The Adjunct Test in Japanese Ellipsis at the Prosody-Information Structure Interface

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Abstract: The so-called adjunct test (Oku 1998; Park 1997) has been used in the literature on Japanese ellipsis as a critical diagnostic test to distinguish between the argument ellipsis and verb-stranding VP-ellipsis analyses of null object constructions. The main purpose of this paper is to show that neither analysis is empirically adequate on its own because both adjunct-inclusive and adjunct-exclusive readings are actually available when prosody and Question under Discussion (Roberts 1996) are taken into consideration. We propose that the availability of the adjunct-inclusive reading is governed by a tight interaction of the information structure of an elliptical clause with appropriate discourse set ups, an interaction that we model within the Question under Discussion framework. We further argue that our analysis provides an illuminating account for the issue of interspeaker variation concerning the availability of the reading, a point that we show to be verified by the results of our informal acceptability judgement study with 60 native Japanese speakers.

Keywords: adjunct test, prosody, focus, information structure, argument ellipsis, verb-stranding VP-ellipsis, Japanese, Question under Discussion, implicit prosody hypothesis

1 Introduction

The so-called adjunct test has been used in the literature on Japanese ellipsis as a critical litmus tool to diagnose whether elliptic objects in this language are derived through argument ellipsis, an ellipsis operation directly targeting an argument, or verb-stranding VP-ellipsis, whereby ellipsis targets all materials within the VP after overt verb-movement out of it (see Otani and Whitman 1991, Oku 1998, Funakoshi 2016, Simpson 2023, Landau 2023 and many other references cited therein).

To illustrate how this test works, consider examples in (1a, b).[1]

(1) a. Bill-wa kuruma-o teineini aratta.
Bill-TOP car-ACC carefully washed
'Bill washed his car carefully.'

b. John-wa *e* arawanakatta.
John-TOP didn't.wash
'lit. John didn't wash *e*.' (Oku 1998:172)

The object in (1b) can go missing because it is identical to the overt corresponding object in

[1] In this paper, we follow the Leipzig Glossing Rules (https://www.eva.mpg.de/lingua/pdf/Glossing-Rules.pdf) in glossing the Japanese examples.

(1a), *kuruma-o* 'car-ACC'. Since the derivation of this null object, in principle, may involve argument ellipsis or verb-stranding VP-ellipsis, both operations independently argued for in previous research, the exact syntactic mechanism responsible for the generation of this type of object has been hotly contested up until now, often with mixed and inconclusive results.

It is against the background of this debate that the adjunct test was devised as a diagnostic probe into the derivation of null objects in Japanese. Oku (1998:172), to whom the test is credited to (but see Park 1997, who independently came up with this test in Korean), points out, regarding (1b), that "it is hard (or impossible, for some speakers) to get the interpretation in which the adverb is understood in the elliptic site; that is, in [(1b)], it is hard to get the reading that John didn't wash the car carefully, which would imply that John did wash the car but not in a careful manner." Instead, Oku notes, "the most natural and easily available interpretation" of (1b) is the one according to which John didn't wash the car at all. To account for the fact that (1b) lacks the adjunct-inclusive (hereafter, **AI**) reading, Oku argues that the null object in (1b) arises through argument ellipsis, as schematically depicted in (2), where the adjunct is not represented, to begin with.[2]

(2) Argument ellipsis: [$_{TP}$ John-wa [$_{VP}$ ~~kuruma-o~~ arawanakatta]]
John-TOP car-ACC didn't.wash

By contrast, Funakoshi (2016) observes that examples like (1b) can have the AI reading and takes this observation as supporting evidence in favor of the verb-stranding VP-ellipsis analysis of null objects. According to this analysis, the null object example in (1b) is derived instead as indicated in (3). The AI reading is available, Funakoshi argues, because the elided VP here contains the adverb *teineini* 'carefully'.[3]

(3) Verb-stranding VP-ellipsis: [$_{TP}$ John-wa ~~[$_{VP}$ kuruma-o teineini *t*$_{V}$]~~ arawanakatta]
John-TOP car-ACC carefully didn't.wash

Indeed, the AI reading in elliptic object constructions has been reported to exhibit considerable interspeaker variation in previous studies (Takahashi 2008; Abe 2013; Funakoshi 2016; Oku 2016; Tanaka 2023, among others), a topic to which we will return in Section 4.

Against this background, the main purpose of this paper is to show that when prosody and Question under Discussion (hereafter, **QUD**) are taken into consideration, both adjunct-inclusive and adjunct-exclusive readings are actually available in data such as (1). To be more

[2] Throughout in this paper, a strike-through indicates ellipsis.
[3] Note that VP-ellipsis in English allows the AI reading as the primary reading, as in (i).

(i) a. Alan had chopped up the garlic carefully. Heather had as well. (^{OK}AI reading)
b. Hiro imitated shellfish with great accuracy. Leila did too. (^{OK}AI reading)
(Goldberg 2005:89–90)

specific, we demonstrate that the availability of the AI reading is governed by a tight interaction of the information structure of antecedent and elliptical clauses with appropriate discourse set ups, an interaction that we model within the QUD framework (Roberts 1996). We propose that particular information structures conveyed through three separate types of focus in (4a−c), which are mediated through distinct prosodic contours, can correctly demarcate the range of cases, including those documented in the literature, where the AI reading is available.

(4) Three types of focus
    a. verum focus (Sections 2 and 3)
    b. predicate focus of negation (Sections 2 and 3)
    c. contrastive focus (Section 5)

We suspect that in most previous studies, sentences in question were arbitrarily processed and interpreted with a particular prosody that fits the most natural context for each speaker (Kitagawa and Fodor 2003, 2006), which results in a particular judgement associated with it. Thus, interpretations that were actually available were deemed impossible (or difficult) due to extraneous processing factors. In this paper, we aim to point out such methodological issues, often overlooked in the previous literature.

In addition to this methodological issue, the present findings suggest that neither the argument ellipsis analysis nor the verb-stranding VP-ellipsis analysis is adequate in accounting for the availability/unavailability of the AI reading in null object constructions. The argument ellipsis analysis presented in Oku (1998) as is predicts the AI interpretation to be always unavailable. The verb-stranding VP-ellipsis à la Funakoshi (2016), which mechanically derives the AI interpretation via syntactic V-raising and VP-ellipsis, does not seem to account for why discourse setups/information structure and the relevant prosody affect the availability of the AI interpretation in significant ways.

