Embedded negative polar questions in Japanese*
Consequences for the speech act embedding view of the complementizer *to*

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Abstract

When embedded under *ka to*, Japanese negation *nai* does not have to contribute its usual truth reversing meaning, that is, it is *expletive*. We argue that this behavior is predicted if this embedded negation is part of a positively biased negative polar question. To produce an analysis, a better understanding of the complementizer *to* is needed. We catalogue several of its unique properties, and conclude that it embeds speech acts. Our analysis builds on previous work (as well as traditional Japanese grammar) that analyzes *to* as a quotative marker. We offer an analysis of the syntax and semantics of *to*-clause embedding that makes progress relative to prior work, and that unifies the analysis of *to*-clauses that are selected by the matrix predicate with those that are not.
Keywords: expletive negation; biased questions; negative polar questions; speech act embedding; quotative marker; complementizer

1 Introduction

In certain embedding environments, Japanese negation *nai* does not have to contribute its usual truth reversing meaning. For example, *nai* appears in the embedded clause in (1), and yet the interpretation is such that the propositional argument of the attitude verb is not negated (cf. Yoon 2011, 2013 for a similar effect in Korean).

(1) Yoko-wa [Sota-ga uta-o utawa-**nai**-**ka**-to] **kitaishi**-te i-ru.
Yoko-TOP Sota-NOM song-ACC sing-**NEG**-**KA**-TO **hope**-TE ASP-NPST
(lit.) 'Yoko hopes, wouldn't Sota sing a song.'
'Yoko hopes that Sota might sing a song.'

The complementizer *to* is obligatory in (1). Remove it, and the sentence is unacceptable. *Ka* on the other hand can be removed, but the meaning changes so that *nai* fulfills its usual negative role, reversing the truth value of the object of Yoko's attitude:

*~15,400 words. The analysis in this paper was first presented in a manuscript that was made publicly available in August 2021. Early versions of this work were presented at conferences and workshops from June 2018 to July 2019, and the current version at a conference in December 2022 that included a proceedings publication.

(2) Yoko-wa [Sota-ga uta-o utawa-**nai**-to] **kitaishi**-te i-ru.
Yoko-TOP Sota-NOM song-ACC sing-**NEG**-TO **hope**-TE ASP-NPST
'Yoko hopes that Sota won't sing a song.'

Furthermore, when *ka* is absent as in (2), the matrix subject's attitude about the embedded clause becomes stronger than it is in (1), as indicated by the use of *might* in the translation of (1) but not (2).

What are the roles of *nai*, *to* and *ka* in producing these effects? One view is that the expletive negation in (1) is related to embedded expletive negation in French, as in (3) (Yoon, 2011, 2013; Choi & Lee, 2017):

(3) Nous tenterons d' **éviter** qu' il (**n'**) apprenne la nouvelle avant son départ.
we try.FUT to avoid that he NEG learn.SUBJ.PRES the news before his departure
'We will try to prevent him from learning the news before he leaves.'[1] *French*

However, there is a two-sided asymmetry between embedded expletive negation in Japanese and French that calls such a unified analysis into question. First, expletive *nai* appears under predicates that do not license expletive *ne* in French, such as *kitaisuru* 'hope' in (1) (cf. Yoon (2011) who also notes this asymmetry). Second, French expletive *ne* is licensed by predicates that do not allow expletive *nai* in Japanese, such as *prevent/avoid*. Compare (3) to (4):

(4) *Watashi-wa [sono shirase-ga Yoko-no mimi-ni haira-**nai**-ka-to] sake-ta.
I-TOP that news-NOM Yoko-GEN ear-DAT enter-**NEG**.NPST-Q-TO avoid-PST
'I avoided that the news would (not) reach Yoko's ear.'

If the embedded expletive negations in the two languages are one and the same phenomenon, then these asymmetries are puzzling.

We believe that they are distinct phenomena, and will pursue a unique analysis for the Japanese data. Our analysis will explain embedded expletive negation in Japanese as the negation of a positively biased negative polar question (we will use the abbreviation 'NPQ' to refer to negative polar questions that have a positive speaker bias). Consider the matrix NPQs in (5):[2]

(5) Context: A, B and Yoko have placed their orders at a café. While Yoko is away from the table, a waiter brings three cups of coffee. A thinks that she heard Yoko order tea earlier, and says to B:
Yoko-wa ocha-o chuumonshi-te **nai**$_{tc}$?
Yoko-TOP tea-ACC order-TE **NEG**$_2$.NPST
'Didn't Yoko order tea?'

