs can come to evince target reconstruction effects in inverted specificational pseudoclefts (e.g., Den Dikken, Meinunger & Wilder 2000), as in (3), where a *wh*-clause containing the negative quantificational expression *not* follows a DP object comprising two disjuncts:

(3) Sushi *or* pasta is what John did *not* order.

What is noteworthy here is that although *not* linearly follows and does not c-command *or* in surface syntax, (3) means that sushi is what John did not order AND pasta is what John did not order, viz. the conjunctive reading of disjunction. This reading is a manifestation of a reconstruction effect of the phrase *sushi or pasta* at a level of linguistic interpretation where *or* is c-commanded by *not*. If JLEs exhibit reconstruction effects with sentences like in (3), we are warranted to conclude that it is not simply the ‘visible’ strings of words that they use for interpretation, but rather they depend on computations calculated over abstract linguistic representations of a hierarchical nature. To the best of our knowledge, there is no previous L2 research that has sought to reveal L2 learners’ (L2ers’) complex linguistic knowledge via reconstruction effects with negated disjunction.

The remainder of this paper is organized as follows: In Section 2, we briefly review L1 and L2 research on the acquisition of simple negated disjunction. Section 3 is an overview of specificational pseudoclefts and

¹ Current syntactic accounts of reconstruction appeal to the copy theory of movement (Chomsky 1995), according to which a moved element leaves its copy, not its trace. Copies have the same features as the moved elements but without phonetic matrices. On this approach, reconstruction effects are derived through the copies without moving a dislocated element back to its pre-moved position.

reconstruction effects as well as the key L1 acquisition study on this topic that inspired our research. In Section 4, we describe our JLE study on negated disjunction under specificational pseudoclefts. Section 5 reports our results, and we conclude with a discussion of our findings in Section 6.

2 L1 and L2 acquisition of negated disjunction

Given the difference between English and Japanese in negated disjunction, the question arises as to how children acquire their respective properties of disjunction. In the case of English, Crain et al. (2002) reported that children, like adult native English speakers, have a conjunctive interpretation only in cases where *not* c-commands *or* (as in, e.g., (2a) vs. (2b)). As for Japanese, Goro and Akiba (2004) provided evidence that adult native speakers interpret (4) as meaning that “it was either the carrot or the pepper, not both, that the pig didn’t eat,” which we call the disjunctive “not-both” reading, whereas Japanese children around age 5 assign the conjunctive “neither” reading of disjunction to (4), which can be paraphrased as “the pig ate neither the carrot nor the pepper.”

- (4) Butasan-wa ninjin-ka piiman-o tabe-nakat-ta.
Pig-TOP carrot-or pepper-ACC eat-NEG-PST
Lit. ‘The pig didn’t eat the carrot or the pepper.’

According to Goro’s (2019) review of previous studies, children with cross-linguistically different L1s, such as Hungarian, Italian and Turkish, similarly start off interpreting disjunction under local negation conjunctively, contrary to the disjunctive interpretation assigned by adult native speakers of the languages. L1 acquisition studies on this topic thus far suggest that young children all behave like English-acquiring children in initially preferring the conjunctive interpretation of negated disjunction.

Building on Szabolcsi’s (2002) research that first pointed out the cross-linguistic variation in the semantics of negated disjunction, Goro (2007) proposed the “Disjunction Parameter,” in which disjunction is lexically parametrized: Disjunction is a positive polarity item (PPI) in some languages but not in others. Japanese disjunction *-ka* is a positive polarity item [+PPI], interpreted as being outside the scope of sentential negation, which generates the exclusive “not-both” reading ($\neg A \vee \neg B$). English disjunction *or*, by contrast, is not a positive polarity item [-PPI] and is interpreted as being inside the scope of sentential negation, yielding the inclusive “neither” reading ($\neg A \wedge \neg B$). It is important to note that the circumstances under which $\neg A \wedge \neg B$ is true form a subset of the ones under which $\neg A \vee \neg B$ is true. As such, L1 children would face a learnability problem if they initially selected the superset [+PPI] value of

the Disjunction Parameter when the target grammar actually has the subset [-PPI] value. This is because a disjunctive interpretation generated by the superset value cannot be falsified by direct positive evidence.

Such learnability considerations led Goro (2007) to hypothesize that L1 children acquiring any language initially adopt the subset [-PPI] value of the Disjunction Parameter. It is thus for this reason that L1 children acquiring Japanese start by interpreting disjunction *-ka* as having the value [-PPI], yielding the conjunctive interpretation (NOT > OR). Later they abandon the subset [-PPI] value for the superset [+PPI] value on the basis of positive evidence that disjunction *-ka* is a positive polarity item.

Grüter et al. (2010) extended the L1 acquisition research on the Disjunction Parameter to the L2 context, examining scope interpretations of disjunction under local sentential negation both by adult L1-English L2ers of Japanese (ELJs) and by adult JLEs. In general, the two groups demonstrated differential performance regarding their respective target interpretations. While ELJs acquired the target disjunctive interpretation of Japanese, all but four of the 32 JLEs had the non-target-like reading, adopting the disjunctive interpretation for English by a very wide margin.

Grüter et al. (2010) explained the asymmetry between the two L2 groups in terms of L1 transfer and L2 learnability. ELJs were able to discard their L1 subset [-PPI] value of the Disjunction Parameter in favor of the Japanese superset [+PPI] value on the basis of positive evidence. By contrast, for JLEs to acquire knowledge of the exclusively conjunctive interpretation, they have to retreat from their L1 superset [+PPI] value to the English subset [-PPI] value. Is negative evidence required for them to unlearn the interpretation from Japanese? It is extremely unlikely that JLEs produce English negated disjunction sentences that unambiguously have the disjunctive interpretation and then get corrected to the target conjunctive interpretation. Moreover, Grüter et al. determined, and Otsu and Sueoka (2019) recently confirmed, that the conjunctive interpretation of negated disjunction in English is not the subject of explicit instruction in the classroom; it is not even mentioned in English-language textbooks commonly used in Japan.² Consequently, it is doubtful that JLEs are given direct information that unambiguously indicates that English disjunction *or* under negation results in only a conjunctive “neither” reading. It should thus be very hard, if not impossible, for them to relinquish the “not-both” interpretation transferred to English negated disjunction sentences.

Whether *more advanced* JLEs can in fact systematically retreat to the target conjunctive reading remains unstudied. Grüter et al., moreover, focused on negated sentences like *John does not speak German or French*, where *not* precedes and c-commands *or* in the surface structure. The

²Grüter et al. (2010: 145) do note illustration in a preparation text for university entrance exams.

present study builds on that research and investigates scope interpretations of negated disjunction in inverted specificational pseudoclefts (introduced in (3)) such as *The crab or the fish is what he will not get*. Here, negation neither precedes nor c-commands disjunction in surface syntax but the conjunctive reading is certainly possible if not preferred (see below); this makes evident that it is not linear order but rather abstract hierarchical structure that matters in the interpretation of negated disjunction.

3 Specificational pseudoclefts and reconstruction effects

There are two types of specificational pseudoclefts, as in (5), where a *wh*-phrase can appear before or after a copula:

- (5) a. What John ordered was pasta.
b. Pasta was what John ordered.

The *wh*-phrase in (5a) introduces the heading of a list, and the post-copular “counterweight” provides the listed item(s); in an inverted specificational pseudocleft as in (5b), the counterweight appears before the *wh*-phrase. Following Den Dikken et al. (2000), we call specificational pseudoclefts as in (5a) and (5b) Type A and Type B, respectively. Den Dikken et al. observed that the two have different syntactic and semantic properties. In particular, the Type B specificational pseudocleft has a narrower range of reconstruction effects and connectivity effects. For example, although binding connectivity is observed in both types, as in (6), the Type B one does not exhibit reconstruction effects, as exemplified in (7b):

- (6) a. What John_i is is important to himself_i.
b. Important to himself_i is what John_i is.
(7) a. ?What nobody bought was any wine.
b. *Any wine was what nobody bought. (Den Dikken et al. 2000)

Crucial for our interests, the Type B specificational pseudocleft displays reconstruction effects with disjunction under negation, as in (3). Whether one adopts an LF reconstruction approach (Schlenker 2003) or a PF deletion approach (Den Dikken et al. 2000) to the syntactic derivation of Type B specificational pseudoclefts,³ the availability of a conjunctive reading in (3) suggests that disjunction is c-commanded by negation at an abstract linguistic level. Following Kiguchi and Thornton (2016), we will assume the LF reconstruction approach in this paper.

³ For example, Kiguchi and Thornton (2016) posit different derivations for Type A and Type B specificational pseudoclefts, while Crain (2012) assumes a uniform analysis of the two.

Kiguchi and Thornton (2016) tested L1 English-acquiring children’s interpretations of negated disjunction in Type B pseudoclefts, e.g., (8a), by way of a truth-value judgment task (TVJT; Crain & Thornton 1998). They adopted the analysis of Heycock and Kroch (2002) that the counterweight *a piece of coral or a plant* is reconstructed at LF, putting it back within the scope of the negative subject *nobody*, as illustrated in the structure in (8b):

- (8) a. A piece of coral or a plant is what nobody brought back.
 b. [A piece of coral or a plant] is what nobody brought back [~~a piece of coral or a plant~~]. (Reconstruction at LF)

Despite the lack of direct evidence of reconstruction, the 4- to 5-year-old children consistently took the conjunctive interpretation, as did the adult L1-English controls; this suggests that children have adult-like knowledge of abstract syntactic structure where reconstruction effects are observed.

4 The study

The present study—spurred by the Kiguchi and Thornton (2016) L1 acquisition study—investigated JLEs’ interpretations of English negated disjunction in Type B pseudoclefts. Our research questions asked: (i) Can adult JLEs regularly come to switch (from the disjunctive “not-both” interpretation of Japanese) to the conjunctive “neither” interpretation in simple English negated disjunction sentences? (ii) If so, can they manifest reconstruction effects in negated disjunction under inverted pseudoclefts, where the relevant c-command relation is ‘invisible’ in surface syntax?

4.1 Participants

A total of 32 adult JLEs and a control group of 12 adult native English speakers (ENCs), recruited in Japan and the U.S., participated in the study; 11 JLEs were excluded from analysis due to performance on screening items (see §4.3; for exclusion criteria, see §5.1). Table 1 provides the participants’ language background information and their scores on an independent measure of English proficiency, a Cloze test (Brown 1980). In addition, at the time of testing, the JLEs ranged in age from 20 to 45 ($M = 31$, $SD = 6.31$) and the ENCs from 20 to 61 ($M = 34$, $SD = 11.74$).

Group	<i>n</i>	Age of onset			Years of residence in the U.S.			Cloze test score (Max = 50)		
		Mean	Range	<i>SD</i>	Mean	Range	<i>SD</i>	Mean	Range	<i>SD</i>
JLEs	21	11	8–13	1.6	5	0–19	5.0	39.0	20–45	5.5
ENCs	12	–	–	–	–	–	–	43.8	32–50	5.0

Table 1. Participants’ background information after exclusions

Although the proficiency of the JLEs as a group is relatively high, an independent samples *t*-test showed that the mean scores of the two groups are significantly different ($t(32) = 2.65, p < .01$).

4.2 Procedure

All the experimental tasks were conducted fully online, in writing, using Google Forms. After filling out the consent forms, participants completed the main task, a written TVJT devised in the “prediction mode.” Participants were shown five pictures for each story in which two cartoon characters, Winnie the Pooh and Piglet, were playing a guessing game; at the second picture, Pooh made a guess (in a speech bubble) about what would happen later in the story, e.g., “Tigger will get the shell, but the crab or the fish is what he will not get.” After watching what actually transpired in the story, Piglet reviewed (at the fifth picture) the guess that Pooh had made earlier, after which participants were asked to judge whether Pooh’s guess was right or wrong. The main reason for choosing the prediction mode of the TVJT was to make the use of disjunction in the sentences felicitous because disjunction is typically utilized when the speaker/writer is uncertain about which of the two disjuncts takes/took place (e.g., Tieu, Yatsushiro, Cremers, Romoli, Sauerland & Chemla 2017). The TVJT was followed by a language background questionnaire; the last task was the English Cloze test (Brown 1980). The entire experimental session took 30–45 minutes.

4.3 Materials

Our experiment employed a TVJT to test availability of the conjunctive “neither” interpretation of negated disjunction in inverted specificational pseudoclefts. The rationale behind focusing on the conjunctive reading of negated disjunction in this type of sentence is that it is taken to be a consequence of reconstruction of the phrase containing the disjuncts.

The TVJT had a total of six critical target items involving negated disjunction in a Type B pseudocleft; each sentence occurred in two conditions: a *true* condition ($k = 3$), where the conjunctive interpretation is true, and a *false* condition ($k = 3$), where such an interpretation is false. Each item in the TVJT, including the fillers and screening items, consists of a 5-picture short story. At Picture 1, Piglet introduces, by way of a speech bubble, the story’s characters and objects. For example, one of the Picture 1 contexts that Piglet introduced to the participants is as in (9):

- (9) “Tigger was on a boat with Donald Duck and they saw a shell, a crab and a fish in the water. Since Donald Duck couldn’t swim, he asked Tigger to show him how to get them. ‘Pooh, can you guess what will happen next?’”

At Picture 2, Pooh makes his guess (also in a speech bubble) about what will happen; this prediction constitutes the target sentence, e.g., as in (10):

- (10) Tigger will get the shell, but the crab or the fish is what he will not get.

Pictures 3 and 4 cover what actually happens in the story. In the *true* condition, Piglet narrates a story where the conjunctive interpretation of the target sentence is true; in regard to (10), Tigger got neither the crab nor the fish as in Figure 1a. In the *false* condition, Piglet narrates a story where the conjunctive interpretation of the target sentence is false; in regard to (10), Tigger got the crab but not the fish as in Figure 1b:



Figure 1a. Crucial picture in the TVJT corresponding to target sentence (10), in the *true* condition.



Figure 1b. Crucial picture in the TVJT corresponding to target sentence (10), in the *false* condition.

Finally, in Picture 5, Piglet reviews the guess Pooh had made in Picture 2.

In addition to 16 filler items, there were six screening items. All the screening items were simple negated disjunction sentences without pseudoclefts, such as in (11), to test whether participants had the conjunctive interpretation in sentences without reconstruction (i.e., where negation precedes and c-commands the disjuncts in surface syntax).

- (11) Snoopy will use the chopsticks, but he will not use the spoon or the fork.



Figure 2a. Crucial picture in the TVJT corresponding to screening sentence (11) in the *true* condition.

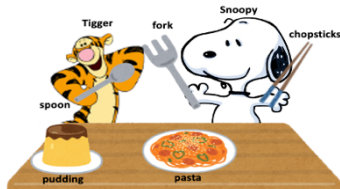


Figure 2b. Crucial picture in the TVJT corresponding to screening sentence (11) in the *false* condition.

Like the target sentences, each screening sentence occurred twice, once in a *true* condition ($k = 3$), where the conjunctive “neither” interpretation is true, and once in a *false* condition ($k = 3$), where the conjunctive interpretation is false.

Note that it was essential for us to assess (JLE) participants’ knowledge of simple negated disjunction. Without determining that they do have the conjunctive interpretation in this case, it would be pointless to test them on the conjunctive interpretation in the context of reconstruction effects in the target pseudocleft sentences.

5 Results

5.1 Screening items in the TVJT

Prior to analyzing the data in the critical items, we analyzed the six screening items (which, recall, were simple negated disjunction sentences such as in (11)). The ENC_s accepted the screening items in the *true* condition and rejected them in the *false* condition 100% of the time. The mean acceptance for JLE_s was 75.0% ($SD = 43.5$) in the *true* condition and 27.0% ($SD = 44.7$) in the *false* condition. Analysis by individual revealed that 15 JLE_s uniformly had the conjunctive reading (i.e., they accepted all items in the *true* condition and rejected all items in the *false* condition), which points to their successful acquisition of the target interpretation in English. On the other hand, there were four JLE_s who almost never allowed this reading (only one out of six screening items), which indicates that they had not acquired the target scope interpretation of negated disjunction in English.

We ran a correlational analysis to examine whether JLE_s’ performance on the screening items is a function of L2 proficiency, the latter as measured by the English Cloze test. The two conditions (*true* and *false*) were combined to calculate the proportion of interpretation accuracy (out of six) on screening items. A significant correlation (Pearson $r = .62$, $p < .001$) emerged, suggesting that the acquisition of the target conjunctive interpretation is related to L2 development. This finding also indicates that we succeeded in replicating an outcome in Grüter et al. (2010): a correlation between L2 accuracy and L2 proficiency.

The screening items were used to exclude from analysis of the critical items those participants who did not allow a conjunctive interpretation in simple negated disjunction. Participants needed to have at least two (of three) correct responses both on *true* screening items and on *false* screening items in order to be included. All 12 ENC_s met this criterion, but 11 (of 32) JLE_s had to be excluded. Consequently, 21 JLE_s and 12 ENC_s were retained for analysis of the critical items (see Table 1).

5.2 Critical items in the TVJT

Figure 3 displays the acceptance rate (*true* responses) in each critical condition by group.

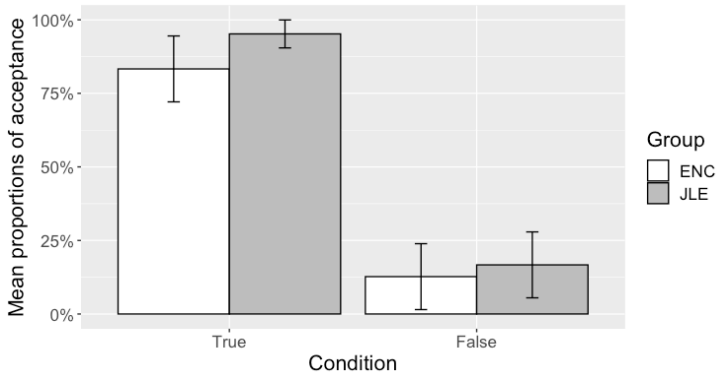


Figure 3. Mean proportion of acceptance (*true* responses) in the TVJT. *Note.* Error bars indicate standard errors of the mean.

In the *true* condition, where the conjunctive “neither” interpretation is true, the mean acceptance was 83.3% ($SD = 11.2$) for ENC and 95.2% ($SD = 21.8$) for JLEs. In the *false* condition, where the conjunctive interpretation is false, the mean acceptance was 12.7% ($SD = 38.9$) for ENC and 16.7% ($SD = 38.9$) for JLEs.

Table 2 reports the output of the mixed-effects logistic regression model which was constructed on *Acceptance* (*true* responses) in the critical items, with *Condition* (true vs. false) and *Group* (JLE vs. ENC) as fixed effects and with *Participant* and *Item* as random effects (glmer (Acceptance ~ Condition*Group + (1| Participant) + (1| Item))).

	β	SE	z	p	OR [95% CI]
Intercept	.27	.24	1.13	.259	1.31 [.82, 2.08]
Condition	4.07	.47	8.62	.000	58.62 [23.22, 147.97]
Group	.53	.47	1.13	.259	1.71 [.68, 4.31]
Condition × Group	1.70	.95	1.80	.071	5.50 [.86, 35.06]

Table 2. Summary output of the model

Note. Effect sizes for fixed effects are shown in the odds ratio (OR) alongside their 95% confidence intervals (CI).

The results show a significant main effect of *Condition* ($\beta = 4.07$, $SE = .47$, $p < .001$) but not *Group* ($\beta = .53$, $SE = .47$, $p = .259$), and there was also no *Condition* by *Group* interaction ($\beta = 1.70$, $SE = .95$, $p = .071$). The lack

of a significant interaction here suggests that the two groups performed similarly in the two critical conditions.

Analyses by individual were conducted on the critical items by looking for correlations; this time, no significant correlation between interpretation accuracy (out of six, i.e., three *true*, three *false*) and Cloze test score emerged for either the JLEs (Pearson $r = -.29$, $p = .20$) or the ENCs ($r = -.40$., $p = .20$). (The absence of a significant correlation among the JLEs is unsurprising since those of lower English proficiency had already been excluded by our screening criterion—see §5.1).

6 Discussion

This experimental study probed reconstruction effects in the interpretation of negated disjunction in inverted specificational pseudoclefts on the part of advanced adult L1-Japanese L2ers of English. Their data show that they can systematically come to have the target property at issue, an interpretation of negated disjunction distinct from that of their L1.

We saw from the results on the screening items (see (11)) that advanced JLEs are able to acquire the conjunctive “neither” interpretation in simple English sentences with negated disjunction (this answers our first research question—see §4). The observed correlation between acceptance of the conjunctive reading and L2 proficiency is in keeping with the hypothesis (e.g., Schwartz & Sprouse 1996) that JLEs transfer their L1 grammar and start off by assigning the disjunctive “not-both” reading to negated disjunction in English. Indeed, the 11 lower-proficiency JLEs’ screening-item performance (which led to the exclusion of their data from further analysis) corroborates a key finding of Grüter et al. (2010). The results of the remaining 21 advanced JLEs indicate that they were able to revise their L1-based interpretation of negated disjunction, taking instead the conjunctive reading; this suggests a retreat/switch from the disjunctive interpretation of negated disjunction to the conjunctive interpretation of negated disjunction. The question that naturally ensues is *how* JLEs can overcome this learnability problem (see §2). As discussed earlier, it is very unlikely that JLEs encounter direct evidence for the exclusively conjunctive interpretation of English negated disjunction; it is also very unlikely they learn it from L2 instruction, since their English-language textbooks simply do not deal with the interpretation of disjunction under negation (e.g., Grüter et al. 2010; Otsu & Sueoka 2019—but see fn. 2).

One potential way for JLEs to overcome the learnability problem derives from the interplay between pragmatics—Grice’s (1975) Cooperative Principle (and in particular the Maxim of Quality)—and grammar, as put forward by Gualmini and Schwarz (2009) and picked up in Grüter et al. (2010). In brief, they propose that when the Interlanguage

grammar of an L2er assigns an interpretation to a target language sentence that is pragmatically infelicitous, this may become the evidence that pushes that L2er's grammar to re-evaluate that interpretation. For example, suppose there is a JLE whose Interlanguage grammar permits only the disjunctive interpretation in English negated disjunction; suppose further that this JLE hears the sentence "John does not speak German or French" but is well aware that the speaker of that utterance believes that John speaks neither of the languages. The JLE might find the uttered sentence infelicitous, in line with the Cooperative Principle, because an ostensibly more informative alternative, viz., "John speaks neither German nor French," is available.⁴ This inference of infelicity could then lead the JLE to a (subconscious) re-evaluation of the disjunctive interpretation assigned by the Interlanguage grammar (and ultimately perhaps to relinquishment of that reading in favor of the conjunctive reading—see Grüter et al. 2010: 147). Grüter et al. provided perhaps an even simpler example of how L2ers could use pragmatic knowledge to revise the relevant mapping from syntax to semantics in an Interlanguage grammar: A common sign in classrooms across the English-speaking world says "No food or drinks allowed"; the exclusively disjunctive interpretation that a non-advanced JLE has may well contradict what, based on prior experience, that JLE believes is more likely to be true, viz. that neither food nor drinks are allowed. Again, it is the JLE's inference of the infelicity of the disjunctive interpretation that could set in motion a revision of the Interlanguage grammar that instead engenders a conjunctive interpretation of negated disjunction. In sum, having these kinds of experiences with negated disjunction in various contexts could have provided the advanced JLEs in our study with pragmatically-propelled evidence of the inaccuracy of the disjunctive reading and led to (under Goro's 2007 approach) their resetting of the Disjunction Parameter to the English subset value, i.e., [-PPI].

The importance of this learnability issue notwithstanding, the primary focus of this study was our second research question: Can JLEs manifest reconstruction effects in negated disjunction under inverted pseudoclefts? Here, importantly, negation does not appear to precede or c-command disjunction in the surface structure. Indeed, one of the motivations for

⁴ From the perspective of (non-advanced) JLEs, the English sentence "John does not speak German and French" could also be an ostensibly more informative alternative, since although English native speakers can get the disjunctive interpretation (in which *not* scopes over *and*), the Japanese translation of this sentence, as in (i), generates a conjunctive interpretation (in which *-to* scopes over *-nai*); see Grüter et al. (2010) for relevant discussion:

- (i) John-wa doitugo-to furansugo-o hanasa-nai.
 John-TOP German-and French-ACC speak-NEG
Lit. 'John doesn't speak German and French.'

using this type of sentence is that the conjunctive “neither” reading can be derived only via reconstruction, an operation that is not ‘visible’ in the surface string of words. Our data show that advanced JLEs consistently took the conjunctive interpretation in Type B pseudoclefts containing negated disjunction, just like the native English controls did. Of critical import is the conclusion that this outcome implies, namely that JLEs make use of operations computed over abstract syntactic representations.

The advanced JLE results in this research constitute a demonstration of overcoming an L2 poverty-of-the-stimulus problem (e.g., Schwartz & Sprouse 2013). This finding cannot be explained (i) by the L1 grammar, since negated disjunction in Japanese has the disjunctive “not-both” interpretation, (ii) by L2 classroom instruction, since English-language textbooks for JLEs do not touch on the interpretation of disjunction under negation (much less in inverted specificational pseudoclefts), (iii) by English input, since it is implausible to assume that JLEs are exposed to direct evidence of the exclusively conjunctive meaning of negated disjunction (much less in inverted specificational pseudoclefts). This L2 poverty-of-the-stimulus study, in a nutshell, is thus the first (to begin) to show from reconstruction effects that UG constrains adult L2 acquisition.

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SECTION 3
Poster Papers

Part 1
Phonetics
Phonology
Morphology
Historical Linguistics

Argument Structure and Rendaku: An Experimental Study

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1 Introduction

In Japanese, when a compound is formed with one preceding element 1 (E1) and one following element 2 (E2), if the initial sound of E2 is a voiceless obstruent, it may change into a voiced obstruent, as in (1).

- (1) a. *sita* ‘under’ + *kaki* ‘writing/drawing’ = *sita-gaki* ‘draft’
b. *oo* ‘big’ + *huri* ‘falling’ = *oo-buri* ‘raining hardly’

This phenomenon is called *rendaku*, also known as *sequential voicing*. It has been argued that *rendaku* tends to occur when E1 and E2 have an adjunct relationship as in (1), while it tends not to occur when E1 and E2 have an argument relationship as in (2) (e.g. Okumura 1984, Sato 1989).

- (2) a. *e* ‘paint’ + *kaki* ‘writing/drawing’ = *e-kaki* ‘painter’
b. *yuki* ‘snow’ + *huri* ‘falling’ = *yuki-huri* ‘snowing’

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In (2a) and (2b), the E1s are arguments of the E2s. *Painter* is a person who *draws a paint* (2a) and *snowing* is the state where *snow falls* (2b). In the former case E1 represents the direct object (henceforth, DO), and in the latter case E1 represents the subject. In contrast, the E1s do not look like an argument in (1a) and (1b). Rather, they modify E2 as an adjunct.

This study examines how the different grammatical relations of E1 and E2 affect the occurrence of *rendaku* in deverbal noun (DN) compounds, in which E2 is a nominalized verb. The findings of this study suggests that *rendaku* is influenced by the syntactically and semantically defined “distance” (to be qualified in Section 5) between E1 and E2. Furthermore, not only argument-adjunct distinction, but more specific subcategorization of grammatical relation between E1 and E2 is one of the key factors that determines whether *rendaku* occurs or not.

2 Previous Studies

This section reviews two previous studies on *rendaku* that are directly relevant to the present study: Nakamura & Vance (2002) and Fukasawa (2021).

2.1 Nakamura & Vance (2002)

Nakamura & Vance (2002) investigated the claim that the occurrence of *rendaku* depends on whether E1 is a DO or a non-DO of E2. In their experiment, twenty-one participants were first provided with a spoken prompt, in which (i) E1 is a DO of E2, or (ii) E1 is a non-DO of E2, and then they were asked to pronounce a DN compound that appropriately described the context of the sentence. For example, either *kutu-o hosu* ‘hang shoes to dry’ or *yoru-ni hosu* ‘hang (something) to dry at night’ were provided. Then participants were asked to produce a compound based on *kutu* ‘shoe’ and *hosu* ‘dry’ or on *yoru* ‘night’ and *hosu*. If *rendaku* tends to occur with non-DO E1s, participants should more often produce *kutu-hosi* for *kutu-o hosu* and *yoru-bosi* for *yoru-ni hosu* than *kutu-bosi* and *yoru-hosi*, respectively. The prediction was borne out. Participants gave more *rendaku* responses to non-DO compounds (61%) than DO compounds (28%), and the difference was statistically significant. This study provided experimental evidence that *rendaku* is less likely to occur when the E1 is the DO of E2, compared to cases where E1 is not a DO of E2.

Although Nakamura & Vance (2002) provides the first experimental evidence for the relevance of E1-E2 relation on *rendaku*, this study did not examine any other kinds of grammatical relations than DO and non-DO. As is discussed in the next subsection, other categories, such as subject-DN and

locative argument-DN compounds should also be investigated, since they show clear tendencies to trigger *rendaku*.

2.2 Fukasawa (2021)

In Fukasawa (2021), I collected DN compounds whose E2 had a voiceless obstruent as the initial sound (i.e. a potential *rendaku* segment) from *Kojien* (2011), one of the most popular monolingual Japanese dictionaries. 2,440 possible *rendaku* candidates were coded for the presence or absence of *rendaku* and for the E1-E2 relationship.

The study found that *rendaku* was observed in 54.37% of compounds when E1 is an argument of E2 (i.e., E1 is subject, DO or locative argument; N = 1166), and 97.68% of compounds when the E1-E2 relation is not an argument relation (N = 1371). Looking in more details, *rendaku* was observed in 69.47% of subject-DN compounds (N = 190), 50.22% of DO-DN compounds (N = 922), 72.22% of locative argument-DN compounds (N = 64),¹ 100% of locative adjunct-DN compounds (N = 196), and 97.87% of instrument-DN compounds. Importantly, percentages of *rendaku* vary between different subcategories of arguments and adjuncts. Significant differences were observed not only between argument-DN and adjunct-DN compounds, but also between subject-DN and DO-DN compounds. In other words, DO and non-DO classification might be too coarse to capture the tendencies to *rendaku*. This issue motivated a new experimental study with subcategories of arguments and adjuncts, which is discussed in the next section.

3 Current Experimental Study

This section introduces how the current experimental study was designed and conducted.

3.1 Design of the Experiment

The goal of this study is to investigate whether subcategories of argument-DN compounds and adjunct-DN compounds behave differently in terms of the occurrence of *rendaku* in the production of new compound words. The current study examined three types of argument-E2 relations, subject-DN, DO-DN and locative argument-DN compounds, and two types of adjunct-

¹ Locative argument-DN compounds are compounds in which E1 denotes a place but an argument (i.e. required by the verb) in the corresponding sentence. For example, the corresponding sentence for *hada-kake* 'skin-putting; blanket' is *hada-ni kake-ru* 'skin-DAT put-PRES; put something onto the skin'. Without 'skin', the meaning of the verb 'put' sounds incomplete.

E2 relations, locative adjunct-DN and instrument-DN compounds. Since many studies have pointed out that *rendaku* seldom occurs in non-Chinese loanwords in Japanese (e.g. Takayama 2005, Vance et al. 2017), the experiment was also designed to compare compound formation with nonce words and with existing words, which is referred to as “E2 reality”. All conditions are summarized in Table 1.

Condition #	Argument-adjunct combination	E2 Reality
1	Subject vs. Loc adjunct	Existing
2	Subject vs. Loc adjunct	Nonce
3	Subject vs. Instrument	Existing
4	Subject vs. Instrument	Nonce
5	DO vs. Loc adjunct	Existing
6	DO vs. Loc adjunct	Nonce
7	DO vs. Instrument	Existing
8	DO vs. Instrument	Nonce
9	Loc argument vs. Loc adjunct	Existing
10	Loc argument vs. Loc adjunct	Nonce
11	Loc argument vs. Instrument	Existing
12	Loc argument vs. Instrument	Nonce

Table 1: Relation comparison for each condition

Each compound was combined with two different contexts, an argument context (Subject, DO, or Loc argument in Table 1) and an adjunct context (Loc argument or Instrument). The compounds are further combined with either existing or nonce E2. Hence, twelve conditions were prepared. Participants were shown two pronunciations for each compound, one with *rendaku* and the other without, and were asked to choose the one that they thought was natural. The total number of the items was 24, as two items were prepared per condition.

3.2 Materials

Table 2 shows all existing E1 + existing E2 items, and Table 3 shows all existing E1 + nonce E2 items used in this experiment. As described above, each of the E1-E2 combination was presented with either an argument context or an adjunct context.

Item #	Condition #	E1	E2
01	1	<i>umi</i> ‘ocean’	<i>sini</i> ‘dying’
02	1	<i>yama</i> ‘mountain’	<i>hare</i> ‘shining’
03	3	<i>huti</i> ‘edge’	<i>kire</i> ‘cutting (intr)’
04	3	<i>tue</i> ‘cane’	<i>tati</i> ‘standing’
05	5	<i>sima</i> ‘island’	<i>kai</i> ‘buying’
06	5	<i>niwa</i> ‘garden’	<i>kari</i> ‘borrowing’
07	7	<i>hera</i> ‘spatula’	<i>kiri</i> ‘cutting (tr)’
08	7	<i>ito</i> ‘thread’	<i>kui</i> ‘eating’
09	9	<i>kame</i> ‘jar’	<i>tame</i> ‘storing’
10	9	<i>koya</i> ‘shed’	<i>tuke</i> ‘attaching’
11	11	<i>hasi</i> ‘chopsticks’	<i>kake</i> ‘hooking’
12	11	<i>ita</i> ‘board’	<i>sasi</i> ‘stabbing’

Table 2: List of existing E1 + existing E2

Item #	Condition #	E1	E2 (intended meanings)
13	2	<i>kura</i> ‘warehouse’	<i>here</i> ‘breaking’
14	2	<i>gake</i> ‘cliff’	<i>temai</i> ‘becoming’
15	4	<i>kome</i> ‘rice’	<i>tami</i> ‘growing up’
16	4	<i>iwa</i> ‘rock’	<i>soruki</i> ‘sinking’
17	6	<i>yume</i> ‘dream’	<i>seke</i> ‘fortune-telling’
18	6	<i>tera</i> ‘temple’	<i>hinai</i> ‘reparing’
19	8	<i>kami</i> ‘paper’	<i>kute</i> ‘rolling’
20	8	<i>nuno</i> ‘cloth’	<i>setasi</i> ‘washing’
21	10	<i>taru</i> ‘barrel’	<i>sate</i> ‘marinating’
22	10	<i>soto</i> ‘outside’	<i>suse</i> ‘hiding’
23	12	<i>tume</i> ‘nail’	<i>sati</i> ‘stabbing’
24	12	<i>kasa</i> ‘umbrella’	<i>hotasi</i> ‘hooking’

Table 3: List of existing E1 + nonce E2

The examples in (3) and (4) show English translations of Item #01 with an existing E2.

(3) Existing subject-DN compound

Your neighbor said, “this beach (umi) was beautiful for several decades, but recently, there was an oil spill. If we don’t do anything, the beach will die (si-nu).” To wrap-up what the neighbor said, which expression do you use?

You: “So, if we don’t do anything, ____ will happen.”

- a) *umi-sini* (‘beach’ + ‘dying’) b) *umi-zini*

(4) Existing locative adjunct-DN compound

Your neighbor said, “this beach (umi) was beautiful for several decades, but recently, there was an oil spill. If we don’t do anything, many seabirds will die (si-nu) on the beach.” To wrap-up what the neighbor said, which expression do you use?

You: “So, if we don’t do anything, ____ of many seabirds will happen.”

- a) *umi-sini* b) *umi-zini*

In order to encourage participants to regard nonce E2s as native Japanese words, verbs were presented in different inflectional forms in the contexts. No participant judged both argument and adjunct contexts for the same items. For example, if one participant judged (3), the same person did not judge (4).