The present paper is organized as follows. In Section 2, we provide a characterization of the two types of focus in (4a, b) which we show play a critical role in sanctioning the availability of the AI reading in Japanese null object constructions. In Section 3, we present a technical implementation of our observation in Section 2 within the Structured Meaning Approach (Krifka 2001) and argue that an elliptical sentence allows the AI reading as long as the clause and a particular QUD evoked share the same focus structure and the adjunct is included in the background. In Section 4, we present the results of an acceptability judgement study to address the issue of interspeaker variation concerning the AI reading in a null object construction. We show that the results support our conclusion that the split judgement observed in (1) indeed reflects two different prosodic contours, each feeding a distinct focus structure to yield/block the relevant reading. In Section 5, we provide further support in favor of our QUD-based analysis of the AI reading based on examples involving contrastive focus in (4c). We conclude the paper in Section 6 with a summary of our major findings and their

methodological implications.

2. Two Types of Focus Mediated through Prosody

In this section, we introduce two types of focus that can be associated with (1b), namely verum focus in (4a) and predicate focus of negation in (4b). We characterize these types of focus using the notion of QUDs, which are questions that conversation participants engage in addressing (Roberts 1996). In the QUD framework, the information structure of a sentence is characterized by referring to what QUD it answers, as we will see below (see Onea 2016, Velleman and Beaver 2016 and Beaver et al. 2017 for an overview).

Let us start by noting that (1b) is actually associated with two different prosodic contours informally represented in (5a, b), where the symbol / indicates a prosodic boundary and SMALL CAPS indicate focal accent.

(5) a. John-wa ARAwa-nakat-ta. (no prosodic boundary → verum focus)
John-TOP wash-NEG-PST

b. John-wa / ARAWA-NAkat-ta. (prosodic boundary → predicate focus of negation)
John-TOP wash-NEG-PST

We suggest that the prosodic contours in (5a, b), in turn, signal two focus types and that the availability of the AI reading is controlled by which focus/prosodic structure one has in mind to read/parse (1b). First, when read or parsed as in (5a) with no appreciable prosodic boundary between the subject and the predicate, (1b) expresses *verum focus* in (4a) (Höhle 1988, 1992; Samko 2016; Lohnstein 2016), a type of focus which either affirms or negates the truthhood of a discoursally salient proposition in the ongoing discourse. We assume, following Vermeulen (2012) and Ishihara (2019), that verum focus is morphophonologically carried by an inflected verb in Japanese. When (1b) is read with the prosodic contour in (5a), the most natural discourse background compatible with the entire sequence in (1a, b) is the one where the interlocutors would like to resolve the question whether or not Bill and John washed the car in a careful manner. In other words, the most appropriate QUD which the interlocutors in the current discourse are attempting to answer as a bridge between the global structure of the discourse in (1a, b) and the local characteristics of the null object sentence in (1b) is something like *Did Bill and John wash the car carefully?* In Japanese, the default location for discourse-new focus is the immediately preverbal position (Kuno 1978; Ishihara 2003; Tomioka 2016). Since the manner adverb in this position constitutes the focus of negation, (1b) yields the AI reading that John washed his car but not in a careful manner, when read/parsed as in (5a).

By contrast, when (1b) is read or parsed as in (5b), there is felt to be a salient prosodic break separating the subject and the predicate. We suggest that this prosodic contour manifests *predicate focus of negation* in (4b) whereby the verb *araw* 'to wash' alone forms the focus of negation, an intuition that seems to be shared by most Japanese native speakers we consulted (see also Section 4 where we indeed verify this intuition with an acceptability judgement study). The prosodic parse in (5b), then, negates the event of John's washing itself so that the possible discourse move compatible with the global sequence in (1a, b) cannot include the presupposition that John washed the car. To be more specific, at the beginning of the discourse, the QUD would be something like *Did Bill and John wash the car carefully?*, to which (1a) provides a partial, positive answer. However, when (1b) is read or parsed as in (5b), we know that the utterer has started addressing a different (sub-)QUD, namely *Did John perform the action of washing?* because the predicate focus of negation and its corresponding prosody give rise to this particular QUD. It follows that the AI reading that John washed the car but not in a careful manner is blocked in (1b) when read or parsed as in (5b).[4]

3. A QUD-Based Analysis of the AI Reading within the Structured Meaning Approach

In this section, we present a technical implementation of our observations in Section 2 within the Structured Meaning Approach outlined by Krifka (2001). A word of caution is necessary here. We contend that any formalization within the general QUD framework is compatible with our observations in Section 2. For the purpose of this article, we will use the Structured Meaning Approach à la Krifka (2001) for the QUD-based analysis. However, we do not commit ourselves to this particular technical implementation, for which formalization we take is not our primary concern; rather, our point is that prosody and QUD should be seriously considered in the study of the AI reading in null object constructions in Japanese.

3.1. *A Brief Explication of the Structured Meaning Approach*

Within the QUD framework, discourse coherence is defined by the question-answer congruence between a given sentence and the QUD it addresses. To formally define this notion, we adopt the Structured Meaning Approach to question meanings and focus meanings as outlined below (von Stechow 1990; Krifka 2001).[5] According to this approach, question meanings are functions that, when applied to the meaning of the answer, yield a proposition (Krifka 2001:288). For example, the meaning of the *wh*-question *Who sings?* shown in (6a) is

[4] Another possibility is that the discourse starts with the QUD, *Did Bill and John wash the car?* In this discourse, (1a) provides additional information about the manner of washing that is not under discussion. Yet, since it still provides an answer to the QUD, it counts as relevant to the discourse. Further, (1b) with the focus structure/prosody in (5b) leads to the adjunct-exclusive reading because it negates the event of washing anyway.

[5] The Structured Meaning Approach is often discussed in comparison with the Alternative Semantics Approach (Rooth 1985, 1992). We leave the question whether adopting one approach over the other has different empirical consequences for future research.

understood as a function. So, when the answer *John* in (6b) is plugged in, the function in question returns the proposition that John sings, as shown in (6c). In addition, the question meaning requires the domain part of the function in its representation. Thus, the question in (6a) is semantically represented as a pair in (6d), where B (Background) refers to the function part of the question meaning and R (Restriction) refers to the domain part.

(6) a. Who sings? $\lambda x.\mathbf{sing}(x)$
b. John John
c. John sings. sing (John)
d. <B, R> = <$\lambda x.\mathbf{sing}(x)$, PERSON>

A focus meaning of an answer is also represented as a pair <B′, F> where F (Focus) refers to the focused element. For example, in (7b), B′ corresponds to the function $\lambda x.\mathbf{sing}(x)$ and F corresponds to *John*, the focused element.

(7) a. Who sings? <B, R> = <$\lambda x.\mathbf{sing}(x)$, PERSON>
b. [$_F$ John] sings. <B′, F> = <$\lambda x.\mathbf{sing}(x)$, John>

Given the definitions above, a criterion for a congruent Q-A pair can be formally expressed as in (8).