NPQs like this have been described as requiring the speaker to have a positive bias, that is, the speaker must have a prior expectation or belief that the positive answer is true (for prior discus-

[1] http://bdl.oqlf.gouv.qc.ca/bdl/gabarit˙bdl.asp?t1=1&id=2467

[2] Note that using the nominalizer *no* as in (i) is another way of expressing NPQ.

(i) Yoko-wa ocha-o chuumonshi-ta n ja **nai**$_{tc}$?
Yoko-TOP tea-ACC order-PST NO DE.WA **NEG**$_2$.NPST
'Isn't it the case that Yoko ordered tea?'

sion of negative polar questions in Japanese and other languages, see Romero & Han, 2004; Sudo, 2013; Hara et al., 2014; Ito & Oshima, 2016; Rieser, 2017; Hirayama, 2018; AnderBois, 2019; Frana & Rawlins, 2019; Oshima, 2019; Shimoyama et al., 2019; Goodhue, 2022b). Ito & Oshima (2016, 4) argue that the negation in NPQs like (5) must be 'tonally compressed', hence the subscript *tc*, which means the 'total disappearance, as well as mere subdual/weakening, of pitch movements.' In contrast, regular negation *na'i* is marked with an apostrophe to indicate a lexical accent, and its presence in a polar question does not entail positive bias. To separate the two, we will gloss nai_{tc} as NEG$_2$, and *na'i* as NEG$_1$.[3]

Pursuit of our analysis of embedded expletive negation in Japanese combined with other relevant data leads to a more general picture of embedding under the complementizer *to*: We demonstrate that *to*-clause embedding has many unique traits, which we argue can be explained if we analyze it as a kind of speech act or mental utterance embedding (see, for example, Saito (2017); Kim (2018); Kim & Tomioka (2014); Maier (2014)). We provide an analysis of *to*-clause embedding that makes progress on the breadth of data captured relative to prior work. Viewed in the light of this analysis, *ka* will be seen to play the same role as it does in matrix clauses, which we further suggest may be distinct from its role as an interrogative complementizer in other embedded contexts.

The paper is organized as follows: In section 2, we discuss background on NPQs, and make a first argument that embedded expletive negation can be reduced to the negation in an embedded NPQ. In section 3, we introduce several properties of *to*-clauses that influence our analysis. Then in section 4, we present our analysis. In section 5, we return to the puzzles about the distribution of embedded expletive negation raised above, and explain them in light of our analysis. We conclude in section 6.

2 Positively biased negative polar questions (NPQs)

2.1 Matrix negative polar questions

The negative polar question (NPQ) in (7) can be felicitously uttered in context (6), adapted from Ito & Oshima (2016), in which B has a prior expectation that the orange that A is eating is sweet.[4]

[3] This prosodic distinction can be affected by the choice of verb. With some verbs such as *ku'-ru* 'come-NPST', the pitch accent is placed immediately before negation (e.g. *ko'-nai*), and as a result, the distinction between NEG$_1$ and NEG$_2$ is blurred because there is no tone to compress to begin with. This issue can be avoided by using the aspectual form, as in *ki'-te na'i* 'NEG$_1$' vs. *ki'-te nai* 'NEG$_2$' (see Ito & Oshima, 2016). We leave it to future work to further probe the prosodic characterization of negation in both matrix and embedded clauses.

[4] In Ito and Oshima's (2016) original context, B has only heard that oranges this year are exceptionally sweet, and he has not eaten one yet. In this context, however, the English negative polar question 'Isn't it sweet?' sounds a bit odd, and a positive polar question 'Is it sweet?' would be preferred (a positive polar question would also work in Japanese in this context). We modified the context to (6) so that we would have acceptable NPQs in both Japanese and English. In fact, it is possible that example (7) in Japanese may be more acceptable in the modified context than in the original context as well.