3.3 Procedures

The experiment was conducted online, using Google Forms. Sixty-four students at the University of Tokyo participated and received a ¥500 Amazon Gift Card as compensation. Data from two participants were removed due to their responses to screening items. Hence data from 62 participants were analyzed. Differences in rendaku rates among different conditions were examined by a logistic regression and chi-square test, using the lmerTest package (Kuznetsova et al. 2017) in R (Version 1.2.1578).

4 Results of the Experiment

This section presents the results of the experiment. Due to the limited space, this paper reports a subpart of the experiment that focuses on a comparison between the findings from the corpus study and the experiment, and therefore discusses the results that concern the items with existing E2. As was mentioned in Table 1, however, the full experiment involved an additional factor, whether E2 was an existing or nonce item.

Figure 1 compares the results of existing compounds in the corpus study (Fukasawa 2021) with the results of the experiment with compounds with an existing E2.

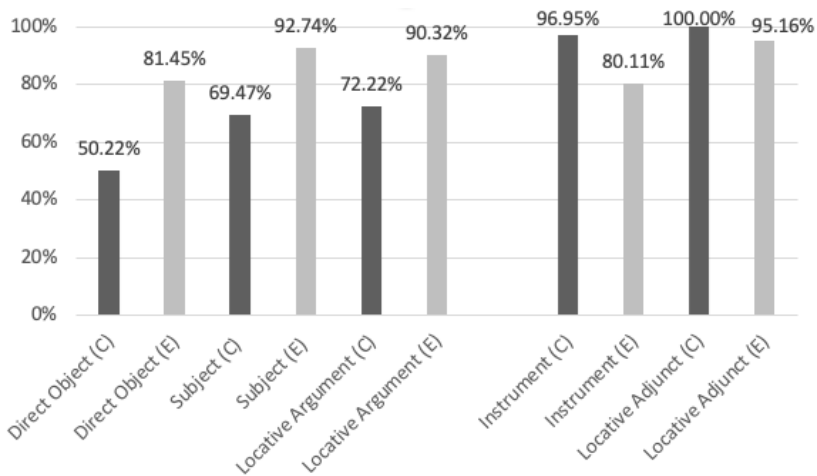


Figure 1: Rendaku rates of compounds with existing E2s

The bars with (C) represent the means from the corpus data, while the bars with (E) represent the means from the experimental data. There are three major findings that are consistent between the corpus and in the experiment. First, subject-DN compounds consistently showed a numerically higher rendaku rate than DO-DN compounds. Second, locative argument-DN compounds showed a numerically higher rendaku rate than DO-DN compounds. Lastly, locative adjunct-DN compounds showed a numerically higher percentage of rendaku than instrument-DN compounds. Although the tendency that locative adjunct-DN compounds show higher rendaku rates than locative argument-DN compounds was consistent between the two studies, the difference between the two kinds of locative-DN in the experiment was small compared to what was observed in the corpus.

5 Discussion

This section discusses what the findings from the two studies suggest. The adjunct compounds consistently showed a higher rendaku rate compared to the argument compounds. Although the results with locative argument compounds are different between the two studies, the findings from the other subcategories still argue for the necessity of examining subcategories of arguments and adjuncts in order to syntactically explain rendaku tendencies, as the results show that the rate of rendaku was consistently lower in DO-DN compounds than subject-DN compounds.

Now a new question arises: Why is the *rendaku* rate of DO-DN compounds lower than subject compounds, and that of instrument compounds is lower than locative compounds?

Satō & Yokosawa (2018) hypothesize that one of the key factors that determines the occurrence of *rendaku* is how speakers recognize the compound. That is, *rendaku* is likely to apply when speakers when speakers subconsciously want to morphologically mark the compound formation in order for it to be clearly recognized as one word, whereas it is not likely to occur when speakers are certain that the compound can be recognized as one word without a morphological marker. For example, ‘appear and disappear’ has two forms, *mie-gakure* and *mie-kakure* ‘seeing-hiding’ with and without *rendaku*. Satō & Yokosawa assume that the word occurs without *rendaku* when the speaker wants to emphasize the independent meanings of each element, ‘appear’ and ‘disappear’.

Although Satō & Yokosawa only offer this generalization as a speculation, it seems reasonable to expand it and propose that speakers always have two opposite subconscious motivations regarding *rendaku*: one is to apply *rendaku* in order to show that the produced compound is one word, and the other is not to apply *rendaku* in order to keep the second element unchanged and make semantic processing easier for hearers. Under this assumption, *rendaku* is relatively less motivated when the relationship of E1 and E2 is strong and there is more reason to retain E2’s original pronunciation form, while *rendaku* is relatively more motivated when the relationship between E1 and E2 is weak and there is more need to mark the connection of the two elements.

This assumption explains why DO-DN compounds occur with *rendaku* less often than subject-DN compounds. A DO or an internal argument is syntactically closer to the verb than a subject or an external argument. In terms of semantics, internal arguments are under idiosyncratic selectional requirement (e.g., the DO of *eat* must be edible), while external argument are subject to a broader selection (the subject of *eat* must be an agent). Either way, it is reasonable to assume that E1 and E2 hold a stronger relationship in DO-DN compounds than subject-DN compounds. The different *rendaku* rates of instrument-DN compounds and locative-DN compounds can be explained in a similar way. Takamine (2017) proposes a structural hierarchy of Japanese PPs, as in (5).

- (5) Structural hierarchy of Japanese PPs
Temporal/Locative > Comitative > Reason >
Instrumental/Means > Goal/Material > Manner

Based on (5), locative adjuncts always take higher position than instrumental adjuncts. Hence, instrumental adjuncts are syntactically closer to the

verb than locative adjuncts. Semantically, locative adjuncts are generally compatible with any eventive predicates (e.g., the subject may *eat* anywhere), while instruments are specific to the type of events that the verb denotes (only utensils can occur with *eat*). Therefore, we can argue that the relationship of E1 and E2 is stronger in instrument-DN compounds than locative adjunct-DN compounds. With a relatively stronger relationship, E2s in DO-DN compounds and instrument-DN compounds tend not to occur with *rendaku*.

In conclusion, the findings reported in this study confirm that the frequency of *rendaku* is affected by the specific types of argument/adjunct relations between E1 and E2. It provides novel experimental support for the claim that *rendaku* is more motivated when the E1-E2 relation is relatively more distant while it is less motivated when the relation is relatively closer.

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Territory Feature and a Distributed-Morphology Approach to Clause Periphery

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1 Introduction

Recent studies on the syntax-discourse interface have argued that the discourse information is syntacticized in the clause periphery (Speas and Tenny, 2003; Haegeman and Hill, 2013). Allocutive markings have been examined to analyze the structure of such speech act projections (Miyagawa, 2017; Portner et al., 2019; Yamada, 2019). However, the exact features represented syntactically in the left periphery have not yet been fully revealed. Investigating a hitherto understudied honorific allocutive marker (the *addressee-honorific upgrader* or AHU), we propose that a feature encoding the information about the territory of the addressee (*territory feature*) is also syntactically represented in the clause periphery in addition to a feature for the addressee honorification. They condition the use of AHUs via node-sprouting, as proposed and developed in the recent literature of Distributed Morphology (Choi and Harley 2019; Ikawa and Yamada to appear, a.o.).

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2 Data

Japanese is well-known to be equipped with *addressee-honorific* (AH) *markers*, which encode the speaker’s respect for the addressee (Miyagawa, 2017; Yamada, 2019). A sentence without an AH marker is called a plain form, as in (1)a. On the other hand, the one with an AH marking (e.g., *mas(i)*) is called the polite form, as illustrated in (1)b.

- (1) a. *watasi-wa soo it-ta.* b. *watasi-wa soo ii-masi-ta.*
 1sg-TOP so say-PST 1sg-TOP so say-AH-PST
 ‘I said so’

AHUs, our main concern, are different from — but are related to — AH markings. They are linguistic elements that occur contingently on an AH marker and enhance the level of politeness already encoded by an AH (e.g., *moos* ‘say.AHU’, or ‘be/ASP.AHU’, *mair* ‘come/ASP.AHU’; Kikuchi 1994; Yamada 2019; Oshima 2018). Observe the sentence in (2)b.

- (2) a. **watasi-wa soo moosi-ta* b. *watasi-wa soo moosi-masi-ta.*
 1sg-TOP so say-PST 1sg-TOP so say-AH-PST
 ‘I said so (intended)’ ‘I said so’

The verb *iw* ‘say’ (*ii* and *it* are its allomorphs) in (1)b is upgraded to *moosi* in (2)b, its AHU counterpart. The at-issue semantic content remains the same, but the politeness level of (2)b is now enhanced (Property 1: ENHANCEMENT). For example, it is rather strange for a student to use (2)b when talking to their senior, whereas (1)b is appropriate when talking to a president. An AH must also be used within the same sentence when an AHU is present. In (2)a, *moosi* is therefore illicit because *mas* does not exist within the same sentence (Property 2: CONTINGENCY).¹

These two properties both concern honorificity toward the addressee. This seems to suggest that an AHU is an instance of honorific allocutivity. Interestingly, however, AHUs also show similarity with subject-honorific (SH) markers. In this regard, they can be considered as hybrid expressions that combine an utterance-honorific property with argument-honorific characteristics.

First, AHU restricts the subject (Property 3: SUBJECT RESTRICTION). It displays a function opposite an SH marking. Observe the sentence in (3)b.

¹ Some may wonder if *moosi* and *mas* are fused to form a new word or morpheme. However, an AHU is licensed even when they are not adjacent.

- (i) *watasi-wa soo moosi-te i*(-masi)-ta.*
 1SG-TOP so say.AH-te PRG-AH-PST
 ‘I was saying so.’

Unlike the non-AHU sentence in (3)a, the use of *moosi* makes the 2P subject unacceptable.

- (3) a. {*watasi/kare/anata*}-*wa ii-masi-ta*.
 1sg/3sg/2sg-TOP say-AH-PST
- b. {*watasi/kare/#anata*}-*wa moosi-masi-ta*
 1sg/3sg/2sg-TOP say.AHU-AH-PST
 ‘{I/you/he} said.’

This restriction looks like a person restriction, but purely morphosyntactic features do not regulate it. As shown in (4), the sentence is illicit even when the entire subject phrase refers to a 3P individual, if the 2P pronoun modifies it.²

- (4) [{*watasi/#anata*}-*no sidookyookan-wa*] *soo moosi-masi-ta*
 1sg/2sg-GEN advisor-TOP so say-AH-PST
 ‘My / #Your advisor said so’

Furthermore, as indicated by (5), if the subject refers to someone close to the addressee, the sentence sounds unacceptable, even though the subject phrase does not contain any overt 2P expressions. In contrast, the sentence is acceptable when the subject referent is not an acquaintance of the addressee, as in (6) — which also contains a 3P subject.

- (5) # *yamada-san-ga moosi-masi-ta*.
 Yamada-Mx.-NOM say.AHU-AH-PST
 ‘Mx. Yamada said (Context: Mx. Yamada is someone close to the addressee).’
- (6) *puraton-ga moosi-masu-ni-wa*. . .
 Plato-NOM say-AH-as-TOP
 ‘As Plato says. . .’ (Kikuchi, 1994, 273)

The fact that an AHU *cannot* be used when the subject refers to either (i) the addressee or (ii) someone close to the addressee can be unified, as shown in (7):³

²For some speakers, *my advisor* does not sound perfectly acceptable, either; we thank David Y. Oshima for pointing this out. Even for such speakers, however, the observation still holds that the sentence is worse with *anata* than with *watasi*.

³Previous studies such as that of Kikuchi (1994) and Oshima (2018) classify AHUs into the cases where the subject is the 1P pronoun or someone close to the speaker, and the cases where the subject is the 3P expression whose referent is not close to the speaker. They claim that the subject is dishonored in the former case to relatively raise the status of the addressee. Given the availability of AHU in (4) with *watasi*, where the subject referent is close to the 1P and still cannot be supposed to be dishonored, we consider the subject lowering effect to be illusory and hence propose a unified analysis for the cases with a 1P subject (or subject referring to someone close

- (7) An AHU cannot be used when the referent of the syntactic subject is in the territory of the addressee.

Although the exact territory of the addressee depends on the speaker's construal and is thus a semantic or pragmatic notion, the target of the restriction is fixed to the referent of the syntactic subject. For example, as given in (8), the passive construction confirms that it is not the agent but the syntactic subject that matters when using an AHU. As shown in (9), a dative-subject construction also demonstrates that an AHU is sensitive to the subjethood, not the morphological case (whether it is marked with a *-ga*).

- (8) *{watasi/kare/#anata}-wa sensei-gata-ni*
 1sg/3sg/2sg-TOP professor-PL-by
sikar-arete-mairi-masi-ta
 scold-PASS-ASP.AHU-AH-PAST
 'I/he/#you have been scolded by the professors'
- (9) *{watasi/kare/#anata}-ni-mo sidaini eigo-ga*
 1sg/3sg/2sg-DAT-too gradually English-NOM
yom-ete-mairi-masi-ta
 read-can-ASP.AHU-AH-PAST
 'I/he/#you too came to be able to read English'

Second, an AHU can be optionally present multiple times within a single sentence in a verb and an aspectual head, as demonstrated in (10) (Property 4: MULTIPLICITY).

- (10) *sensei-ga {it-tei/moosi-tei/it-temairi/moosi-temairi}*
 teacher-NOM say-PRG/say.AHU-PRG/say-PRG.AHU/say.AHU-PRG
masi-ta.
 AH-PRS
 'The teacher was saying.'

Multiple markings are also obtained with SHs, as exemplified in (11) (Kishimoto, 2012; Yamada, 2019; Ikawa and Yamada, to appear). This property is, therefore, another critical similarity to the SH construction.

- (11) *sensei-wa {it-teir/ossyat-teir/it-teirassyar/ossyat-teirassyar}-u.*
 teacher-TOP say-PRG/say.SH-PRG/say-PRG.SH/say.SH-PRG-PRS
 'The teacher is saying.'

to the speaker) and cases with a 3P subject, as shown in (7). However, at least some speakers disfavor (4) even with *watasi* as mentioned in fn.2. For those speakers, there might have to be further distinctions between the 1P uses and 3P uses of AHUs.

3 Analysis

In the discussion so far, we have introduced four essential characteristics of AHUs. This section accounts for them by using (i) discourse-related features in the left periphery, which can enter an Agree-relationship with the subject, and (ii) the node-sprouting operation triggered by those features. The former was built on the analysis of AH by Portner et al. (2019) and Yamada (2019), while the latter was built on the analysis of SH by Ikawa and Yamada (to appear), which allows us to capture the similarity of AHUs to both AH and SH.

3.1 Discourse-related Features

By developing the view that cP is equipped with features capturing the relation among discourse participants (Portner et al., 2019), we propose that two distinct features are relevant for AHU morphology — (i) addressee-honorific (AH) feature and (ii) territory feature.

The first feature — the AH feature — is designed to express the politeness relationship between the speaker and the addressee, which takes the form [AH: Sp, +/−, Add] and is present on c.⁴ It consists of three slots: (i) the Sp, (ii) the Add, and (iii) the value. Based on these slots, this feature specifies whether the speaker has a positive or negative politeness attitude toward the addressee, as represented in (12).

$$(12) \quad \llbracket [\text{AH: Sp, +, Add}] \rrbracket = \lambda p. p \bullet \text{Sp respects Add.}$$

If c is borne with the feature [AH: Sp, +, Add], the AH-marker *mas* is used in the clause (Yamada, 2019). Recall that, although this is a necessary condition for the use of AHU morphology, it is not a sufficient condition: AHU further requires that the syntactic subject be outside of the territory of the addressee.

The second feature — the TERRITORY FEATURE (TR) — is used to capture this secondary condition. This feature also consists of three slots: (i) an *evaluatee*, (ii) a *territory holder*, and (iii) the value (+/−), which specifies whether the evaluatee is inside or outside the territory of the territory holder. In the current case, the territory holder is the addressee, and the evaluatee is the referent of the syntactic subject. Since the sentence with an AHU is illicit unless the syntactic subject is outside the territory of the addressee, we propose that c must be born with a negatively-charged territory feature to license the AHU marking, as represented in (13).

⁴Portner et al. (2019) propose a similar feature [status: S≤A] for the politeness information and define it as having a function of performatively updating the social hierarchy between the speaker and the addressee. Yet the social hierarchy is not the only factor playing a role in the Japanese addressee-honorific system, at least (McCready, 2019; Yamada, 2019; Yamada and Donatelli, 2020). For this reason, we do not use the status feature in this paper. As far as the morphosyntax is concerned, this change does not cause any significant differences in the subsequent discussion.

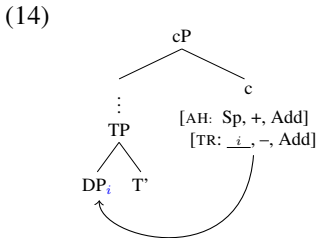
- (13) $\llbracket[\text{TR: Subj, -, Add}]\rrbracket = \lambda p. p \bullet$ the subject referent is outside the territory of add. (to be revised)

In the following sections, we show how the AHU morphology with the four properties reviewed in Section 2 refers to these features.

3.2 Step 1: Agreement between the Subject and Clause Periphery

Suppose *c* is born with a territory feature in a specific clause. For this feature to be interpreted properly, the territory holder and the evaluatee in that clause must be decided. For the territory holder, we can assume that the territory feature on *c* is born with the territory holder filled, as it is fixed to the addressee in the context. The question is more pressing for the evaluatee. Given that the evaluatee is the syntactic subject in the clause, the territory feature must refer to the syntactic structure to determine the evaluatee.

To capture this, we propose that the evaluatee slot starts as unspecified, and becomes specified during the syntactic derivation. More specifically, the head *c* has a probing index feature and probes down for a DP. Given that the closest DP that it *c*-commands is the structural subject of the clause, *c* establishes an Agree relationship with it and is valued by the index features on the probe, as shown in the structure in (14).



Following Ikawa (to appear), we claim that this creates “co-bound” relationship between the subject and the evaluatee in the territory feature.⁵ The revised semantics of the territory feature in (15) illustrate this point. When the subject has index *i*, the evaluatee of the territory feature is also indexed as *i*. As a result, the territory feature is interpreted such that the referent of the subject is outside of the territory of the addressee.

- (15) $\llbracket[\text{TR: } i, -, \text{Add}]\rrbracket = \lambda p. p \bullet \llbracket[\text{DP}_i]\rrbracket$ is outside the territory of Add.

Thus, *c* born with the feature in (15) is compatible only with the sentence where the syntactic subject is outside the territory of the addressee. We claim that an AHU is possible only when *c* is born with this negative territory feature in addition to a positively-charged AH feature (Property 2: Contingency), and

⁵ See also McKenzie (2012) for a related idea.

hence appears only when the subject is outside the territory of the addressee (Property 3: Subject Restriction).

The Enhancement Effect (Property 1) can also be attributed to the availability of the territory feature. Indeed, the semantics of the territory feature are concerned only with the addressee's territory and do not directly manipulate the honorific level. However, this feature has a catalytic effect; when it is present, a special pragmatic rule strengthens the intended politeness level. It has been argued that honorificity is an expression of (psychological) 'distancing' (cf., Takiura to appear, a.o.), and it is likely that it has a pragmatic (semantic) interaction with the territorial meaning. However, we leave the detailed analysis of this issue to future research.

3.3 Step 2: Node Sprouting

The analysis has so far captured AHU's orientation to allocutivity. However, AHU markings can occur in multiple positions simultaneously (Property 4: Multiplicity). How specifically do the features in the left periphery affect the forms of verbs and auxiliaries?

Recall that multiplicity is shared by SHs, as seen in (11). To capture the multiplicity of SHs, we proposed in Ikawa and Yamada (to appear) that the overt SH markers do not realize the syntactic element responsible for SH construction, which we assumed to be a [+HON] feature on a subject DP. Instead, the overt markers are postsyntactically introduced into a structure triggered by a [+HON] feature on the subject via morphological operation *node sprouting*, which inserts a node into a structure after spell-out on the way to PF (Halle and Marantz, 1993; Choi and Harley, 2019, a.o.). More specifically, we claimed that, after spell-out, a node HON is inserted into all the heads c-commanded by a subject with the [+HON] feature. Even though there is only one subject with [+HON], overt marking spreads over multiple heads c-commanded by the subject.

A similar analysis is applicable to AHU morphology. We propose the node-sprouting rule in (16): an AHU node is inserted into a head H if H is c-commanded by the c with a positive AH and a negative territory feature.

(16) Sprouting rule:

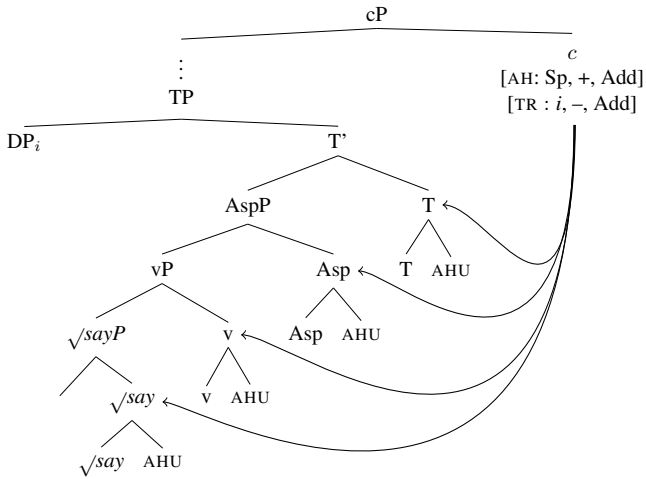
$$H \rightarrow [H \text{ AHU}] / _ \text{ is c-commanded by } c_{[AH: Sp, +, Add], [TR: i, -, Add]}$$

This rule makes every head that gets c-commanded by $c_{[AH: Sp, +, Add], [TR: i, -, Add]}$ sprout an AHU node. These inserted AHU nodes condition the allomorphy of the heads it attaches to by the vocabulary insertion (VI) rules, as given in (17)-(18). Keeping this in mind, consider the structure in (19).

(17) a. $\sqrt{\text{say}} \rightarrow \text{moos} / [_ \text{ [AHU]}]$ b. $\sqrt{\text{say}} \rightarrow \text{iw} / \text{elsewhere}$

(18) a. $\text{Asp} \rightarrow \text{or} / [_ \text{ [AHU]}]$ b. $\text{Asp} \rightarrow \text{ir} / \text{elsewhere}$

(19)



The rule in (17) states that $\sqrt{\text{say}}$ gets realized as *moos*, when its sister is an AHU node and as *iw* otherwise. The same holds for the Asp head, as in (18). We consider that an AHU node is realized as phonologically null, as shown in the rule in (20); it acts as a catalyst. The lack of AHU morphology on *v* and T derives from the lack of VI rules for *v* and T, which are applicable specifically in the presence of an AHU node.

(20) AHU $\rightarrow \emptyset$

Note that such node-sprouting analysis accounts for the appearance of AHU morphology in low positions and straightforwardly derives the observation in (10) above that AHU morphology appears in multiple positions. Recall that multiple occurrences of AHU marking are optional. This optionality is attributed to the probabilistic application of morphological rules. We assume that a postsyntactic deletion rule makes the features or nodes of AHU inactive or transparent in the VI process, and the application of this rule is optional, as long as at least one of the nodes is realized.⁶

Operation node-sprouting is considered to be phase-bound (Choi and Harley, 2019). Thus, the current account predicts that AHU morphology is possible only when it co-occurs in the same phase as the *c* head, which bears discourse-related features. Previous studies have not agreed on the issue of which clause can include a projection that bears discourse-related information (Miyagawa, 2012; Yamada, 2019; Bhadra, 2017; Alok, 2020, a.o.). However, Yamada (2019) claims that AH morphology is also derived via node-sprouting

⁶ Alternatively, one can propose that the AHU-insertion rule is optional. For example, in analyzing Amharic haplogogy, Kramer (2010, 228) proposes this line of analysis.

triggered by the AH feature on *c*. The current proposal, combined with his analysis, predicts that AHU should occur in the same phase as AH. This prediction is borne out: the sentence in (21) shows that even if there is an AH marker *mas* in the matrix clause, it is not possible to use an AHU element or ‘be.AHU’ in the embedded clause unless there is another occurrence of *mas* in the same clause. This supports our claim that the insertion of AHU morphology is triggered by *c* via node-sprouting, which is phase-bound.

- (21) *watasi-wa* [*watasi-no titi-ga soko-ni*
 1sg-TOP 1sg-GEN father-NOM there-at
 {*ori-masu/iruu*oru*}-*koto-o*] *sitte-ori/i-masi-ta*
 be.AHU-AH/be/be.AHU-that-ACC know-ASP.AHU/ASP-AH-PAST
 ‘I knew my father was there.’

4 Conclusions and Future Studies

This paper has provided a formal account of hitherto understudied AHU morphemes. We proposed a new formal feature, *territory feature*, to account for the peculiar property of AHU. Extending the analysis of addressee honorifics in the literature, we have claimed that a negatively-charged territory feature, together with a positively-charged AHU feature, conditions the insertion of AHU morphology in the heads below.

While this paper only targets AHU, the effect of speech act participants’ territorial information on linguistic expressions has been sporadically reported. For example, demonstratives are known to show sensitivity to the territorial information of the speaker and the addressee (Kamio, 1997). Another potentially relevant case comes from Jingpo: Zu (2015) reports that intimacy between the subject and the speaker, or a *bonding relationship*, affects the ϕ -agreement on the predicate. We leave it for future research to analyze how the proposal in this paper about AHU relates to these other phenomena.

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On The Names of Chinese Tones in Japanese

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1 Introduction

The awareness of the Chinese tones must have come to Japan quite early. Though the original, writing-only, diffusion of Classical Chinese texts, mostly Buddhist and through the mediation of Sino-Paekche or other Korean variations, could theoretically dispose of the tonal distinctions whatsoever, as early as 630 Japanese state started to send diplomatic missions to Tang China, where an everyday, spoken form of Chinese was to be encountered and learned.

In the 8th century, we already encounter the widespread composition of Chinese-style poetry at the court, which requires tonal knowledge for the correct distribution of syllables in lines (*Kaifūsō*, the earliest of the extant anthologies, was compiled in 751), while the orthography of the poems in the so-called “alpha” section of *Nihon Shoki* of 720 (Miyake 2003, pp. 37–9) has been suspected since (Takayama 1981) to contain the distinction between the high and low pitch of Japanese syllable, represented by the distinctions between level and oblique tones pertaining to Chinese characters (also inspired by the forms of Chinese poetry).

The most important function of tones, however, was (and still remains) the correct chanting of Buddhist formulae. Though doctrinal texts are normally

reset in kanbun-kundoku (in fact, these were one of the first texts to get such a treatment starting with late 8th century (Frellesvig 2010, p. 182), such as the *Konkōmyō saishō ō kyō*, glossed in early 9th century; see (Zisk, 2018). Yet, the so-called *dhāraṇī*, or mystical formulae, required pronunciation as exact as possible, and it was specifically for the pronunciation of those the production of tones was studied in the Buddhist circles vigorously (De Boer 2010, Vol. II, pp. 350ff.), starting with the *Shittan-zō* “The Treasury of Siddham” written by the Tendai monk Annen in 880 based on the explicit descriptions of people who studied Chinese in China, as well as the oral tradition passed from the Chinese informants (*idem*, p. 371).

With this widespread study of tonal language it would be expected for the fixed names of the tones themselves to be established in Japan. And indeed, any dictionary provides us with the correct terms. But the terms themselves are peculiar and do not match to either the most popular readings of the corresponding characters or any of the formalized systems of readings existing in Japan. In this article we try to establish the reasoning that led to the emergence of these readings (especially the aberrant *hyō*) and learn whether they are an accident of history or can actually tell us something about the reception of tone in premodern Japan.

2 Names for Tones

The four tones, with their readings in modern Mandarin, are: *píngshēng* “level tone,” *shǎngshēng* “rising tone,” *qùshēng* “departing tone,” *rùshēng* “entering tone”. None of these characters is decidedly rare in common usage in Chinese or Japanese, and for some of those multiple Japanese readings exist. In Table 1, the modern Mandarin label, a reconstructed Early Middle Chinese (EMC) reading, as well as *Go-on* and *Kan-on* layers of readings in Japan are listed for convenience. They are supplemented by the readings of the character for “tone” itself. Note that here and later, instead of Baxter notations, as described in (Baxter 1992, pp. 45–86), we use IPA-style reconstructions of Early Middle Chinese pronunciation in Pulleyblank-Miyake system, that is, the readings of (Pulleyblank 1991) as emended by (Miyake 2003, pp. 146-9) and re-converted for the ease of comprehension from Miyake’s notation back to Pulleyblank’s IPA-like one.

Character	“level”	“rise”	“depart”	“enter”	“tone”
Mandarin	<i>píng</i>	<i>shǎng</i>	<i>qù</i>	<i>rù</i>	<i>shēng</i>
EMC	biəŋʲ	ʃiəŋX	kʰiəH	ŋipˊ	ɕiəŋʲ
Formal Go-on	byaũ	zyaũ	ko	nipu	syau
Formal Kan-on	peĩ	syau	kyo	zipu	seĩ

TABLE 1 Names of the tones

Now we consider the readings given for tone names in the general Japanese dictionaries (*kokugo jiten*), namely, the following three:

1. *Daijisen*, “Great Fountainhead of Words” (Shōgakukan, since 1995), edited by Matsumura Akira;
2. *Daijirin*, “Great Forest of Words” (Sanseidō, since 1988), edited by Matsumura Akira;
3. *Seisenban Nihon Kokugo Daijiten*, “Shōgakukan’s Japanese Dictionary, Concise Edition” (Shōgakukan, 2006). The abridgement of the complete 14-volume edition is done by eliminating around 40% of entries and deleting half of the usage quotations; the words in question are retained.

The following current readings for the tone names are attested by all three in agreement. The readings are given in modern pronunciation and (in parentheses) in transliteration of historical kana orthography, with **bold** emphasis on the main entry, supposed to represent the “main,” or “most recognized” reading.

- level tone: **hyō-shō** (**pyaũ-syaũ**), hyō-sei (pyaũ-seī), hei-sei (peī-seī);
- rising tone: **jō-shō** (**zyaũ-syaũ**), jō-sei (zyaũ-seī);
- departing tone: **kyo-shō** (**kyo-syaũ**), kyo-sei (kyo-seī);
- entering tone: **nis-shō** (**niQ-syaũ**), nis-sei (niQ-seī).

We observe that, despite no standardization of the usage of *sei* vs. *shō*, though *Go-on* reading seems to be marginally more popular. However, there is internal consistency in the names of the tones themselves, but the consistency is peculiar.

- While *peī* is Kan-on, *pyaũ* is an unexpected combination of a Kan-on-like voiceless initial with a Go-on final;
- The reading *zyaũ* is explicitly Go-on;
- The reading *kyo* is explicitly Kan-on;
- The reading *niQ* is explicitly Go-on.

What could be the explanation of such a mismatch in patterns?

3 Why the Layers of Readings are Different

Theoretically, there could be two kinds of circumstances where the current tone name readings could form. One is the circle of the courtiers. While soon after the establishment of the official contacts with Tang China the professional Chinese teachers hired from mainland Asia became available (the *on-hakase*), as early as late 9th century, soon after the break of contacts, this practice ceased (De Boer 2010, p. 343). The educated lay people no more had a reliable source to learn tonal distinctions. Meanwhile, the composition

of Chinese poetry never ceased, and the awareness of tones was still required for it – but, more importantly, the vocalic rendition of those became unneeded and even redundant due to the fact these poems were increasingly, as any other Chinese, vocalized through *kanbun-kundoku*. Thus, the only necessary data about tones was the fact that the characters (or the particular meanings of the characters) can be either “level” (*hyō*) or “oblique” (*soku*, itself a Kan-on term), with the remaining three tones subsumed under this descriptive label; sometimes the property of being *soku* is retrievable from kana rendering (specifically, in the case of entering tones), sometimes not. Were the labels coming from this circle, we would expect either using Kan-on altogether – Kan-on, as based on the vernacular of Chang’an, was imported as a “lay” or “Confucian” vocalization (De Boer 2010, p. 344) – or just using the simplest everyday readings of the characters.

Were the names coming from the Buddhist circles though, that would mean they emerged in an atmosphere where tones were studied and attempted to be vocalized for centuries after the direct contacts with China ceased, in a multitude of competing schools of reading. The pronunciations employed here would more likely be Go-on than Kan-on, though it is not guaranteed, but, more importantly, they are expected to form some kind of system and being chosen consciously.

In both cases, it is possible that alternate names competed or that some of the names were later replaced by more “regular” or “familiar” ones, leading to further confusion in the system.

Still, the mismatch between the persistence of Go-on and Kan-on systems begs for an explanation. As proposed by Zev Handel (p.c.), one possible explanation is to notice that *kyo* “departing” is the aberrant entry, with the remaining (main) readings being Go-on or Go-on-connected; in this case, it could be proposed that all the readings were initially chosen in Go-on, with *ko* being replaced by *kyo* through analogy with the glide present in the previous two entries, similar to how the reading *yo* for the numeral 4 when counting was replaced by *yon* through analogy with *san* “3” beside it: **hyō-jō-ko-nit* > *hyō-jō-kyo-nit*. This theory has an additional attractive side as it explains the domination of *shō* reading over the Kan-on *sei*: all the readings were initially Go-on.

4 The Distribution of the Readings in Everyday Japanese

An alternate, and, perhaps, easier option that I prefer is that the readings picked were simply the ones most completely assimilated into the Japanese language in general. In order to check that, we however, should first analyze which readings of the characters under question are prevalent in everyday language. The results, with reference to the official *Jōyō* table of characters and

the actual usage, are as follows.

- *píng* “level”: Both *byō* and *hei* are Jōyō, but *hei* is overwhelmingly more popular. In fact, the whole usage of the reading *byō* is completely limited to one word, *byōdō* “equality,” that started as a Buddhist term, but was appropriated during Meiji era for an important Western political concept¹.
- *shǎng* “rising”: Both *jō* and *shō* are Jōyō, but *jō* is decidedly more recognizable. While the list of words where *shō* appears is not small, it is still shorter than one for *jō* and apparently assembles words where *shǎng* is used for its metaphoric extensions of “high in society” (as *shushō* “emperor”) or “impeccable in morals” (as *shōnin* “holy man, saint”); none of words where *shǎng* means literally “up” as a direction seem to employ *shō*.
- *qù* “departing”: Both *ko* and *kyo* are Jōyō, but *kyo* is overwhelmingly more popular. The only usage of *ko* is a frequent but lone word *kako* “the past.” Strictly saying, this (Sanskrit *atīta*) is also a Buddhist concept; note that its parallel concepts, “the present” (*genzai*, not ***kensai*, *kenzai*) and “the future” (*mirai*, not ***birai*) are also persistent in Go-on readings (and perhaps influenced the fact that only Go-on readings remain in the language for all its component characters).
- *rù* “entering”: Only *nyū* <*nipu* is given in Jōyō. The reading corresponding to the Kan-on *zipu* also exists, but mutated to *ju* (with short *u*), and, apparently, all of the rare words employing it also have variant with the usual *nyū* (*jusui* “suicide by drowning” is also *nyūsui*, and in the literal meaning “enter water” even *nyūsui* only; *juraku* “proceeding to Kyoto” also *nyūraku*). Note that the reading *niQ-* we encounter in *nis-shō* seemingly does not occur elsewhere; *nyū* consistently shows this form even before sei’on, as *nyūsha* “enter a company,” *nyūka* “being entered in a new family register”, etc.
- *shēng* “voice, tone”: the presence of the reading *sei* here is overwhelming; however, the rare words connected with tones or chanting all are read with *shō*. With this, the idea of the Buddhist provenance of the names becomes more probable.