(8) Criterion for Congruent Question-Answer Pair Q-A
Where [[Q]] = <B, R> and [[A]] = <B′, F>: B=B′ and F∈R (Krifka 2001:296)

The answer in (7b) is deemed a congruent answer to the question in (7a) because the answer and the question share an identical background (i.e., B=B′) and the focus element, *John*, is a member of the restriction (i.e., F∈R).

The Structured Meaning Approach allows us to formally define the information structure of a sentence and its relationship to the discourse structure within the QUD framework. For example, in the discourse shown in (9Q, A), the question meaning of the QUD, *What did Yusuke wash?*, and the focus meaning of the answer, *Yusuke washed a car*, have the representations in (9a) and (9b), respectively.

(9) Q: What did Yusuke wash? A: Yusuke washed a car.
a. <B, R> = <$\lambda x.\mathbf{washed}(x)$(Yusuke), THING>
b. <B′, F> = <$\lambda x.\mathbf{washed}(x)$(Yusuke), a car>

In addition, the QUD in the discourse shown in (10Q, A), *Did Yusuke wash a car?*, has the representation in (10a), where POLARITY is a set consisting of an identity function Id and a

negative operator ¬. Accordingly, the focus meaning of the answer to the QUD, *Yusuke washed a car*, is represented as a pair in (10b).

(10) Q: Did Yusuke wash a car? A: Yusuke washed a car.
  a. <B, R> = <λ*f*.*f* (Yusuke washed a car), POLARITY>
     POLARITY = {Id,¬}
  b. <B′, F> = <λ*f*.*f* (Yusuke washed a car), Id>

(9b) and (10b) indicate the focus-background structure underlying the discourses in (9Q, A) and (10Q, A), respectively. Importantly, both discourses are accepted as coherent, for the pairs in (9) and (10) meet the condition on congruent Q-A pairs defined in (8).

In the following section, we will propose a discourse condition on the licensing of the AI reading in null object constructions.

3.2. *A QUD-based Analysis of the AI Reading in Null Object Constructions*

Having explained the basic ideas of the Structured Meaning Approach, we now propose that a null object construction in Japanese permits the AI reading as long as the construction and the QUD it evokes share the same focus structure and the adjunct is included in the background. Let us illustrate how this analysis works, using the examples in (1a, b). The question meaning of the QUD in (1), with the prosodic parse in (5a), is represented as a pair <B, R> in (11a) (recall from Section 2 that the QUD, when so parsed, expresses verum focus), whereas the focus meaning of the example in (1b) is expressed as a pair <B′, F> in (11b), in which POLARITY is in F(Focus).[6]

(11) a. <B, R> = <λ*f*.*f* (John washed the car carefully), POLARITY>
     (POLARITY = {Id,¬})
  b. <B′, F> = <λ*f*.*f* (John washed the car carefully), ¬>

Note that (11a) and (11b) share the same focus structure and the manner adverb is included in the background. Therefore, the AI reading is correctly predicted as acceptable when the prosodic/focus structure is as circumscribed in (5a).

By contrast, the question meaning of the QUD with the parse shown in (5b) and the focus meaning of (4b) are expressed in (12a) and (12b), respectively. Recall that this parse expresses predicate focus of negation where the event of John's washing itself is negated.

(12) a. <B, R> = <λ*f*.*f* (John washed), POLARITY>
     (POLARITY = {Id,¬})

[6] Strictly speaking, (11a) represents a sub-QUD that (1b) answers. For ease of exposition, we formalize only the sub-QUD, which the null object sentence in each example answers.

b. <B′, F> = <λ*f*.*f* (John washed), ¬>

The AI reading is blocked in this case because the QUD does not contain the adjunct even though (12a) and (12b) share the same focus structure, unlike what happens in (11a, b).

Some astute readers might say that the QUDs in (11a) and (12a) are arbitrarily created; hence, the QUD-based analysis lacks falsifiability. However, it must be noted that we are claiming that the null object construction in (1b) allows the AI reading as long as it has appropriate discourse set ups and prosody. Needless to say, there are numerous other QUD candidates with which (1b) can be interpreted. Yet, the actual set of QUDs with which (1a) and (1b) with the AI reading form a coherent discourse seem to be limited to the one in (11a), though there could be a few more others. The QUD-based analysis can be falsified if the AI reading is not obtained in the elliptical clause *even though it provides a congruent answer to some QUD whose background has the adverb in it*. Thus, our analysis indeed ensures falsifiability.

4. On Interspeaker Variation on the AI Reading: An Acceptability Judgement Study

In this section, we show that our current analysis sheds new light on the issue of interspeaker variation concerning the AI reading in examples like (1a, b). Recall from Section 1 that the AI reading in null object constructions has been reported in the previous literature to exhibit considerable variation, often with mixed and inconclusive results, despite the rather crucial role that the reading was held to play in the argument ellipsis vs. verb-stranding VP-ellipsis debate. Thus, Funakoshi (2016:118) points out that "[i]n fact, not a few Japanese speakers, including the author, accept the null adjunct reading in [(1b)] although it is true that the other reading is preferred in these examples." Takahashi (2008) echoes a similar observation: "I have occasionally encountered speakers of Japanese who accept the readings that would be possible if adjuncts were somehow included in ellipsis sites." Funakoshi (2016:119) further observes that the AI reading is more readily available in (13) than it is in (1a, b), a judgement that the present authors also concur with.

(13) Bill-wa teineini kuruma-o aratta-kedo, John-wa *e* arawanakatta.
Bill-TOP carefully car-ACC washed-but John-TOP didn't.wash
'lit. Bill washed the car carefully, but John didn't wash *e* (=the car).'
(Funakoshi 2016:119)

We argue below that the split judgement expressed concerning examples like (1a, b) truthfully reflect the aforementioned prosodic contours in (5a, b) feeding two different focus structures, namely verum focus and predicate focus of negation.

4.1. *The Acceptability Judgment Study*

We collected data regarding the availability of the AI reading from 60 native Japanese speakers from various age ranges using Google Forms from July 19, 2023 through August 3, 2023. The participants were asked to play two different online stimuli of the sentence in (14) both uttered by a single male Japanese native speaker and were instructed to answer whether the AI reading was available in that sentence with one or the other sound stimulus in mind. The F_0-pitch contours of Stimulus 1 and Stimulus 2 with annotations, created with Praat (Boersma and Weenink 2023), are shown in Figures 1 and 2.[7] Note that the experiment we conducted is informal in nature. However, even this informal evidence is sufficient to show that prosody and QUDs are deeply involved in the availability of the AI interpretation in null object constructions in Japanese.