(6) Context: A is eating an orange. B has already eaten one from the same bag and it was exceptionally sweet. B says to A:

(7) Amak-u **nai**$_{tc}$? ↑ (*↓)
sweet-INF **NEG**$_2$.NPST
'Is**n't** it sweet?'
⇝ The speaker is biased toward the proposition that it's sweet. (positive speaker bias)

The negation *nai*$_{tc}$ in (7) is obligatorily tonally compressed. Example (7) must also have rising intonation at the end as indicated by '↑', forcing it to be a question. See Ito & Oshima (2016) for more discussion of the prosodic properties of *nai*$_{tc}$ 'NEG$_2$' compared to *na'i* 'NEG$_1$'.[5]

(7) requires the speaker to be biased for the propositional prejacent of the question. (8) from Ito & Oshima (2016) demonstrates this, since the speaker has no bias in the context, and (7) is infelicitous.

(8) Context: A eats a piece of orange and grimaces. B has no prior expectation about the quality of the oranges.
B says to A: #(7)

Compare (7) to (9), which features regular negation *na'i* 'NEG$_1$' and is felicitous in context (8), where there is contextual evidence that the orange is not sweet.

(9) Amak-u **na'i**? ↑ (↓)
sweet-INF **NEG**$_1$.NPST
'Is it **not** sweet?' ('It is not sweet.')

This shows that positive speaker bias is not a necessary component of all negative polar questions in Japanese, just those with tonally compressed negation.[6] This suggests that tonal compression of negation plays a similar role to preposing of negation in several other languages discussed by Romero & Han (2004), including English as seen in the translations of Japanese examples here. Note also that unlike (7), it is possible to utter (9) with falling intonation, in which case it would be interpreted as the declarative statement 'It is not sweet.'

Nai$_{tc}$ behaves differently from *na'i* in other ways that suggest that negative polar questions with *na'i* are negative in a way that NPQs with *nai*$_{tc}$ are not. For example, *nai*$_{tc}$ does not license strong negative polarity items, as observed by Aihara (2009) and Ito & Oshima (2016). Compare (10) with (11):

[5] If NEG$_2$ were followed by the Q-particle *ka* in (7), then the sentence final intonation could either rise or fall. However, either way, it would be interpreted as a question (a self-addressed one in the case of falling intonation).

[6] The intonational pattern of (9) on the other hand may be acceptable in positive bias contexts like (6). This is not unlike English low negation questions such as the translation in (9), which are compatible with positive bias but do not require it.

(10) Yoko-wa **nani-mo** chuumonshi-te **na'i**?
Yoko-TOP what-MO order-TE **NEG**$_1$.NPST
'Has Yoko not ordered anything?'

(11) *Yoko-wa **nani-mo** chuumonshi-te **nai**$_{tc}$?
Yoko-TOP what-MO order-TE **NEG**$_2$.NPST
'Hasn't Yoko ordered anything?'

Nai$_{tc}$ also behaves differently from *na'i* with respect to tests developed by Goodhue (2022b) to show that preposed negation in English polar questions such as *Did**n't** Jane eat?* is not interpreted in the propositional prejacent of the question. These tests use not-at-issue content contributed by presuppositions and conventional implicatures to examine the content that projects out of questions. For instance, *again* presupposes that the proposition denoted by its complement has happened before.

(12) Did Jane eat **again**?
presupposes: Jane ate before

If *again* can scope over negation, then negation should be able to be part of the presupposition.

(13) Did Jane **not** eat **again**?
can presuppose: Jane did not eat before

However, the presupposition projecting from the preposed negation question cannot contain negation.

(14) Did**n't** Jane eat **again**?
presupposes: Jane ate before
cannot presuppose: Jane did not eat before

This leads to the conclusion that *again* cannot scope above negation in (14). The explanation pursued in Goodhue (2022a,b) is that preposed negation scopes outside the propositional prejacent of the question.[7] Other tests supporting this conclusion deployed in Goodhue (2018, 2022b) include projecting content (*also*, *as*-parentheticals), negation sensitivity (*until*- and *for*-adverbials), and polar particle responses to negative sentences.