The strange behaviour of *rù*, however, is neither exceptional nor unexpected; it merely shows the trend towards the unification of forms. As soon as *nipu* > *nyū* change is finalized, it becomes hard to coexist with the bound

¹ In fact, *Nihon Kokugo Daijiten* provides examples of the usage *fyōdō* and even *hyōtō* in the 17th century, but these should probably be considered fiction; until Meiji period, there was no standardization in the usage of the dakuten.

The occasional *heitō*, resetting the whole word into Kan-on, however, are obviously real; in Meiji, seemingly, there was an attempt to secularize the word by doing this conversion, which was doomed, perhaps due to the existence of the word *byōdō* in general language from, say, the name of the temple *Byōdō-in* in Uji, Kyoto.

form *niQ-*. The reformation to the separate form *nyū* is an expected behaviour; something similar to the emergence of *ju* happens also to the numeral “ten”, where the bound form *jiQ-* with counters almost turned to *juQ-*.

To summarize, the appearance of specifically *hei* (as secondary option), *jō*, *kyō*, and a form starting with *n* need not to be internalized through Go-on vs. Kan-on dichotomy as these are generally the main forms used. It is still possible to assume that the names were initially given in Go-on; but the change *ko* > *kyō*, if it ever existed, could be caused by the popular use and not by association. Possibly, both explanations are valid.

It may be possible to argue that some of these readings refer not to tones, but to some additional meanings of these binomes. In fact, one of the four words under question has an obvious secondary meaning, namely *shāngshēng*, that can easily mean nothing but “high voice.” However, the dictionaries are aware of that fact. Still, the readings corresponding to that meaning in *Nihon Kokugo Daijiten* are, nevertheless, the vernacular *uwagoe* and the expected *jōsei*; this does not change the fact both *jōshō* and *jōsei* are valid readings for this tonal name.

However, nothing of the previous discussion before explained the unusual-looking form *hyō* for the name of the level tone. Now we will shift our attention to this problem.

5 Additional Evidence

There is an option that there is nothing to discuss and this (these) reading(s) emerged recently, say, in Edo period, due to purely internal processes. However, we have earlier attestations. It is hard to find examples with proper furigana, especially with guarantee of the correct voiced distinction, but we have the abundance of Western sources on the language of the 17th century.

The Nippo jisho dictionary (Doi et al. 1980) does not mention the names of any tone. However, it also does not mention any occurrence of *píng* read as “fiǒ.” It contains “equality” with the expected “biǒdǒ” reading and multiple occurrences of “fei.”

On the other hand, the *Arte da Lingoa de Iapam* (Rodrigues 1604) by João Rodrigues features an extensive section “Da Poesia de Japam” (Vol. II, pp. 180ff.). Within it, he describes the practice of Chinese-style composition and explains the tonal metre of Chinese regulated verse. In the explanation, he divides the tones into “level” and “oblique,” calling them *Fiǒ* and *Socu*, respectively.

Notably, this is the only occurrence of *píng* read like “fiǒ” in the Portuguese corpus. Rodrigues deviates with the modern usage in the second case where currently the reading *hyō* has gained acceptance, that is, in era names.

Everyone perusing the list of era names in modern Japan, finds an ad-

ditional evidence of *píng* as *hyō* outside of contexts connected with music and tone. These are, first, the multiple Tenpyō eras (729–767) and, secondly, Kanpyō (889–898). Even now, yet, there is no fixed usage; *Kōjien* dictionary, for example, gives Tenbyō and even Tenhei as alternatives for the first, and Kanbei, Kanpei, and Kanhei for the second. Japanese version of Wikipedia is more conservative on the first, with only Tenpyō, but explicitly refuses to declare a correct version from among Kanpyō, Kanpei, and Kanhei for the other one.

For Rodrigues, however, these peculiar *-pyō* forms do not exist. The only reading for the era now known as Tenpyō is given to be “Tembiō,” while the current Kanpyō is instead “Quampeī.” Of course, it is possible that *Tembiō* stands for *Ten+piō̄*, not *biō*, but the evidence of *Quampeī* in the same list rather points that *biō* is just it, *biō*.

6 Possible Reasoning for *pyō*

It is possible that the reading *pyaū* was incorporated from some intermediate stage of Middle Chinese, after the devoicing of the initial already happened, while the final still had a glide: probable *[pʰiəŋʰ], which appears during the development of EMC [biəŋʰ] to Chang’an LMC [pʰiəŋʰ].

The phenomenon of combining go-on and kan-on elements in the initial and final of the same Sinitic segment is known and not limited to *pyaū* “level”; as commented in (Wenck 1957), the same happens specifically with several characters using “level” as phonetic element, such as *píng* “to comment on; to discuss; to debate”² and *píng* “apple”, both also rendered in Japanese as *hyō*. It is thus plausible to propose *pyaū* as borrowed from some intermediate stage of Middle Chinese, as described above. This would explain the naming of Tenpyō era (if it is indeed ancient). However, any explanation has to account for the strange retention of *pyaū* specifically in the context of tones despite the constant competition against the “correct” kan-on and go-on, which are both frequent.

Perhaps, the answer to the perseverance of *pyaū* despite both *byaū* and *peī* being widely used and immediately recognizable is in the specific feature of the tone names themselves. As we already established, a Go-on etymology of the original tone names is the most probable³. But the tones names in Chinese are all of the same tones themselves: [biəŋʰ] is level, [tʰiəŋX] is rising, [kʰiəH] is departing, [ŋipʰ] has a final obstruent; in fact, in modern Mandarin, where both of the historical readings of “rising” character, [tʰiəŋH] and [tʰiəŋX], coalesced into *shàng*, for the tone name only, *shǎng* is used, to retain the

² This reading is ancient, as (Doi et al. 1980) contains many entries confirming it.

³ And, as *soku* is itself Kan-on, only then penetrated the poetic circles, where Kan-on was preferred.

relation⁴.

Thus, it is possible that the creators of the Japanese renderings would want to retain this property. This can immediately explain the peculiar form *nissei* for the entering tone, which emphasizes the final obstruent of *niQ-*, unlike the forms similar to *nyū*.

It is though less clear why would *pyaū* be considered “more flat” than *byaū*. A possible option would be to consider the tonal split of Late Middle Chinese. The Japanese were obviously aware of its emergence (De Boer 2010, p. 386), and the logical sequence could follow a similar path.

The overview of the initial consonants of Middle Chinese according to their behaviour during the tonal split is given in Table 2 below.

Name of the category	Definition	EMC	LMC
<i>qīng</i> (clear)	voiceless	[p]	[p]
<i>cìqīng</i> (second clear)	voiceless aspirated	[p ^h]	[p ^h]
<i>zhuó</i> (muddy)	voiced	[b]	[pfi]
<i>cìzhuó</i> (second muddy)	nasal	[m]	[^m b] or [m]

TABLE 2 Categories of the initials

Note that the *second muddy* category included both prenasalized (normally) and nasal (when followed by nasal-ending final, as (Miyake 2003, pp. 155-6) explains) LMC reflexes.

The route of the tonal split is represented differently in the modern varieties of Sinitic; however, the primary distinction was consistently between *clear* (including also *second clear*, strictly saying, irrelevant for the tonal split but included due to the analogy with the Sanskrit classification (De Boer 2010, p. 381) that was taken for inspiration) and *muddy* categories, sometimes (as in modern Mandarin) additionally complexified by the differences in the tonal treatment of the *second muddy* consonants. To simplify, the shift involved the absence of change in *clear* but devoicing and denasalization leading to the changed contour in *muddy*.

The word EMC [biəŋ¹] “level” contains a muddy initial [b] and is thus submitted to the tonal split: EMC [biəŋ¹] high level > Chang’an LMC [pfiəŋ¹] rising. The following logical sequence could have been followed: the character “level”, when referring to tone, should be read with (shifted) level tone. However, in the Go-on reading *^mbyaū* the initial consonant does not correspond to the *muddy* class that should have been rendered as [pfi]. An honest

⁴In modern Mandarin, the name *shāng* refers to the tone melody 214, which is the descendant of the historical Rising Tone in most of the situations; however, with voiced non-nasal initials, present in [ʔiəŋX], it merged into *qù*, now pronounced 51, instead.

mistake or desire to maintain the tonal image of the original could have led to the substitution on the Kan-on reading for the initial.

A question appearing immediately: why, in such case, was there no substitution in the reading of *zyaũ* “rising”? The same argument holds: the initial consonant [ʧ] is *muddy*, and thus “rising” underwent the split. Hence, the continuous presence of the voiced and prenasalized (Frellesvig 2010, pp. 34ff.) consonant *z* could have been considered undesirable. Perhaps, the popular forms could have given some influence, due to the exact Kan-on form with the voiceless consonant being ever less prominent for *shǎng* than for *píng*.

7 Conclusion

The question of the strange readings of the tonal names in Japanese still requires further study. An indispensable source that might lead to a decisive solution would be the attestations of furigana annotation specifically for the tone names, especially in a context strictly distinguishing voiceless and voiced elements of consonantal pairs.

Judging by the evidence assembled as of now, the conjectures about a borrowing from an intermediate stage of Middle Chinese before the loss of the medial (especially if the evidence of *hyō* (*píng*) “to comment on; to discuss; to debate” is relevant) and the desire to imitate the tonal qualities of the words somehow possess the most explicative power. It can be stated with some surety that the names of the tones are of Buddhist provenance and likely not immediately from the community of the poetry writers, and they are of Go-on provenance. However, as previously observed, no explanation can deal with the details exhaustively. The question merits further research.

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SECTION 3

Poster Papers

Part 2

Syntax

Reversed Polarity Sluicing in Japanese*

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1 Introduction

Reversed polarity sluicing (RPS, hereafter) is a type of sluicing first discovered by Kroll (2019, 2020) where the presumed antecedent TP differs from the elliptical TP in terms of polarity, as illustrated in (1):

- (1) I don't think that [TP California will comply]_A, but I don't know why [TP ~~California won't comply~~]_E.

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The primary contribution of this paper is in showing that Japanese sluicing exhibits RPS; see Yagi (2021) and Yagi et al. (2021) for a different type of reversed-polarity ellipsis involving the proform *soo* ‘so’. (2) is a case in point:

- (2) Boku-wa [TP kotosizyuuni koronaka-ga
 I-TOP by.the.end.of.this.year coronavirus.crisis-NOM
 syuusokusuru]_A-to omottei-nai-si, naze [TP...]_E-ka-mo
 is.over-COMP think-NEG-and why Q-also
 aruteido kentoogatuiteiru.
 to.some.extent can.guess
 ‘I don’t think that [the coronavirus crisis will be over by the end of this year]_A, and I can also kind of guess why [it will not be over by then]_E.’

Theoretically, I will develop a pragma-semantic analysis of RPS in Japanese which adopts Kroll’s (2019, 2020) dynamic semantic approach to its English counterpart and will uncover hitherto unnoticed syntactic/semantic properties associated with this construction, including its verb-sensitivities to RPS and its clear contrast with clausal argument ellipsis with respect to RPS.

This paper is organized as follows. In section 2, I will extend the pragma-semantic analysis of RPS developed by Kroll (2019, 2020) to its Japanese counterpart. In section 3, I will argue against the alternative analysis of Japanese RPS based on the Syntactic NEG Raising hypothesis. In section 4, I will report my novel finding that *omow* ‘to think’, but not *sinziru* ‘to believe’, allows RPS, and show how this contrast can be accounted for under my analysis. I will conclude this paper in section 5 by pointing out one issue with my analysis from the impossibility of RPS under clausal argument ellipsis.

2 A Pragma-Semantic Analysis of RPS in Japanese

Let us start by making sure that examples like (2) represent a genuine case of polarity reversals under ellipsis. One might ask whether the reversed polarity reading in (2) is derived not because the ellipsis site selects the positive subordinate clause of the antecedent clause marked by _A, but because it takes the whole antecedent clause including the matrix negative clause. This extra antecedent option, one might continue, assigns the negative antecedent to the ellipsis site, thereby giving the impression that we are dealing with the reversed polarity-like interpretation. Let us call this the ‘long-source reading’, to be compared with the ‘short-source reading’, where the ellipsis site takes the embedded clause of the antecedent marked by _A. There are two strategies to distinguish between these two readings. One is to use two different subjects in antecedent and elliptical clauses (Gajewski 2021); the other is to use inherent pragmatic incompatibilities in the choice of the matrix verb heading

the elliptical clause vis-à-vis the matrix verb of the antecedent clause. The first strategy is exemplified in (3).

- (3) Boku-wa [TP tinpanzii-ga gengo-o hanaseru]_A-to-wa
 I-TOP chimpanzee-NOM language-ACC can.speak-COMP-TOP
 omottei-nai-ga hontoonotokoro gengogakusyatati-desura
 think-NEG-but in.truth linguists-even
 naze [TP ...]_E-ka-wa wakattei-nai.
 why Q-TOP understand-NEG
 ‘I don’t think that [chimpanzees can speak language]_A, but the truth is that
 even linguists have not understood yet why [they cannot speak language]_E.’

In this example, the long-source reading is pragmatically infelicitous, for linguists are not expected or obliged to figure out why the speaker thinks that chimpanzees cannot speak language; their goal is to try to understand why chimpanzees cannot do so. This way, we can make sure that (3) involves RPS.

The other strategy is to use inherent pragmatic incompatibility between the matrix verb heading the whole antecedent clause and the matrix verb heading the embedded clause to undergo ellipsis. To illustrate, consider (4).

- (4) # Boku-wa naze kotosizyuuni koronaka-ga
 I-TOP why by.the.end.of.this.year coronavirus.crisis-NOM
 syuusokusuru-to omow-anai-ka aruteido kentoogatuiteiru.
 is.over-COMP think-NEG-Q to.some.extent can.guess
 ‘I can kind of guess why I don’t think that the coronavirus crisis
 will be over by the end of this year.’

(4) is odd because people don’t make a guess about why they themselves think this or that. The oddness of this example thus shows that *omow* ‘to think’ cannot head a clausal complement when it is further embedded by the matrix verb *kentoogatuiteiru* ‘can guess’. Indeed, the example in question becomes acceptable when the embedded verb is removed, as shown in (5).

- (5) Boku-wa naze kotosizyuuni koronaka-ga
 I-TOP why by.the.end.of.this.year coronavirus.crisis-NOM
 syuusokusi-nai-ka aruteido kentoogatuiteiru.
 is.over-NEG-Q to.some.extent can.guess
 ‘I can kind of guess why the coronavirus crisis will not be over by the
 end of this year.’

Keeping this background in mind, let us return to (2). Since the matrix verb selecting the elliptical clausal complement is *kentoogatuiteiru*, the ellipsis site cannot contain the whole antecedent clause headed by *omow*, given the pragmatic incompatibility between the two verbs. Thus, we can guarantee that (2) involves a bona fide instance of RPS in which the elliptical clause is

mismatched with the embedded clause of the matrix antecedent with respect to polarity values.

I propose that Kroll's (2019, 2020) analysis of RPS in English be extended to its Japanese variant. Kroll adopts a pragma-semantic approach to the neg-raised reading based on the excluded middle (EM, hereafter) presupposition, an analysis originally due to Bartsch (1973) and further elaborated in subsequent works such as Gajewski (2005, 2007). According to this approach, neg-raising verbs such as *think* come along with the presupposition that the speaker thinks either that a particular proposition is true or that it is not true. This presupposition, in turn, interacts with truth conditions of a negated proposition involving such verbs to yield the interpretation where the matrix negation behaves as if it took the embedded scope. This sequence of interpretive steps is depicted in (6):

$$(6) a \text{ doesn't think that } p \dots$$

$$\frac{\neg \forall w (w \in B_a \rightarrow w \in p) \quad \forall w (w \in B_a \rightarrow w \in p) \vee \forall w (w \in B_a \rightarrow w \notin p)}{\therefore \forall w (w \in B_a \rightarrow w \notin p)} \quad (\text{Gajewski 2007:291})$$

Kroll also adopts a dynamic interpretation system (Heim 1983a, b) whereby context does not have to be updated only at the end of a whole clause but instead can be evaluated on the basis of a current discourse. Context update in this system is defined in (7a, b). Note that a context c and a proposition p both denote a set of worlds so that entailment between the two is expressed here by the subset relationship; if c entails p , then $c_L \subseteq p$.

- (7) Context update
- (a) If c entails the presupposition of p , then $c + p = c \cap p$.
 - (b) If c does not entail the presupposition of p , then c is undefined.
- (Kroll 2019:12)

Kroll proposes that sluicing is a pragmatics-sensitive PF-deletion phenomenon licensed by local contextual entailment. Specifically, a TP can undergo PF-deletion if the proposition denoted by the TP is entailed by a local context in which it is uttered. This pragmatic approach to sluicing – which Kroll terms *Local Givenness* – is formally defined in (8).

- (8) Local Givenness: A TP α can be deleted iff *ExClo* ($[[\alpha]]^g$) expresses a proposition p such that $c_L \subseteq p$. (Kroll 2019:12)

Adapting Kroll's dynamic interpretation theory of RPS to Japanese, the RPS example in (2) is derived through a step-by-step derivation in (9a-f).

- (9) a. $[[A]]^g = \lambda w'. \neg \forall w [w \in \text{DOX}(s)(w') \rightarrow \text{will_be_over_by_the_end_of_the_year}(\text{Covid-19})(w)]$

- b. $\lambda w'. [\forall w [w \in \text{DOX}(s)(w') \rightarrow \text{will_be_over_by_the_end_of_the_year}(\text{Covid-19})(w)] \vee \forall w [w \in \text{DOX}(s)(w') \rightarrow \neg \text{will_be_over_by_the_end_of_the_year}(\text{Covid-19})(w)]]$
- c. $\lambda w'. \forall w [w \in \text{DOX}(s)(w') \rightarrow \neg \text{will_be_over_by_the_end_of_the_year}(\text{Covid-19})(w)]$
- d. $W \cap C(\lambda w. \neg \text{will_be_over_by_the_end_of_the_year}(\text{Covid-19})(w)) = W \cap \{w: \neg \text{will_be_over_by_the_end_of_the_year}(\text{Covid-19})(w)\} = c_{LE}$
- e. $ExClo([\text{[E]})^S = \{w: \neg \text{will_be_over_by_the_end_of_the_year}(\text{Covid-19})(w)\}$
- f. $c_{LE} \subseteq \{w: \neg \text{will_be_over_by_the_end_of_the_year}(\text{Covid-19})(w)\}$

(9a) states that the speaker does not think that the coronavirus crisis will be over by the end of this year. Due to the EM presupposition triggered by *omow*, the speaker thinks that the crisis will be over by then or that it won't be over by then: (9b). These two steps yield the neg-raised reading for the antecedent: (9c). Kroll assumes that verbs like *think*, *see*, and *believe* may assert their clausal complement as true in a local context independently of the matrix clause (Higginbotham 1975). Then, (9c) creates a local context c_L in which the worlds under consideration are restricted to those worlds in which the crisis won't be over by the end of this year: (9d). (9e) shows that the sluice denotes the set of worlds in which the crisis won't be over by the end of this year. Since the local context set-up in (9d) entails the elided TP, as shown in (9f), the reversed-polarity reading is obtained in (2).

3 Against the Syntactic NEG Raising Analysis of Japanese RPS

In this section, I will compare my analysis of Japanese RPS with a potential alternative drawing on the Syntactic NEG Raising Hypothesis (Fillmore 1963; Collins and Postal 2014). According to this hypothesis, negation starts its life in the embedded clause and is interpreted there before it undergoes movement into a matrix position for pronunciation. This hypothesis yields a straightforward account of the Japanese RPS example. Consider the relevant representations of the antecedent and elliptical clauses of (2) in (10a, b).

- (10) a. Antecedent: [Kotosizyuuni koronaka-ga syuusokusuru-NEG]_A
 b. Ellipsis site: [Kotosizyuuni koronaka-ga syuusokusuru-NEG]_E

In the rest of this section, I will present three arguments against this alternative analysis of Japanese RPS. I owe all the arguments below to Yagi (2021) and Yagi et al. (2021), who also argue against the same analysis as applied to the type of polarity-reversed ellipsis involving the anaphoric proform *soo* 'so'.

My first argument comes from the distribution of positive polarity items such as *dareka* ‘someone’. Such items take scope over clausemate negation, as shown in (11). The syntactic analysis then predicts that they must exhibit the same scope relation under PSR, but this prediction is falsified by (12), where *anata-no taisetuna dareka-o* takes scope under negation.

- (11) Kono keikaku-wa anata-no taisetuna dareka-o sukuw-nai.
 this plan-TOP you-GEN important someone-ACC save-NEG
 ‘This plan won’t save your special someone.’
 (*Neg>someone; someone>Neg)

- (12) Boku-wa [_{TP} kono keikaku-ga anata-no taisetuna
 I-TOP this plan-TOP you-GEN important
 dareka-o sukuw]_A-to-wa omow-anai-si, kako-no zibun-no
 someone-ACC save-COMP-TOP think-NEG-and past-GEN self-GEN
 keiken-kara naze [_{TP} ...]_E-ka-mo aruteido kentoogatuku.
 experience-from why Q-also to.some.extent can.guess
 ‘I don’t think that [this plan will save anyone important to you]_A,
 and, based on my past experiences, I can also kind of guess why
 [it won’t do so]_E.’ (Neg>someone; *someone>Neg)

By contrast, my own analysis correctly predicts this scope reversal. There is no stage of syntactic derivation for (12) at which negation would stand in the clausemate relation with the negation in the embedded clause because negation takes the embedded scope only through the EM presupposition.

My second argument is concerned with the distribution of reduplicated universal quantifiers of the form *NP-ga-NP* ‘NP-NOM-NP’. Aihara (2007) points out that such reduplicated quantifiers cannot co-occur with negation in the same local clause, as illustrated in (13). Given this observation, the syntactic analysis wrongly predicts that a RPS example as in (14) should be ungrammatical because negation and the reduplicated quantifier *minna-ga-minna* ‘everyone-NOM-everyone’ would both occur in the embedded clause.

- (13) * Minna-ga-minna wakutinsessyu-o kiboositei-nai.
 everyone-NOM-everyone vaccination-ACC wish.for-NEG
 ‘Everyone doesn’t wish to get vaccinated.’

- (14) Boku-wa [_{TP} minna-ga-minna wakutinsessyu-o
 I-TOP everyone-NOM-everyone vaccination-ACC
 kiboositeiru]-to-wa omottei-nai-si mawarini-mo
 wish.for-COMP-TOP think-NEG-and around-also
 tyuutyositeiru-hito-ga iru-node naze [_{TP} ...]_E-ka-mo
 hesitate-person-NOM exist-because why -Q-also
 aruteido kentoogatuku.

to.some.extent can.guess

‘I don’t think that [everyone wishes to get vaccinated]_A, and I can also kind of guess why [not everyone wishes to get vaccinated]_E, because there are people around me who hesitate to do so.’

The contrast between (13) and (14) can be accounted for under my present analysis, on the other hand, because the matrix negation is not associated with any syntactic position within the embedded clause.

The final argument is based on the distribution of what Watanabe (2013) calls bipolar expressions such as *NP-o nanika* ‘some NP-ACC’. Bipolar expressions are so named because they are acceptable neither in positive nor negative contexts, as shown by the ungrammaticality of both (15a) and (15b).

- (15) a. *Kono purojekuto-wa zyuyyoona seika-o
this project-TOP significant achievement
nanika ageta
something raised
‘Intended: This project yielded some significant achievement.’
- b. * Kono purojekuto-wa zyuyyoona seika-o
this project-TOP significant achievement
nanika age-nak-atta.
something raise-NEG-PST
‘Intended: This project didn’t yield any significant achievement.’
(Watanabe 2013:191, with minor modifications)

With Watanabe’s observation in place, consider now (16):

- (16) Boku-wa [_{TP} kono purojekuto-ga zyuyyoona seika-o
I-TOP this project-NOM significant achievement-ACC
nanika ageru]_A-to-wa omottei-nai-si, naze
something raise-COMP-TOP think-NEG-and why
[_{TP} ...]_E-ka-mo aruteido kentoogatuku.
Q-also to.some.extent can.guess
‘I don’t think that [this project will yield some significant achievement]_A, and I can also kind of guess why [the project won’t yield any significant achievement]_E.’ (adopted from Watanabe 2013:191)

If the Syntactic NEG raising analysis were right, the derivation of the antecedent clause in (16) would involve the negation within the same clause with *zyuyyoona seika-o nanika*, thereby erroneously ruling out (16) on a par with (15b). Again, the pragma-semantic alternative is consistent with the grammatical example in (16) vis-à-vis (15b) because at no stage of the syntactic derivation is the anti-clausemate restriction ever violated.

4 Verb-Sensitivity to RPS and Evidentiality in Japanese

Interestingly, the verb *omow* ‘to think’ allows, but the verb *sinziru* ‘to believe’ disallows, PRS. This point is clear from the contrast between (2) and (17):

- (17) # Boku-wa [TP kotosizyuuni koronaka-ga
 I-TOP by.the.end.of.this.year coronavirus.crisis-NOM
 syuusokusuru]_A-to sinzitei-nai-si, naze [TP...]_E-ka-mo
 is.over-COMP believe-NEG-and why Q-also
 aruteido kentoogatuiteiru.
 to.some.extent can.guess
 ‘I don’t believe that [the coronavirus crisis will be over by the end of this year]_A, and I can also kind of guess why [it will not be over by then]_E.’

One common criticism leveled against the pragma-semantic approach has been why neg-raising predicates are idiosyncratically distributed both within and across languages (Horn 1978). Yet, my current analysis permits a principled explanation for the contrast between (2) and (17). *Sinziru* requires some sort of evidence for the truth of the embedded proposition. This observation is verified by (18), where *sinziru*, unlike *omow*, is incompatible with *tokuni riyuu-wa nai-kedo* ‘I don’t have any particular reason but...’.

- (18) Boku-wa tokuni riyuu-wa nai-kedo [CP Toranpu-ga
 I-TOP in.particular reason-TOP not.exist-but Trump-NOM
 daitooryoosen-ni saisyutubasuru-to] {omotteiru/#sinz-
 iteiru} presidential.election-for run.again-COMP think/believe
 ‘I don’t have any particular reason why, but I {think/believe} that Trump will run again for office.’

Notably, a person not having evidence for a proposition *p* is sufficiently different from that person having evidence for the falsehood of *p*. It is this extra evidential flavor, I contend, that blocks the EM presupposition from being triggered with *sinziru*. Note, furthermore, that this verb-sensitivity to RPS is problematic for a pseudosluicing analysis of Japanese RPS (cf. Nishiyama et al 1996; Merchant 1998, 2001). According to this analysis, the reversed polarity reading in (2) would be derived from the underlying structure in (19), where the deep propositional anaphor *soo* ‘so’ picks up a salient antecedent (the negative variant of the antecedent TP) before it undergoes ellipsis.

- (19) ...naze ~~soo~~-ka-mo aruteido kentoogatuku.

This analysis, however, incorrectly predicts that (17) allows RPS because the variant of (17) with *soo* inserted before *naze* ‘why’ allows this reading.

5 An Open Issue: Clausal Argument Ellipsis and RPS

I conclude this paper with a brief discussion of one outstanding issue with my proposed analysis and a potential solution to the issue. The issue comes from clausal argument ellipsis. Let us assume that the ellipsis of a clausal complement of *omow* involves a full-fledged sentential base, followed by CP-ellipsis. (20) shows that the CP complement of this verb blocks RPS, unlike in (2).

- (20) #Hanako-wa [_{CP} zibun-no teian-ga saiyoosareru-to]_A
Hanako-TOP self-GEN proposal-NOM accepted-COMP
omottei-nai. Taroo-wa [_{CP} ...]_E omotteiru.
think-NEG Taro-TOP think
'intended: Hanako doesn't think [that her proposal will be accepted]_A. Taro thinks [that his proposal will be accepted]_E.'

Why doesn't CP-ellipsis yield RPS? Here is a possible answer to this question. Under Kroll's theory, RPS is derived via PF-deletion, which tolerates a local contextual update triggered by the EM presupposition associated with *omow*. Given this, the impossibility of RPS in (20) follows if CP-ellipsis involves LF-copy (Shinohara 2006; Saito 2007, 2017) instead, which, by definition, may only copy a syntactic object already constructed from an antecedent clause to the empty slot in the elliptical clause. This solution, in turn, yields the new generalization that mismatch may be tolerated under PF-deletion, but not under LF-copy (Matsuo 1998; Sato 2021). This emerging dichotomy in clausal ellipsis also ties well with Sakamoto's (2017, 2020) generalization that phasal ellipsis is implemented by LF-copy whereas phasal complement ellipsis is derived through PF-deletion.

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Against Syntactic Neg-raising: Evidence from polarity-reversed ellipsis in Japanese

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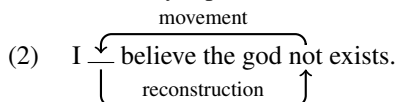
It has been observed that the sentence (1) is ambiguous. In one interpretation (1a) the speaker is agnostic whether the god exists. On the other hand, the interpretation (1b) makes a stronger claim that the speaker believes that the god does not exist. There have been two analyses proposed for the reading (1b): the syntactic *Neg-raising* (Filmore, 1963; Ross, 1973; Collins and Postal, 2014) and the semantic-pragmatic inference (Bartsch, 1973; Horn, 1978, 1989; Gajewski, 2007, a.o.). This study argues against the former and for the latter, by investigating a *polarity-reversed ellipsis* in Japanese.

- (1) I don't believe the god exists.
- a. The speaker does not have an belief that the god exists.
 - b. The speaker believes that the god does not exist.

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1 Two Strategies for the Stronger Reading

The stronger reading in (1b) is generally observed with attitude predicates such as *believe* or *think*, and is derived by either syntactic Neg-raising or a pragmatic-semantic inference. The former analysis claims that the negation in the matrix clause in (1) is originated in the embedded clause, moving to the matrix clause in the surface (overt) syntax, and is reconstructed to the embedded clause for the relevant interpretation in covert syntax. The proposal is schematically represented in (2).



The latter analysis hinges on the semantic definition of the attitude predicate *believe*. Crucially, it assumes that *believe* has the *excluded middle presupposition*: when an attitude holder x believes p , it is presupposed that x believes p or x believes $\neg p$. Combined with this presupposition, negation of the matrix attitude makes an inference to the stronger reading. As illustrated in (3), the assertion negates the first disjunct of the presupposition. Hence, the stronger claim in (3c) is inferred.

(3) $\llbracket x \text{ does not believe } p \rrbracket$

- a. Assertion: $\lambda w. \neg \forall w' \in B_{x,w} [p(w) = 1]$
- b. Presupposition: $\forall w' \in B_{x,w} [p(w') = 1] \vee \forall w' \in B_{x,w} [p(w') = 0]$
- c. (a) + (b): $\lambda w. \forall w' \in B_{x,w} [p(w) = 0]$

A crucial difference between these two analyses is that there is a *syntactic* realization of the negation in the embedded clause under the syntactic Neg-raising account, but not in the semantic-pragmatic inference. The purpose of this study is to show that the syntactic presence of negation in the embedded clause makes wrong predictions, arguing for the semantic-pragmatic inference. The argument comes from *polarity-reversed* ellipsis (observed for English by Kroll (2019)) in Japanese. In a nutshell, given the identity condition on ellipsis we cannot assume the syntactic realization of a negation within an embedded clause, contrary to what the syntactic Neg-raising analysis predicts. The rest of this paper is organized as follow. Section 2 sets up a background on the syntax of Japanese, summarizing the argument of Sakamoto (2016) that clausal anaphora *soo* involves ellipsis. Section 3 discusses a polarity reversed ellipsis in Japanese, introducing the identity condition on ellipsis. Section 4 is the main part of this study, laying out two arguments against the syntactic Neg-raising. Section 5 concludes and discourses remaining issues.

2 *Soo* Anaphora as Ellipsis

In Japanese, clausal anaphora *soo* can replace a redundant clause. In (4b), for instance, the anaphora replaces the embedded clause in (4a).

- (4) a. *Boku-wa* [*Ayane-ga ninshinsiteiru to*] *omotteiru*.
 I-TOP Ayane-NOM pregnant C think.ASP
 ‘I think that Ayane is pregnant.’
- b. *Isya-mo soo omotteiru*.
 doctor-ALSO SOO think.ASP
 ‘A doctor thinks so too.’

Sakamoto (2016) argues that the *soo*-construction involves ellipsis and that (4b) has the covert structure in (5).

- (5) *Isya-mo* [*Ayane-ga ninshinsiteiru to*] *soo omotteiru*.
 doctor-ALSO Ayane-NOM pregnant C SOO think.ASP

One piece of evidence for his argument is that A-movement is possible out of a ‘replaced’ *soo*-site (for other evidence and more discussions see Sakamoto (2016)). Consider the ECM construction in (6). As argued by Hiraiwa (2005), Kuno (1976) and Tanaka (2002), in Japanese an accusative-marked ECM subject is base-generated within an embedded clause and can move to a matrix clause. In (6a), the accusative-marked subject appears left to the adverb modifying the matrix predicate, which assures that *Ayaka-o* is located in the matrix clause. Crucially, this movement is possible even out of a *soo*-site, as illustrated in (6b’).

- (6) a. *Taro-wa Ayaka_i-o orokanimo* [_{CP} *t_i tensai da to*] *omotteiru*.
 Taro-TOP Ayaka-ACC stupidly genius COP C think.ASP
 ‘Taro stupidly thinks that Ayaka is genius.’
- b. *Ziro-wa Kana_i-o orokanimo* [_{CP} *t_i tensai da to*] *omotteiru*.
 Ziroo-TOP Kana-ACC stupidly genius COP C] think.ASP
 ‘Ziro stupidly thinks that Kana is genius.’
- b’. *Ziroo-wa Kana_i-o orokanimo soo omotteiru*.
 Ziroo-TOP Kana-ACC stupidly soo think.ASP
 ‘Ziro stupidly thinks soo.’

If there were no underlying syntactic structure in the *soo*-site, no movement should be possible out of its domain (Depiante (2000), Johnson (2001), Merchant (2013), a.o.). Thus, Sakamoto concludes that Japanese clausal *soo* anaphora involves ellipsis and the structure as in (5). In a later section we base our discussion on Sakamoto's conclusion and take the *soo*-construction as an instance of ellipsis.

3 Polarity-Reversed Ellipsis in Japanese

Kroll (2019) observes ellipsis cases in English where an elided site has the opposite polarity to its antecedent clause. In (7), for instance, the elided clause has the opposite polarity to the affirmative antecedent clause.

- (7) I don't think that [California will comply],
 but I don't know why [~~California won't comply~~]. (Kroll, 2019, 2)

A similar paradigm is also observed in the Japanese *soo*-construction, as shown in (8). Notice in (8b) that the matrix predicate is *not* negated in, and that the additive particle *mo* on the matrix subject forces a reading where the speaker and the doctor have the same opinion on the pregnancy of Ayane. Thus, we should interpret the elided part as 'Ayane is not pregnant,' having the opposite polarity to the antecedent CP in (8a).

- (8) a. *Boku-wa* [<sub>CP_A *Ayane-ga ninshinsiteiru to*] *omottei-nai si*,
 I-TOP Ayane-NOM pregnant C think-NEG and
 'I don't think that Ayane is pregnant, and'
 b. *Isya-mo* [<sub>CP_E *Ayane-ga ninshinshitei-nai to*] *soo omotteiru*.
 doctor-also Ayane-NOM pregnant-NEG C SOO think.ASP
 'The doctor thinks so too.'</sub></sub>

3.1 An Issue: Polarity-reversed Ellipsis and Neg-raising

It is widely recognized that ellipsis requires a certain *identity* between the antecedent and the elided clause (Ross, 1963; Rooth, 1992; Merchant, 2001, a.o.). There are two lines for the identity condition; *syntax identity* and *semantic identity*. The former requires a syntactic isomorphism for ellipsis, while the latter licenses ellipsis via semantic notions like (mutual) entailment. However, it appears that no proposed identity condition licenses ellipsis of *CP_E* anteceded by *CP_A* in (8), due to the opposite polarity. Here is where the discussion in section 1 becomes relevant.