(14) Taro-wa kuruma-o teineini aratta kedo,
Taro-TOP car-ACC carefully washed but
Hanako-wa *e* arawanakatta.
Hanako-TOP didn't.wash
lit. 'Taro washed the car carefully, but Hanako didn't wash *e* (=the car).'

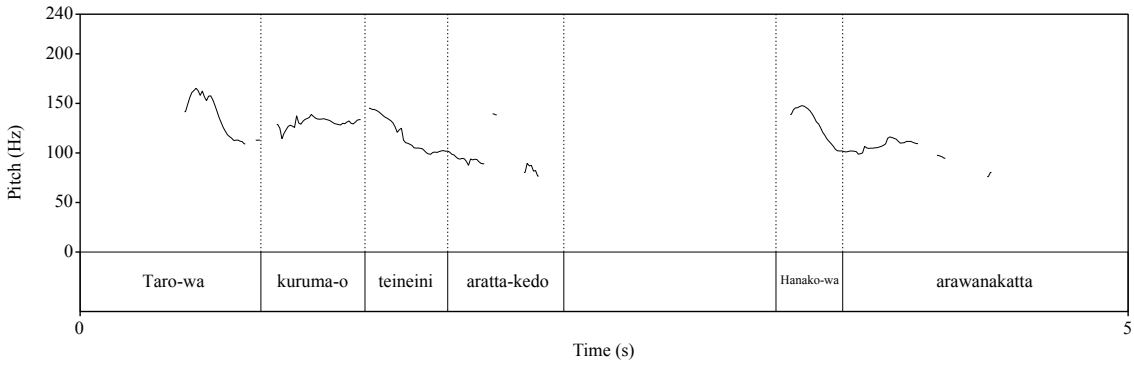
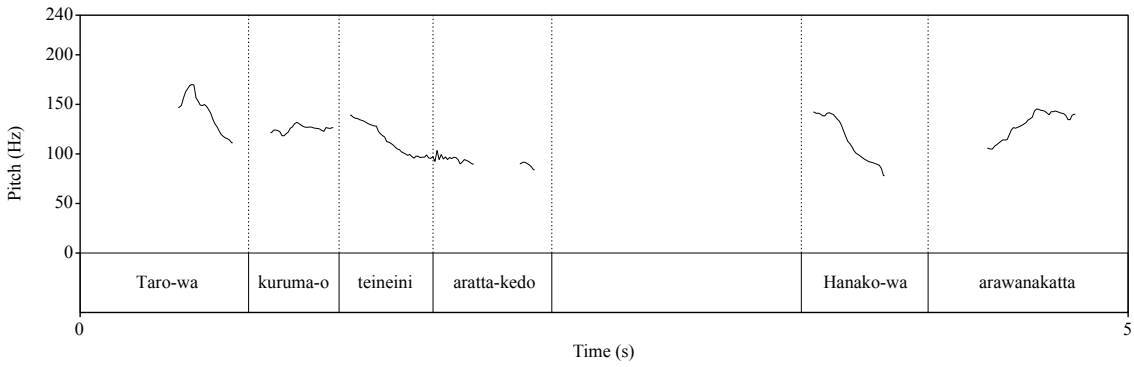


Figure 1: F_0-pitch contour of Sound Stimulus 1



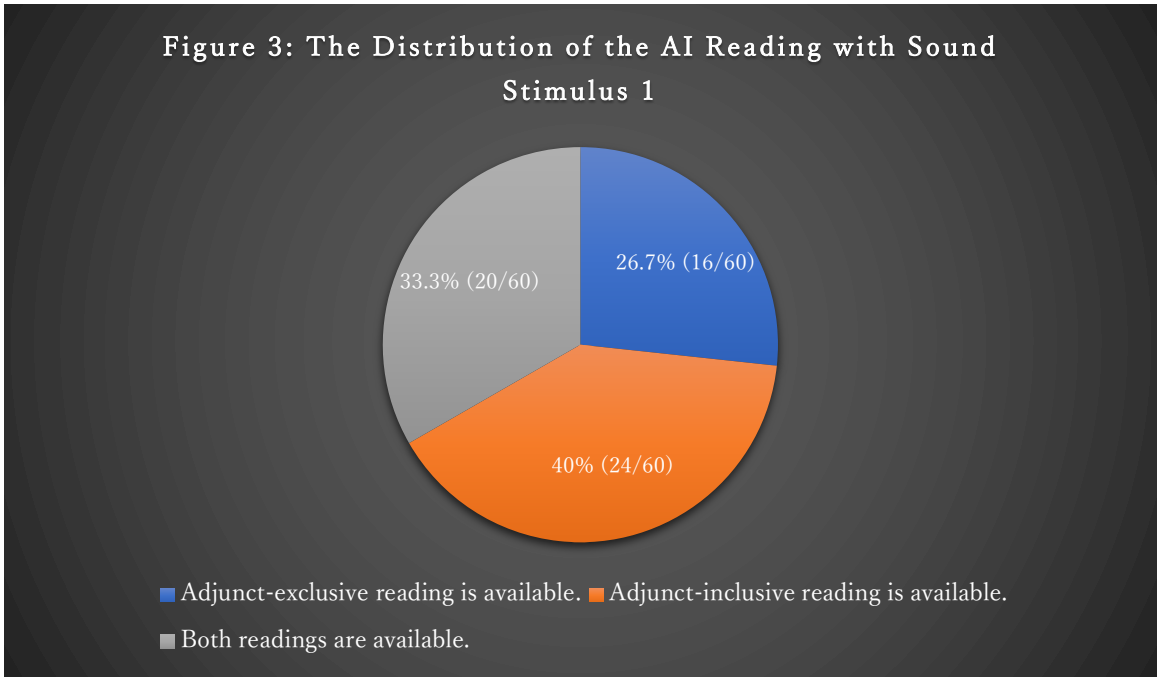
[7] The actual audio stimuli used are available at https://drive.google.com/file/d/1YTjz1XEQUuOCkIQr5Hg-Ig-nVv9mbrxhF/view?usp=share_link, where the first and second sound stimuli were designed to closely model the prosodic contours characterized in (5a) and (5b), respectively.