Parallel observations hold in Japanese (Shimoyama, Goodhue & Hirotani, 2019). By using *mata* 'again', we can see that *nai*$_{tc}$ is also interpreted outside the propositional prejacent of the question.[8]

[7]Following previous work (Hartung, 2006; Sailor, 2013; Goodhue, 2022b; AnderBois, 2019), we assume that Ladd's (1981) ambiguity does not exist in American English, and in particular that there is no inner negation reading of questions with preposed negation.

[8]Support for positing a specialized negation morpheme in a syntactically high position also comes from the phenomenon of monophthongization, where *nai*$_{tc}$ is pronounced as *ne*, as in (i). This question only has the interpretation where the speaker is positively biased. See Hara, Kawahara & Feng (2014); Oshima (2019) and Sailor (2013).

(i) Tsuuka, sore ii-sugi ja **ne**?
rather it say-excess COP.WA NEG$_2$
'Well, isn't what you just said a bit too much?' (Rikudoo Sen'nin, *Naruto Shippuden*, episode 420)

(15) Yoko, **mata** tabe-te **nai**$_{tc}$?
Yoko again eat-TE **NEG**$_2$.NPST
'Isn't Yoko eating again?'
presupposes: Yoko was eating before.
cannot presuppose: Yoko was not eating before.

However, counterparts of (15) with **na'i** could have the negative presupposition, much like the low negation question in (13).

What we have seen in this section is that NPQs with *nai*$_{tc}$ convey the speaker's positive bias toward the propositional prejacent of the question. Furthermore, *nai*$_{tc}$ is interpreted outside the propositional prejacent of the question. We will not review competing analyses of NPQs because our analysis of embedded expletive negation will not depend on the fine details. What matters below is what we have shown here: that it is an empirical fact that such NPQs convey a speaker bias, and that there is evidence that the negation may be interpreted high. In analyses such as Romero & Han (2004), Krifka (2017), and Goodhue (2022b,a), this negation is still interpreted as negation in the sense that it either reverses truth values or acts as a set-theoretic complementation operator. What distinguishes it from typical negation is that it is high in the left periphery, above a common ground management operator or speech act operator. We think this kind of analysis is on the right track, as opposed to analyses in which the negation is a subjunctive mood marker, discourse particle, or is otherwise not interpreted as negating some constituent. Thus for us, *nai*$_{tc}$ is still negation, despite its apparent expletiveness.

2.2 Embedded expletive negation as part of an embedded NPQ

We have just seen that tonally compressed negation in NPQs results in a positively biased question, and that tests for negation reveal that such NPQs lack the semantic effects of negation. Thus, if the negation in examples like (1) are part of an embedded NPQ, then their expletiveness would fall out as a straightforward prediction. Two initial arguments can be given in support of this view, one from prosody, the other from interpretation.

For the argument from prosody, recall that (1), repeated in (16), demonstrates that in certain cases negation in an embedded clause does not contribute a truth reversing meaning. We can now add that, intuitively, whether the negation is expletive or not depends on whether the negation is tonally compressed or not:

(16) Yoko-wa [Sota-ga uta-o utawa-{(a) **na'i**/(b) **nai**$_{tc}$}-ka-to] kitaishi-te i-ru.
Yoko-TOP Sota-NOM song-ACC sing-{**NEG**$_1$/**NEG**$_2$}-KA-TO hope-TE ASP-NPST
a. 'Yoko hopes that Sota will not sing a song.'
b. 'Yoko hopes that Sota might sing a song.'

Na'i leads to truth reversal in (16a), while *nai*$_{tc}$ does not, leading instead to (16b). Since this matches characteristics of unembedded NPQs, it lends support to the idea that what is embedded in examples like (1)/(16) are NPQs.

The argument from interpretation begins with (17), which demonstrates a declarative embedded under *to*, where the matrix predicate is *omou* 'think'.

(17) Yoko-wa [[Ken-ga hannin **da**] **to**] omot-te i-ru.
Yoko-TOP Ken-NOM culprit COP.NPST TO think-TE ASP-NPST
'Yoko thinks that Ken is the culprit.'

Interpretationally, (17) seems like a standard attitude report, just like its English translation. Compare it to (18), which illustrates embedding of a positive polar question under *to* under *omou* 'think'.