As reviewed in section 1, the stronger reading in (1) can be accounted for by either syntactic Neg-raising in (2) or the semantic-pragmatic inference in

(3). Since the matrix predicate in (8) is also an attitude verb that licenses the stronger reading, we can appeal to (2) or (3) to meet the elliptical identity. The former theory reconstructs the negation in the matrix clause in (8a) to the embedded clause as in (9a). Being completely identical, CP_A and CP_E will meet any kind of elliptical identity condition, regardless of syntactic or semantic.

(9) Polarity Reversed Ellipsis with Syntactic Neg-raising

- a. I think [CP_A Ayane is not pregnant]
- b. The doctor thinks *soo* [CP_E Ayane is not pregnant]

On the other hand, the semantic-pragmatic way of deriving the stronger reading does not have to meet the syntactic isomorphism. It thus app leads to a semantic characterization of an elliptical identity, and this is a line of analysis pursued by Kroll (2019). Simplifying her proposal, she argues that CP_E can be elided if a local context (Karttunen, 1974; Schlenker, 2009) entails CP_E . She further argues that for an attitude predicate PRED, $xPREDp$ asserts that the complement p is true in the local context. In (8), then, the excluded middle presupposition induced by the attitude predicate *omowu* ‘think’ and the assertion together makes an inference to the proposition that *The doctor thinks that Ayane is not pregnant*, in the same way as in (3). Since *omowu* ‘think’ is an attitude predicate, it further asserts in the local context that the complement *Ayane is not pregnant* is true. Then the local context entails the elided clause in (8), and hence the ellipsis in question is licensed.

In the next section we argue against syntactic Neg-raising. Our argument goes as follows. Polarity-reversed ellipsis requires either syntactic Neg-raising or the semantic-pragmatic inference: crucially the former assumes a negation is reconstructed to an embedded clause, while the latter does not. We will show that the reconstruction of the negation makes wrong predictions, thus claiming that the semantic-pragmatic strategy is preferred over the syntactic strategy. Our claim is summarized in the table below. The data set examined below suggests that the paradigm is explained only by the combination of the semantic-pragmatic strategy for the strong reading and the semantic characterization of elliptical identity.

(10)	Syntactic Identity	Semantic Identity
Syntactic Neg-raising	*	*
Sem/Pra Inference	*	✓

4 Two Arguments Against Syntactic Neg-raising

4.1 *Min'na-ga-min'na*

Aihara (2007) observes that *min'na-ga-min'na*, a special kind of universal quantifier, is incompatible with a clause-mate negation, as illustrated in (11).

- (11) **Min'na-ga-min'na ko-nak-atta.*
everyone-NOM-everyone come-NEG-PAST

Intended: 'Everyone didn't come.'

What is important for us here is that with (12a) as its antecedent, (12b) can be interpreted as 'the teacher thinks not everyone praised Ayane.' This reading is not predicted by the syntactic Neg-raising analysis because if we were to reconstruct the matrix negation in (12a) to the embedded clause, it would go against the ban observed in (11). Since the reconstruction is prohibited by an independent reason, the syntactic analysis cannot meet the identity condition on ellipsis in (12), thus predicting ellipsis is impossible, contrary to the fact.

- (12) a. *Boku-wa [min'na-ga-min'na Ayane-o hometa to]*
I-TOP everyone-NOM-everyone Ayane-ACC praised C
omottei-nai si,
think-NEG and,

'I don't think everyone praised Mary, and'

- b. *Sensei-mo soo omotteiru.*
Teacher-ALSO SOO think.

'The teacher thinks so, too.'

I.e., 'The teacher thinks **not** everyone praised Mary.'

By contrast, the semantic-pragmatic inference, which does not have to utilize reconstruction, does not face the same difficulty. Under the semantic characterization of an elliptical identity, the antecedent and the elided site do not have to contain exactly the same lexical items, as long as the semantic identity condition is satisfied. Thus, the elided clause in (12b) may have another universal quantifier, say *daremo-ga* 'everyone-NOM', which does not have any restriction on its distribution. Being a universal quantifier, it is semantically identical with *min'na-ga-min'na* and the elided clause meets the semantic identity condition.

4.2 Bipolar items

Watanabe (2013) shows that a bipolar item *NP-o nanika* is incompatible

with a clause-mate negation. Notice that the phrase induces an existential quantification as shown in (13).

- (13) **Sono-projekuto-ga seika-o nanika age-nak-atta.*
 the-project-NOM achievement-ACC something raise-NEG-PAST
 ‘The project didn’t achieve {anything / something.}’

Interesting for us here is that with (14a) as its antecedent, (14b) can be interpreted as ‘the leader thinks that the project didn’t achieve anything.’ The same reasoning for *min’na-ga-min’na* in the previous subsection applies here as well. To be more specific, due to the ban in (13), the syntactic Neg-raising analysis predicts that reconstruction of negation is impossible, and so is ellipsis, contrary to the fact.

- (14) a. *Boku-wa [sono-projekuto-ga seika-o nanika*
 I-TOP [the-project-NOM achievement-ACC something
age-ta to] (-wa) omottei-nai si,
 raise-PAST C] (-TOP) think-NEG and
 ‘I don’t think the project achieved something.’
- b. *Riidaa-mo soo omotteiru.*
 Leader-ALSO SOO think.
 ‘The leader thinks so, too.’

Again, the semantic-pragmatic inference analysis does not have to posit the bipolar item in the elided clause. Thus, the elided clause may contain another existential quantifier, say *nanika-no-seika* ‘something-GEN-achievement’, which does not have any restriction on its distribution.

5 Conclusion and Remaining Issue

We have laid out two empirical arguments against the syntactic Neg-raising analysis to account for the stronger meaning in (1), concluding that the semantic-pragmatic inference should be preferred to derive the meaning in question.

However, a further complexity comes in when we take other elliptical constructions into account. Namely, ellipsis of a complement clause without *soo* does not allow the polarity-reversed reading as shown in (15).

- (15) a. *Boku-wa* [*Ayane-ga ninshinsiteiru to*] *omottei-nai si*,
 I-TOP Ayane-NOM pregnant C think-NEG and
 ‘I don’t think Ayane is pregnant, and’
- b. *#Isya-mo* [*Ayane-ga ninshinshitei-nai to*] *omotteiru*.
 doctor-ALSO Ayane-NOM pregnant-NEG C think.ASP
 Lit. ‘The doctor thinks Ayane is not pregnant, too.’

One possible account is to appeal to different procedures of ellipsis: PF-deletion (Merchant, 2001) for the *soo* construction and LF-copying for the null complement in (15). As its name suggests, LF-copying is an operation to copy a syntactic structure from the antecedent to the elided place. Being a copy, it requires a strong syntactic isomorphism, which predicts impossibility of the polarity-reversed ellipsis. PF-deletion, on the other hand, generally goes well with a looser semantic characterization of an identity, which tolerates some syntactic differences (as we have seen in this article). Thus, different procedures of ellipsis may predict different behaviors of ellipses, but we have to leave a further investigation of this possibility for future work.

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SECTION 3
Poster Papers

Part 3
Formal Semantics
Pragmatics

The Use Conditional Meaning of Japanese Discourse Particle *ittai* in Questions

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1 Introduction

Ittai is a discourse particle in Japanese that can be used in different types of non-canonical questions: extreme ignorance questions (EIQs), self-addressed questions (SAQs) and cornering questions (CorQs). None of the current accounts (of these question types) covers all uses of *ittai*, and hence the present paper offers a unified analysis of *ittai* and bridges the gap between the different uses of *ittai* in questions.

This paper focuses on the use of *ittai* in non-canonical questions. What are non-canonical questions? Pragmatic research on questions distinguishes canonical questions as opposed to non-canonical questions. Canonical questions, also called information-seeking questions (ISQs), are described in (1).

- (1) a. questions uttered by the speaker A, addressing to the hearer B,
- b. questions where A does not know the answer and wants to know the answer,
- c. questions where A believes that B might know the answer,
- d. questions where A requests B to react to the question; ideally A expects that B will provide an answer.

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Questions are classified as non-canonical questions when they deviate in one or more ways from this scheme. The present paper focuses on three different types of non-canonical questions: extreme ignorance questions (EIQs), cornering questions (CorQs) and self-addressed questions (SAQs).

EIQs, known as English *wh-on-earth* questions (den Dikken & Gianakidou 2002, Rawlins 2009), or “can’t find the value” questions (Bayer & Obenauer 2011), convey the speaker’s frustration about the lack of an answer in the context where a) the speaker has tried to look for an answer, b) possible answers were dismissed (Eckardt & Yu 2020), c) the speaker possibly has to consider unlikely possible answers (Rawlins 2009), and d) the speaker may believe that the addressee knows the answer. An English EIQ is shown in (2).

EIQ scenario A and B are parents. Their son, Eric, usually comes home around 9 p.m. at the latest, but it is midnight now and Eric is not home yet. A has tried to call Eric, but he did not answer the phone. A and B have tried to find Eric in all the possible places where he could be, yet they could not find him. A utters to B.

(2) Where on earth is Eric?

In a normal circumstance like in (1), it is odd to utter an EIQ directly to the addressee in the beginning of a conversation. The example (2) shows us that an EIQ is felicitously uttered when the speaker cannot find any possible answer and she is in desperate need of getting answers in the context. In other words, there must be a backstory for the speaker to utter an EIQ instead of an ISQ. CorQs, similarly, also require a backstory in the context so that they can be felicitously uttered.

CorQs, known as English *or-not*-alternative questions (*or-not*-AltQs), are used to put the discourse in a ‘cul de sac’, meaning to ‘corner’ the addressee into providing an answer (Biezma 2009). According to Biezma (2009), they are characterized by two properties (P1, P2)¹, shown in (3).

(3) a. **P1:** *or-not*-AltQs are inappropriate discourse initially. (Biezma 2009: 38)

Scenario A is in charge of coordinating the cooks for a banquet dinner. B is one of the cooks. Dinner is tomorrow.

A (to B): # Are you making pumpkin soup or not?

¹ Please also see Beltrama et. al (2018), which offers an experimental study on decomposing cornering effects.

- b. **P2:** *or-not*-AltQs do not license follow-up questions/‘daughter’ questions.

Scenario A is in charge of coordinating the cooks for a banquet dinner. B is one of the cooks. Dinner is tomorrow and A needs to know what is happening with pumpkin soup.

A: Are you making pumpkin soup?

B: (Silence and dubitative faces)

A: ✓ Are you making pumpkin soup or not?

B: (Silence and dubitative faces)

A: # Are you making pumpkin soup?

Thus, a CorQ can only be felicitously uttered if a) a plain ISQ was asked before, and b) the ISQ remained unanswered. These two conditions form the backstory for the speaker to ask a CorQ felicitously in the context.

SAQs, also called conjectural questions (Littell et al. 2010), are characterized as “uttered in the absence of an addressee” in the literature (Eckardt 2020, 2). While English SAQs are not marked by specific phrases, some languages provide specific lexical particles to indicate that a question is self-addressed; for instance, St’át’imcets =*ká* (Littell et al. 2010), Cuzco Quechua -*chá* (Faller 2003), German discourse particle *wohl* (Zimmermann 2008, 2013; Eckardt 2020), Korean question particle -*na* (Eckardt & Disselkamp 2019), and Japanese evidential modal *daroo* (Hara 2006, 2018, 2019). SAQs, like EIQs, express that the speaker has difficulty to find answers. The difference between SAQs and EIQs lies in the belief of the speaker. The speaker in a SAQ context does not believe that the hearer may provide the answer; otherwise, the question should be seen as an EIQ. But the speaker may utter a SAQ to invite the hearer to speculate an answer to the question together (Eckardt 2020). A Japanese SAQ example is shown in (4).

SAQ scenario A and B are flatmates. A has been looking for her key for hours, but she cannot find it. A never tells B where she keeps her key. A utters next to B:

- (4) Kagi-wa doko-ni aru daroo (ka)?
 key-TOP where-LOC be modal Q
 ‘(I wonder) where the key is.’

The example (4) can be roughly translated to English using ‘I wonder’. The use of Japanese modal *daroo* in a question marks the question as conjec-

tural, not an ISQ to the addressee. As we have seen the three different types of non-canonical questions (i.e. EIQs, CorQs and SAQs), the present paper will discuss the data of Japanese discourse particle *ittai* that can be used in these types of questions in the next section.

2 Data

The Japanese particle *ittai* in a question like (5) conveys the speaker's impatience, annoyance and ignorance to the question (Oguro 2017, Kuroiwa 2019).

- (5) Ittai nani-o John-wa wasureta no?
ittai what-ACC John-TOP forgot Q
'What the hell did John forget?'

Though studies have investigated the syntactic position of *ittai* in interrogatives (Huang & Ochi 2004), and have also compared the syntactic similarities and differences between English *wh-the-hell*-questions and *wh-ittai*-questions (Oguro 2017, Kuroiwa 2019), to the best of my knowledge, very little literature has discussed the semantics or pragmatics of *ittai*. In the following, I show how *ittai* is used in EIQs, CorQs and SAQs, and this paper offers an insight into the pragmatic use of *ittai* in different non-canonical questions.

2.1 Ittai in EIQs

As we have seen before, English EIQs use phrases like *on-earth* or *the-hell*; Similarly, Japanese questions can use *ittai* to express EIQs, shown in (6).

EIQ scenario A and B are a couple. A is hosting her birthday party today. A asked B to only order some drinks and chicken wings for the party. Now A sees that there is pizza on the table and A asks B if he ordered the pizza, but B says he did not. A utters in the party:

- (6) Dare-ga ittai pizza-o chuumonshi-ta no?
who-TOP ittai pizza-ACC order-PST Q
'Who the hell ordered the pizza?'

Without using *ittai* in (6), the question will be a plain information-seeking question, and it will be infelicitous in the EIQ scenario. The use of *ittai* conveys the difficulty in searching for an answer, since A cannot imagine anyone else but B to have ordered the food.

2.2 Ittai in CorQs

Ittai may also be used in CorQs which express *cornering effects* (Biezma 2009). Thus, *ittai*-CorQs serve a similar function as the English *or-not*-AltQs. Beyond the *cornering effects*, *ittai* in CorQs conveys the speaker's impatience and urgency towards an answer from the addressee, because it is difficult for the speaker to get the answer in the first place. An *ittai*-CorQ in a sample dialogue is shown in (8).

Dialogue of *ittai*-CorQs:

A utters:

- (7) Konban nani tabe-tai no? (ISQ)
tonight what eat-want.to Q
'What do you want for dinner tonight?'

B responds: 'I will need more time to think about it.' However, 3 hours have passed, and B still does not offer any answer. A is very hungry now and she utters to B:

- (8) Bangohan ittai taberu no, tabe-nai no? (CorQ)
dinner ittai eat Q, eat-not Q
'Do you still want to have dinner or not?'

Without using *ittai* in (8), the question will be a plain ISQ like (7). Then there will be no signal from A to B that A is running out of patience and that A demands an answer from B in the utterance time. Based on this example, we can see that the use of *ittai* in questions is beyond the purpose of having questions answered, but expresses the emotional attitudes (i.e. impatience, annoyance, dissatisfaction, etc.) from the speaker to the addressee.

2.3 Ittai in SAQs

SAQs convey that a) the speaker has difficulty finding an answer, and b) the speaker does not believe the addressee knows the answer. Furthermore, *ittai*-SAQs express the speaker's despair to get an answer, as shown in (9).

SAQ scenario A and B are flatmates. A has been looking for her ring for hours, but she cannot find it. A never tells B where she keeps her ring. A utters next to B:

- (9) Yubiwa ittai doko-ni oi-ta kana?
ring ittai where-LOC put-PST Q
'(I wonder) where the hell the ring is.'

Without using *ittai*, the emotions of the speaker towards the question will not be expressed. Hence, the use of *ittai* in a SAQ expresses that the question is difficult to answer for the speaker and conveys that the speaker is desperately hoping for an answer.

2.4 Interim Summary

As the data (6), (8) and (9) have shown, *ittai* introduces two restrictions on the contexts of use; namely, a question (i.e. an ISQ) has been asked in the previous time, and the speaker has tried to search for an answer in the previous time before the utterance time. To felicitously utter an *ittai*-EIQ, the speaker must have searched for possible answers in the previous time, but she failed to have one. To felicitously ask an *ittai*-CorQ, the speaker must have asked an ISQ to the addressee in the previous time, but the addressee did not provide the answer; hence, the speaker needs to use *ittai* in questions to force the addressee to offer an answer. Last but not least, when uttering an *ittai*-SAQ, the speaker has tried to look for an answer, but she failed to find one. Therefore, firstly, when the speaker utters *ittai* in questions, she always expresses that a question has been asked but obtaining an answer to the question was not a success.

Secondly, using *ittai* in questions emphasizes the difficulty in obtaining an answer. Uttering *ittai*-EIQs means that the speaker is extremely ignorant to the question (i.e. the speaker has no clue what an answer may be); hence, it is obvious that finding answers to EIQs is difficult. If the speaker has gotten the answer when asking an ISQ in the beginning of the conversation, then she would not have to ask a CorQ to force an answer from the addressee. Consequently, *ittai*-CorQs also show that the speaker finds it difficult to get an answer. One may argue that it is not necessary to use *ittai* in SAQs, but the use of *ittai* conveys the speaker's despair towards the difficulty in finding answers to the hearer or whomever around her. Based on this summary of the felicitous use of *ittai* in contexts, an analysis on *ittai*-questions may be developed, which is also the goal of this paper.

3 Towards An Analysis

The analysis builds on the framework by Davis & Gutzmann (2015). I propose that *ittai* can be explained by a hybrid semantic framework that combines use- and truth-conditional content. While the truth-conditional content specifies the worlds where the sentence is true, the use-conditional content

specifies the contexts where the sentence can felicitously be uttered. Davis & Gutzmann (2015) used the superscripts *t* and *u* to distinguish truth-conditional from use-conditional content; *t* is established by the notion of truth and *u* connects the expression and the condition of felicity. Building on this framework, the semantics of *ittai* is shown in (10).

- (10) *ittai*: for questions. Taking arguments of type $\langle\langle s,t \rangle, t \rangle$.
- a. Truth-conditional content: $\llbracket ittai \rrbracket^t = \lambda Q.Q$, given Q is of type $\langle\langle s,t \rangle, t \rangle$. This ensures that *ittai* can only combine with questions.
 - b. Use-conditional content: *sets of contexts* (where c_s = speaker in context c)
 - (i) $\llbracket ittai \rrbracket^u = \{c: c_s \text{ emphasizes that the speaker has tried to search answers for } Q \text{ in previous time, but answers for } Q \text{ remain tremendously difficult to get in } c_w\}$
 - (ii) $\llbracket ittai \rrbracket^u = \textit{felicitous}$, if $c_{@} \in \{c: c_s \text{ emphasizes that the speaker has tried to search answers for } Q \text{ in previous time, but answers for } Q \text{ remain tremendously difficult to get in } c_w\}$

I moreover suggest that *ittai* is a shunting use-conditional item (i.e. shunting UCI) in the sense of Gutzmann(2013). Shunting UCIs are words that shunt their argument to the use-conditional tier and derive the use-conditional content. In other words, the argument for a shunting UCI is used at the use-conditional level, but not reused at the truth-conditional level. Therefore, taking the proposed analysis, we can derive the interpretations of *ittai*-EIQ (6), *ittai*-CorQ (8) and *ittai*-SAQ (9) in the following:

- (11) a. $\llbracket (6) \rrbracket^t = \{\{w: \text{the neighbor next door ordered in } w\}, \{w: \text{the delivery man ordered the pizza in } w\} \dots\}$
 b. $\llbracket (6) \rrbracket^u = \textit{felicitous}$ if $c_{@} \in \{c: c_s \text{ emphasizes that the speaker has tried to search answers for } Q \text{ in previous time, but answers for } Q \text{ remain tremendously difficult to get in } c_w\}$
- (12) a. $\llbracket (8) \rrbracket^t = \{\{w: \text{the addressee wants to have dinner in } w\}, \{w: \text{the addressee does not want to have dinner } w\}\}$
 b. $\llbracket (8) \rrbracket^u = \textit{felicitous}$ if $c_{@} \in \{c: c_s \text{ emphasizes that the speaker has tried to search answers for } Q \text{ in previous time, but answers for } Q \text{ remain tremendously difficult to get in } c_w\}$
- (13) a. $\llbracket (9) \rrbracket^t = \{\{w: \text{the ring is in the kitchen in } w\}, \{w: \text{the ring is in the bathroom in } w\} \dots\}$
 b. $\llbracket (9) \rrbracket^u = \textit{felicitous}$ if $c_{@} \in \{c: c_s \text{ emphasizes that the speaker has}$

tried to search answers for Q in previous time, but answers for Q remain tremendously difficult to get in c_w }

I use Hamblin question semantics, according to which the meaning of a question is the set of all possible answers to it. For truth-conditional meanings of (6), (8) and (9), *ittai*, as a function, takes a question and returns the set of propositions (i.e. the possible answers to the question). As (a) of (11), (12) and (13) shows, *ittai* does not contribute any meaning to the truth-conditional contents at this point. (11-a), (12-a) and (13-a) show that the truth-conditional meanings of *ittai*-questions are a set of propositions.

Ittai contributes its meaning at the use-conditional level, presented in (11-b), (12-b) and (13-b). The use-conditional content describes the felicity conditions for an utterance, and the use-conditional content of *ittai* is a set of contexts where the speaker, c_s , has looked for answers to the question, but answers were very difficult to obtain in the context. Therefore, for an *ittai*-question to be felicitously uttered, the context of evaluation, $c_@$, of that question must be in the set of contexts where the speaker has searched for answers to the question but it was very difficult to find answers for the question. In this way, EIQs, CorQs and SAQs can be characterized by a common set of properties. This explains why *ittai* can be used in all three senses.

4 Discussion

A reviewer pointed out that *ittai* in polar questions, illustrated in (14), sounds degraded in the scenario for (8).

- (14) #Bangohan ittai taberu no?
dinner ittai eat Q
'Do you WANT_F² to have dinner?'

(8) was an *ittai*-CorQ with A-or-not-A form. (14) is built from (8), by omitting the disjunct, "*tabe-nai no* (eat-not dinner)". It is puzzling that *ittai* works in the form of *or-not*-AltQs, not in that of polar questions, because logically speaking, polar questions and *or-not*-AltQs denote the same set of propositions, either $\{p, \neg p\}$. However, the native Japanese informant points out acceptable uses of bare polar *ittai*-questions as in the scenario (15).

- (15) **CorQ revised scenario** A and B are a couple. They have promised

²Notice that English may use *focus* in polar questions to emphasize that the question has been asked and to request an answer from the addressee. For the better English translation of (14), *focus* is marked in the question.

each other that they will have dinner together. A asked B, “What do you want for dinner tonight?”. However, B keeps playing games and does not respond to A’s question. Overtime, A is getting very angry, so A utters to B: (16).

- (16) Bangohan ittai taberu no?
dinner ittai eat Q
‘Do you WANT_F to have dinner?’

According to the informant’s intuition, (16), repeated from (14), is acceptable when A strongly believes that she and B will have dinner and B knows the answer to (16) is affirmative. If this is correct, the acceptability of *ittai* in polar questions depends on A and B’s beliefs in the context. The proposed analysis predicts that (16) is acceptable as in scenario (15), but fails to capture the additional restrictions on A and B’s beliefs. I leave a proper analysis of bare polar *ittai*-questions for the future, expecting that the core content of *ittai* will remain as in (10).

5 Conclusion

This paper presents three different types of non-canonical questions (i.e. EIQs, CorQs and SAQs) in which Japanese discourse particle *ittai* is used, and a unified analysis of *ittai* in terms of its pragmatic usage is provided. The analysis adopts the framework from Davis & Gutzmann (2015) and proposes that *ittai*, used in questions, contributes a use-conditional meaning that the speaker in the context has tried to seek answers to the question before and answers for the question are tremendously difficult to obtain.

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The Same Modality in Different Levels of Meaning

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1 Introduction

This paper addresses the semantic difference between two Japanese sentence-final expressions *mai* (Miyake 1995, Tagawa 2006, among others) and *mono-ka* (Oguro 2014, 2015, 2018, Goto 2018, and Asano 2020). Asano (2020) deals with the semantics of *mono-ka* and argues that *mono-ka* expresses a modal meaning as the presupposition of the sentence, rather than as an assertion. Building on this, I propose that another sentence-final expression *mai* expresses the same modal meaning as the assertion. That is, *mai* and *mono-ka* contribute the same modality to different levels of meaning. Furthermore, presenting with several new data, I point out a thus far unnoticed requirement for *mono-ka*: utterances with *mono-ka* must be those that challenge a preceding utterance.

The rest of this paper is organized as follows: Section 2 presents data that show semantic differences between *mai* and *mono-ka*. Section 3 provides an analysis and Section 4 explains the data. In Section 4, I also provide a semantic condition that must be fulfilled by challenging utterances. Section 5 summarizes the paper and presents the remaining issues and implications.

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2 Data

Both *mai* and *mono-ka* convey that their prejacent (the proposition in the scope of the modals) is very unlikely to be true:^{1, 2}

- (1) a. John-wa kuru mai.
John-TOP come MAI
'John will never come.'
- b. John-ga kuru mono-ka.
John-NOM come MONO-KA
'John will never come.'

The first fact to capture is that these two modals differ from ordinary inferential expressions such as *omou* 'think'. As Asano (2020) observes, *mono-ka* requires that the speaker and other conversational participants share a piece of information that supports the unlikeliness of the prejacent. The same restriction is also observed for *mai*. See below:

- (2) (You and Mary are talking about John's whereabouts. You and Mary know that he is either now in a restaurant, in a gym, or in his office, and that given his schedule, it is almost certain that he is not in his office. Mary asks you "Do you think he is in his office?" You reply:)
 - a. Ofisu-ni-wa iru mai/mono-ka.
office-in-TOP be MAI/MONO-KA
'(He) can't be in his office.'
 - b. Ofisu-ni-wa i-nai to omou.
office-in-TOP be-NEG COMP think
'I think (he) is not in his office.'
- (3) (You and Mary are talking about John's whereabouts. You and Mary know that he is now either in a restaurant, in a gym, or in his office. Only you know that given his schedule, it is almost certain that he is not in his office. However, Mary knows nothing about these facts, and you know that Mary knows nothing. Mary asks you "Do you think he is in his office?" You reply:)
 - a. #Ofisu-ni-wa iru mai/mono-ka.
office-in-TOP be MAI/MONO-KA

¹ Besides their epistemic use, these two modals can encode bouletic modality (modality related to the speaker's desire). This point will be briefly addressed in Section 5. The analysis presented below is only for epistemic use.

² For some unknown reason, the subject of *mai*'s prejacent is basically marked with *wa*, while that of *mono-ka*'s prejacent is marked with *ga*. To exclude the possibility that the difference in the subject marking affects the judgments (as pointed out by Frank Sode p.c.), the subjects of the prejacentes in the following data are omitted.

- b. Ofisu-ni-wa i-nai to omou.
office-in-TOP be-NEG COMP think

In (2), the speaker shares with Mary knowledge about John’s schedule, which supports the unlikelihood of the prejacent (*He is in his office*), while in (3), only the speaker has such knowledge. The unavailability of *mai* and *mono-ka* in (3) indicates that, unlike other inferential expressions, these two modals require that the unlikelihood of the prejacent follow from some pieces of information shared by the speaker and other participants.

Second, as observed by Asano (2020), *mono-ka* can only be used when the utterance or action preceding it is unexpected in terms of the body of information that the speaker assumes is shared by all conversational participants. In (2), the speaker and Mary share the knowledge about John’s schedule, so Mary’s question (*Is John in his office?*) is unexpected for the speaker; Mary does not have to raise such a question because she knows that John is certainly not in his office. In such cases, *mono-ka* is felicitous. However, if the preceding utterance is not unexpected, *mono-ka* sounds unnatural, while *mai* does not show such a restriction:

- (4) (You and Mary are talking about John’s whereabouts. You and Mary know that he is now either in a restaurant, in a gym, or in his office, and that given his schedule, it is almost certain that he is in his office. Mary asks you “Where do you think he is?” You reply:)
- a. Ofisu-ni-wa iru mai.
office-in-TOP be MAI
‘He can’t be in his office.’
- b. #Ofisu-ni-wa iru mono-ka.
office-in-TOP be MONO-KA

In this case, the speaker and Mary share information about John’s schedule. Nevertheless, *mono-ka* sounds odd, because Mary’s question *Where do you think he is?* is not unexpected for the speaker; John cannot be in his office, but he might be either in a restaurant or in a gym, so it is natural for Mary to question which option is true. This shows that *mono-ka*, but not *mai*, requires the unexpectedness of the preceding utterance.

In addition, I propose that utterances with *mono-ka* must challenge the preceding utterance, while those with *mai* do not have to:

- (5) (You and Mary are talking about John’s whereabouts. You and Mary know that he is now either in a restaurant, in a gym, or in his office, and that given his schedule, it is almost certain that he is in his office and not in a restaurant. Mary asks you “Where do you think he is?” You reply:)

- a. Resutoran-ni-wa iru-mai.
restaurant-in-TOP be-MAI
'(He) can't be in a restaurant.'
- b. #Resutoran-ni-wa iru-mono-ka.
restaurant-in-TOP be-MONO-KA

In (5), Mary's question about John's whereabouts is somewhat unexpected, because the speaker and Mary both know that John is certainly in his office, and both are aware that each is privy to this information. Nevertheless, *mono-ka* sounds odd.

I suggest that (5b) is infelicitous because sentences with *mono-ka* must be uttered in order to challenge the preceding utterance. In the felicitous example (2), Mary no longer has a reason to raise the question (*Is John in his office?*) if what the speaker tries to convey (i.e., *John is not in his office*, abstracting away the modality expressed by *mono-ka*) is accepted. In this case, I say that the speaker's utterance successfully challenges the preceding one. Meanwhile, in (5), even if what the speaker tries to convey (*John is not in a restaurant*) is accepted, Mary still has a reason to raise the question because that information alone does not determine whether he is in a gym or in his office, so the speaker's utterance does not challenge Mary's question in (5b).

3 Analysis

Asano (2020) argues that sentences with *mono-ka* contain no at-issue content (as in McCready's (2010) analysis of the Japanese adverb *yokumo*), and instead they encode a presupposition that the prejacent's unlikelihood follows from what is known to the speaker and contextually salient participants. Building on this, I propose that both *mai* and *mono-ka* require that the unlikelihood of the prejacent (expressed here as $\text{LOW}(\text{PROBABILITY}(p))$, where p is the prejacent) follows from the intersection of the Common Ground, i.e., the set of propositions known to all conversational participants, and that *mai* expresses this modality as assertion, whereas *mono-ka* expresses it as presuppositional content.

I depart from Asano in proposing that *mono-ka* contributes to the *speaker presupposition* (Stalnaker 2002), rather than to the standard notion of presupposition. The standard notion of presupposition is what all conversational participants take for granted in the context of utterance. Meanwhile, the speaker presupposition is what *the speaker believes* all conversational participants (including the speaker herself) take for granted. My analysis is presented schematically as follows; CG and Sp.Presup. stand for the Common Ground and speaker presupposition, respectively:³

³The content of $\text{LOW}(\text{PROBABILITY}(p))$ can be defined more formally by using the Kratzerian-

- (6) $\llbracket p\text{-mai} \rrbracket = \begin{cases} \text{Assertion} : \cap \text{CG} \subseteq \text{LOW}(\text{PROBABILITY}(p)) \\ \text{Sp.Presup.} : \text{empty} \end{cases}$
- (7) a. $\llbracket p\text{-mono-ka} \rrbracket = \begin{cases} \text{Assertion} : \text{empty} \\ \text{Sp.Presup.} : \cap \text{CG} \subseteq \text{LOW}(\text{PROBABILITY}(p)) \end{cases}$
 b. Utterances with *mono-ka* must challenge their preceding utterance.⁴

By uttering *p-mai*, the speaker asserts that the unlikelihood of *p* follows from the current common ground. In other words, the speaker of *p-mai* conveys that the body of information shared by all conversational participants entails that *p* is very unlikely.

Meanwhile, *p-mono-ka* has no assertive content; therefore, it makes no contribution to the discourse if its presupposition has already been satisfied in that discourse. I propose that the only way for *p-mono-ka* to contribute to the discourse is *accommodation* (Lewis 1979, among others).⁵ Accommodation is a phenomenon where, by making an utterance with a presupposition that has not been contained in the common ground, the common ground is adjusted to the one satisfying that presupposition. Sentences with *mono-ka* can be felicitously uttered only when the speaker finds that their presupposition is not satisfied in the discourse. By uttering those sentences, she tries to correct what other participants presuppose (more intuitively, she tries to remind other participants that $\cap \text{CG} \subseteq \text{LOW}(\text{PROBABILITY}(p))$ has already been contained in the common ground).⁶

The current claim, where *mai* and *mono-ka* contribute to different levels

style of modal semantics (as Asano 2020 does):

- (i) $\text{LOW}(\text{PROBABILITY}(p)) = \{w : \forall w' [\cap f(w) \wedge w' \text{ is a most ideal world in terms of } g(w) \rightarrow \neg p(w')]\}$, where $\cap f(w)$ corresponds to $\cap \text{CG}$, and $g(w)$ is the set of propositions that are normally true in w .

The detailed meaning of this modality is not directly relevant in this paper: what is important in the following discussion is the level of meaning at which this modality is expressed.

⁴ I do not believe that (7a) and (7b) are independent of each other. As we will see below, *mono-ka* must be used correctively because of its lack of an assertive component (as stated in (7a)). It is reasonable to assume that (7b) derives from this aspect of the usage *mono-ka*.

⁵ My proposal differs from Anano's (2020) in this regard: while I propose that accommodation must occur whenever *mono-ka* is felicitously used, she assumes that it triggers accommodation in some limited cases. This divergence makes no empirical difference, as far as I can see.

⁶ This is in line with Stalnaker's (2002) argument about accommodation. Speaker presupposition is the speaker's belief about the common ground. Therefore, presenting speaker presupposition ϕ to other conversational participants simply adds to the common ground that the speaker believes that ϕ is a member of the common ground, rather than adding ϕ to the common ground. According to Stalnaker, however, ϕ is added to the common ground if the other participants come to believe ϕ . In this case, the speaker alters others' presuppositions by presenting her speaker presupposition, which is what utterances with *mono-ka* are argued to do in my analysis.

of meaning, is corroborated in (8). It is generally assumed that at-issue (i.e., assertive) contents, unlike not-at-issue contents including presupposition, can be followed by denial.⁷ As in (8), *mai* and *mono-ka* show this distinction:

- (8) (Mary asks a speaker A “Do you think John is in his office?” A replies and another speaker B immediately reacts to A’s utterance:)
- a. A: Ofisu-ni-wa iru mai.
office-in-TOP be MAI
‘(He) can’t be in his office.’
B: Uso-o toku-na. iru kanoosei-wa takai.
lie-ACC tell-NEG_{IMP} be possibility-TOP high
‘Don’t tell a lie. He is likely to be in his office.’
- b. A: Ofisu-ni-wa iru mono-ka.
office-in-TOP be MONO-KA
B: ??Uso-o toku-na. iru kanoosei-wa takai.
lie-ACC tell-NEG_{IMP} be possibility-TOP high

In both cases, B’s denial targets the prejacent of *mai* and *mono-ka*. The (in)felicity of the denial in (8a) and (8b) suggests that the prejacent of *mai* is an at-issue content, while that of *mono-ka* is not-at-issue.

4 Capturing Data and a Semantic Condition on Challenging

This section examines how the semantics proposed in (6) and (7) captures the data presented in Section 2. We begin with (2). In this case, $CG = \{q: \text{The speaker and Mary know } q\} = \{John \text{ is either in a restaurant, in a gym, or in his office} \wedge John \text{ is certainly not in his office}\}$. Therefore, $\cap CG \subseteq \text{LOW}(\text{PROBABILITY}(p))$, where $p = John \text{ is in his office}$. This is what is asserted in the *mai*-sentence; the speaker asserts that $\text{LOW}(\text{PROBABILITY}(p))$ can follow from their shared knowledge. As for *mono-ka*, although $\text{LOW}(\text{PROBABILITY}(p))$ is already contained in CG , Mary raises the question that she does not have to. Therefore, the speaker has reason to correct what Mary presupposes, by challenging her question. Hence, *mono-ka* can also be used.