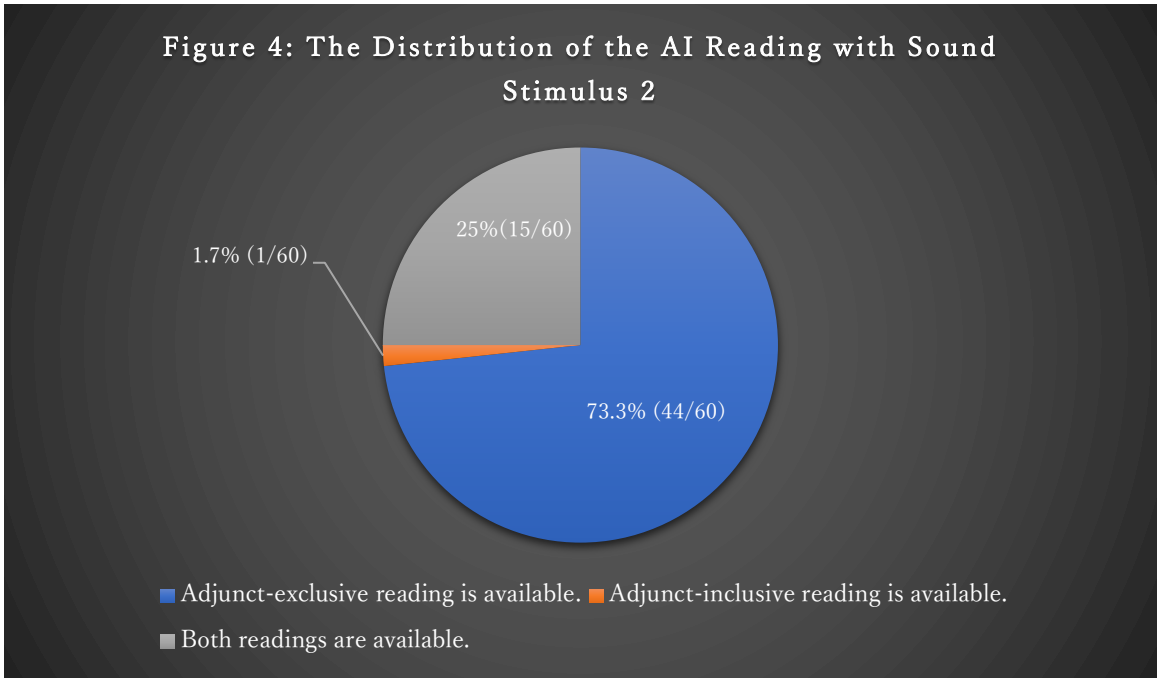
Figure 2: F_0-pitch contour of Sound Stimulus 2

Based on the analytic assumptions of our present approach outlined thus far, we made the following two predictions concerning the availability of the AI reading in (14) with the two prosodically controlled stimuli. First, when the prosody is carefully controlled so as to ensure verum focus in (5a), as was done with the first stimulus, the most natural QUD that will be so evoked should be, *Did Bill and John wash the car carefully?* Thus, the question meaning of the QUD and the focus meaning of the actual utterance in (14) should share the same focus structure with the manner adverb included in the background. Given this, we predicted that the AI reading should be predominant in this case.

Second, when the prosody is controlled instead to evoke predicate focus of negation as outlined in (5b) with the help of the second stimulus that reflects this type of focus, then the most natural sub-QUD that will come to mind should be, *Did John perform the action of washing?*, where the manner adverb is not included in the background of either the question meaning of the QUD or the focus meaning of the utterance itself (see the last paragraph in section 2). Therefore, we predicted that the AI reading should be difficult to come by so that the adjunct-exclusive reading should be more salient.

The results of our informal acceptability judgment study show that these two predictions are indeed confirmed. Figure 3 and Figure 4 summarize the number of those participants who gave one of the three possible judgements while listening to the utterance in (14) with the first or the second sound stimuli in mind: a) the adjunct-exclusive reading (i.e., John didn't wash the car, to begin with.), b) the AI reading (i.e., John washed the car but not in a careful manner.), and c) both readings are available.





Two observations are of particular significance for our current study. First, Figure 3 shows that 24 out of the 60 speakers (40%) accepted only the AI reading with Sound Stimulus 1 (read without a pause between the subject and the verb). In contrast, Figure 4 shows that the number of speakers who accepted only the AI reading with Sound Stimulus 2 (read with a pause between the two items) is just one (1.7%). Second, the number of participants who accepted only the adjunct-exclusive reading drastically increased from 16/60 (26.7%) to 44/60 (73.3%) when they switched from Sound Stimulus 1 to Sound Stimulus 2. These two observations suggest that whether an adjunct is included in the interpretation of a null object construction is controlled by the particular focus structure of the clause signaled by a distinct prosodic contour and its interaction with possible QUD set ups.

4.2. *On the Importance of Prosody and QUDs in the Study of Ellipsis*

To the best of our knowledge, no previous study has paid much attention to the largely ignored (though tacitly recognized) issue of the interspeaker variation regarding the AI reading in ellipsis constructions in Japanese, much less its well-governed distribution controlled by prosodic and information structural factors, as we have just demonstrated above. The results of our informal experiments show that neither the argument ellipsis analysis presented in Oku (1998) as is nor the verb-stranding VP-ellipsis analysis à la Funakoshi (2016) is empirically adequate. The argument ellipsis analysis predicts the AI interpretation to be always absent, while the verb-stranding VP-ellipsis analysis predicts that the AI reading can be obtained irrespective of prosodic factors. Once prosody and QUDs are taken into consideration, it is

obvious that both adjunct-inclusive and adjunct-exclusive readings are available in data such as (1), as we have demonstrated in Sections 2 and 3. We suspect that native speaker participants often end up adopting different prosodies when they give acceptability judgements in the null object construction in question, and hence, a particular judgement that is actually grammatically available is deemed as if it were unavailable. We will come back to a more in-depth discussion of our current findings in the concluding section.

A caveat is in order here. Given the developments of research on ellipsis over the past decade, both the argument ellipsis and the verb-stranding VP-ellipsis analyses are not necessarily incompatible with the AI reading. Once supplemented by the recently proposed operations such as *adjunct ellipsis* (Oku 2016; Tanabe and Kobayashi 2024), which elides the adjunct itself, or *pragmatic enrichment* (Ahn and Cho 2021; Landau 2023), which states that an adjunct meaning is recovered from the context with no recourse to syntactic structure, the argument ellipsis analysis can derive the AI interpretation in the following way. Here, we focus on the adjunct ellipsis analysis. When applied to (1), the schematic representation would be something like (15) (See (2) for comparison).

(15) Argument ellipsis with adjunct ellipsis:

[$_{TP}$ John-wa	[$_{VP}$ ~~kuruma-o~~	~~teineini~~	arawanakatta]]
John-TOP	car-ACC	carefully	didn't.wash

Through multiple applications of ellipsis targeting the argument and the adjunct, the analysis can correctly include the adjunct in the ellipsis site, as illustrated in (15), as proposed by Funakoshi (2016).