(18) Yoko-wa [[Ken-ga hannin **ka**] **to**] omot-te i-ru.
Yoko-TOP Ken-NOM culprit Q TO think-TE ASP-NPST
'(Lit.) Yoko thinks, is Ken the culprit.'
'Yoko thinks Ken might be the culprit.'

Intuitively, interrogatives embedded under *to* convey a weaker meaning than declaratives embedded under *to*, as indicated by the use of the epistemic modal 'might' in the English translation of (18) but not (17). We will refer to this weakening effect as *hedging*.

Now consider in (19) an embedded expletive negation of the sort we began the paper with.

(19) Yoko-wa [[Ken-ga hannin ja nai$_{tc}$ **ka**] **to**] omot-te i-ru.
Yoko-top Ken-nom culprit COP.WA NEG$_2$ Q TO think-TE ASP-NPST
'(Lit.) Yoko thinks, isn't Ken the culprit.'
'Yoko thinks that there is a good possibility that Ken is the culprit.'[9]

Intuitively, (19) also has a hedging effect when compared to the embedded declarative in (17). At the same time, (19) is not as hedged as the embedded positive interrogative in (18). This intuition may become even clearer with the adverb *tsuyoku* 'strongly' modifying the matrix verb in these examples: (17) and (19) would remain fine while (18) would become odd. The examples form a scale then, with the embedded declarative (17) the least hedged, the embedded positive interrogative (18) the most hedged, and the embedded expletive negation (19) in the middle. This is why we translate the declarative as unmodalized, the positive interrogative with 'might', and the negated version with 'good possibility' or 'probably'.

This interpretational scale can be explained by our view that embedded expletive negation like in (19) is part of a NPQ, in combination with our view of how the global interpretation of sentences with *to*-clauses embedded under attitudes is derived. Here is a first pass at our eventual analysis in section 4: *To* attributes the act of asking the embedded interrogative or asserting the embedded declarative to the embedding subject. In declarative cases, the matrix attitude predicate takes as complement the propositional content of the assertion. In interrogative cases, the matrix attitude takes as complement a proposition representing the bias expressed by the *to*-question.[10]

The NPQs discussed in subsection 2.1 convey a relatively strong bias in favor of the proposition embedded under negation. Positive polar questions on the other hand convey a weaker bias. Consider (20c), which can be used felicitously in neutral contexts like (20a), but can also be used

[9] Another natural translation is 'Yoko *suspects* that Ken is the culprit'.

[10] While *omou* 'think' happily embeds simple positive polar questions with *ka to* in (18), Mizuno (2021) observes that *shinjiru* 'believe' does not embed simple positive polar questions with *ka to*. We think this may be due to a strength difference between *shinjiru* and *omou* in which *omou* can be used to express weaker commitments, while *shinjiru* expresses more certainty. Thus the relatively weak bias of a positive polar question is less appropriate when combined with *shinjiru* than with *omou*.

in contexts in which the speaker is confronted with evidence in favor of the positive answer like (20b). The latter is an example of positive evidential bias as discussed by e.g. Büring & Gunlogson (2000); Sudo (2013); Krifka (2015).[11]

(20) a. A has just walked in the front door, and she is looking for her roommate Yoko. She has no idea whether Yoko is home or not, but their mutual roommate B is, so A says to B: (20c)
b. A and B are in the basement. A thought that they were home alone because Yoko went out earlier, but then she hears a noise upstairs, and says to B: (20c)
c. Yoko kaet-te ru (ka)?
Yoko return-TE ASP.NPST Q
'Is Yoko home?/Has Yoko returned?'

Given the weaker bias of positive polar questions relative to NPQs, we understand the scale of hedging effects from (17) to (19) on our view: The positive question embedded under *to* in (18) has the weakest bias, and so is most hedged; the NPQ embedded under *to* in (19) has a stronger bias, and so is less hedged; and the *to* embedded assertion in (17) delivers an unmodalized proposition to the matrix predicate, so it is not hedged at all. This picture depends on our view of embedded expletive negation in Japanese as the negation in a NPQ.