In (3), $CG = \{p: \text{The speaker and Mary know } p\} = \{John \text{ is in a restaurant, in a gym, or in his office}\}$. Therefore, $\cap CG \not\subseteq \text{LOW}(\text{PROBABILITY}(p))$, where $p = John \text{ is in his office}$, because CG does not contain any proposition about the unlikelihood of John being in his office. The *mai*-sentence is infelicitous because what it asserts contradicts the state of the common ground in the context. The use of *mono-ka* is also banned; the speaker presupposition contradicts what *mono-ka* requires.

In (4), $CG = \{p: \text{The speaker and Mary know } p\} = \{John \text{ is either in a}$

⁷ For more fine-grained discussion on this kind of denial, see McCready (2010).

restaurant, in a gym, or in his office \wedge *John is certainly not in his office*}. Therefore, $\cap\text{CG} \subseteq \text{LOW}(\text{PROBABILITY}(p))$, where $p = \textit{John is in his office}$. This allows the utterance with *mai* as in (4a), for the same reason as in (2). As I suggested in the previous section, *mono-ka* can only be used when the speaker finds it necessary to correct what other participants presuppose. The answer to Mary's question (*Where do you think John is?*) does not follow from CG, so her question is not unexpected for the speaker. Therefore, the speaker does not find that her presupposition is not shared by others, so she has no reason to make accommodation. Hence, *mono-ka* is infelicitous.

In (5), $\text{CG} = \{p: \textit{The speaker and Mary know } p\} = \{John \textit{ is either in a restaurant, in a gym, or in his office} \wedge \textit{John is certainly in his office, but not in a restaurant}\}$. Therefore, $\cap\text{CG} \subseteq \text{LOW}(\text{PROBABILITY}(p))$, where $p = \textit{John is in a restaurant}$. Therefore, *mai* can be used. As I suggested in Section 2, *mono-ka* is infelicitous because the utterance (5b) does not challenge Mary's preceding question. I propose that an utterance with *mono-ka* must satisfy the following condition in order to challenge the preceding utterance:

- (9) The speaker can challenge the preceding utterance q by saying *p-mono-ka* only when $\neg p$ resolves the Question Under Discussion (QUD) raised by q .

The QUD raised by Mary's preceding utterance in (5) is *Where is John?*. $\neg p$ (*John is not in a restaurant*) does not resolve this question. Therefore, in the context of (5), (9) is not satisfied. This defies the requirement that utterances with *mono-ka* must be challenging utterances.

Meanwhile, in (2), the QUD raised by Mary's question is *Is John in his office?*.⁸ This question is resolved by the falsity of the prejacent (*John is not in his office*). Hence (9) is satisfied.

It is predicted that a *mono-ka* utterance can be used felicitously in the same context as in (5) if it fulfills (9). This prediction is borne out as follows:

- (10) (The same context as (5))

⁸ The utterance preceding the *mono-ka* sentence does not have to be a question:

- (i) (You and Mary are talking about John's whereabouts. You and Mary know that he is now in a restaurant, in a gym, or in his office, and that given his schedule, it is almost certain that John is not in his office. Mary says to you "John is in his office." You reply:)
- Ofisu-ni-wa iru mono-ka.
office-in-TOP be MONO-KA
'(He) is certainly in his office .

In this case, Mary's preceding utterance is about whether John is in his office, so I assume that the QUD raised by a declarative sentence is the same as the one raised by the polar question based on it; that is, the QUD raised by *John is in his office* is *Is John in his office?*.

Ofisu-igai-no-basyo-ni-wa iru-mono-ka.
 office-except-GEN-place-in-TOP be-MONO-KA
 ‘(He) can’t be in any places other than his office.’

In this case, the prejacent is *John is in any place other than his office*, so its negation (*John is in his office*) resolves the raised QUD *Where is John?*, making *mono-ka* felicitous.⁹

The constraint in (9) is not proposed solely for *mono-ka*; it is a notational variant of a general constraint on challenging. I propose that, at least in Japanese, challenging is subject to almost the same constraint as (9), which can be stated as follows:

- (11) The speaker can challenge the preceding utterance *q* by saying *p* only when *p* resolves the QUD raised by *q*.¹⁰

To see that (11) is at work, consider the following example:

- (12) Nani-o it-teiru. Ofisu-ni-wa i-nai.
 what-ACC say-PROG office-in-TOP be-NEG
 ‘What are you saying? He is not in his office.’

Here, I assume that the first sentence is a marker that signals that the following sentence is intended to challenge the addressee’s utterance, and that the second sentence corresponds to *p* in (11). (12) is acceptable under the context of (2), but not under the context of (4). This is explained by (11); the truth of *p* (*John is not in his office*) resolves the QUD in (2) (*Is John in his office?*) but not the QUD in (4) (*Where is John?*). The same discussion applies to (13):

- (13) (The same context as (5))
 a. #Nani-o it-teiru. Resutoran-ni-wa i-nai.
 what-ACC say-PROG restaurant-in-TOP be-NEG
 ‘What are you saying? He is not in a restaurant.’
 b. Nani-o it-teiru. Ofisu-igai-no-basyo-ni-wa i-nai.
 what-ACC say-PROG office-except-GEN-place-in-TOP be-NEG
 ‘What are you saying? He is not in places other than his office.’

(11) explains these data; in (13a), the truth of the second sentence (*John is not in his office*) does not resolve the QUD in (5) (*Where is John?*), while the truth of the second sentence in (13b), which amounts to *John is in his office*, does. The correlation between the (un)acceptability of (12)-(13) and that of

⁹Note that (3) is a case where (9) is fulfilled but the requirement on the speaker presupposition (7a) is not.

¹⁰Here, the truth of *p* must resolve the QUD while in (9), $\neg p$ is required to do so. The presence of negation in (9) comes from the built-in negation in the semantics of *mono-ka*.

mono-ka examples indicates that (9) is a variant of (11), which is a general constraint on challenging.¹¹

5 Conclusion, a Remaining Issue, and an Implication

This paper argued that the difference between *mai* and *mono-ka* can be attributed to the difference in the levels of meaning to which they contribute. While *mai* asserts that the unlikelihood of the prejacent follows from the common ground, *mono-ka* expresses this modality as the speaker presupposition. Because sentences with *mono-ka* possess no assertive content, they can be used only when accommodation is required, that is, when the speaker finds it necessary to correct what other participants presuppose. This is done by challenging the addressee's preceding utterance. The challenging is subject to a semantic condition: the falsity of the *mono-ka*'s prejacent must resolve the QUD raised by the preceding utterance.

A remaining issue is the possibility of extending the current analysis. Although the focus of this paper has been on their epistemic meaning, these two modals can express bouletic modality (a modality related to the speaker's desire):

- (14) Nidoto annna koto-o iu mai / mono-ka.
 again that thing-ACC say MAI / MONO-KA
 'I will never say that thing again.'

It remains to be explored whether the proposed analysis can be applied to this bouletic use.

Finally, modals have traditionally been classified according to their modal force and modal flavor, as shown in Table 1. My proposal differentiates *mai* and *mono-ka* in terms of the semantic dimension they contribute. This raises a possibility of this dimensional difference being a third parameter of the modal typology, as shown in Table 2.¹²

	force	flavor
<i>must</i>	necessity	free
<i>can</i>	possibility	free
<i>k'a</i> (St'át'imcets)	free	epistemic

TABLE 1 The traditional typology of modals (cf. Matthewson et al. 2007)

¹¹ Interestingly, (12), under the context of (4), and (13a) become acceptable if uttered without the first sentence (the sentence signaling that the whole sequence is a challenging utterance). This indicates that (11) is a constraint solely on challenging, not on assertion in general.

¹² Davis and Matthewson (in press) deals with the St'át'imcets frustrative marker *séna7* and

	force	flavor	dimension
<i>-mai</i>	necessity	epistemic or bouletic	assertion
<i>mono-ka</i>	necessity	epistemic or bouletic	presupposition

TABLE 2 A new typology of modals with the parameter of *dimension*

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argue that it introduces a modal meaning to the not-at-issue content. This might support the current claim that some modals express their modality at the not-at-issue level.

A Disjunctive-Unconditional Analysis of Japanese *Sukunakutomo* ‘at least’

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1 Introduction

In this paper, I examine the Japanese numeral modifier *sukunakutomo* as in (1), which I argue is an adverbial clause that is interpreted as an alternative/disjunctive unconditional.

- (1) **Sukunakutomo** go-nin-no gakusei-ga odot-ta.
at.least five-CL-GEN students-NOM dance-PAST
‘At least five students danced.’

My analysis of *sukunakutomo* being a type of unconditional construction is based on the presence of a conjunctive morpheme *tomo* ‘whether.’ (2) demonstrates that the morpheme is observed in an unconditional construction.¹

¹ Some might argue that the unconditional *tomo* is not involved in *sukunakutomo* because although unconditionals such as (2) are grammatical without *mo* of *tomo*, *sukunakutomo* is incomplete without it.

- (i) a. Taro-ga ko-yooto(-mo), Hanako-wa yorokoba-nai.
Taro-NOM come-SBJV-MO, Hanako-TOP please-NEG
‘Whether Taro comes or not, Hanako won’t be pleased.’
b. Sukunakuto*(mo) go-nin-no gakusei-ga odot-ta.
at.least five-CL-GEN students-NOM dance-PAST

- (2) Taro-ga ko-yoo-**tomo**, Hanako-wa yorokoba-nai.
 Taro-NOM come-will-TOMO Hanako-TOP please-NEG
 ‘Whether Taro comes or not, Hanako won’t be pleased.’

(Hiraiwa and Nakanishi 2020, 399)

By analyzing *sukunakutomo*—for example (1)—as an unconditional with *tomo*, it is possible to naturally capture what is termed as an ignorance implicature of this item (Hirayama and Brasoveanu 2018; Ihara 2020; Ihara and Mizutani 2020). The ignorance implicature that *sukunakutomo* in (1) triggers is such that the utterer is uncertain as to exactly how many students actually danced. Conversely, the unconditional in (2) implicates that the speaker is uncertain whether Taro is actually going to come. In this paper, I demonstrate through the decomposition of *sukunakutomo* that the ignorance implicature of *sukunakutomo* derives from its disjunctive-unconditional nature.

The rest of this paper is organized as follows. In the next section, I decompose *sukunakutomo* and present its structure as an adverbial clause. Then, in section 3, another inference of *sukunakutomo* is observed to illuminate that it is unconditional. Section 4 expands extensively on Rawlins 2008, 2013. In this section, I formulate the unconditional semantics of *sukunakutomo*. In section 5, I present its presupposition to derive inferences. To corroborate my analysis, I discuss, in section 6, the scope rigidity of *sukunakutomo* over negation. Some concluding remarks are provided in section 7.

2 Decomposition

As previous research, including Ihara 2020; Ihara and Mizutani 2020, has already proposed a decomposition analysis of *sukunakutomo*, I adopt a somewhat different route in this study. I decompose *sukunakutomo* into a comparative predicate *sukunaku* ‘smaller’ and *tomo* ‘whether,’ providing (1) a rough interpretation in (3), which amounts to saying that five students danced regardless of the actual number of students that danced.

‘At least five students danced.’

However, the obligatory presence of *mo* is not an idiosyncratic property of *sukunakutomo*. Rather it is observed in unconditional clauses with the configuration “adjective-*tomo*” like *sukunakutomo*.

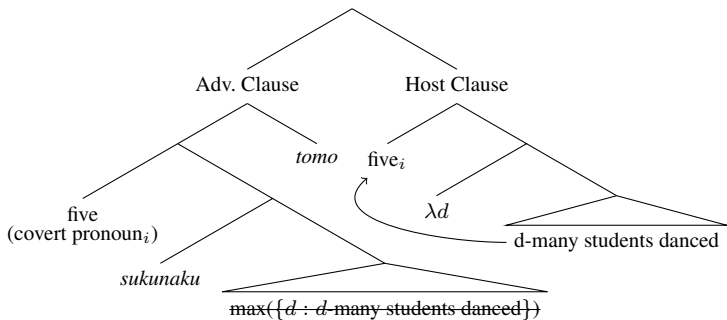
- (ii) Neru-no-ga osoku-to*(mo) go-ji-ni oki-ro.
 sleep-thing-NOM late-**tomo** five-o’clock-at wake-IMP
 ‘Whether you go to bed late or not, wake up at five.’

Therefore, though I have no ultimate answer to the reason why *mo* is required in *sukunakutomo*, it is certain that the *mo* is a general requirement in unconditional clauses with adjectives.

- (3) whether 5 is smaller than the number of the students who danced, 5 students danced.

My rationale for providing this interpretation is that *tomo* in *sukunakutomo* functions as a disjunctive unconditional morpheme, whereas *sukunaku* serves as a comparative that denotes an inequality between two numbers, namely the modified number 5 and the actual number of dancing students. In this proposal, the sentence with *sukunakutomo* involves a biclausal structure wherein *sukunakutomo* is an adverbial clause attached to the host clause with a modified numeral. Here, it is necessary to make clear how the modified numeral 5 is semantically composed both in *sukunakutomo* clause and in host clauses. Moreover elaboration is required with regard to the derivation of the comparative standard—that is what I refer to as the actual number—in the *sukunakutomo* clause. The resolutions that I postulate to these are the following two covert ingredients inside the *sukunakutomo* clause: (i) a covert pronoun indexed to the modified numeral and (ii) a covert comparative standard identified with the maximal degree of the set denoted by a QRed predicate of its host. These postulations yield the structure for (1) in (4). In (4), the pronoun indexed to the degree 5 is present. Furthermore, degree abstraction via QR operation applies in the host clause, and the resulting predicate also appears with a maximal operator as a comparative standard in the *sukunakutomo* clause. The predicate *sukunaku* compares and denotes the inequality between these two numbers such that five is smaller than the maximal number of the students who danced. Note that the pronoun is covert and the comparative standard is not pronounced due to ellipsis under the identity of the predicate in the host clause.

- (4) ‘*sukunakutomo* five students danced’



The proposition that five is smaller than the actual number is composed with the morpheme *tomo*, eventually providing an antecedent for the unconditional semantics and interpreted as ‘whether or not 5 is smaller than the maximal number of the students who danced.’ The more formal seman-

tics of *sukunakutomo* is elaborated in section 4; in the following section, I present relational indifference, an observed implicature to corroborate the unconditional-clause nature of *sukunakutomo*.

3 Relational Indifference

Rawlins (2013) and Nakanishi (2021) observe that unconditionals can trigger another inference of *relational indifference*. For instance, (2), repeated as (5), can express an implication that whether Taro comes is irrelevant to Hanako's pleasure.

- (5) Taro-ga ko-yoo-**tomo**, Hanako-wa yorokoba-nai.
 Taro-NOM come-will-TOMO Hanako-TOP please-NEG
 'Whether Taro comes or not, Hanako won't be pleased.'

If *sukunakutomo* is really given an unconditional interpretation, it is predicted that in some cases, *sukunakutomo* introduces a commitment to indifference rather than ignorance. This prediction is borne out in (6).

- (6) Context:
 In a city council, more than half affirmative of 18 votes were required to pass a bill, and the speaker knows that exactly 15 people have voted in favor of the relevant bill.

Sukunakutomo 10-nin sansee sita kara sono hooan-wa
 at.least 10-CL affirmative did because that bill-TOP
 kaketu-sare-ta.
 endorse-PASSIVE-PAST

'Because at least 10 voted for the bill, it was endorsed.'

This utterance is perfect even in the context where the speaker knows exactly how many members voted for the bill, suggesting that the *sukunakutomo* in (6) derives no ignorance inference. Instead, it triggers a relational indifference that is described in words as below.

- (7) Relative to the fact that the minimum requirement, namely 10 affirmative votes, was satisfied, it does not matter whether the number 10 was equal to or smaller than the actual number of 15.

The above fact that *sukunakutomo* can express such an implicature as relational indifference, in addition to that of ignorance, argues that it should be analyzed as an unconditional construction. In the following section, I enter into the formulation of unconditional semantics of *sukunakutomo* by capitalizing on a proposal made by Rawlins.

4 Unconditional Semantics of *sukunakutomo*

In this section, I apply to *sukunakutomo* the analysis of unconditionals given by Rawlins (2008, 2013), in which a disjunctive unconditional is assumed to introduce a pair of alternatives. Given this, the antecedent of the unconditional in (5) is translated, as below.

$$(8) \quad \llbracket \text{Taro-ga ko-yoo } tomo \rrbracket^c \\ = \{ \lambda w. \text{Taro comes in } w, \lambda w. \text{Taro does not come in } w \}$$

On par with (8), I argue that the *sukunakutomo* clause of (1), repeated in (9), is also interpreted as an alternative set. To compose it, I define the lexical entry of each item in the *sukunakutomo* clause, as below.

$$(9) \quad \text{Sukunakutomo go-nin-no gakusei-ga odot-ta.} \\ \text{at.least five-CL-GEN students-NOM dance-PAST} \\ \text{'At least five students danced.'}$$

$$(10) \quad \begin{aligned} \text{a. } \llbracket tomo \rrbracket^c &= \lambda P_{\langle s,t \rangle}. \{ \lambda w. P(w), \lambda w. \neg P(w) \} \\ \text{b. } \llbracket sukunaku \rrbracket^c &= \lambda n_{\langle d \rangle} \lambda n'_{\langle d \rangle}. n' < n \\ \text{c. } \llbracket \text{covert pronoun} \rrbracket^c &= 5 = \max(\{d : 0 \leq d \leq 5\}) \\ \text{d. } \llbracket \text{comparative standard} \rrbracket^c & \\ &= \max(\{d : d\text{-many students danced}\}) \\ &\rightarrow \text{abbreviated as } \max(st.) \text{ for the sake of saving space} \end{aligned}$$

As the denotation in (10a) shows, *tomo* takes a proposition and returns a pair of alternatives with one negated. In addition, (10b) shows that *sukunaku* is a comparative predicate that denotes an inequality relation between two numbers, as I mentioned in section 2. Composing the lexical items in (10) with the structure in (4) yields (11) for the interpretation of the *sukunakutomo* clause.

$$(11) \quad \llbracket 5 \text{ sukunaku comparative standard } tomo \rrbracket^c \\ = \{ \lambda w. 5 < \max(st.) \text{ in } w, \lambda w. 5 \geq \max(st.) \text{ in } w \}$$

Sukunakutomo as a pair of alternatives is then composed pointwise with its host. According to Rawlins (2008, 2013), unconditionals semantically function as ordinary conditionals, and after Kratzer (1986) a conditional is analyzed as providing a restrictor for the covert necessity modal. Given this assumption, (12) follows.

$$(12) \quad \llbracket (9) \rrbracket^c = \left\{ \begin{array}{l} \llbracket [\Box[5 < \max(st.)]] 5 \text{ students danced} \rrbracket \\ \llbracket [\Box[5 \geq \max(st.)]] 5 \text{ students danced} \rrbracket \end{array} \right\}$$

To derive the conditional meaning, the necessity modal is defined as universal quantification over worlds accessible from the evaluation world according to a contextually provided accessibility function F_c (namely, the modal base), and the definition is given below.

$$(13) \quad \llbracket \square \rrbracket^c = \lambda P_{\langle s,t \rangle} \lambda Q_{\langle s,t \rangle} . \lambda w . \forall w' \in F_c(w) [P(w') \rightarrow Q(w')]$$

This applies to the pair in (12), and finally (14) gains.

$$(14) \quad \llbracket (9) \rrbracket^c = \left\{ \begin{array}{l} \lambda w . \forall w' \in F_c(w) [5 < \max(st.) \text{ in } w' \rightarrow 5 \text{ students danced in } w'] \\ \lambda w . \forall w' \in F_c(w) [5 \geq \max(st.) \text{ in } w' \rightarrow 5 \text{ students danced in } w'] \end{array} \right\}$$

(14) is a pair of alternatives, such that for every accessible world w' , if 5 is less than or greater than the number of the students who danced in w' , then there were 5 students who danced in w' .

This is not the end of the story because the original sentence denotes not a set of propositions like in (14) but a singleton set. Thus, following Kratzer and Shimoyama (2002), a Hamblin universal operator in (15) must be assumed to assert that every proposition in the set is true.

$$(15) \quad \llbracket \forall \alpha \rrbracket^{w,g} = \{ \lambda w . \forall p \in \llbracket \alpha \rrbracket^{w,g} : p(w) = 1 \} \\ \text{(Kratzer and Shimoyama, 2002)}$$

This creates the conjunction of the two alternatives, namely {if $5 < \max(st.)$ then five students danced AND if $5 = \max(st.)$ then five students danced}.

Note also that $5 > \max(st.)$ is ruled out of the second alternative, and it is interpreted as $5 = \max(st.)$ because its consequent asserts that there were five students. In this way, we interpret *sukunakutomo* as an unconditional construction with the meaning ‘whether the modified number is equal to or less than the actual number.’ In the next section, I succinctly illustrate how ignorance and indifference arise in unconditionals.

5 Presuppositions and Inferences

In this section, following Rawlins (2008, 2013), I first explicate how relational indifference arises in unconditional constructions, and then move on to the discussion of ignorance implicatures.

5.1 Relational indifference

Conducting a number of tests (see Rawlins 2013: section 3.1), Rawlins suggests that an unconditional adjunct like *whether Mary cooked pasta or pizza* is an interrogative clause and that a question operator is syntactically present within the clause, as in (16).

$$(16) \quad [\forall [Q [\text{whether Mary cooked pasta or pizza}]] [\text{John was pleased}]]$$

Rawlins further assumes that this operator triggers the two presuppositions of domain exhaustivity and mutual exclusivity, as in (17a) and (17b), where cs stands for the context set provided by the input context of interpretation.

$$(17) \quad \llbracket [Q]\alpha \rrbracket^c = \llbracket \alpha \rrbracket^c, \text{ defined for } w, g, \alpha \text{ only if } \llbracket \alpha \rrbracket^{w,g} \subseteq D_{\langle st \rangle} \text{ and} \\ \text{a. } \forall w \in cs : \exists p \in \llbracket \alpha \rrbracket^c : p(w) = 1 \quad \text{(exhaustivity)}$$

- b. $\forall p, p' \in [\alpha]^c : (p \neq p') \rightarrow \neg \exists w \in cs : (p(w) \wedge p'(w))$ (exclusivity)
(Rawlins, 2013)

(17a) presupposes that for every possible world, either of the alternatives holds true. (17b), on the other hand, presupposes the impossibility for both the alternatives to be true in the same world.

I would like to remind the reader of two things mentioned in the last section: An unconditional adjunct provides domain restrictors for the modal [see (12)], and the final denotation of an unconditional sentence is a singleton set (see (15)). This unconditional semantics, augmented with the presuppositions, results in an unconditional adjunct that provides a jointly exhaustive set of modal restrictors. For any domain restriction for a modal we could try, the modal claim is always true (see Rawlins 2013 section 2.4 for more detail). Thus, in the case of *sukunakutomo 10 voted for the bill*, in any domain, i.e., however many voted for the bill in a world, it is necessarily true that 10 people voted for the bill, which amounts to a relational indifference.

5.2 Ignorance

Let us enter into the discussion of ignorance implicature. We have already seen that an unconditional adjunct provides exhaustive and exclusive restrictors for the modal.

Rawlins adds another assumption that has to do with the modality, according to which the modal is subject to the non-triviality presupposition in (18).

- (18) $F_c(w) \cap p \neq \emptyset$,
where $F_c(w)$ is the modal base and p is the set of the worlds characterized by the restrictors

This presupposes that in the modal base contains some world in which a restrictor argument is true. Given that alternatives are composed pointwise, (18) applies to each proposition in the alternative set. For instance, the non-triviality of ‘whether $5 < \max(st.)$ ’ in *sukunakutomo 5 students danced* is described as below.

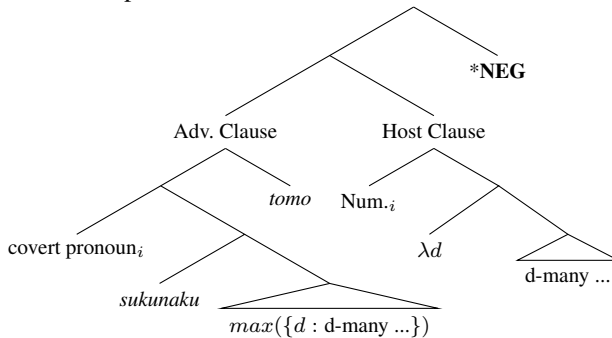
- (19) $\left\{ \begin{array}{l} F_c(w) \cap \{5 < \max(st.), \text{ not } 5 = \max(st.)\} \neq \emptyset \\ F_c(w) \cap \{5 = \max(st.), \text{ not } 5 < \max(st.)\} \neq \emptyset \end{array} \right\}$

In the above set, I add *not A* because of mutual exclusivity in (17b), i.e., both alternatives cannot simultaneously hold true. As long as the modal base $F_c(w)$ is compatible with the speaker’s belief in the evaluation world, (19) denotes that the speaker’s belief includes, for each alternative, at least one world in which it holds. This is equivalent to the speaker’s ignorance such that she is not sure whether the actual number exceeds 5.

6 Above Negation

It follows from my account of the implicatures that *sukunakutomo* cannot be interpreted under negation. Specifically, *sukunaku* cannot take as its comparative standard a QRed predicate that negation outscopes in the host clause, which is schematized as (20).

(20) The uninterpretable structure with *sukunakutomo* under negation



This structure is uninterpretable because a contradiction arises between the implicature introduced by *sukunakutomo* and the assertion of the host clause. As elaborated in the previous section, *sukunakutomo* induces an implicature based on the presuppositions, which are immune to the negation as a hole. Thus, the implicature obtained from (20) is that there is at least one possible world for either alternative, i.e., (i) the modified number is equal to the exact number and (ii) the modified number is smaller than the exact number, where it is true. The host clause, however, is susceptible to the existence of negation, and thus its resulting reading from the structure in (20) is such that P is true for “less than” the modified number.

To illustrate this point more clearly, it suffices to observe the uninterpretability of *sukunakutomo* in an environment in which its narrow scope reading is forced with regard to negation. For such an environment, (21a), adapted from Watanabe 2004, shows that the scope of an item under negation is determined by the relative position of a negative polarity item (NPI) like *mettani*.

- (21) a. Kaigi-ni-wa 10-nin ko-nak-atta.
 meeting-GEN-TOP 10-CL come-NEG-PAST
 ‘It was not the case that 10 people came to the meeting.’
 ‘There were 10 people who did not come to the meeting.’
 (not > 10; 10 > not)
- Kaigi-ni-wa mettani 10-nin ko-nak-atta.
 meeting-GEN-TOP rarely 10-CL come-NEG-PAST

‘It was often the case that at most 9 people came to the meeting.’
 (not > 10; *10 > not)

Given this, it is predicted that the sequence ‘NPI ... *sukunakutomo* ... NEG’ must be uninterpretable, which (22b) verifies.

- (22) a. **Sukunakutomo** 10-nin mettani ko-nai.
 at.least 10-CL rarely come-NEG
 ‘There are at least 10 people who rarely come.’
- b. ?? Mettani **sukunakutomo** 10-nin ko-nai.
 rarely at.least 10-CL come-NEG
 ‘It is often the case that at most 9 people come.’

In (22a), there arises no conflict between (i) the implicature of *sukunakutomo* and (ii) the host-clause assertion: (i) 10 or more than 10 people rarely come and (ii) there are (at least) 10 people who rarely come. Conversely, (22b) invokes a conflict between the two: (i) 10 or more than 10 people come and (ii) it is often the case that at most 9 people come.²

In the following final section, I briefly summarize my proposal and mention a remaining question.

7 Concluding Remarks

In this paper I propose that *sukunakutomo* should be analyzed as a disjunctive unconditional construction. Through its decomposition, I demonstrate that the implicatures of *sukunakutomo*, *ignorance* and *relational indifference*, derive from its unconditional nature.

Before closing this section, I would like to mention one case where *sukunakutomo* modifies a non-numerical expression.

- (23) Sukunakutomo John to Mary-wa ki-ta.
 at.least John and Mary-TOP come-PAST
 ‘At least John and Mary came.’

My current proposal indeed fails to capture the above case because it is not simple to define the maximality of John and Mary in a way that fits into the intuitive meaning of (23). However, we could solve this by revising the semantics of *sukunaku* ‘smaller.’ If *sukunaku* is defined in terms of a subset relation, e.g., John and Mary is a subset of the individuals who came, (23) would be interpreted in a fashion similar to what I have explicated in this

² Schwarz and Shimoyama (2009) also observe that *sukunakutomo* coerces a numeral to have a wide scope wrt negation while Ihara (2020) and Ihara and Mizutani (2020) argue that the narrow-scope reading leads to “at most” interpretation. I put aside this discussion for future work.

paper. Adopting this sort of subset semantics requires us to meticulously examine numerical cases once again, though.

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Two Strategies for Being ‘at least’: Japanese *sukunakutomo* and English *at least*

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1 Introduction

The Japanese *sukunakutomo* is often assumed to be a counterpart of the English superlative modifier *at least*, because they share the same two readings, the epistemic (EPI) and concessive (CON) readings (Nakanishi and Rullmann 2009):

- (1) a. At least three people came.
b. The speaker is uncertain about exactly how many people came. (EPI)
c. Three people came and three people’s coming is not the best result and not the worst result either. (CON)
d. Sukunakutomo 3-nin kita.
sukunakutomo three-CL came
‘At least three people came.’ (EPI/CON)

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However, they differ in their availability of the EPI-reading. The EPI-reading of *sukunakutomo* is difficult to obtain if it is used with a scale with mutually exclusive alternatives, where the prejacent and its alternatives cannot be true at the same time (Rullmann (2007)):

- (2) Q: How did Taro's race go in yesterday's final?
- a. Taro at least won a silver medal.
 - b. The speaker is uncertain about what medal Taro won. (EPI)
 - c. Taro won a silver medal and winning a silver medal is not the best result and not the worst result either. (CON)
 - d. Taro-wa *sukunakutomo* ginmedaru-o totta. (??EPI/CON)
 Taro-TOP *sukunakutomo* silver.medal-ACC won

Unlike (1d), the prejacent (i.e. *Taro won a silver medal*) and its alternatives (i.e. *Taro won a bronze medal* and *Taro won a gold medal*) cannot be true simultaneously, and the EPI-reading is unavailable in this case.

This paper addresses two questions about *sukunakutomo*: (i) how are the two readings derived? and (ii) why does the availability of the EPI-reading depend on a scale with which it is associated? Extending our previous work (Ihara and Mizutani (2021)), this paper claims that *sukunakutomo p* is a concessive conditional like *even-if-conditionals*, which consists of *sukunai* 'little/few', *to* (the conditional morpheme) and the focus particle *mo* 'even', and that the two readings correspond to the two interpretations of *even if*, *standing-if* and *introduced-if* (Bennett (1982) and Guerzoni and Lim (2007)), and derives the unavailability of the EPI-reading through the incompatibility of the additive presupposition of *mo* with a mutually exclusive scale.

The structure of this paper is as follows. Section 2 reviews a previous analyses of *at least* and our previous work and points out that they cannot answer the above two questions. Section 3 demonstrates that the proposed concessive conditional analysis of *sukunakutomo* can derive the two readings and capture the restriction on the EPI-reading. Section 4 concludes this paper.

2 Previous Analyses

2.1 Chen (2018)

Chen (2018) proposes that *at least* can be decomposed into the preposition *at*, the comparative *less* and the superlative morpheme *-est* and has the semantics in (3a), which derives the truth conditions of (2a) as in (3c):¹

¹Chen (2018) assumes two different LFs for the two readings of *at least* but we set aside this difference due to space limitations. In addition, this paper does not discuss other previous analyses of *at least* (e.g. Geurts and Nouwen (2007)). See Ihara and Mizutani (2021) for the discussion

- (3) a. $\llbracket \textit{at least} \rrbracket^{w,c} = \lambda\alpha_{\langle s, t \rangle}. \exists\gamma[\gamma \in C \wedge \gamma_w \wedge \forall\beta[\beta \in C \wedge \beta \neq \alpha \rightarrow \mu_C(\alpha) < \mu_C(\beta)]]$, where μ_C is a covert measure function and C is a set of alternatives associated with focus. (Chen 2018:69)
- b. Simplified LF of (2a): $\llbracket \textit{at least} \llbracket \text{Taro won a [silver]}_F \text{ medal} \rrbracket \rrbracket$
- c. $\llbracket (2a) \rrbracket^{w,c} = \exists\gamma[\gamma \in C \wedge \gamma_w \wedge \forall\beta[\beta \in C \wedge \beta \neq \textit{'Taro won a silver medal'} \rightarrow \mu_C(\textit{'Taro won a silver medal'}) < \mu_C(\beta)]]$
- d. $C = \{ \textit{Taro won a bronze medal}, \textit{Taro won a silver medal}, \textit{Taro won a gold medal} \}$

The superlative meaning (the underlined parts in (3c)) demands that the prejacent is the lowest among its alternatives, and the lower ranked alternative (i.e. a bronze medal) is excluded from C , as in (3d).

The EPI-reading is obtained when the informativity is at issue. The above truth conditions state that there is one element in C that is true. In other words, (2a) is true iff Taro won a silver or gold medal. Because the speaker does not provide the most informative unique answer, the ignorance effect arises.

The CON-reading is obtained when the evaluativity is at issue and the relevant higher alternative in C (i.e. a gold medal) is contextually known to be false. In this context, the prejacent is the only true proposition in C , and it is entailed. Given the presence of the higher and lower ranked alternatives (i.e. gold and bronze medals), the prejacent is not the best and not the worst either, which gives rise to the concessive flavor.

It seems that Chen's (2018) analysis of *at least* can be directly applied to *sukunakutomo*, because these two expressions share the same two readings. However, there are two difficulties. The first is the difference in the morphological makeup. Chen's (2018) analysis involves the superlative meaning (the underlined part in (3c)), and this is the reflection of the superlative morpheme in *at least*. In the case of *sukunakutomo*, there is no superlative morpheme involved, and it is unclear why *sukunakutomo* has such a superlative meaning. The question is, therefore, why *sukunakutomo* has the same two readings as *at least* despite the fact that the former does not contain the superlative morpheme. The second is the difference in the availability of EPI-readings. As noted above, unlike *at least*, the EPI-reading of *sukunakutomo* is difficult to obtain when it is associated with a scale with mutually exclusive scale. If these expressions have the same semantics, this is unexpected. Hence, an alternative analysis of *sukunakutomo* is called for.

2.2 Ihara and Mizutani (2021)

In our earlier work (Ihara and Mizutani (2021)), we claim that *sukunakutomo* can be decomposed into *sukunai* 'few/little', *to* (conditional), and *mo* 'even',

on the difficulties in applying these analyses to *sukunakutomo*.

and forms a concessive conditional like *even if* and that the superlative meaning is derived from the scalar presupposition of *mo*. The adjective *sukunai* is interpreted as *few* or *little* and the exact interpretation (i.e. exactly a ‘small’ amount) is obtained through the MAX-operator (cf. Kennedy (2015)).

- (4) $\llbracket \textit{sukunai} \rrbracket^{w,c} = \lambda D_{\langle d, t \rangle} . \text{MAX}(D) = d_{\Delta}$, where D is a set of degrees and d_{Δ} is a small value relative to the context c .

Following Kratzer (1986), the conditional morpheme *to* is assumed to introduce a covert necessity operator to derive its conditional meaning.