Likewise, the verb-stranding VP-ellipsis analysis can also derive structures with and without null adjuncts. When applied to (1), the verb-stranding VP-ellipsis derives either the structures in (16b) or (16c), the latter of which does not include the adjunct to begin with, as long as structural identity can be evaluated with the lower VP (i.e., VP2) in (16a) (See (3) for comparison).[8]

(16) Verb-stranding VP-ellipsis:

a.	[$_{TP}$ Bill-wa	[$_{VP1}$ teineini	[$_{VP2}$ kuruma-o	t_V]]	arawanakatta]
	Bill-TOP	carefully	car-ACC		didn't.wash
b.	[$_{TP}$ John-wa	~~[$_{VP1}$ teineini~~	~~[$_{VP2}$ kuruma-o~~	~~t_V]]~~	arawanakatta]
	John-TOP	carefully	car-ACC		didn't.wash
c.	[$_{TP}$ John-wa	~~[$_{VP2}$ kuruma-o~~	~~t_V]~~	arawanakatta]	
	John-TOP	car-ACC		didn't.wash	

[8] The word order of the object and the adjunct is not relevant in (16), which we do not discuss here.

Therefore, both the argument ellipsis and the verb-stranding VP-ellipsis analyses can in principle derive structures that syntactically allow both adjunct-inclusive and adjunct-exclusive readings, given recent attempts to yield the AI reading such as adjunct ellipsis and pragmatic enrichment.

In light of the above discussion, then, what does this paper have to say to the ongoing debate on the argument ellipsis vs. the verb-stranding VP-ellipsis analysis on the null object constructions in Japanese? Our point is that neither analysis can explain why certain prosodical patterns facilitate the AI reading on the one hand and block such interpretation on the other hand. We have demonstrated that when prosodic factors and QUDs are considered, both adjunct-inclusive and -exclusive readings are actually available in Japanese null object constructions. The observations and the analysis in this paper suggest that these extrasyntactic factors must be taken into account when studying the null object constructions, or possibly, elliptical expressions in general. Because such prosodical and discoursal factors have been dismissed in most previous studies, the so-called adjunct test (Oku 1998; Park 1997) has long been used without criticism to determine whether the argument ellipsis analysis or the verb-stranding VP-ellipsis analysis is correct. However, now that we know that the adjunct test is essentially uninformative unless prosody and QUDs are tightly controlled, the main takeaway of this paper is that future research on ellipsis must be conducted with careful attention to these extrasyntactic factors.

4.3. *Discussions on the Results of the Acceptability Judgment Study*

In this subsection, we briefly address two questions regarding the results reported in Figure 3 and Figure 4. First, we can see from these Figures that 20 out of the 60 participants (33.3%) accepted both the AI reading and the adjunct-exclusive reading based on Sound Stimulus 1 and that 15 out of the 60 participants (25%) accepted these readings based on Sound Stimulus 2. The question here is why there were a sizable number of participants who reported that both readings are available in the two sound stimuli. We suggest two possible explanations on this type of speakers. One explanation is that some of these speakers may have possibly missed the prosodic boundary separating the subject from the predicate so that they (mistakenly) perceived Stimulus 1 and Stimulus 2 as identical, contrary to our intent, thereby yielding this unexpected outcome (albeit through an extraneous error).

The other explanation is that, as elaborated in the paragraphs preceding these Figures, our QUD-based analysis only says that the AI reading should be more dominant when the utterance in (14) is read as in Sound Stimulus 1 (without a pause between the subject and the predicate) whereas it is the adjunct-exclusive reading that should become more prevalent when it is read as in Sound Stimulus 2 (with a pause between the two elements). Recall further that the reason we qualified the predictions this way was because our analysis made use of the relative concept "the most natural QUD," not the unique or absolute QUD, that will be evoked given the two prosodic/focus structures embodied by Sound Stimulus 1 and Sound

Stimulus 2 (see the last paragraph in Section 3 as well as footnote 6 in Section 4). Consequently, our current analysis is itself consistent with the existence of the participants accepting both readings under the two prosodic contours.

At any rate, what is more important for our present purposes is that the predominant readings indeed turned out to be the AI reading for 24 participants (40%) for the sentence in (14), when parsed as in Sound Stimulus 1, and the adjunct-exclusive reading for 44 participants (73.3%) for the same sentence when parsed as in Sound Stimulus 2, a pair of results that exactly match the predictions of our present approach to the AI reading.

The other question raised by the acceptability judgment study is concerned with the design of the acceptability judgement study, namely, whether the results would have changed if we had supplied the participants with real world contexts that serve to evoke natural QUDs rather than the prosodic cues. It is noted that we are utilizing the notion of QUD as one possible way to characterize discourse contexts in a precise way. Thus, we contend that the results would not have been significantly affected even if we had opted to use this context-based method for our acceptability survey. Recall that our system is so designed as to link a particular prosodic contour with a distinct focus structure (verum focus or predicate focus of negation) to compute the most natural QUD in each case. Of course, the fundamental question remains as to whether a particular QUD/context information feeds a prosody or vice versa, but our point remains essentially unaffected by this ordering issue as long as there is a certain correspondence between prosodic contours and focus-related information structure.

5. Additional Evidence for Our Analysis from Contrastive Predicate/Object Focus

In this section, we will present further data supporting our current analysis of the AI reading under null object constructions based on the third type of focus in (4c) (i.e., contrastive focus). To start, let us consider the example in (17). With the QUD/context in mind, (17A1-A2) as a whole is interpreted as follows: What Bill did not do carefully is washing dishes, whereas what John did not do carefully is wiping dishes. In other words, the AI reading is licensed in (17A2).

(17) A1: Bill-wa teineini sara-o ARAW-anak-atta.
Bill-TOP carefully dish-ACC wash-NEG-PST
'Bill did not wash dishes carefully.'
A2: John-wa *e* sara-o HUK-anak-atta.
John-TOP dish-ACC wipe-NEG-PST
'lit. John did not wipe e (=dishes).'
QUD: What is it that Bill and John did not do carefully?

The pair in (17) expresses *contrastive predicate focus*, in which the two VPs, *sara-o araw* 'to wash dishes' and *sara-o huk* 'to wipe dishes', are contrastively focused. Within the QUD framework, the pair in question is most naturally analyzed as providing an answer to the

common QUD in (17). The AI reading in (17A2) is then naturally accounted for because this QUD and the focus meaning of (17A2) share the same focus structure and the manner adverb is included in the background, as depicted in (18).