But our informal story above raises questions about the details: How do we derive the interpretations just sketched? In particular, how are polar questions able to embed under declarative-selecting (antirogative) predicates like *omou* 'think' and *kitaisuru* 'hope'? And what is the role of the complementizer *to*? We turn in section 3 to a closer investigation of the properties of the complementizer *to*, before proposing an analysis that answers these questions in section 4. Then we will be in a position to return in section 5 to the puzzles about the distribution of expletive negation raised in section 1 and offer our explanation.

3 Properties of *to*-clause embedding

There is a widespread view with roots in traditional Japanese grammar as well as in work in the generative tradition in which *to* is analyzed as a 'quotative marker' (Saito, 2012, 2015; Kratzer, 2013; Maier, 2014; Sauerland & Yatsushiro, 2014; Tomioka & Kim, 2015, 2016; Kim, 2018; Shimamura, 2018; Saito, 2019; Yoshida, 2019; Sode & Sugawara, 2021). Some languages have counterparts of *to* that are transparently related to quotation in that the form includes a morpheme related to the verb for 'say' (*e.g.,* Chappell, 2008; Major, 2021). For example, in Okayama Japanese, the counterpart of *to* is *yuu-te* '(lit.) saying' (cf. also Turkish *diye*, Özyıldız 2018):

(21) Sore-o kii-ta sutaffu-san-tachi-mo [sugoi ee-yan **yuu-te**] yuu-te kure-te, ...
it-ACC hear-PAST staff-POL-PL-also very good-JAN say-TE say-TE BEN-TE
'Also the staff members who heard that (=my idea) told me that it was very good.'[12]

To can embed direct quotations (direct reports of speech), as in (22).

[11] If (20c) ends with '*no* (*ka*)', it is usable only in the biased context. We leave for future exploration properties of the particle *no* in questions in relation to the so-called extended copula or *no da*-construction.

[12] https://www.youtube.com/watch?v=HCkm1BVNzF8 (FUJII Kaze, ANNnewsCH, 5'50", 09/23/2020)

(22) Yoko-wa [“**watashi**-no jooshi-ga **yok-ka-go-ni** modoru” to] getsuyoobi-ni
Yoko-TOP I-GEN boss-NOM four-day-later-on return.NPST TO Monday-on
ii-mashi-ta.
say-POL-PST
‘Yoko said on Monday, “**My** boss will return **four days from now**”.’

However, *to* does not always embed direct quotations. By changing the deictic and anaphoric expressions in the qutoation in (22) to those in (23)—*watashi* ‘I’ and *yok-ka-go* ‘four days from now’ become *kanojo* ‘she’ and *ashita* ‘tomorrow’—we show that these expressions are not required to get their interpretation from the context of utterance of the quotation, as would be required if it were a direct quotation. Instead they can get their interpretation from the context of utterance for the matrix clause. Thus we show that *to* is also able to embed an indirect report of speech (assume (23) is uttered on Thursday):

(23) Yoko-wa [**kanojo**-no jooshi-ga **ashita** modoru to] getsuyoobi-ni ii-mashi-ta.
Yoko-TOP she-GEN boss-NOM tomorrow return.NPST TO Monday-on say-POL-PST
‘Yoko said on Monday that **her** boss would return on **tomorrow**.’

That *to* can embed indirect reports of speech can also be shown by the use of long-distance matrix *wh*-question formation. (24) attempts to form a matrix *wh*-question from within a direct quotation, and so is unacceptable. But matrix *wh*-question formation is perfectly acceptable from the indirect report of speech in (25) (Kuno, 1988; Oshima, 2006a).

(24) *Yoko-wa [“**watashi**-no jooshi-ga **itsu** modoru” to] getsuyoobi-ni ii-mashi-ta ka?
Yoko-TOP I-GEN boss-NOM when return.NPST TO Monday-on say-POL-PST Q
(Intended) ‘When did Yoko say on Monday, “*My* boss will return *t*”.’

(25) Yoko-wa [**kanojo**-no jooshi-ga **itsu** modoru to] getsuyoobi-ni ii-mashi-ta ka?
Yoko-TOP she-GEN boss-NOM when return.NPST TO Monday-on say-POL-PST Q
‘When did Yoko say on Monday that *her* boss would return?’