- (5) a. $\textit{to}_{\textit{conditional}}(p)(q) \rightsquigarrow \text{NEC}_w[p] [q]$, where NEC is a covert necessity operator.
 b. $\llbracket \text{NEC}_{\textit{to}} \rrbracket^{w,c} = \lambda p . \lambda q . \forall w' \in \bigcap f_c^*(w) : q(w')$, where $f_c^*(w) = f_c(w) \cup \{ \llbracket p \rrbracket \}$ and f_c is a conversational background in c .

The focus particle *mo*, like *even*, presupposes that the prejacent is ranked the lowest with regard to a contextually salient graded property ($<_c$) (cf. Nakanishi 2006). The graded property is associated with not only likelihood but also unexpectedness, noteworthiness and so on (Rullmann 2007):

- (6) $\llbracket \textit{mo} \rrbracket^{w,c} = \lambda p . p_w \wedge \partial (\forall q [q \in \llbracket p \rrbracket^{\text{ALT}} \wedge q \neq p \rightarrow p <_c q])$,
 where ∂ is a presupposition operator (see Beaver (2001)).

Under this analysis, the simplified LF of (1d) is (7a), where *mo* takes a sentential scope (see Aoyagi (1998) a.o.), and the adjective *sukunai* in *sukunakutomo* takes a contextually determined covert scalar anaphor α_{amount} of type $\langle d, t \rangle$ (cf. Kayne (2005) and Sawada (2016)) and it is resolved as in (7b). Given these ingredients, (2d) is interpreted as in (7d).

- (7) a. $\llbracket \boxed{3} \textit{mo}_{\textit{even}} \boxed{2} \textit{to}_{\textit{conditional}} \boxed{1} [\textit{sukunai}]_F \alpha \rrbracket [\text{three people came}]]]$
 b. $\llbracket \boxed{1} \rrbracket^{w,c} = \llbracket \textit{sukunai} \rrbracket^{w,c} (\llbracket \alpha \rrbracket^{w,c})$
 $= \llbracket \lambda I_{\langle d, t \rangle} . \text{MAX}(I) = d_{\Delta} \rrbracket (\lambda d . d\text{-many people came}_w)$
 $= \text{MAX}(\lambda d . d\text{-many people came in } w) = d_{\Delta}$, where $\llbracket \alpha \rrbracket^{w,c} = \lambda d . d\text{-many people came}_w$
 c. $\llbracket \boxed{2} \rrbracket^{w,c} = \llbracket \textit{to}_{\textit{conditional}} \rrbracket^{w,c} (\llbracket \boxed{1} \rrbracket^{w,c}) (\llbracket \textit{three people came} \rrbracket^{w,c})$
 $= \text{NEC}_w [\text{MAX}(\lambda d . d\text{-many people came in } w) = d_{\Delta}]$
 $[\exists d [\text{people}(x) \wedge \text{came}_w(x) \wedge \mu(x) = 3]]$
 d. $\llbracket \boxed{3} \rrbracket^{w,c} = \llbracket \textit{mo}_C \rrbracket^{w,c} (\llbracket \boxed{2} \rrbracket^{w,c})$
 $= \text{NEC}_w [\text{MAX}(\lambda d . d\text{-many people came in } w) = d_{\Delta}]$

- $$[\exists d[\text{people}(x) \wedge \text{came}_w(x) \wedge \mu(x) = 3]]$$
- $\wedge \partial(\forall q [q \in \llbracket 2 \rrbracket^{\text{ALT}} \wedge q \neq \llbracket 2 \rrbracket^{w,c} \rightarrow \llbracket 2 \rrbracket^{w,c} <_c q])$, where $<_c$ is resolved as the *less-than* relation.
- e. $\llbracket 2 \rrbracket^{\text{ALT}}$
 $=\{\text{if the number of people who came was } d, \text{ three people came:}d\}$

The assertion states that if the number of people who came was d_Δ , which is a small value relative to the context c , three people came. The scalar presupposition demands that among the alternative propositions of the form ‘if the number of people who came was d , three people came’, the prejacent is the least in terms of $<_{\text{less-than}}$. To meet this requirement, d_Δ should be the least value. The resulting meaning is that if the number of people who came was the least, three people came. In this way, the existence of *mo* ensures the superlative meaning without using the superlative morpheme.

The ignorance effect of the EPI-reading is derived pragmatically through a typical rule of conversation (Grice (1989)): The speaker asserted that in the case where the number of people who came was the least, three people came, but did not mention other cases (e.g. cases where the number of people who came was large, the largest and so on). From this, we can infer that the speaker does not know how many people came when the number of people who came was larger than the least. Hence, the ignorance inference arises.

The above analysis correctly derives the superlative meaning without the superlative morpheme and captures the ignorance inference of the EPI-readings. However, there remains several problems: It is unclear how the CON-reading is derived based on the meaning of the concessive conditional and why the EPI-reading is difficult to obtain when *sukunakutomo* is associated with a scale with mutually exclusive alternatives.

3 Proposal

As in (8), *even if* has two different readings: one in which the consequent is entailed (= *introduced-if*) and the other in which it is not (= *standing-if*):

- (8) a. Even if the bridge were standing, I wouldn’t cross.
 \rightsquigarrow I wouldn’t cross. (Introduced-if)
- b. Even if John drank [one ounce of whiskey]_F, she would fire him.
 $\not\rightsquigarrow$ she would fire him (Standing-if)
 (Guerzoni and Lim 2007:276)

Recall that according to Chen (2018), the prejacent of the CON-reading of *at least* is entailed, while that of the EPI-reading is not. Based on this similarity, this paper claims that the two readings of *sukunakutomo* correspond to the

two readings of *even if*: The former corresponds to *introduced-if*, where the consequent is entailed, and the latter corresponds to *standing-if*, where the consequent is not entailed.

3.1 Guerzoni and Lim (2007)

Guerzoni and Lim (2007) assume that *even* in *even if* has the standard semantics, which involves additive (existential) and scalar presuppositions.

- (9) $\llbracket \textit{even} \rrbracket(C)(p)(w)$ is defined iff (Guerzoni and Lim 2007:278)
 $\exists q \in C [q \neq p \ \& \ q(w) = 1]$ & Additivity
 $\forall q \in C [q \neq p \neq q \rightarrow p <_{\text{likely/expected}} q]$ Scalarity
 If defined, then $\llbracket \textit{even} \rrbracket(C)(p)(w) = p(w)$ Assertion

According to Guerzoni and Lim (2007), the entailment of the consequent is obtained if *even* is associated with the covert AFF(irmative) operator in the *if*-clause. Given this, the truth conditions are derived as follows:²

- (10) a. $\llbracket \text{AFF} \rrbracket^o = \lambda t. t$, $\llbracket \text{AFF} \rrbracket^f = \{ \lambda t. t, \lambda t. t = 0 \}$
 b. Even [if [AFF]_F the bridge were standing, I would not cross]
 c. C={that if the bridge were standing I wouldn't cross, that if the bridge were not standing I wouldn't cross}
 d. Assertion: If the bridge were standing I would not cross.
 e. Existential Presupposition
 $\exists q [q \in \{ \text{that if the bridge were standing I wouldn't cross, that if the bridge were not standing I wouldn't cross} \} \ \& \ q \neq \text{that if the bridge were standing I wouldn't cross} \ \& \ q(w) = 1]$
 \Leftrightarrow that if the bridge were not standing I would not cross is true in evaluation world.
 f. Scalar Presupposition
 That I would not cross is less likely if the bridge were standing than if the bridge were not standing.(Guerzoni and Lim 2007:282)

Alternative propositions that *even* operates on consist of *if* p , q and *if* $\neg p$, q . As a result, the combination of the existential presupposition and the assertion leads to the statement *if* p , q and *if* $\neg p$, q , which exhaustifies the logical possibilities. This amounts to saying that under any circumstance, the consequent q is true. Hence, the consequent is entailed.

The second reading of *even if* is derived if *even* is associated with an element other than the covert AFF operator in the *if*-clause (e.g. a degree expression). The truth conditions of the second reading are derived as follows:

² $\llbracket X \rrbracket^o$ and $\llbracket X \rrbracket^f$ denote the ordinary and focus semantic values of X , respectively.

If Taro was not d_{Δ} -successful, Taro won a silver medal.

- f. Assertion: If Taro was d_{Δ} -successful, Taro won a silver medal.

The point here is that the combination of the existential presupposition and the assertion: If Taro was d_{Δ} -successful or was not d_{Δ} -successful, Taro won a silver medal. This exhaustifies the logical possibilities, and the consequent is entailed. In addition, a silver medal is not the worst result and not the best result either. Hence, the CON-reading is obtained.

Next, let us consider the EPI-reading of (1d). The LF is (13a), where *mo* is associated with the degree expression *sukunai* like *standing-if* and α is resolved as in (13b) because the informativity is at issue:

- (13) a. [mo_{even} [$\text{to}_{\text{conditional}}$ [p *sukunai*_F α] [q three people came]]]
 b. $\alpha = \lambda d. d$ -many people came.
 c. $C = \{\text{if the number of people who came was } d, \text{ three people came: } d\}$
 d. Scalar Presupposition: ‘If the number of people who came was d_{Δ} , three people came’ $<_{\text{likely}}$ ‘If the number of people who came was any other degree, three people came’
 e. Existential Presupposition: If the number of people who came was $d \neq d_{\Delta}$, three people came.
 f. Assertion: If the number of people who came was the least, three people came.

The scalar presupposition requires that the prejacent is the least likely among its alternatives (i.e. the prejacent is required to entail all the other alternatives). To satisfy this requirement, d_{Δ} should be the least. The result is that if the number of people who came was the least, three people came. Given the entailment reversal of the antecedent of the conditional, for any $d > d_{\Delta}$, if the number of people who came was d , three people came. However, this does not consider all the relevant cases (e.g. a case in which no people came). The consequent is, therefore, not entailed.

Next, let us consider why the EPI-reading of (2d) is difficult to obtain:

- (14) a. # [mo_{even} [$\text{to}_{\text{conditional}}$ [p *sukunai*_F α] [q Taro won a silver medal]]]
 b. $\alpha = \lambda d. d$. Taro won d -many medals in the race
 c. $C = \{\text{if Taro won } d\text{-many medals in the race he won a silver medal: } d\}$
 d. Scalar Presupposition: ‘If the number of medals that Taro won

- was d_{Δ} , he won a silver medal' $<_{\text{likely}}$ 'If the number of medals that Taro won was d , he won a silver medal'
- e. Existential Presupposition: If Taro won $d \neq d_{\Delta}$ -many medals, he won a silver medal.
 - f. Assertion: If the number of medals that Taro won was d_{Δ} , he won a silver medal.

The problem arises from the existential presupposition. Given that one individual can receive only one medal in one race, d_{Δ} should be one. Hence, the existential presupposition results in 'if the number of medal Taro won was $d > d_{\Delta}$ he won a silver medal' but this requires that Taro won more than one medal in one race. However, this is impossible given the nature of a scale with mutually exclusive alternatives. Hence, the EPI-reading is blocked.

The difference in the availability of EPI-readings between *at least* and *sukunakutomo* is summarized as follows: The EPI-reading of *at least* states that there should be one member in C that is true, which is equivalent to a disjunctive sentence. We can form disjuncts from mutually exclusive propositions (e.g. Taro won a silver medal or a gold medal). Hence, the EPI-reading of *at least* is possible when it is associated with a mutually exclusive scale. The EPI-reading of *sukunakutomo*, on the other hand, requires that, due to the additive presupposition of *mo*, there should be more than one members in C that are true, but this requirement cannot be compatible with mutually exclusive scales. Hence, the EPI-reading of *sukunakutomo* is difficult to obtain if it is associated with these scales.

4 Conclusion

This paper claims that the two readings of *sukunakutomo* correspond to the two readings of *even if* and that the incompatibility of the EPI-reading with a mutually exclusive scale arises from the additive presupposition of *mo*. However, the availability of the EPI-reading seems to differ according to speakers.⁴ In fact, even when such a scale is involved, the EPI-reading is possible if the contrastive *wa* is added or if the non-past form of the verb or modals such as *darou* 'would' is used:

⁴ The additive presupposition of *mo* plays a crucial role for the current analysis. However, it is well known that the additive presupposition of scalar particles is absent in some cases.

(i) a. #We invited [Bill]_F, although we didn't invite anyone else.

b. John is even a [full]_F professor. (Guerzoni and Lim 2007:288)

The additive presupposition explains the infelicity of the first example, but the second example indicates that this presupposition is optional, because the associate of *even* in this example constitutes a scale with mutually exclusive alternatives. Our speculation is that the optionality of this presupposition leads to the speaker variation of the availability of the EPI-reading.

(15) Q: How did Taro's race go in yesterday's final?

- a. Taro-wa sukunakutomo ginmedaru-wa totta.
Taro-TOP sukunakutomo silver.medal-CT won
- b. Taro-wa sukunakutomo ginmedaru-o toru/toru-darou.
Taro-TOP sukunakutomo silver.medal-ACC win/win-would

(EPI/CON)

At present, we have nothing to say about these facts, and leave the analysis for our future research.

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Contrastive topic =*gyaa* in Ikema-Nishihara Miyakoan of Southern Ryukyus

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1 Introduction

The primary purpose of this study is to describe the usage of =*gyaa*, one of the background (topic) particles in Ikema-Nishihara Miyakoan (hereafter, Nishihara). Nishihara has a rigid system to mark the information structure (i.e., focus vs. background) morphosyntactically using both background and focus particles. The particle =*gyaa* is typologically uncommon because it is

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an accusative-dedicated background (topic) form for objects (Hayashi, 2010; 2017) or a contrastive topic for other elements (Tao, 2018). Regarding the information structure (IS) marking system, what distinguishes Nishihara and other Miyako dialects from the rest of Ryukyuan languages and Japanese is that they have an obligatory focus particle (=du) that indicates an information (non-contrastive) focus (Shimoji, 2018). In describing the usage of =gyaa compared with the focus =du, this paper also discusses the relationship between contrastiveness and focushood, which is often blurred in languages like Japanese, where a focus is mainly expressed by intonation.

2 Background

2.1 The information-structure particles in Nishihara

Nishihara has three types of IS marking particles: =du (focus particle), =a (background/topic particle¹), and =gyaa (object background/topic particle), all of which can be used as contrastive (Hayashi, 2013; 2016; 2017). Within a sentence, all the elements preceding the element to which the focus particle =du is attached are coded by the background marker =a or, in the case of an object, =gyaa in the form of =u=gyaa² (see 2.3 for details). As Tao (2018) reports on Ikema Miyakoan, a language closely related to Nishihara, =gyaa can follow nouns of other grammatical relations, such as subjects and datives, when the nouns are contrasted.

2.2 The origin of =gyaa

The marker =gyaa is considered to stem from =gami=a ‘=LIM=TOP’ (Tao 2018). In the Irabu dialect, =gami is a limited case marker, and =gami=a ‘=LIM=TOP’ can be used as a contrastive topic marker (Shimoji, 2017: p.165). Based on this observation, Tao (2018) argues that =gyaa in Ikema Miyakoan is from =gamyaa, which is a natural morphophonological change in this language. There is a slight difference in usage between Ikema and Nishihara, but, as Tao says, =gyaa in Nishihara has the same origin and is thought to have acquired the usage of non-contrastive topics in the object.

It is important to note that all other Miyako dialects also have an object background form that appears as =u=ba ‘=ACC=TOP/BG’. Only a few dialects,

¹ This particle is what is widely referred to as a "topic" marker. For the clarity of the indicated object, the second author also sometimes calls it "topic" marker, but functionally it is more accurate to call it "background" rather than "topic". Indicating "topic" is included in its function (see section 2.3 or Hayashi 2017 in detail). For this reason, the "background" is used here instead of "topic" as the label of =a and =gyaa.

² =a can also be used to indicate the object background.

including Nishihara, have $=u=gyaa^3$. It is still unclear why or how Miyako has such an accusative-dedicated object background marker, which has not been found in other Ryukyuan languages. As Miyakoan extensively marks cases to distinguish subject and object, there could be a motivation to distinguish subject and object topics.

2.3 The IS marking of Nishihara

Nishihara's IS coding is mainly realized morphologically (Hayashi, 2017). It has both a focus particle $=du$ and background particles $=a$ or $=gyaa$, which are all enclitics, attached to various parts of a sentence in a paradigmatic manner. Both IS particles, along with word order and predicate form, are used together to indicate the IS of the sentence. Under certain conditions, namely, when the sentence is present (non-past), positive, or declarative, the focus particle is obligatory. The focus particle appears only once in a clause, indicating the left edge of the focus domain. The right end of the focus domain was not marked. The words/phrases of a sentence before the $=du$ -attached phrase should be coded with background particles, whereas the phrases/words after the focus particle can be optionally coded with background particles if they are not in focus. The system is schematized in Figure 1, where PRED is a predicate and X is a phrase preceding the predicate.

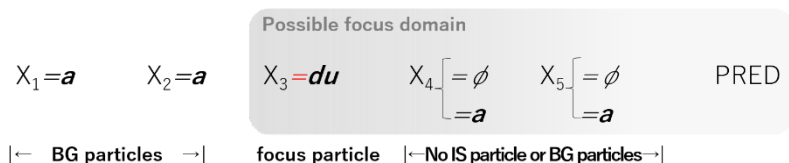


Figure 1. IS particles in a sentence: The word order and focus domain

The usage of $=du$ ‘FOC’, as we said, is to indicate the informationally “new” part of a sentence (with or without contrastive meaning). It includes the most common usage of focus, namely coding the answering part of the *wh*-question (Lambrech, 1994).

- (1) (Replying to “What can you see?”)
mayu=nu=du. mii-rai ui
 cat=NOM=FOC see-POT PROG.NPST
 “I can see a cat.”

³Ikema Miyakoan also have $=u=ba$ in addition to $=u=gyaa$ (Tao 2018). $=u=ba$ is not usually observed in Nishihara.

As =*du* is obligatory in all present/positive/declarative sentences to indicate new information, it also appears in sentence-focus constructions, the so-called thetic sentences.

(2) (Finding a cat walking outside)

mayu=nu=du mii-rai ui
 cat=NOM=FOC see-POT PROG.PRES
 “Ah, I can see a cat.”

As in (2), when the whole sentence carries new information, =*du* is attached to the initial part of the sentence. It can also be used in the so-called “contrastive focus” without changing any form, including intonation.

(3) (Replying to “You see a dog?”)

aran, mayu=nu=du mii-rai ui
 no cat=NOM=FOC see-POT PROG.PRES
 “No, I can see a cat.”

Background particles can also be used in contrastive meanings without changing the form/intonation. This is exemplified by (4).

(4) *taroo=ya t-tai-suga ziroo=ya kuu-n*
 Taro=BG1 come-PST-but Jiro=BG1 come-NEG
 “Taro came, but Jiro didn’t come.”

As shown above, IS particles in Nishihara indicate what is informationally new or background, and all IS particles can express contrastiveness. This study investigated the use of the second background marker, =*gyaa*.

2.4 The purpose of this study

In the following sections, we discuss the usage of the background particle =*gyaa* when it is attached to the subject and object, especially with an interest in the question, “what is the difference between contrastive focus and contrastive topic?” The basis of this questioning is the fact that, as Repp (2016) points out, “focus” and “contrast” are often confused concepts. Particularly in languages such as English, where the focus is marked by intonation in the same way as in contrast, these can lose their formal distinction⁴. On the other

⁴ This of course has a lot to do with how focus is defined. Especially in relation to contrast, as Repp points out, the definition of focus in Rooth (1992) 's alternative semantics can be synonymous with some definitions of contrast. In the present study we mainly use the characterization of IS and focus based on Lambrecht (1994) which is independent of contrast, because it is more

hand, in Nishihara, the information structure is primarily presented in a morphosyntactic manner, and contrastiveness is independent of it. Therefore, if =gyaa is a background marker, it can be predicted that even when it appears contrastive, there should be a difference from the contrastive focus.

To confirm this, we investigated the usage of =gyaa, especially in the answering part for *wh*-questions, which is the typical usage of the focus. As mentioned above, =gyaa in Nishihara occurs most frequently as an object background marker, with or without a contrastive meaning. In contrast, as reported by Tao (2018) regarding the property of =gyaa in Ikema, =gyaa attached to elements other than the object is expected to always have a contrastive meaning in Nishihara. In the following, we will show how =gyaa is used in each of these two different cases and describe the relationship between IS properties and the contrastiveness of IS markers in Nishihara.

3 Data

We created a questionnaire to control the context: contrastive vs. non-contrastive, and background vs. focus (answer to the question). The second author, who mainly conducted fieldwork in Miyako, interviewed a consultant via telephone. The main consultant was a female speaker who was born in 1951. The interviews were conducted several times, in March and April 2021.

4 Subject =gyaa

We found that *gyaa* coding subjects can only be used as a contrastive. It can code the answer to a question, but the sentence implies that the speaker does not answer the question entirely, which is a characteristic of a contrastive topic.

4.1 Contrastive use of =gyaa in subjects

Gyaa-coding subjects is always contrastive. As shown in the comparison between (5) and (6), for example, the *gyaa*-coded noun in (5) referring to ten people, not contrasted with anybody else, is not acceptable, whereas the *gyaa*-coded noun in (6) referring to three people in contrast to the remaining seven people, is acceptable.

(5) Non-contrastive

(I had ten classmates in my elementary school.)

unu tuu=nu hitu={u/#gyaa} nnama=mai myaaku=n=du
 that 10=GEN person={BG1/BG2} now=also Miyako=DAT=FOC

sufficiently descriptive at least for the case of Nishihara. For reasons of space, we do not explain these further in this paper.

ui=doo

remain.NPST=SFP

“Those 10 people still remain in Miyako.”

(6) Contrastive

**unu micyaai=gyaa nnama=mai myaaku=n=du*

that 3.people=BG2 now=also Miyako=DAT=FOC

ui=doo

remain.NPST=SFP

The contrast of these examples indicates that subject-coding =*gyaa* can only be used as contrastive, unlike object-coding =*gyaa* (§5).

4.2 Incomplete answers to a question

Are the contrasted *gyaa*-coded subject foci; Can they be the answer to a question? The answer is yes and no; *gyaa*-coded subjects can answer a *wh*-question, but the sentence implies that it is only an incomplete answer. For example, in (7), a *gyaa*-coded subject implies that there could be other regions that received the prize. This is similar to what has been pointed out regarding the contrastive topic *wa* in Japanese (Tomioaka, 2009). Also note that the concession marker =*suga* ‘though’ is necessary to leave an implication, which is another piece of evidence showing that the answer is incomplete.

(7) Q: Which (region) won the prize?

nudatsi=tu kaimata=gyaa zzii=du u-tai=suga

Nudatsi=and Kaimata=BG2 receive.CVB=FOC RES-PST=though

“(I don’t remember... Oh!) (At least) Nudatsi and Kaimata won the prize, but... (I do not know others).”

However, (8), where the focus marker =*du* is used instead of =*gyaa*, is the complete answer to the same question.

(8) *nudatsi=tu kaimata=nu=du zzi-tai*

Nudatsi=and Kaimata=NOM=FOC receive-PST

(9) is another example showing that the *gyaa*-coded subjects are incomplete; as the answer to a question “how many people came”, (5) implies that more than 10 people might have come.

(9) Q: How many people came?

tuu=nu hitu=gyaa tti=du u-tai

10=GEN person=BG2 come.CVB=FOC RES-PST

“At least 10 people came.”

4.3 Concession clause

In the case of contrasting clauses, =gyaa appears only in concession clauses. This is because *the gyaa*-attached nouns are only partially informative.

(10) Contrastive

taroo={ya/gyaa} aici-tai-suga=du, ziroo={ya/#gyaa} haicci-tai
Taro={BG1/BG2} walk-PST-but=FOC Jiro={BG1/BG2} run-PST
“Whereas Taro walked, Jiro ran.”

(11) *taroo={ya/gyaa} ucinaa=nkai iki=du,*

Taro={BG1/BG2} Okinawa=ALL go.CVB=FOC

ziroo={ya/#gyaa} yamatu=nkai ha-tai

Jiro={BG1/BG2} Japan=ALL leave-PST

“Taro went to Okinawa, Jiro went to mainland Japan.”

5 Object =gyaa

So far, we have been discussing the *gyaa*-coded subjects. However, as mentioned in Section 2, =gyaa appears most frequently as an accusative topic, as in =u=gyaa, where =u is an accusative case particle. For this reason, =gyaa is called a topic marker and is dedicated to an accusative marker (Hayashi 2010, 2017).

In this section, we describe the usage of object =u=gyaa and compare it with that of subject =gyaa. We show that, unlike subject =gyaa, object =u=gyaa can appear as both contrastive and non-contrastive but still code background/topic, which implies that =gyaa is contrastive and background/topic but never as a (contrastive) focus.

Unlike subject =gyaa, object =u=gyaa can appear both contrastive and non-contrastive, as exemplified in (12). Note that a non-contrastive subject coded by =gyaa is not acceptable, as shown above.

(12) Non-contrastive (continuous)

(Yesterday, I got soba soup.)

unu soba-tsuyu=u=gyaa kyuu tsukai yaa

That soba-soup=ACC=BG2 today. use.CVB RES2.NPST

“That soba soup, I used (it) today.”

In addition, unlike subject =gyaa, object =gyaa can appear in both contrasting clauses, as shown in (13).

(13) Contrasted clauses

mancyuu={yu=gyaa/ya}. nama=hii=mai fau=suga

papaya={ACC=BG2/BG1} raw=INST=also eat=though

nn={*nu=gyaa/na*} *nii=du* *fau*
 potato={ACC=BG2/BG1} boil.CVB=FOC eat.NPST
 “Whereas (we) eat papaya raw, (we) eat potatoes cooked.”

Importantly, *=u=gyaa* is unnatural as the answer to a question, presumably because, unlike *=gyaa* coding subject, *=u=gyaa* acquired non-contrastive usage and may not be sufficiently contrastive compared to subject *=gyaa*, as exemplified in (14).

(14) (What did you eat yesterday?). – I ate soba.

?*soba=u=gyaa* *fau-dusi-tai=suga*
 soba=ACC=BG2 eat-FOC-PST=though

6 Discussion

In summary, *gyaa*-coded subjects are always contrastive and background, that is, they cannot be the perfect answer to a question; the sentence implies that the speaker does not fully know the answer to a *wh*-question, and the sentences are often required to end with a concession marker. *Gyaa*-coded objects, on the other hand, can appear non-contrastive and background. Given that they cannot appear as the answer to a question, even with the implication that the answer is not perfect, *gyaa*-coded objects are not contrastive. The results are summarized in Table 1. The fact that the element coded by a contrastive and background marker can only be a partial answer to a question is reminiscent of the contrastive *wa* in Standard Japanese (Hara, 2006; Tomioka, 2009; Oshima, 2021).

	Background	Focus
Non-contrastive	<i>=a</i> / <i>=u=gyaa</i> (Object)	<i>=du</i>
Contrastive	<i>=a</i> / <i>=gyaa</i> (Subject) / <i>=u=gyaa</i> (Object)	<i>=du</i>

Table 1. Summary of the usage of *=gyaa* and other IS markers in Nishihara

It is a major assumption that contrastive topic is a sub-type of focus especially in the formal analysis,⁵ where “the focus semantic value of a sentence [is] a set of alternatives from which the ordinary semantic value is drawn, or a set of propositions which potentially contrast with the ordinary

⁵ See, for example, Narrog (2019) for the discussion on confusion between focushood and contrastiveness.

semantic value” (Rooth, 1992: p.76; See Oshima, 2021 in Japanese, among others). Other scholars argue that contrastiveness and focushood are different concepts (Lambrecht, 1994; Vallduví & Vilkuna, 1998, among others). In Nishihara, where background and focus are distinguished morphologically and contrastiveness can be realized by both background and focus markers, it is reasonable to assume that the three concepts, background, focus, and contrastive, are distinct concepts but not subtypes of any one of them.

7 Conclusion

This study investigated the use of =gyaa in Ikema-Nishihara Miyakoan and found that it is a contrastive background marker coding subject and a simple background marker coding object. We argue that backgroundness (topichood), focushood, and contrastiveness are distinct concepts. We also found that an element coded by contrastive and background markers (so-called contrastive topic markers) can only be a partial or imperfect answer to a question because they are in the background instead of focus. We will investigate the theoretical basis using more data in a future study.

Why gyaa-coded subjects and objects behave asymmetrically remains a mystery, although we speculate that the motivation could be to distinguish subjects and objects in the background exactly like when they are case-coded. In general, Miyakoan almost always codes subjects and objects overtly, and zero-coded nouns are rarely found. In this language, there might be some functional or structural pressure to distinguish between subjects and objects.

Abbreviations

ACC Accusative; BG1 Background; CVB Converb; DAT Dative; GEN Genitive; LIM Limitative; NOM Nominative; NPST Non-past; POT Potential; PRES Present; PROG Progressive; PST Past; RES Resultative; SFP Sentence final particle; TOP Topic

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SECTION 3
Poster Papers

Part 4
Discourse
Functional Approaches

Differential Manifestations of Personal (Pro-)noun Omission in Japanese and Korean: A Functional-Pragmatic Account

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1 Introduction

The first and second personal pronouns are deictic words closely related to the verbalization of the speaker and hearer. Japanese and Korean first and second personal pronouns are similar in that they not only encode social deictic meanings, but also show relatively low ‘referential density’ (i.e. the average ratio of overt argument NPs (nouns or pronouns) to available argument positions in the clause; Bickel 2003) in discourse; in other words, they are frequently omitted in discourse.

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This paper analyzes the verbalization patterns (i.e. uses/non-uses) of the first and second personal pronouns in Japanese and Korean based on the functional-pragmatic analysis of their tokens in Japanese and Korean original TV drama scenarios and their counterparts dubbed in Korean and Japanese.

The organization of this paper is as follows. Section 2 presents an outline of Japanese and Korean personal pronouns, followed by a review of relevant previous studies. Section 3 provides an analysis of the data in terms of three types of verbalization pattern. Section 4 presents an analysis of yet another grammatical phenomenon that supports our cross-linguistic findings, i.e. noun-modifying constructions. Section 5 presents the conclusion.

2 First and Second PNs of Japanese and Korean

2.1 Personal Pronouns and Personal Terms in Japanese and Korean

It has been pointed out in both Japanese and Korean literature (e.g. Suzuki 1973; Kim 1988, *inter alia*) that the grammatical concept of “personal pronoun” is not necessarily indispensable. This is based on the facts that, unlike many languages that have this grammatical category, (i) first and second PNs in Japanese and Korean do not belong to a closed class, (ii) they have social deictic meanings, and (iii) they do not show grammatical agreement.

Let us take a look at the so-called second personal pronouns first. Japanese *omae* and Korean *ne*, can be both labelled as ‘less formal, casual *you*’, because they are used in a non-formal setting particularly when the hearer has socially lower or equal status compared to the speaker. On the other hand, *anata* in Japanese and *tangsin* in Korean can be labelled as relatively ‘formal *you*’, because they are usually used in a formal setting when the hearer has socially no higher status than the speaker.

However, their social deictic meanings are more complex than the description just presented. For example, even though it is true that *anata* and *tangsin* are relatively ‘formal’ forms, their use is pragmatically restricted when the hearer has higher social status than the speaker (e.g. a businessman does not address his boss as *anata/tangsin*). Alternatively, job titles such as *syatyoo/sacangnim* ‘boss’ could be used in place of second personal pronouns.

The same is true of first personal pronouns. It is not so uncommon to observe job titles or kinship terms (the so-called ‘fictive use’) being used instead of first personal pronouns when the speaker refers to himself/herself in Japanese and Korean (e.g., a young man could refer to himself as *oniisan/hy-eng* ‘elder brother’ when he is talking to a child he does not know).

Considering these idiosyncratic features of personal terms in Japanese, Suzuki (1973) proposed the terms *jisyoosi* (terms for the self), *taisyoosi* (terms for the hearer), and *tasyoosi* (terms for others) in place of the first,

second and third personal terms in Japanese. In view of the morphosyntactic and semantic similarities of Korean personal terms to those in Japanese, it would be not be unreasonable to assume that these terms are also applicable.

Nevertheless, the so-called personal pronouns in the two languages should be distinguished from the other forms in that they are inherently deictic words whose main function is to mark the speaker and the hearer but not the third party. We will thus use ‘personal noun’ (PN), following Takubo (1997), as a cover term for those deictic words used to refer to the speaker and the hearer in a Japanese or Korean discourse.

2.2 PNs and Their Token Frequency

Jung (2020) investigated the usage frequency of personal terms occurring in Japanese and Korean novels (original) and their translations. She has found that PNs are more frequently omitted in Japanese than Korean, mainly because Japanese has richer structural clues such as benefactive verbs and passive constructions that help to identify the referent. For example, while a Japanese second PN can be omitted in (1a) because *youtu* ‘give’ marks the speaker as a giver (subject), and the hearer as a receiver (object), its Korean counterpart should appear on the surface of the sentence as a person involved in the direction of movement because *cwu* ‘give’ does not mark the speaker as a giver (subject) nor the hearer as a receiver (object).

- (1) (J) a. Mamotte yaru koto-wa dekinai. Sumanai.
 protect.GER give thing-TOP cannot sorry
 (K) b. *Ne*-l cikye-cwu-ci mos hay-mianhay.
 you-ACC protect-give-cannot do.CONJ-be.sorry
 ‘I cannot protect **you**. Sorry.’

(Jung 2020: 64, Glosses added)

Though her pioneering research is very insightful and suggestive, it is not without methodological flaws. First, since Jung’s studies (2020) were based on written data (novels), it is essential that spoken language data be considered. We will thus use TV drama scenarios and their dubbed version to see whether the same tendency can be observed. Second, we will need to pay attention to the fact that the same contrast of ‘use’ (Korean) and ‘non-use’ (Japanese) of PNs can be found even when there is no structural difference between the two languages, as in (2) (a Korean original drama and its Japanese translation). This seems to suggest that the omission of PNs is not just a matter of grammar, but may arguably be related to the preferred organization of discourse pragmatic information.

(2) (The speaker A, having sat on a chair and waited for her children for a long time, got upset.)

A: [Why haven't they shown up since I called them earlier.]

a. (K) *Nay*-ka casik-ul calmos kiw-ess-e.

I-NOM kid(s)-ACC wrong raise-PAST-DECL

b. (J) (φ) kosodate-wo matigae-ta wa.

raising kids-ACC make an error-PAST SFP

'(The speaker talks to herself) *I* failed to discipline them.'

(Korean TV drama *Sulkiowun Uysasaynghwal*)

Third, Jung (2020) failed to capture the similarities in PN omission between Japanese and Korean in contradistinction to languages like English, i.e. the fact that PNs in both languages tend to be frequently omitted.

We will address the following question: On what discourse/pragmatic conditions do Japanese and Korean explicitly express PNs or leave them implicit? We will pursue this question by comparing three types of PN omission patterns observed in our data.

3 The Data and Results

The data consists of one Korean original TV drama *Cohahamyen Wulinun* (abbreviated as 'C' hereafter) with its Japanese dubbed version (8 episodes, 351 minutes), and one Japanese original TV drama *Zenrakantoku* (abbreviated as 'Z' hereafter) with its Korean dubbed version (8 episodes, 380 minutes). We transcribed dubbed versions manually because there was no transcription available, and had our transcriptions checked by one Korean native speaker and two Japanese native speakers.

Table 1 demonstrates that less than half of first and second personal PNs in Korean original TV dramas were overtly expressed, while over 50% of the PNs were omitted in the Japanese dubbed version. Table 2, on the other hand, shows that more than 90% of first PNs, and 80% of second PNs in Japanese original TV drama were overtly expressed, while less than 10% of the PNs were omitted in the Korean dubbed version. These results show that PNs tend to be more frequently omitted in Japanese, while they tend to be more overtly expressed in Korean.