(18) a. <B, R> = <λ*x*. (John did not do *x* carefully), ACTION>
b. <B′, F> = <λ*x*. (John did not do *x* carefully), wiping dishes>

Note that (17A2) cannot be analyzed as an instance of verb-stranding VP-ellipsis à la Funakoshi (2016), who argues that the AI reading is derived with an overt object only when the contrastively focused object escapes from the VP-ellipsis site. Notice that the object itself is not contrastively focused in (17A); what is focused is the VP. Thus, the object cannot have undergone focus movement out of VP. Moreover, as first discussed by Goldberg (2005:171), verb-stranding VP-ellipsis is known to obey the so-called verb-identity requirement to the effect that the antecedent and main verbs of the elliptic clause must be identical in their root and derivational morphology. Because the verbs in (17A1) and (17A2) are not identical, Funakoshi's analysis predicts that the AI reading is not obtained in (17A2), contrary to facts.

A similar analysis can be extended to cover the AI reading in examples like (19a, b), which now involve *contrastive object focus*, also discussed in Funakoshi (2016), where the objects in the antecedent and elliptical clauses – *sara* 'dish' and *kuruma* 'cars' – are contrasted (see also Oku (2016) for a similar observation).

(19) A1: Bill-wa teineini SARA-o araw-anak-atta.
Bill-TOP carefully dish-ACC wash-NEG-PST
'Bill did not wash dishes carefully.'
A2: John-wa *e* KURUMA-o araw-anak-atta.
John-TOP car-ACC wash-NEG-PST
'lit. John did not wash cars.'
QUD: What is the thing that Bill and John did not wash carefully?

Here again, the two answers in (19A1) and (19A2) are construed as providing a congruent answer to the common QUD shown in (20), with an adverb in the background structure, thereby yielding the AI reading, as a natural consequence of our QUD-based analysis.

(20) a. <B, R> = <λ*x*. (John did not wash *x* carefully), THING>
b. <B′, F> = <λ*x*. (John did not wash *x* carefully), car>

A question arises at this juncture in connection with the contrastive object example in (19). As Funakoshi (2016:135−136) notes, when we remove the contrastive focus property from (19A2) by replacing the contrastive KURUMA-o 'car-ACC' with a non-contrastive

expression such as *sara-o* 'dish-ACC', the resulting sentence no longer permits the AI reading, as shown in (21A2) (see also Simpson et al. 2013 for a similar generalization based on the AI reading in null argument contexts in Hindi, Bangla and Malayalam).

(21) A1: Bill-wa teineini sara-o araw-anak-atta.
Bill-TOP carefully dish-ACC wash-NEG-PST
'Bill did not wash dishes carefully.'
A2: John-wa kuruma-o araw-anak-atta.
John-TOP car-ACC wash-NEG-PST
'John did not wash a car.'

As briefly mentioned above, Funakoshi (2016:136) himself argues that the contrast between examples like (19A2) and (21A2) with respect to the AI reading is straightforwardly derived through his verb-stranding VP-ellipsis analysis if the contrastively focused object undergoes movement out of the VP (Jayaseelan 1990; Lasnik 1995, 1999) before the latter undergoes VP-ellipsis. (19A2) permits the AI reading thanks to this derivation whereas (21A2) cannot be derived this way because the overt object is not contrastively focused.

We believe, however, that the impossibility of the AI reading in (21A2) vis-à-vis (19A2) is only apparent. We maintain that whether the AI reading is obtained in (21A2) also depends on the QUD in the discourse. First of all, if (21A1) and (21A2) are read without a focal stress on the objects, they are no longer congruent answers to the QUD in (20), given that contrastively focused objects are most naturally read with a stress on them. The question then is what QUD(s) they answer if they are to be understood in a coherent discourse. One possible QUD to which (21A1) and (21A2) are congruent answers is actually the one in (17), repeated below in (22). As answers to this QUD, (22A1) and (22A2) are VP-focus sentences, and hence the objects themselves are not contrastively focused. Thus, they are not read with an emphatic stress. Nonetheless, (22A2) allow the AI reading just like (17A2) does.

(22) A1: Bill-wa teineini sara-o araw-anak-atta.
Bill-TOP carefully dish-ACC wash-NEG-PST
'Bill did not wash dishes carefully.'
A2: John-wa *e* kuruma-o araw-anak-atta.
John-TOP car-ACC wash-NEG-PST
lit. 'John did not wash a car.'
QUD: What is it that Bill and John did not do carefully?

The question meaning of the QUD and the focus meaning of the sentence in (22A2) are shown in (23a, b), respectively. Since they share an identical background where the adjunct is included, the AI reading in (22A2) is explained.

(23) a. <B, R> = <λ*x*. (John did not do *x* carefully), ACTION>
b. <B′,F> = <λ*x*. (John did not do *x* carefully), washing a car>

Given this, we suggest that the AI reading is to some extent difficult to get in the sentence pair in (21) because not everyone comes up with a natural context such as (22) where the sentences are interpreted in a coherent discourse with the adjunct in the background. In contrast, if the objects are contrastively focused, it is relatively easy to imagine a context such as (19), in which the adjunct constitutes a part of the background of a coherent discourse.

6. Concluding Remarks

Throughout the paper, we have argued that the adjunct test must be used with utmost care by controlling contexts, specified by QUDs and prosody which expresses certain types of focus. We have demonstrated that both adjunct-inclusive and adjunct-exclusive readings are available in data such as (1), repeated here as (24), when prosodical factors and the QUD set ups are properly controlled.

(24) a. Bill-wa kuruma-o teineini aratta.
Bill-TOP car-ACC carefully washed
'Bill washed his car carefully.'
b. John-wa *e* arawanakatta.
John-TOP didn't.wash
'lit. John didn't wash *e*.' (Oku 1998:172)

To recap the empirical observations in this paper, we have seen that the range of cases where the AI reading is possible is correctly characterized by particular information structures conveyed through three distinct types of focus in (4a-c), which, in turn, are mediated through different prosodic contours. This observation is summarized in Table 1.

	Verum Focus	**Predicate Focus of Negation**	**Contrastive Focus**
Examples	(1b)/(14) (without a pause)	(1b)/(14) (with a pause)	(17)/(19)/(22)
AI reading	✔	*	✔
Adjuncts in background	✔	*	✔

Table 1: Three Focus Types in Japanese and the Availability of the AI Reading

We have presented a technical implementation of the foregoing observation within the Structured Meaning Approach (Krifka 2001) and have argued that the AI reading is licensed as long as an elliptical clause and a QUD evoked by a particular discourse share the identical focus structure and the adjunct is included in the background. We have then reported the results

of our informal acceptability judgement study with 60 native Japanese speakers with controlled prosodic stimuli and have shown that the results provide confirmation for our pragmatic approach to the generation of the AI reading in elliptic contexts.

Furthermore, our analytic results (particularly as they pertain to the acceptability judgment study explained in Section 3) show that extra-syntactic factors – prosody, information structure and focus articulation – must be carefully controlled for when certain acceptability judgements/interpretations are to be elicited (Fodor 2002a,b; Kitagawa and Fodor 2003, 2006, among others). A critical discussion on this point offered by Kitagawa and Fodor (2003) is instructive for us to relate our current approach to their methodological reflection on the actual practice of generative grammar.

It was reported in the early 1990s that a *wh*-question as in (25) has only the subordinate *wh*-interrogative scope (Nishigauchi 1990; Watanabe 1992).

(25) Kimi-wa [$_{CP}$ Emi-ga nani-o kat-ta-ka] sitteiru-no?
you-TOP Emi-NOM what-ACC buy-PST-Q know-Q
a. Subordinate *wh*-scope: 'Do you know what Emi bought?'
b. * Matrix *wh*-scope: 'What is the thing such that Emi bought it?'

Since this judgement has long been taken in the literature to reflect genuine syntactic knowledge concerning the syntax of Japanese *wh*-question, considerable efforts have been made in the field to provide a principled explanation for this aspect of grammar.

Kitagawa and Fodor (2003), however, take issue with this tradition and point out that the matrix *wh*-scope interpretation, long held to be impossible in (25), is actually grammatically available when an emphatic accent is placed on the *wh*-phrase *nani-o* 'what-ACC', with all subsequent lexical accents being eradicated globally till the end of the matrix clause, as schematically depicted in (26). Here, bold small capitals indicate an emphatic accent or a sharply raised F_0-peak whereas underlining indicates the domain of deaccenting/eradication of lexical accents.

(26) Kimi-wa [$_{CP}$ Emi-ga **NA**ni-o kat-ta-ka] sitteiru-no?
you-TOP Emi-NOM what-ACC buy-PST-Q know-Q
a. * Subordinate *wh*-scope: 'Do you know what Emi bought?'
b. Matrix *wh*-scope: 'What is the thing such that Emi bought it?'

Kitagawa and Fodor argue that the subordinate *wh*-scope reading seems to be the only reading available in (25) because native Japanese speakers are most likely to read it with a default prosodic contour indicated in (27), where lexical accents on the verbal complex in the matrix clause are not eradicated or deaccented. The hypothesis underlying this reasoning is known under the name of the Implicit Prosody Hypothesis, stated in (28) (Fodor 2002a, b).

(27) Kimi-wa [CP Emi-ga **NA**ni-o kat-ta-ka] sitteiru-no?
you-TOP Emi-NOM what-ACC buy-PST-Q know-Q
a. Subordinate *wh*-scope: 'Do you know what Emi bought?'
b. * Matrix *wh*-scope: 'What is the thing such that Emi bought it?'

(28) The Implicit Prosody Hypothesis:
In silent reading, a default prosodic contour is projected onto the stimulus, and it may influence syntactic ambiguity resolution. Other things being equal, the parser favors the syntactic analysis associated with the most natural (default) prosodic contour for the construction (Fodor 2002a:113).

Kitagawa and Fodor further note that the matrix scope interpretation in (25) was overlooked not only due to prosodic factors but also due to pragmatic factors. The subordinate/indirect question interpretation of (25) simply asks whether the interlocutor knows what Emi bought; hence it may be used in a context where the speaker believes that she bought something, but does not know what she actually bought. By contrast, the matrix/direct question interpretation of (25) requires a much more specific context to sound natural. Specifically, it can be used in a context where the speaker believes that there is something to be bought and that his/her interlocutor knows if Emi bought that thing. The question is then asked to inquire what that is. Clearly, however, such a rich context is harder to imagine in a real-world situation, and so Japanese speakers are naturally inclined to read the sentence in (25) with the prosodic contour shown in (27) when they are presented without any specific contextual cues favoring one prosody (e.g., (27)) over the other (e.g., (26)).

It is our considered opinion that the force of the implicit prosody in Fodor's (2002a) sense is applicable to our current investigation – the AI reading under ellipsis – much more directly. When one studies ellipsis constructions, it is particularly difficult to distill syntactic judgements from his/her acceptability judgements, for ellipsis is essentially a multi-dimensional phenomenon whose complete understanding requires complex interactions among syntax, phonology, semantics and pragmatics.

This difficulty is further fueled by the fact that ellipsis of the surface anaphora type (Hankamer and Sag 1976), including argument ellipsis constructions in Japanese, requires a linguistic antecedent so that a null argument construction must follow a full-fledged antecedent. Accordingly, to see whether a particular elliptical clause exhibits a certain interpretive trait such as the AI reading, one must verify whether, and if so, under what contexts they would interpret the pair of sentences in a coherent discourse. For this reason, giving an acceptability judgement on the AI reading in examples like (1a, b) can never be teased apart independently of discourse/information structural conditions and, correlatively, prosodic contours that carry this type of information. Accordingly, when native speaker participants read or parse the null

object construction, they assign a prosodic contour according to a salient context that happens to come to their mind first. As a result, a particular judgement that is actually grammatically available is somehow masked by this extraneous processing constraint.

Concurrently, our empirical findings in Sections 3 and 4 show that that neither the argument ellipsis analysis nor the verb-stranding VP-ellipsis analysis by itself is sufficient to account for the availability/unavailability of the AI reading in null object constructions. On the one hand, the argument ellipsis analysis presented in Oku (1998) as is predicts the AI interpretation to be always absent because the adjunct in question is not involved in the derivation, to begin with. On the other hand, the verb-stranding VP-ellipsis à la Funakoshi (2016) simply posits that the AI interpretation is in principle derived via syntactic V-raising and VP-ellipsis. Hence, the analysis is not sufficient on its own; it does not seem to explain why non-syntactic factors such as discourse setups/information structure and the relevant prosody significantly affect the availability of the AI interpretation. Furthermore, recent studies on this topic suggest that the presence of an AI interpretation neither supports the verb-stranding VP-ellipsis nor does it reject the AE analysis (Landau 2023; Tanabe and Kobayashi 2024). Considering this recent development and the findings of the present study, it can no longer be determined on the basis of the adjunct test alone whether the argument ellipsis analysis or the verb-stranding VP-ellipsis analysis is correct.

We conclude this paper, then, by saying that the findings reported in this paper should necessitate serious reconsideration of the commonly held view of the sound and meaning systems as merely ornamental components of natural language grammar.

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