Japanese translation counterparts to Korean 1 st PNs	Number of tokens	Japanese translation counterparts to Korean 2 nd PNs	Number of tokens
1 st person PNs (e.g. <i>watasi</i> ‘I’)	268 (45.66%)	2 nd person PNs (e.g. <i>omae</i> ‘you’)	148 (35.49%)
1st person PNs omitted in Japanese	297 (50.60%)	2nd person PNs omitted in Japanese	246 (58.99%)
Proper nouns	0 (0%)	Proper nouns	11 (2.64%)
Lexical items other than 1 st PNs (e.g. <i>kotira</i> ‘this way’)	21 (3.58%)	Lexical items other than 2 nd PNs (e.g. <i>sotira</i> ‘that way’)	8 (1.92%)
2 nd person PNs	3 (0.51%)	1 st person PNs	4 (0.96%)
Total	587 (100%)	Total	417 (100%)

Table 1. Japanese translation counterparts to Korean PNs

Korean translation counterparts to Japanese 1 st PNs	Number of tokens	Korean translation counterparts to Japanese 2 nd PNs	Number of tokens
1 st person PNs (e.g. <i>na</i> ‘I’)	225 (94.54%)	2 nd person PNs (e.g. <i>ne</i> ‘you’)	196 (84.48%)
1st person PNs omitted in Japanese	13 (5.46%)	2nd person PNs omitted in Japanese	15 (6.47%)
Proper nouns	0 (0%)	Proper nouns	0 (0%)
Lexical items other than 1 st PNs (e.g. <i>ic-cok</i> ‘this way’)	0 (0%)	Lexical items other than 2 nd PNs (e.g. <i>kuccok</i> ‘that way’)	17 (7.33%)
2 nd person PNs	0 (0%)	1 st person PNs	4 (1.72%)
Total	238(100%)	Total	232(100%)

Table 2. Korean translation counterparts to Japanese PNs

3.1 PNs Verbalized in Both Languages

The first pattern to be discussed concerns PNs that are verbalized in both languages. PNs in this pattern usually mark information new to the hearer whose referent cannot be identified by (contextual) inference. It should be noted that these PNs are not normally omissible, as in (3).

- (3) (A girl A is hiding from her boyfriend. When she made eye contact with a boy B, she asked him not to tell her boyfriend that she was hiding.)
 B: [(Looking at A) Hilarious!]

- a. (K) {*Nay*/* ϕ } *elkwul kulehkey ppanhi po-l swu iss-nun salam,*
 my face like that stare-can-ADN.PRS people
hun-chi anh-untey.
 common-NEG-but
- b. (J) {*Ore-no*/* ϕ } *kao sonna huuni mi-ru yatu,*
 I-GEN face like that manner see-NON.PST guy
soo i-nai-ze.
 not much exist-NEG-SFP
- ‘It is rare to see someone staring at **my** face like that.’

(C: 1-1)

In example (3), *elkwul* and *kao* ‘face’ are NPs introduced for the first time in the discourse and it is not the kind of information being shared by the speaker and hearer at the time of the utterance. In other words, they represent “hearer-new” (and in this example, “discourse-new”) information (Prince 1992). Please note that the genitive *nay* and *ore-no* ‘my’ cannot be omitted in (3a, b); otherwise the referent of the ‘face’ cannot be identified. In this pattern, no significant difference was found between Japanese and Korean.

3.2 PNs Omitted in Both Languages

The second case under discussion concerns PNs that are omitted in both languages. One of the reasons makes it possible is because they bare many structural clues that helps to identify the referent of a PN without overtly expressing it. Aside from beneficiary verbs and passive construction pointed out in Jung (2020), the first-person restriction in the mental state verb construction can be considered as another structural clue. In (4), mental state desiderative verbs *-tai* in Japanese and *-ko siph-* ‘want to’ in declarative sentence requires that the co-occurring subject NPs mark first-person, which makes first PN omission possible.

- (4) a. (J) *Kyuuryoo tyokinsi-te okaasanni ryokoo purezento*
 salary save-CONJ mom-LOC travel present
si-tai-na tte omot-te-nda
 do-want QUOT think-ASP-SFP
- b. (K) *Pwucilen-hi welkup moa-se wuli emma yehayng*
 hard-ADV salary save-CONJ our mom travel
ponay-cwu-ko siph-ta kulen sayngkaki tul-tela
 send-give-want to-QUOT like that think-ASP-DECL
- ‘I think that (I) **want to** send you (=my mom) on a trip by saving hard.

(Z: 1-4)

3.3 PNs Omitted in One Language but Verbalized in the Other

The last and most interesting case concerns PNs omitted in one language, but verbalized in the other. According to our data, PNs in Japanese consistently show a stronger tendency to be omitted than their Korean counterparts.

One may attribute this tendency to the fact that Japanese has more structural clues such as beneficiary verbs that help to identify the referent easily compared to Korean, as shown in (1). However, the same contrast can also be observed when there is no such structural difference. See (6) that only one argument (the object *anata-wo*) is verbalized in Japanese, whereas three arguments (the subject *nay-ka*, topic *na*, and object *ne*) are verbalized in Korean.

(6) (A met her lover B after dumping him.)

A: a. (K) {**Nay/φ**}-ka malhay-ss canh-a. {**na/φ**} {**ne/φ**} an
 I-NOM say-PAST NEG-DECL I you NEG
 cohaha-n tako.
 love-PRS QUOT

‘**I** told (you). **I** don’t love **you** anymore.’

b. (J) (φ) it-ta-desyo. (φ) Moo {**anata/φ**}-wo suki-zyanai.
 say-PAST-SFP anymore you-ACC love-NEG

‘(**I**) told (you). (**I**) don’t love **you** anymore.’

B: [How much more time do you need? I know you still love me.]

(C: 1-6)

It should be noted that all the PNs in (6) are potentially omissible, which will then look superficially similar to (5). In this sense, these PNs can be said to be informationally ‘redundant’, because they do not cause any confusion in the interpretation of the sentences in omitted form (Compare to the PN in (3)). The reason that allows the omission to be possible, as explained in relation to (5), is arguably because the contextual information regarding who (=A) said what (i.e. the break up) to whom (=B) is shared by A and B.

Now, we need to address the question of why those ‘redundant’ PNs tend to be expressed in Korean while they tend to be omitted in Japanese.

3.4 Different Discourse Strategy Regarding Missing Information

It has been shown that Japanese and Korean differ significantly as to the omission of PNs that are potentially omissible and to some extent informationally redundant. We argue that the use or non-use of those PNs (which are rather optional than obligatory; compare (6) and (3)) is crucially related to the two contrastive ‘discourse strategies’ employed in the respective languages.

First, one can maximally verbalize PNs to make the sentence informationally accurate. This strategy is motivated by the preference for accuracy at the cost of redundancy. Secondly, one can maximally omit PNs to make the sentence brief. This strategy is motivated by the preference for economy at the cost of extra interpretive burden on the hearer such as the interpretation of contextual or structural clues (e.g. benefactive verbs; see Jung 2020).

The former strategy seems to be favored in Korean in which informational accuracy is a primary factor in the organization of discourse. Thus, the apparently ‘redundant’ information in Korean, can be analyzed as a linguistic clue to help identify the referent more easily in the absence of other structural and contextual information. In contrast, the latter strategy is arguably favored in Japanese in which economy is prioritized and redundancy is dispreferred.

4 Pragmatic Inference and the Noun-Modifying Constructions

The contrastive verbalization patterns towards potentially missing information in Japanese (tendency toward non-use) and Korean (tendency toward use) are manifest in another linguistic construction, i.e. noun-modifying constructions (also known as “relative clauses”) (see Lee and Horie 2020):

- (7) a. (K) Peynchi-ey anc-a, [wulitul-i sa-nun] {kos/φ}
 bench-LOC be seated-CONJ we-NOM live-PRS place
 macunphyen-uy aphatu-lul chyetapo-n-ta.
 opposite side-GEN apartment-ACC look up-PRS-DECL
 ‘I take a seat on the bench and looked up to the apartment house
on the opposite side of the location where we live.’
- b. (J) Benti-ni kosikake, [watasitati-no sumu]
 bench-LOC be seated:CONJ we-GEN live
 {φ}mukai-no apaato-o miage-ru.
 opposite side-GEN apartment-ACC look up-PRS
 ‘I take a seat on the bench and looked up to the apartment house
on the opposite side (of the location) where we live.’

Examples (7a, b) are noun-modifying constructions with relational head nouns, i.e. nouns encoding relative spatial or temporal concepts such as *mukai* and *macunphyen* ‘(the) opposite side’. The locative reference point information needs not to be expressed in Japanese, whereas it needs to be verbalized in Korean, which accords with the contrast in PN omission observed previously. As extensively discussed in Lee and Horie (2020), this contrast is closely related to the extent to which pragmatic inference plays a role in recovering missing information in grammatical constructions.

5 Conclusion

This paper contrasted verbalization patterns of Japanese and Korean first and second PNs from a discourse-functional point of view. Specifically, we have shown that even though in general both languages omit PN frequently, Korean is shown to be more likely to express PNs overtly while PNs are more likely to be omitted in Japanese. This contrast is arguably related to the different discourse strategies employed in the respective languages. We have also shown that a similar contrast is also found in yet another grammatical phenomenon, i.e. the omissibility of reference point information in noun-modifying constructions with relational head nouns.

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The Use of Korean Ideophones in Newspaper Headlines

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1 Introduction

This study is a time-series study that investigates how ideophones (also known as sound symbolic words or expressives) have been used in the headlines of Modern Korean newspapers in perspective of semantic and syntactic features.

It has been suggested that the Modern Korean ideophones are frequently used in newspaper headlines (Kim & Park 2001; Jo & Kang 2013). So far, however, there has been little discussion about what functions ideophones serve and what factors motivate the frequent use of ideophones in newspaper headlines.

This study, therefore, seeks to investigate the use of Korean ideophones in newspaper headlines with two research questions: What function do ideo-

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phones have in the headline? When did ideophones become frequently used in the headlines, and what factors have affected their frequency?

The current paper argues that (i) Korean ideophones have the double function (Iarovici & Amel 1989) in semantic and pragmatic functions; (ii) the frequency of ideophones has increased rapidly from around the 1960s to 1980s to the 2000s; (iii) since the late 20th century, commercial competition has intensified, increasing the tabloidization of Korean newspapers affecting the frequent use of ideophones; and (iv) the semantic and syntactic properties of ideophones fit into the “appropriate headline,” which attributes to the frequency of ideophones.

The remaining part of the paper proceeds as follows. Section 2 gives a brief overview of the previous studies on ideophones in modern newspaper headlines. Section 3 explains the methodology and offers information on data. Section 4 reports the frequency, meanings, and syntactic constructions of ideophones in headlines from 1920 to 2000. Section 5 discusses the socio-cultural and language-internal factors that are assumed to affect the frequency, semantic and syntactic features of ideophones on newspaper headlines. Section 6 summarizes the paper.

2 Previous Studies

Thus far, previous studies have indicated that Korean ideophones are frequently used in newspaper headlines (Kim & Park 2001; Jo & Kang 2013). Based on corpus data, Jo & Kang (2013) investigated the frequency of adverbs in headlines and bodies of the news articles published from 2001 to 2009. They found that there were 65 ideophones out of the top 100 words used in the headlines but none were found in the bodies. In addition, they analyzed the collocations between ideophones and other words and visualized them with the lexical network using statistical methods.

Kim & Park (2001) investigated the morphological, syntactic, and semantic features of ideophones in both online and paper formats of newspaper headlines. So far, however, there has been little discussion about what functions ideophones have in newspaper headlines and what factors motivate the frequent use of ideophones. Moreover, previous works are limited to short-term studies focusing on Contemporary Korean. The current paper traces the historical changes in how ideophones’ semantic and syntactic features have changed and how ideophones have worked in newspaper headlines.

3 Methods

Data was collected using *Naver News Library*, a digitalized newspaper database (from 1920 to 1999). The database contains five companies' newspapers. I used *Dong-A Ilbo* 'Dong-A daily news' (published since April 01, 1920), *Chosun Ilbo* 'Chosun daily news' (published since March 05, 1920), and *Kyunghyang Shinmun* 'Kyunghyang newspaper' (published since October 06, 1946) for this study, which are major newspapers in Korea. In addition, each company's website was used to search the print formats of the newspapers published from January 01, 2000, to December 31, 2000. I counted the number of ideophones normalized across the decade division to seek diachronic changes.

Fifty ideophones based on data from Jo & Kang (2013), Kim & Park (2001), and the ideophones' list in Park (2015) were analyzed. In the data, 47 words are disyllabic (e.g., *kkwul.kkek* 'gulp'), which is the form most frequently used in newspapers (Kim & Park 2001), and four words are reduplicated disyllabics (e.g., *eng.kum eng.kum* 'crawl crawl').

Criteria for examining the data are as follow: (i) whether the ideophone expresses metaphorical meanings or its original meanings (i.e., a sound, a movement, inner feelings, etc.); (ii) what kind of construction the ideophone appears in the headlines (i.e., utterance-edge, adverb-verb, or predicative, Akita 2021; Dingemanse & Akita 2017). An example sentence for each criterion is illustrated below.

The original meaning:

- (1) *Tonghay* *cicin* *sewul-se-to* *huntul*
the.East.Sea earthquake Seoul-LOC-too IDPH
yangyang *aph.pata* 4.2 *kyumo*
Yangyang.County offshore.waters 4.2.magnitude
"The earthquake in the East Sea *shook* Seoul as well. A magnitude 4.2 earthquake occurred in the offshore waters of Yangyang County."
(1996. 1. 25. *Kyunghyang Shinmun* 'Kyunghyang newspaper')

The metaphorical meaning:

- (2) *Mwulka anceng* *taychayk* *huntul*
price stabilization countermeasure IDPH
"The countermeasure of the price stabilization is being *shaken up*."
(2000. 2. 17. *Dong-A Ilbo* 'Dong A daily news')

The utterance-edge construction:

- (3) *Kyengki.sangsung.sey* *1-wel cwuchwum*
 economy.upward.movement January IDPH
Sopi.simli-to *wumccil*
 consumer.confidence-too IDPH
 “The upward economy movement *falters* in January, and consumer confidence *flinches* as well.”
 (2000. 2. 17. Dong-A Ilbo ‘Dong A daily news’)

The adverb-verb construction:

- (4) *Sokto keli sikan chekchek kyeyesan-ha-nun coking.hwa*
 speed distance time easily calculate-do-ATTR jogging.shoes
 “Jogging shoes that *easily* calculate speed, distance, and time.”
 (1985. 8. 1. *Kyunghyang Shinmun* ‘Kyunghyang newspaper’)

The predicative construction:

- (5) *Hwicheng-keli-nun cipang kyengcey*
 IDPH-suffix-ATTR local economy
 “The *faltering* local economy.”
 (2000. 11. 18. *Chosun Ilbo* ‘Chosun daily news’)

4 Results

4.1 The Frequency of Ideophones in Headlines

I have obtained 11,595 ideophones in my data. As shown in Figure 1, the results show a clear increasing tendency of the frequency of ideophones from the 1960s.

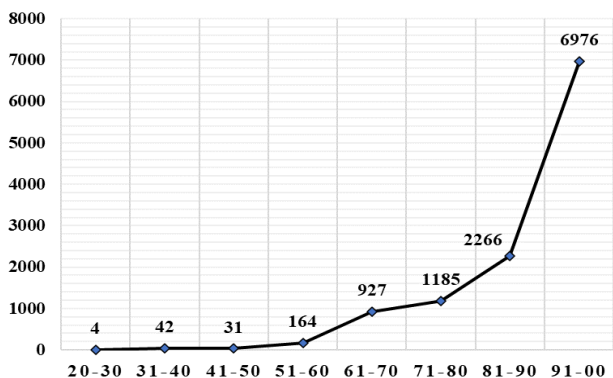


Figure 1. The frequency of ideophones in headlines

Interestingly, the data in the above Figure 1 is that from the 1980s to the 2000s, the frequency of ideophones increased significantly.

In the following sections, I will indicate ideophones' meanings and syntactic construction in headlines, respectively.

4.2 The Meanings of Ideophones in Headlines

As shown in Figure 2, semantically, the ideophones that express metaphorical meanings are more numerous than those representing their basic meanings, such as sounds, manner, and inner feelings. Specifically, the metaphorical meanings occupy the majority from the 1940s to the 2000s.

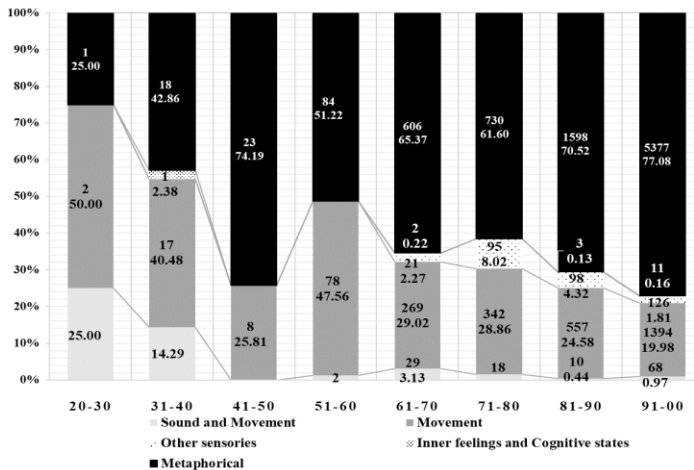


Figure 2. The meanings of ideophones in headlines

As can be seen from Figure 2, the frequent use of the metaphorical meanings of ideophones suggests that the metaphorical meanings of ideophones in headlines have conventionalized considerably.

4.3 The Syntactic Construction of Ideophones in Headlines

Table 3 presents the number of ideophones of the utterance-edge construction in a phrase from the 1950s to the 2000s. They are overwhelmingly more numerous than those used as adverb-verb and predicative constructions.

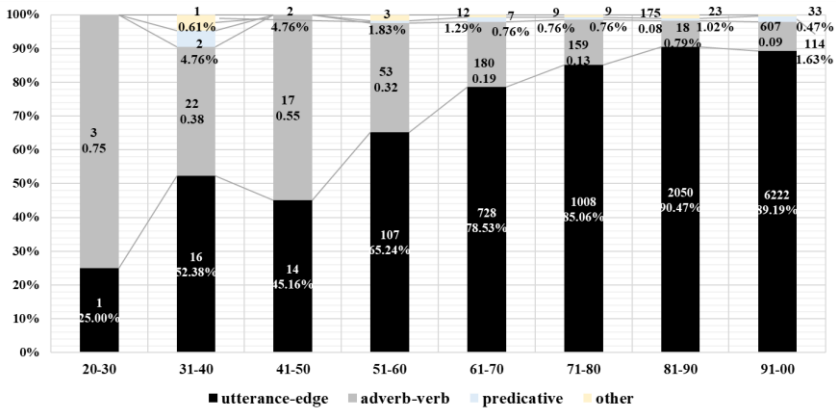


Figure 3. The syntactic construction of ideophones in headlines

The utterance-edge construction is divided into the utterance initial- and the utterance-final construction. Data I found mostly leaned to the utterance-final ones and without main verbs as in (6).

- (6) *Sopi.simli* *'kkwumthul.'*
 consumer.confidence IDPH
 “Consumer confidence *suddenly shows* [signs of rising].”
 (1999. 1. 12. *Kyunghyang Shinmun* ‘Kyunghyang newspaper’)

What makes possible the construction like (6), the ideophone standing alone without a main verb, is the high “semantic specificity” between ideophones and main verbs (Akita 2013a, 2013b; Park 2018). Ideophones with high semantic specificity have a limited number of a few particular verbs that frequently cooccur. In other words, these ideophones exhibit a strong collocational relationship with their main verbs. Thus, if the main verbs are removed from the sentences, the readers can easily restore the main verbs.

In the next section, we will discuss the socio-cultural factors that influence the frequent use of ideophones in headlines (5.1) and the communica-

tive functions that ideophones serve in headlines based on the model by Iarovici & Amel (1989, Section 5.2).

5 Discussion

5.1 Socio-Cultural Factors: Tabloidization and Localization

As reported in Figure 1, the frequency of ideophones in headlines has increased over time. Interestingly, the frequency rose steeply from around 1990 to 2000. It is assumed that one of the reasons for the observed rapid rise of the frequency of ideophones could be mainly attributed to the tabloidization of Korean newspapers from the 1930s.

A recent study by Lee (2020) concluded that Modern Korean newspapers have become tabloidized and designed to attract readers rather than informing, employing the essential elements of tabloidization such as metaphor, adverbs, quotations, and questions. This strong tendency of tabloidization is ascribed to historical and commercial factors.

Newspapers in the 1920s, *Dong-A Ilbo* ‘Dong-A daily news’ and *Chosun Ilbo* ‘Chosun daily news’ were more informative and factual when they were first published as modern newspapers¹. However, since the 1930s, the presses progressively have become tabloidized and dealt with the subjects that attracted the reader’s attention rather than political and social issues to pass strict censorship by the government (Choi & Chae 2008). The pace of tabloidization has accelerated from the late 20th century, because commercial competition has intensified with the appearance of a variety of press companies on paper and online platforms (Kim 2019).

It can thus be suggested that as the tabloidization of Modern Korean newspapers has progressed constantly, the use of ideophones has increased as one of the effective ways to attract readers’ attention using their semantic and syntactic properties such as metaphor and the utterance-final construction.

Another significant factor of rapid increases in the frequency of ideophones is the localization of newspapers from the 1990s. For example, in the headlines in *Dong-A Ilbo* in the 1920s, most of the headlines were written in Chinese characters and a few in Japanese. *Hangul*—the Korean alphabet—was only used for some articles and loanwords. However, the newspaper headlines published from the 1990s have primarily been printed

¹ Choi & Chae (2008: 213) divided the newspapers’ headlines into subjective and objective ones. The objective headlines are a concise presentation of the contents by summarizing the facts, and the subjective headlines have intervened the intention or emotion of the editor or newspaper’s companies. Choi & Chae (2008) found that objective headlines occupied 96.61% (4/118) in the 1920s in *Dong-A Ilbo*.

in *Hangul*. In the headlines of *Chosun Ilbo*, the use of Chinese characters was 61.6% in 1980, which decreased to 5.9% in 2000 as the use of Chinese characters was limited to proper names or a few words that could be semantically ambiguous (Lee 2000: 53-54).

5.2 The Semantic and Pragmatic Functions of Ideophones

In this section, I will discuss how ideophones work in newspaper headlines from their semantic and syntactic features.

Thus far, previous studies have suggested that headlines serve a double function (Andrew 2007; Bell 1991; Dor 2003; Iarovici & Amel 1989). Iarovici & Amel (1989: 442-443) revealed that headlines carry out semantic and pragmatic functions. They proposed that the semantic function is “[to enable] the reader to grasp the meaning of the text,” and the pragmatic function is to “alert the reader to the nature or content of the text.” In other words, affording brief news summaries based on 5W1H (Who, When, Where, What, Why, and How) is the primary role of the semantic function. On the other hand, the pragmatic function refers to headlines involving eclectic devices to make the news fascinating, which entice readers’ attention to the newspapers by employing linguistic devices such as metaphors (Molek-Kozakowska 2013).

Based on the above double function model, this paper argues that ideophones in headlines play a crucial role in providing facts and attracting readers. In view of the semantic function, ideophones convey the “How” of the event.

- (7) *Kholleyla chwungkyek pata **thengtheng** hoyscip **sselleng***
 cholera shock beach IDPH sushi.restaurant IDPH
 “The beach was *empty* (due to) the cholera shock, and the sushi restaurant *is void* (of customers).”

As shown in (7), ideophones *thengtheng* and *sseleng* describe “how” the situation of the beach and the restaurant are. In other words, ideophones give information about the essential content of the text by delineating the events, which makes it easily understandable for the readers.

As for the pragmatic function, ideophones in headlines serve as an agent for attracting readers by using their semantic and syntactic features, such as metaphorical meanings and the utterance-final construction. As can be seen from Figure 2, ideophones are more likely to express metaphorical meanings rather than sounds, manners, and states in the headlines. In addition, as Figure 3 shows, ideophones are frequently situated at the edge of a phrase, and they act as holophrastic ideophones accompanied by a pause and high intonations.

Moreover, ideophones are frequently placed inside curly double quote marks (e.g., *Kilum-kaps “tulssek” “The oil price rose a lot”*). In Korean newspapers, curly double quote marks are implied to emphasize the contents (Lee 2000). These typographic marks have an immediate visual impact on arousing the interest of potential readers.

These findings of the current paper suggest that ideophones are a favored means to convey information and excite readers in Korean newspapers.

6 Conclusion

This paper identified the communicative functions of Korean ideophones in the newspaper headlines from the 1920s to the 2000s. The current study’s findings suggest that Korean ideophones fit into “appropriate headlines” (Iarovici & Amel 1989) with a maximal contextual amount of semantic and pragmatic effects for a minimal amount of processing effort in the headlines. Furthermore, this study strengthens the earlier findings of the conventionalization of Korean ideophones (Park 2019).

A question raised by this paper is whether the frequent use of ideophones in newspaper headlines can be found in other languages as well, such as Japanese. I hope that the findings of this research will highlight the importance of expanding the research scope on the usage of ideophones.

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Corpora

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SECTION 3
Poster Papers

Part 5
Psycholinguistics
Acquisition

Psycholinguistic Evidence for Severing Arguments from the Verb

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1 Background: Mystery of Locality Effect

Many studies of human sentence processing assume that when a verb is input, preceding thematic arguments are retrieved from working memory (Gibson, 2000; Van Dyke and Lewis, 2003; Lewis et al., 2006; Vasishth et al., 2019; among many others). In (1), for example, the subject *neko-ga* ‘cat-NOM’ is assumed to be retrieved when the verb *tataita* ‘hit’ is input.

- (1) Neko-ga [inu-ga oikaketa] nezumi-o tataita.
cat-NOM [dog-NOM chased] mouse-ACC hit.
‘The cat hit the mouse that the dog chased.’

Two factors have been suggested in the literature to affect the difficulty of such retrieval: *similarity* and *locality*. Similarity refers to the feature-based similarity between the retrieval target and other elements in the sentence. According to the cue-based retrieval model (e.g., Van Dyke and Lewis, 2003), retrieval of the correct target becomes difficult in the presence of similar elements since the cues used in retrieval (such as [subject] and [animate]) are

overloaded. In (1), for example, *inu-ga* may interfere with *neko-ga* since both are subjects and animate. Locality, on the other hand, refers to the linear distance between the target and the retrieval site. Studies suggest that distant dependencies are more difficult to process because intervening elements interfere, or the representation of the target element decays over time (Gibson, 2000; Lewis and Vasishth, 2005¹; Van Dyke and McElree, 2011).

While similarity-based interference has received robust empirical support, evidence for locality effect is somewhat slippery (see Nakatani, 2021a, for a concise review). Many studies have observed reading slowdown in distant dependencies (Bartek et al., 2011; Levy et al., 2013; Ono and Nakatani, 2014; Safavi et al., 2016; among others), but some have failed to find one or even found an effect in the opposite direction (Konieczny, 2000; Vasishth and Lewis, 2006; Nakatani and Gibson, 2010).

Notably, unexpected results concentrate on simple argument-verb dependencies in verb-final languages. In Japanese, for example, the locality effect has been observed in dependencies between a *wh*-argument and a verb (plus complementizer); and between a negative polarity item and a negated verb (Ono and Nakatani, 2014; Nakatani, 2021a), but not in simple argument-verb dependencies without such additional complexity (Nakatani and Gibson, 2010). A similar contrast is observed in German (Levy and Keller, 2013). One explanation for this tendency is that orthogonal factors mask the underlying locality effect. Intervening elements may facilitate the processing of the verb by making it more predictable (Levy, 2008) or accessible (Vasishth and Lewis, 2006). Simple argument-verb dependencies in verb-final languages are particularly prone to these factors since the intervening elements are often arguments themselves and have strong ties to the verb. However, the lack of locality effect is not completely reducible to effects of expectation and accessibility, since the same tendency is observed even when these factors are controlled (Levy and Keller, 2013; Nakatani and Gibson, 2010).

For this reason, some studies suggest that head-directionality or the type of the dependency bears directly on the magnitude or even presence of locality effect (for head-directionality, see Levy and Keller, 2013; for dependency type, see Nakatani and Gibson, 2010; Ono and Nakatani, 2014; Nakatani, 2021a). This hypothesis is also consistent with the observation in English that verbs in relative clauses show a stronger locality effect than matrix verbs (Bartek et al., 2011). Based on these proposals, the current study investigates *how* certain structures evade locality effect by a reading experiment

¹ In the original ACT-R model by Lewis and Vasishth (2005), the major source of locality effect was retrieval of predicted heads. Since Lewis et al. (2006) and Vasishth and Lewis (2006), however, retrieval of arguments was featured in addition, and that seems to be the major concern of recent studies using the model (Vasishth et al., 2019).

in Japanese.

2 Experiment: Do We Really Retrieve Arguments at the Verb?³

2.1 Hypotheses and Design

One possible explanation for the lack of locality effect is that the parser adopts a strategy to avoid confusion due to retrieval of distant items. We test the following hypothesis (see Kimball, 1973 and Lewis, 1996 for similar proposals).

- (i) Arguments are cleared from working memory once their thematic dependency is complete.

This strategy would attenuate the locality effect if its major source is interference. For example, in (1), the embedded subject *inu-ga* could be cleared from memory once the embedded clause is complete; then, it would not interfere with the matrix subject *neko-ga* when the matrix verb is input. If interference is the major source of locality effect, this strategy would attenuate the effect.

Alternatively, we can cast doubt on the very idea that arguments must be retrieved at the verb (cf. Friedmann et al., 2008). It is possible that verb-final languages avoid immediate retrieval of arguments upon the input of the verb to evade heavy memory load due to retrieval of multiple arguments in the distance. The hypothesis can be stated as follows (here we limit the scope to Japanese since it is the only language we investigate).

- (ii) Retrieval of arguments does not take place at the verb in Japanese.

This is surprising if arguments are retrieved in order to form the dependency with the verb as an essential part of syntactic and/or semantic structure building. However, such dependencies may not be needed. According to the *constructivist* view in generative syntax (see Marantz, 2013), some or all thematic arguments are severed from the verb and instead introduced by functional heads, as shown in (2).⁴ Semantically, the verb provides a predicate P over the event e , and P is only indirectly related to the arguments x, y, z via e , as shown in (3).

(2) [VoiceP Agent [AppIP Goal [_{VP} Theme [_{√P} Root] v] Appl_{high}] Voice]

(3) $\lambda e. \text{Agent}(x, e) \& \text{Goal}(y, e) \& \text{Theme}(z, e) \& P(e)$

If such constructivist structure underlies sentence processing, there would be

³The experiment was originally presented in the 162nd Conference of Linguistic Society of Japan. The current study contains new statistical and theoretical analyses of the data.

⁴Exactly how arguments are realized is still debated within constructivism. To account for the current result, it suffices if dative arguments are severed from the verb.

2.2 Method

Participants. Forty-four native Japanese speakers from age 20 to 32 (mean: 21.4) participated. Each received 500 yen for participation. One participant was excluded from analysis because of a technical error.

Procedure. The experiment used the moving-window, self-paced reading paradigm (Just et al., 1982). It was conducted on the Ibex Farm website⁶, using the Ibex software by Alex Drummond. A session consisted of a written instruction, two practice trials, and seventy-two test trials. In each trial, a gaze point ‘+’ was presented on the left, followed by a series of dashes that mask the words. When the participant pressed the space key, the next word appeared and the previous word (or the gaze point) was masked by a dash. After the sentence, a yes/no comprehension question followed. A short sentence (e.g., ‘The thief held a silver knife against the detective.’) was presented, and the participant pressed the F key if they thought the sentence was correct, or the J key if they thought it was not. The question sentence contained all the thematic arguments from either the matrix or the embedded clause to prevent participants from focusing on a particular element in advance, but if anything was incorrect, it was always the dative argument.

Materials. Twenty-four sets of target sentences were distributed into three lists in a Latin Square design. Each participant was assigned one of the lists. Forty-eight filler sentences were mixed with these target sentences in a pseudo-random order generated for each participant.

Analysis. Before any further analysis, two participants whose log-transformed reading time per region were 2.5 SDs below or above the mean (4.96 ln ms and 6.89 ln ms; mean: 6.06 ln ms; SD: 0.33) were excluded. Also, one participant whose comprehension accuracy was 2.5 SDs below the mean (55.6%; mean: 80.3%; SD: 9.7) was excluded, but this is the same participant as the one excluded on the basis of the reading time. The data from the remaining forty-one participants were submitted to further analysis. Furthermore, reading times 2.5 SDs below or above the mean, calculated by region and condition, were excluded (2.9% of all data points from target trials).

Comprehension accuracy and log-transformed reading times of the critical and spillover regions were analyzed by (generalized) linear mixed effects modelling (Baayen et al., 2008). Maximal models included fixed effects of [\pm Interference] (A/B vs. C) and [\pm Incompletion] (A vs. B). These effects were coded using Helmert contrasts (Schad et al., 2020), as shown in Table 2.

sentences, however, the reader should be able to detect a clause boundary when two nominative NPs are presented (Miyamoto, 2002). The verb in Region 3 and the dative NP in Region 5 should also help locate the boundary. A *tooten* (shown as comma in Table 1) is also added to the word before the boundary for the same purpose.

⁶<https://spellout.net/> The website was shut down after this experiment in September, 2020.

	Interference	Incompletion
A	1/3	1/2
B	1/3	-1/2
C	-2/3	0

TABLE 2 Coding scheme

	Correct %	SE
A	64.9%	2.9
B	67.4%	3.2
C	69.8%	3.3

TABLE 3 Comprehension accuracy by condition. SE: standard error.

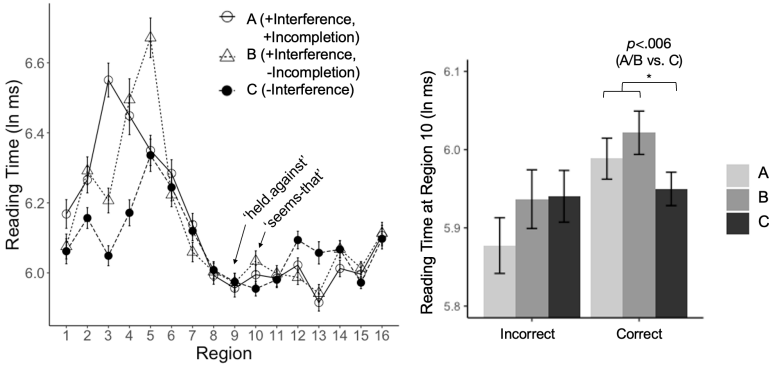


FIGURE 1 Left: Reading times by region and condition in trials with a correct answer to the comprehension question. Right: Reading times in Region 10 by condition and comprehension accuracy. Error bars indicate standard errors.

Comprehension accuracy and its interaction with the other factors were also included since the initial inspection of the data suggests different trends for trials with correct answer to the question (coded as 1/2) and those with incorrect ones (coded as -1/2). Random effects included intercepts and slopes for participants and items. Following Bates, Kliegl, et al. (2015), models were simplified by iteratively removing non-significant random effects.

The analysis was conducted using the R software (R Core Team, 2019). Models were fitted using the `glmer` and `lmer` functions in the `lme4` package (Bates, Mächler, et al., 2015), and *p*-values were estimated using the `lmerTest` package (Kuznetsova et al., 2017).

2.3 Result

Comprehension Accuracy. Table 3 shows comprehension accuracy by condition. No fixed effect reached significance.

Reading time. The left panel of Figure 1 shows reading times by region and condition in trials with a correct answer to the comprehension question. Data from trials with an incorrect answer showed similar trends, but there was one notable difference, described below.

	Estimate	SE	<i>t</i> -value	<i>p</i> -value	
Intercept	5.968	0.039	151.933	<.001	*
Interference	0.028	0.019	1.479	.140	
Incompletion	-0.040	0.032	-1.224	.233	
Accuracy	0.002	0.025	0.079	.937	
Interference:Accuracy	0.100	0.041	2.421	.016	*
Incompletion:Accuracy	0.031	0.049	0.636	.525	

TABLE 4 Model estimates for Region 10. SE: standard error. * indicates $p < .05$.

In Region 9 (embedded verb), no fixed effect reached significance. In Region 10 (spillover region), there was a significant interaction ($p < .02$) between [\pm Interference] and comprehension accuracy. Table 4 shows the estimated model for Region 10. Pairwise comparison revealed that the [+Interference] conditions were significantly slower than the [-Interference] condition only when the comprehension question was correctly answered ($p < .006$) (see the right panel of Figure 1). The trend was reversed (but not significant) for trials with an incorrect answer to the comprehension question.

2.4 Discussion

The result supports neither of the hypotheses we postulated initially. The effect in Region 10 indicates that the dative argument was retrieved at least in trials with a correct answer to the comprehension question, contrary to the prediction of hypothesis (ii). Furthermore, this interference effect was observed even in the [-Incompletion] condition (Condition B), which indicates that the interfering dative NP remained in working memory even after the dependency is complete. Thus hypothesis (i) was not supported either.

Rather, the interaction between [\pm Interference] and comprehension accuracy at Region 10 can be interpreted as follows. If the parser retrieves the dative argument at the verb, that results in *both* slowdown due to interference and better comprehension of the thematic relation. But the parser has another option, namely, not to retrieve the dative argument in order to avoid interference, at the cost of less accurate comprehension. In short, argument retrieval is optional.

This interpretation is consistent with constructivism. As discussed earlier, constructivism predicts that argument retrieval is not syntactically required at the verb. We then hypothesized that arguments are never retrieved at the verb in Japanese. But another possibility that stems from constructivism is that the parser commits to retrieval of arguments for non-syntactic reasons, e.g., for a better understanding of the event e (see (3)). The world knowledge associated with the verb (e.g., *tukituketa* ‘held against’) indicates the presence of a Goal argument, and the parser may look for one, hence the interference effect. But this is not necessary to form a grammatical representation of the sentence,

which is supposedly the minimal requirement in syntactic processing. Therefore the parser should be able to choose whether to retrieve arguments under the trade-off between better comprehension and cost of retrieval.

Importantly, this interpretation is also able to explain the lack of locality effect in previous studies. If argument retrieval is not due to syntactic requirement but for better comprehension, it can also take place in positions before the verb. For example, an argument may trigger retrieval of earlier arguments of the same clause, using the shared event variable as a cue.⁷ For this reason, the surface argument-verb distance does not determine the magnitude of locality effect at the verb as the argument may have been reactivated in an intermediate position. This is particularly the case in verb-final languages, where many arguments are introduced before the verb.

Under the constructivist view, locality effects that appear to be based on argument-verb distance should instead be explained by retrieval of predicted heads such as T, as Lewis and Vasishth (2005) did in the original ACT-R model (see footnote 1). This would explain locality effects in English subject-verb dependencies, and also locality effects in dependencies in verb-final languages that involve an additional predicted head (e.g., Neg in the case of negative concordance). In this regard, an important topic for future work is to investigate whether there are effects that can be attributed to the processing of argument-introducing heads assumed in the current hypothesis.

Before concluding, let us briefly discuss the data from the matrix verb. If locality affects simple argument-verb dependencies, Condition A should be slower than C at the matrix verb since the matrix dative argument (*keezi-ni*) is more distant. However, there was a significant effect in the opposite direction at Region 13 ($p < .001$). Since this effect continues from Region 12, this may be an effect of the scrambled word order (subject – sentential complement – indirect object) in Condition C, which becomes evident in Region 11. As this orthogonal effect is prevalent, the data is consistent with but not particularly supportive of the lack of locality effect in the dependency in question.

3 Conclusion

To summarize, the current experiment showed a significant interaction between retrieval interference of an argument and comprehension accuracy. This effect is consistent with the view that argument retrieval at the verb is optional. This view may also explain why simple argument-verb dependencies in verb-final structures often fail to show locality effect.

⁷ Nakatani (2021b) recently suggested that dependents of the same clause are stored in a ‘dependency chain’, which is updated whenever a new dependent is added, and this is why thematic dependencies do not show locality effect. Although the structural assumption that Nakatani employs is different from ours, the underlying intuition seems similar.

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The Role of the Contrastive Topic *-wa* in the Felicity Judgment of Negation in Japanese*

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1. Introduction

Comprehension of negative sentences is argued to be more difficult than affirmative sentences. Recent studies have focused on the pragmatic felicity in the use of negative sentences, and findings provide support for the argument that the comprehension of negative sentences is modulated by the pragmatic felicity. The current study extended this literature to Japanese. The

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study is based on Nordmeyer and Frank (2018), which examined the felicity judgment of negation in English by manipulating the informativeness of negative sentences. We crucially incorporated a Japanese-specific linguistic factor that was expected to affect the felicity of negative sentences, the contribution of contrastive topic particle *-wa* (Hara, 2006; McGloin, 1987). The goal of this study is two-fold: (i) whether, and in what way, the particle *-wa* in negative sentences modulates the felicity of negation; (ii) whether Japanese speakers show informativeness-based felicity judgment of negation.

2. Background and Research Questions

2.1 Previous Studies in Comprehension of Negation

There has been a debate on what constitutes difficulty in comprehending/processing negation. Earlier psycholinguistic studies revealed that participants took longer to process negative sentences than affirmative sentences (Clark & Chase, 1972; Just & Carpenter, 1971). These findings generated a hypothesis that, when processing a negative sentence, like ‘A robin is not a tree,’ one initially projects an affirmative statement (‘A robin is a tree’) and then negates it. The extra step of applying negation to the initial statement makes negation processing more taxing. This two-step model was further supported by neurolinguistic studies. For example, Fischler et al. (1983) revealed that the processing of a negative sentence, ‘A robin is not a tree,’ elicited an N400 (the negative neural voltage deflection indicating semantic processing costs). They claimed that the semantic mismatch between ‘robin’ and ‘tree’ triggered N400, where the semantic contribution of ‘not’ was ignored instead of incrementally incorporated. Findings supported the two-step model, suggesting that the projection of an affirmative proposition is to be negated later.

Afterwards, a cohort of researchers argued against the two-step model, claiming that difficulty in comprehending negation is yielded when negation is used without the support of pragmatics that would otherwise make it felicitous in a given context. In this vein, Nieuwland and Kuperberg (2008), in an ERP study, had participants read true negative sentences, with and without a preceding phrase which makes the sentences felicitous (e.g., in one condition, but not in the other, a negative sentence ‘scuba-diving isn’t very dangerous’ followed the phrase ‘with proper equipment’). Participants showed an N400 for a critical word (‘dangerous’) when reading the negative sentence without the preceding phrase, but they did not show an N400 when there was the preceding phrase. Contrary to the findings in Fischler et al. (1983), the findings of Nieuwland and Kuperberg suggested that ‘not’ was incrementally considered, rather than applied later, in support of the preceding phrase that makes the negation felicitous and easier to process.

Nordmeyer & Frank (N&F, henceforth) (2018) is one of the latest studies focusing on the pragmatic licensing of negation where they specifically examined informativeness proposed in pragmatic theories (e.g. Frank & Goodman, 2012; Grice, 1975; Horn, 1984; Levinson, 2000). According to these theories, an utterance is expected to be relevant and informative in a given context. N&F manipulated two factors in a visual context which might affect the informativeness of a true, simple negative sentence, e.g., ‘Abby doesn’t have an apple.’ The first factor is whether the mentioned subject character (e.g. Abby) has nothing or an alternative object like a cat. The other is about whether the other characters in the scene have nothing or the mentioned object (e.g. apple). Using a Likert-scale, participants rated how good a test sentence is as a description of a visual scene. They rated the negative sentence higher when Abby has nothing rather than an alternative object (e.g. cat). This was taken to indicate that when Abby has a cat, participants might have found it more felicitous to use an affirmative description about what she really has (i.e., ‘Abby has a cat’) rather than describing what she does not have by using the negative sentence. Participants also rated the negative sentence higher when everybody except Abby has an apple, i.e., where Abby is the only one without an apple, than when they have nothing. This was taken to suggest that the negative sentence is more felicitous to refer to Abby as the unique character who does not have an apple in the scene. Those findings are in line with the prediction based on the pragmatic theories regarding informativeness. From these results, N&F concluded that English speakers judge the felicity of negative sentences based on informativeness manipulated by visual contexts. Taken together, recent studies in English have suggested that the pragmatic support facilitates the comprehension of negation.

2.2 Negation in Japanese and the Role of Contrastive Topic *-wa*

Japanese is a head-final language and its negative morpheme *-nai* appears in the post-verbal position (Kato, 1985). In negative sentences, the scope of negation can be restricted by morphological elements, such as particles. The current study focused on the role of particle *-wa* in negation.

- (1) a. *Abby-wa ringo-wa¹ motte-i-nai.*
 Abby-Thematic TOP apple-**Contrastive** TOP have-PROG-NEG
 ‘Abby doesn’t have an apple (implicature: but she has some-thing else).’

¹ As in (1a), thematic topic *-wa* and contrastive topic *-wa* can coexist in a clause. When there are multiple *-wa* in a sentence, only the first one is thematic topic (Kuno, 1973) and the second one is interpreted contrastively (Oshima, 2021).

- b. *Abby-wa ringo-o motte-i-nai.*
 Abby-Thematic TOP apple-ACC have-PROG-NEG
 ‘Abby doesn’t have an apple.’

Kuno (1973) proposed that topic particle *-wa* can be *thematic* or *contrastive* depending on contexts². McGloin (1987) claimed that in negative sentences contrastive topic *-wa* marks the direct target of negation. In (1a), the object noun *ringo* ‘apple’ is marked with a contrastive topic particle *-wa*, where *ringo* ‘apple’ is the direct scope of negation, rendering the interpretation ‘it is not an apple that Abby has.’ Therefore, in addition to the base meaning ‘Abby doesn’t have an apple,’ (1a) yields the implied meaning ‘Abby has something other than an apple’ as a conventional implicature (Hara, 2006). The object noun in (1b), on the other hand, does not carry a contrastive *-wa* and is marked with an accusative particle *-o*. Thus, (1b) is interpreted as negation of Abby having an apple without implicature.

The phenomenon described above provides an ideal testing ground that allows the examination of the felicity of negative sentences in Japanese, and if the findings in English (N&F, 2018) can be applied to Japanese. Adopting the paradigm of N&F (2018), the current study investigated whether the implicature from contrastive topic *-wa* would affect the felicity judgment of negative sentences in Japanese, as well as whether Japanese speakers would also judge the felicity of negation based on informativeness. We addressed two research questions: (i) Do native speakers of Japanese generate the implicature driven by contrastive topic *-wa* and incorporate it when judging the felicity of negation? The role of contrastive topic *-wa* in negation was discussed in the theoretical literature, but empirical investigation remains sparse. Findings of the current study add new evidence regarding whether the contribution of *-wa* is indeed computed when comprehending negation. (ii) Does adopting the paradigm of N&F (2018) also reveal sensitivity in Japanese speakers to informativeness in negation comprehension? Addressing this question allows a cross-linguistic investigation of informativeness-based felicity judgment.

3. Experiment

3.1 Participants

² The precise nature of roles that *-wa* plays in (1a-b) is a matter of debate, particularly with respect to on what basis one can draw a line between two roles of *-wa*. Oshima (2020) and Tomioka (2016) claim that the role of *-wa* is determined depending on whether *-wa* attaches to a focus element or a non-focus element. In Oshima (2021), thematic *-wa* is argued to be a marker of the groundhood, but it can be interpreted as contrastive topic *-wa* in certain structures. This theoretical debate is left out of the scope of the current study.

A total of twenty-five native speakers of Japanese (age range = 19;9-32;11, mean = 24;3, female = 19, male = 5, gender unidentified = 1) participated in an online experiment which was administered on *Qualtrics* (Qualtrics, 2021). They were recruited through a social networking service and through linguistics courses at the International Christian University, Tokyo, Japan.

3.2 Design

The experiment was designed with one linguistic factor and two visual factors. Sentence Type (Contrastive *-wa* vs. Accusative *-o*) was the linguistic factor, while Subject Animal (None vs. Alternative Object) and Background Animals (None vs. Mentioned Object) were the visual factors. All these independent variables were within-subject variables.

3.3 Materials

3.3.1 Linguistic Materials

There were two types of sentences used in the target stimuli: Contrastive *-wa* as in (2a) and Accusative *-o* as in (2b).

Contrastive *-wa*

- (2) a. *Inu-wa* *ringo-wa* *motte-i-nai.*
 dog-Thematic TOP apple-**Contrastive** TOP have-PROG-NEG
 ‘The dog doesn’t have an apple (but it has something else).’

Accusative *-o*

- b. *Inu-wa* *ringo-o* *motte-i-nai.*
 dog-Thematic TOP apple-ACC have-PROG-NEG
 ‘The dog doesn’t have an apple.’

Note that the only difference between the two sentences is that *ringo* ‘apple’ is marked by a contrastive topic marker *-wa* in (2a) while it is marked by an accusative marker *-o* in (2b). (2a) has the implied meaning ‘..., but the dog has something else’ because of the contrastive topic *-wa* on the object noun, marking *ringo* ‘apple’ as the target of negation (McGloin, 1987) and yielding a conventional implicature (Hara, 2006). On the other hand, (2b) is a simple sentential negation with no implied meaning. Both (2a) and (2b) are true in all the visual contexts (see Table 1 below), but the felicity of each sentence was predicted to vary across the contexts.

3.3.2 Visual Materials

The design of the visual materials was adopted from N&F (2018). The visual context in each trial consisted of four animals with a table placed in front of each of them. When there was an object on the table, participants were instructed to regard the animal right behind the table as ‘having’ the object.

In the target items, there were four types of visual contexts, manipulated in terms of the two conditions: Subject Animal and Background Animals. Subject Animal condition is about whether the subject animal (e.g. ‘dog’ in (2)) has nothing (‘None’ context) or a non-mentioned alternative object such as a banana (‘Alternative Object’ context). Background Animals condition is about whether the other animals in the scene have nothing (‘None’ context) or the mentioned object (‘Mentioned Object’ context) such as an apple in (2). Each type is presented in Table 1.

		Background Animals							
		None				Mentioned Object (e.g. apple)			
Subject Animal	None								
	Alternative Object (e.g. banana)								

Table 1: Four types of visual stimuli (design adopted from N&F, 2018) used in test sentences like (2a-b)

A total of 128 items were created, of which 32 were targets and 96 were fillers. Filler items consisted of 32 false negatives, 32 true affirmatives, and 32 false affirmatives. Across all the 128 items including targets and fillers, the truth of the sentences (true vs. false), the polarity of the sentences (negative vs. affirmative), and the type of particles on subjects (nominative -*ga* vs. thematic topic -*wa* on the subject noun for affirmatives) or objects (contrastive topic -*wa* vs. accusative -*o* for negatives)³ were counterbalanced.

3.4 Procedures

The task was the felicity judgment. In each trial, participants viewed the visual context and the test sentence presented on the screen. They were asked to read the sentence and judge how good the sentence is as a description of the visual context, using a seven-point Likert-scale (*totemo warui* ‘very bad’;

³ The particle on object nouns was always accusative -*o* in affirmatives, and the particle on subject nouns was always thematic -*wa* in negatives.

warui ‘bad’; *yaya warui* ‘somewhat bad’; *futsu* ‘neutral’; *yaya yoi* ‘somewhat good’; *yoi* ‘good’; *totemo yoi* ‘very good’).

Predicted rating patters are described in the following paragraph. First, if participants incorporate the implicature driven by contrastive topic *-wa* into the felicity judgment, they will rate Contrastive *-wa* negative sentences like (2a) higher when the dog has a banana rather than nothing, since the implicature (i.e., ‘... , but the dog has something else’) better matches the situation that the dog has a banana. On the other hand, they will rate Accusative *-o* negative sentences like (2b) (i.e. the negative sentences without implicature) higher when the dog has nothing than an alternative object. This is because, when the dog has a banana, it would be more felicitous to describe what it actually has by uttering a declarative affirmative sentence ‘The dog has a banana’; thus, the felicity of Accusative *-o* negative sentences could get lowered in the context. Participants will also rate both Contrastive *-wa* and Accusative *-o* sentences (2a-b) higher when the background animals have the mentioned object (e.g. apple) than when they have nothing, finding that the dog uniquely not having an apple makes use of the negative sentence more felicitous.

4. Results

Each categorical rating was converted into a numerical score in data analysis, ranging 1 (*totemo warui* ‘very bad’) through 7 (*totemo yoi* ‘very good’). Figure 1 below shows the mean scores of Contrastive *-wa* sentences (Fig. 1a) and Accusative *-o* sentences (Fig. 1b) for each of the four visual contexts.

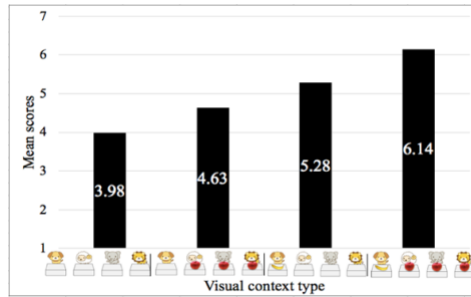


Figure 1a: Mean of the rating scores in Contrastive *-wa* condition

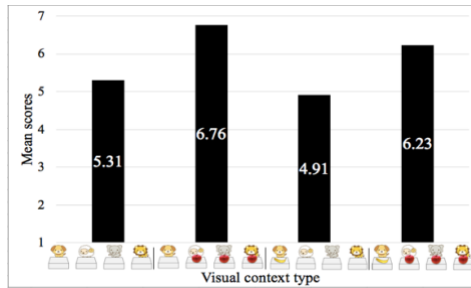


Figure 1b: Mean of the rating scores in Accusative *-o* condition

Overall, the two types of negative sentences were rated differently. In particular, rating pattern with respect to whether the subject animal (e.g. dog) has an alternate object (e.g. banana) or nothing revealed opposing patterns across conditions. Contrastive *-wa* sentences were rated higher when the dog has a banana than when it has nothing (Fig. 1a), while Accusative *-o* sentences were rated higher when the dog has nothing than a banana (Fig. 1b). As for Background Animals, both types of sentences were overall rated higher when the animals other than the dog have an apple than when they have nothing.

To examine whether the observed patterns would be statistically supported, a three-way Analysis of Variance (ANOVA) was conducted, having mean rating scores as the dependent variable and Sentence Type (Contrastive *-wa* vs. Accusative *-o*), Subject Animal (None vs. Alternative Object) and Background Animals (None vs. Mentioned Object) as within-subject variables. A significant main effect of Sentence Type was revealed, suggesting that Contrastive *-wa* condition (Fig. 1a) and Accusative *-o* condition (Fig. 1b) overall elicited a significantly different pattern in mean ratings ($F(1,24) = 18.942, p < .001$). Based on this, a two-way ANOVA was conducted separately for each Sentence Type by having Subject Animal and Background Animals as within-subject variables. First, as for Contrastive *-wa* condition, there was a significant main effect of Subject Animal ($F(1,24) = 19.464, p < .001$), suggesting that negative sentences were rated significantly higher when the dog has an alternative object (e.g. banana) rather than nothing. This finding aligned with our prediction, suggesting that participants incorporated the implied meaning which contrastive topic *-wa* generates ‘..., but the dog has something else,’ and this implicature influenced the felicity ranking of negative sentences. In Accusative *-o* condition, there was also a significant main effect of Subject Animal ($F(1,24) = 12.485, p = .002$), confirming that the rating pattern was indeed opposing to Contrastive *-wa* condition. This also matches the prediction and is consistent with N&F (2018), suggesting that Japanese speakers, when the dog has an alternative object, might have found it more felicitous to use an

alternate declarative sentence (i.e., ‘The dog has a banana’), rather than using the negative sentence. Regarding Background Animals, there was a significant main effect for both Contrastive *-wa* condition ($F(1,24) = 15.624$, $p = .001$) and Accusative *-o* condition ($F(1,24) = 69.632$, $p < .001$), showing that participants rated negative sentences higher when everybody except the dog has an apple than when they have nothing. In line with N&F (2018) and our prediction, this finding suggests that participants found the negative sentence more informative and felicitous when the subject animal is the only one not having the mentioned object in the scene. For both Contrastive *-wa* and Accusative *-o* conditions, there was no interaction between Subject Animal and Background Animals ($p = .499$ for the Contrastive *-wa*, $p = .609$ for the Accusative *-o*).

5. Concluding Remarks

The findings of this study contribute to the literature on the role of particle *-wa* and on the comprehension and processing of negation. First, the results revealed the effect of contrastive topic particle *-wa* on the object noun and the influence of it on the felicity judgment of negation by Japanese speakers, where the findings suggest that they compute the implicature yielded by *-wa*. This finding provides a new piece of empirical evidence that Japanese speakers are aware of the role of contrastive topic *-wa* in simple negation, in which the element carrying *-wa* is the target of negation (McGloin, 1987), and that Japanese speakers can also generate the implicature (Hara, 2006). Second, when no implicature was involved, Japanese speakers rated negative sentences higher when they were expected to be more informative with respect to what the subject animal has and what the other animals have. Replicating N&F (2018), this finding provides cross-linguistic support for informativeness-based felicity judgment of negation. More broadly, the findings of the current study showed that the felicity judgement of true negative sentences varies across contexts. This further supports the argument that the challenge in comprehending/processing negation is not due to the representational complexity in negation, but rather is modulated by pragmatics.

A future extension of this study will investigate the felicity judgment of negation by Japanese-acquiring children by utilizing the paradigm of N&F (2018). The current data revealed the sensitivity of adults to the contribution of contrastive topic *-wa* in determining the felicity of negation. It raises a question as to how children come to know the contribution of *-wa*, which generates a significant effect on the felicity of negation. The extension to Japanese-acquiring children would allow investigation of this question, as well as cross-linguistically promote the literature of the comprehension of negation in children.

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Children's Incorrect Association of the Focus Particle *Dake* in Japanese Clefts

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1 Introduction

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The acquisition of focus particles/phrases have received a lot of attention in the literature, and it has been cross-linguistically observed that children aged around 4–6 show incorrect association of such focus expressions (Mandarin Chinese: Notley et al. 2009, Zhou and Crain 2010, German: Müller 2011, Japanese: Endo 2004, Matsuoka 2007, Sano 2012, Mochizuki et al. 2021). For example, let us consider (1), in which the focus marker *only* is attached to the subject *cat*.

(1) Only the cat is holding a flag.

Suppose that this sentence is given in the following situation: a cat is holding a flag, a duck is holding a flag and a balloon, and a frog is holding a balloon. In this situation, (1) is false since the duck is also holding a flag. However, according to Crain et al (1994) and Notley et al. (2009), over half of children interpret the sentence as if *the cat is only holding a flag*, and thus, the children judged the sentence to be true. In other words, English-speaking children incorrectly associate *only* with VP. On the other hand, children do not show such non-adult-like performance with sentences such as (2), in which *only* precedes VP.

(2) The cat is only holding a flag.

In other words, they do not incorrectly associate *only* with the subject *cat* in (2). Thus, English-speaking children show subject-object asymmetry in their interpretation of *only*. Interestingly, as will be discussed below, Endo (2004) and Mochizuki et al (2021) observed similar phenomena in child Japanese. In this study, we experimentally demonstrate that Japanese-speaking children’s incorrect association is not based on linear order, which provides supporting evidence for Mochizuki et al. (2021).

2 Previous Studies in Child Japanese

As mentioned above, in Japanese, Endo (2004) originally observed Japanese children’s incorrect association of the Japanese focus particles *dake* and *sika*. Let us consider the following examples:

- (3) a. Zousan-dake-ga ringo-o tabe-ta.
 elephant-foc-Nom apple-Acc eat-Past
 ‘Only the elephant ate an apple.’
- b. Zousan-ga ringo-dake-o tabe-ta.
 elephant-Nom apple-foc-Acc eat-Past

‘The elephant only ate an apple.’

(4) a. Zousan-sika ringo-o tabe-*(nakat)-ta.
elephant-foc apple-Acc eat-neg-Past
‘Only the elephant ate an apple.’

b. Zousan-ga ringo-sika tabe-*(nakat)-ta.
elephant-Nom apple-foc eat-neg-Past
‘The elephant only ate an apple.’

The focus particle *dake* corresponds to *only* in English, and *sika* is almost the same as *nothing but* in English. *Sika* is a negative polarity item, and thus, it requires clause-mate negation as in (4).¹

According to Endo (2004), Japanese-speaking children aged 3-6 misinterpret sentences such as (3a) and (4a) as if the focus particles are associated with the object. The correct response rates for (3a) and (4a) were 31.7 percent and 40.3 percent, respectively. On the other hand, the children did not show such non-adult-like performance with (3b) and (4b), in which the focus particles are attached to the object. The correct response rates for (3b) and (4b) were 83.9 percent and 78.0 percent, respectively. In other words, as observed by Crain et al. (1994) and Notley et al. (2009), there is also asymmetry in child Japanese.

What causes children’s non-adult-like behavior and this subject-object asymmetry? According to Notley et al. (2009), adults assign a syntactic structure such as that in (5) to (1), but children assign a structure such as (6) to it.

(5) [_{IP} [_{NP} Only the cat] is holding a flag].

(6) [_{IP} Only [_{IP} the cat is holding a flag]].

Notley et al. (2009) claim that children misanalyze *only* as if it were a sentential adverb. Therefore, children, unlike adults, incorrectly associate *only* with elements which are within the c-command domain of *only*. Also, this can account for why children do not misinterpret a sentence when *only* appears in the pre-verbal position such as in (2); it does not c-command the subject. However, there are other possibilities. One of which is the linear order effect. It seems that children’s incorrect association occurs from left to

¹ In Japanese, a negative polarity can appear in the subject position unlike *anyone* in English. How to license the negative polarity item in the subject position in Japanese is beyond the scope of this paper, and hence, we leave this issue open.

right, but not vice versa. In this paper, we call this possibility *the Linear Order Effect Hypothesis*.

Sano (2012) addressed this issue examining children's interpretation of scrambled sentences such as (7).

- (7) Mikan_i-o zou-dake-ga t_i tot-ta.
 orange-Acc elephant-foc-Nom take-Past
 'An orange, only the elephant took.'

(Sano 2012, p. 529)

The object *mikan* is in the sentence-initial position via scrambling. Therefore, the object precedes the subject with the focus particle, and the subject precedes its trace. In his experiment, some Japanese-speaking children incorrectly rejected test items such as (7) in the matching condition. The correct response rate was 62.5 percent. Compared with the results of Endo's study, although this acceptance rate is high, it is still at chance level. This result suggests that the scrambled object was reconstructed and the participants incorrectly associated *dake* with the object.

In order to investigate to what extent linear order affects children's incorrect association of the focus particle, Mochizuki et al. (2021) examined children's interpretation of Japanese Right Dislocation (JRD) such as in (8) and (9).

- (8) a. Kumasan-dake-ga tot-ta yo, ringo-o.
 bear-foc-Nom take-Past SFP apple-Acc
 'Only the bear took an apple.'

- b. Kumasan-ga tot-ta yo, ringo-dake-o.
 bear-Nom take-Past SFP apple-only-Acc
 'The bear only took an apple.'

- (9) a. Ringo-dake-o tot-ta yo, kumasan-ga.
 apple-foc-Acc take-Past SFP bear-Nom
 'The bear only took an apple.'

- b. Ringo-o tot-ta yo, kumasan-dake-ga.
 apple-Acc take-Past SFP bear-foc-Nom
 'Only the bear took an apple.'

The object is right-dislocated in (8), and thus, the word order is SVO. In contrast, the subject is right-dislocated in (9). Thus, the word order is OVS. In

(8a) and (9a), the focus particle is attached to the sentence-initial argument, and in (8b) and (9b), it is attached to the right-dislocated argument. Using this paradigm allowed us to investigate whether linear order affects children's incorrect association of the focus particle. If the non-adult-like behavior occurs based on the linear order (i.e., from left to right), children should show incorrect associations in (8a) and (9a) since the focus particle appears in the sentence-initial position. In contrast, incorrect associations should not occur in (8b) and (9b) since the focus particle appears with the sentence-final argument. In other words, if the linear order is a crucial factor for children's incorrect association of focus particles, it should not matter whether the argument that the focus particle is attached to is the subject or not.

Contrary to the prediction above, Mochizuki et al. (2021) reported that the participants showed adult-like behavior with (8b) and (9a), in which the focus particle is attached to the object.² The correct response rates for (8b) and (9a) were 81.3 percent. In contrast, the participants showed non-adult-like behavior with (8a) and (9b). The correct response rates for those were 31.3 percent and 25.0 percent, respectively. These results indicate that the surface position of the focus particle is not relevant. For example, in (9a), although the focus particle appears with the sentence-initial argument, children did not show incorrect association. On the other hand, even when the focus particle appeared with the sentence-final argument, children showed non-adult-like behavior. Therefore, Mochizuki et al. (2021) denied the Linear Order Effect Hypothesis. Rather, they suggest that, after reconstruction, the subject is syntactically higher than the object, and incorrect association occurs from the higher position to the lower position. We call this the Syntactic Hierarchical Structure Hypothesis.³

However, to our knowledge, children's interpretation of the focus particles with this kind of non-canonical word order sentences have received less

² Mochizuki et al. (2021) examined children's interpretation of *sika* in JRDs as well. The results are almost the same as those for *dake*.

³ The Syntactic Hierarchical Structure Hypothesis is different from the analysis proposed by Notley et al. (2009) in terms of the followings. First, this hypothesis states that one of the factors causing the subject-object asymmetry is the syntactic hierarchy, but not the c-command domain of the focus phrase/particles; the subject is syntactically higher than the object, but we do not assume here that *dake* attached to the subject directly c-commands the object. Adopting *dake*-raising, Sano (2015) proposed an analysis which is similar to Notley et al.'s analysis, in which *dake* c-commands the object as well as the subject (sentential scope analysis). Second, we do not assume that children incorrectly assign non-adult-like syntactic structures or have non-adult-like grammatical knowledge since such analysis should pose a learnability problem. Suppose that, following Notley et al. (2009) or Sano (2015), children somehow allow non-adult-like structures at a certain stage. Then how do children correct it without negative evidence, which is not available in child-directed speech? This issue is beyond the scope of this paper, and hence, we leave this issue open.

attention. In this study, in order to confirm whether Mochizuki et al.'s claim is valid, we examined children's interpretation of the focus particle *dake* in Japanese Cleft constructions (JCs), which are superficially similar to RDs in terms of the word order.

3 Experiment

Before going into our experiment, let us briefly consider some properties of JCs.

- (10) a. Zousan-ga arat-ta no wa usisan da.
 elephant-Nom wash-Past C Top cow Cop
 'It is the cow that the elephant washed.'
- b. Zousan-o arat-ta no wa usisan da.
 elephant-Acc wash-Past C Top cow Cop
 'It is the cow that washed the elephant.'

In JCs, a presuppositional clause precedes a focused phrase. (10a) and (10b) exemplify Object Cleft and Subject Cleft, respectively. We would like to note here that the word orders are quite similar to those of JRDs: SVO and OVS.⁴ Also, as shown in (11) below, keep in mind that the focus particle *sika* cannot appear in the focused position even when the presuppositional clause contains negation.

- (11) a. Zousan-ga arat-ta no wa usisan-dake da.
 elephant-Nom wash-Past C Top cow-foc Cop
 'It is only the cow that the elephant washed.'
- b. *Zousan-o arawa-nakat-ta no wa usisan-sika da.
 elephant-Acc wash-neg-Past C Top cow-foc Cop
 'It is only the cow that washed the elephant.'

For this reason, we used *dake* in our experiment.

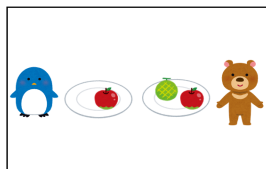
⁴ Needless to say, the syntactic structures of JRDs and JCs should be totally different. In the literature, syntactic analyses of JCs have received a lot of attention, and to our knowledge there are at least four types of analyses: (i) V-raising, the remnant movement and the operator movement analysis (e.g. Koizumi 1995, 2000, Kuwabara 1996); (ii) Base-generation of focus, the topicalization and the operator movement analysis (e.g. Matsuda 1997); (iii) Base-generation of the presuppositional clause and the focus, and the operator movement analysis (e.g. Kizu 2005, Hoji 1985, 1987, 1990); (iv) Direct focus movement and the remnant movement analysis (e.g. Hiraiwa and Ishihara 2002, 2012). In this study, however, we do not commit to a particular analysis.

We examined 10 children (5;7-6;5, mean 6;0) using the Truth Value Judgement Task (Crain and Thornton 1998). In order to directly compare our results with those of Mochizuki et al. (2021), we used the same materials and paradigm as given below. (12a) and (12b) are replications of Endo's study and (12c)-(12f) are the target items.

- (12)a. *S-dake* O V (Canonical)
- b. S O-*dake* V (Canonical)
- c. *S-dake* V O (Object Cleft)
- d. S V O-*dake* (Object Cleft)
- e. O V *S-dake* (Subject Cleft)
- f. O-*dake* V S (Subject Cleft)

Let us examine the target items given in (13) and (14).

- (13)a. Matched situation



- b. Test sentence (= 12e)

Melon-o tot-ta no wa kumasan-dake da yo.
 Melon-Acc take-Past C Top bear-foc Cop SFP.
 'It is only the bear that took a melon'

- (14)a. Mismatched situation



- b. Test sentence (=12f)

Ehon-dake-o kat-ta no wa nekosan da yo.
 picture book-Foc-Acc buy-Past C Top cat Cop SFP
 'It is only the picture book that the cat bought'

There were two trials for each condition. Considering the results of Mochizuki et al. (2021), it was predicted that the participants would show non-adult-like behavior for (13) but show good performance for (14).

4 Results and Discussion

First, let us present the results of the canonical sentences. As observed in the previous studies, the participants showed the subject-object asymmetry. When the focus particle was attached to the subject, the correct response rate was 45 percent (9/20). In contrast, when it was attached to the object, the correct response rate was 90 percent (18/20). Thus, we successfully replicated the results of Endo's study.

Next, let us show the results for Object Clefts such as (12c) and (12d). As for Object Clefts, both the Linear Order Effect Hypothesis and the Syntactic Hierarchical Structure Hypothesis predict the same results. In (12c), the focus particle is attached to the subject and it appears in the subject position. Thus, it was predicted that children should show incorrect association of *dake*. In contrast, in (12d), *dake* is attached to the object and it appears in the sentence-final position. Therefore, it was predicted that they should show adult-like performance. In fact, this prediction was borne out. The correct acceptance rate for (12c) is only 30.0 percent (6/20), while for (12d) it was 90.0 percent (18/20).

Finally, let us present the results for Subject Clefts: (12e) and (12f), which correspond to (13) and (14). Note that the Linear Order Effect Hypothesis and the Syntactic Hierarchical Structure Hypothesis predict different results. Under the Linear Order Effect Hypothesis, children's incorrect association should not occur in (13) since the subject with *dake* appears in the sentence-final position. In contrast, under the Syntactic Hierarchical Structure Hypothesis, the subject with *dake* is syntactically higher than the object after reconstruction to the canonical position. Thus, children should show incorrect association. Furthermore, for (14), the Linear Order Effect Hypothesis predicts that children's incorrect association should occur, but the Syntactic Hierarchical Structure Hypothesis predicts that it should not. The results are as follows: The correct response rate for (13) was 55 percent (11/20) and that of (14) was 95 percent (19/20). Thus, these results clearly refute the Linear Order Effect Hypothesis.

5 Conclusion

Our results clearly refute the possibility of incorrect association based on linear order. Our observations suggest that incorrect association occurs based on syntactic hierarchical structures after the reconstruction of subjects and

objects in JCs. These results also provide supporting evidence for the findings in Mochizuki et al. (2021): there is clear subject-object asymmetry. However, there remains the possibility that subject-object asymmetry is due to their grammatical function (i.e. Subject/Object) rather than to syntactic hierarchy (i.e. asymmetrical c-command relation). We leave this issue for future research.

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