This data shows that *to* can embed both direct and indirect reports of speech. Despite this, *to* has often been assumed to be a declarative complementizer occupying the C-position, comparable to English *that* (see *e.g.* Mizuno 2022 for a recent example). In the following subsections, we demonstrate several empirical facts about *to*-clause embedding that would be puzzling on the assumption that *to* is a declarative complementizer. For each empirical phenomenon introduced, we use deictic and anaphoric expressions as well as long-distance *wh*-dependencies to show that the unique properties of *to*-clause embedding do not depend on direct quotation. We will argue that these facts are best explained by the quotative marker view of *to*, which we use to motivate our analysis in section 4, in which *to* embeds speech act phrases.

3.1 *To* embeds interrogatives under antirogative predicates

First, as already seen in sections 1 and 2, *to* embeds interrogative clauses under predicates that do not select for interrogatives, *antirogative* predicates. We now demonstrate this more carefully. Consider two cases of genuine interrogative embedding without *to* in (26). In both (26a) and (26b), the sentences are acceptable when the embedding verb is interrogative-selecting like ‘know’, but

they are unacceptable when the embedding verbs are the antirogative 'think' or 'hope'.[13] The translations show that the same pattern holds in English.

(26) a. Yoko-wa [**dare**-ga hannin **ka**] {shit/*omot/*kitaishi}-te iru.
Yoko-TOP who-NOM culprit Q know/think/hope-TE ASP.NPST
'Yoko {knows/*thinks/*hopes} who the culprit is.'

b. Yoko-wa [kanojo-no jooshi-ga hannin {**ka/kadooka**}] {shit/*omot/*kitaishi}-te iru.
Yoko-TOP she-GEN boss-NOM culprit Q/whether know/think/hope-TE ASP.NPST
'Yoko {knows/*thinks/*hopes} whether her boss is the culprit.'

When *to* is used however, an interrogative clause can be embedded under antirogative predicates, as shown in (27) (cf. Lahiri, 2002; Saito, 2015; Yoshida, 2019).[14]

(27) Yoko-wa [[kanojo-no jooshi-ga hannin **ka**] **to**] {omot/kitaishi}-te iru.
Yoko-TOP she-GEN boss-NOM culprit Q TO think/hope-TE ASP.NPST
'(Lit.) Yoko {thinks/hopes}, is her boss the culprit.'
'Yoko {thinks/is hopeful} that her boss might be the culprit.'

The third person pronoun *kanojo* 'she' in (27) can co-refer with the matrix subject *Yoko*, showing that *to*'s complement is not a direct quotation. Likewise, (28b) demonstrates the ability to form a matrix *wh*-question from the polar interrogative embedded under antirogative *omou* 'think' in (28a), further showing that we are not observing direct quotation.

(28) a. Yoko-wa [[**natto**-ga kusat-te ru **ka**] **to**] omot-ta.
Yoko-TOP natto-NOM rotten-TE ASP.NPST Q TO think-PST
'(Lit.) Yoko thought, has the natto gone bad.'
'Yoko thought that the natto might have gone bad.'

b. Yoko-wa [[**nani**-ga kusat-te ru **ka**] **to**] omot-ta no?
Yoko-TOP what-NOM rotten-TE ASP.NPST Q TO think-PST NO
'(Lit.) What did Yoko think, has *t* gone bad?'
'What did Yoko think might have gone bad?'

If *to* were a declarative complementizer like English *that*, then (27) and (28) should be unacceptable, like (26) and its translations, since the embedded clauses would deliver interrogative clauses to antirogative predicates.

We think the acceptability of these examples speaks in favor of the view that *to* is not a declarative complementizer, but instead that *to* combines with a speech/thought act phrase, and attributes authorship of that act to the matrix subject.[15]

[13]Predicates that select for interrogatives can be further subdivided into two kinds: Predicates like 'ask' and 'wonder' that select only for interrogatives as complements are *rogatives*. Predicates like 'know' that select for either interrogatives or declaratives are *responsives*.

[14]A *wh*-interrogative cannot be embedded under antirogatives via *to*. We think this is because the antirogative predicate needs to combine with some kind of propositional argument, and the *wh*-interrogative fails to deliver one. This will fall out of our analysis in section 4.

[15](28b) raises an interesting question: How does the *wh*-phrase take wide scope from within the embedded clause

3.2 *To* embeds imperatives

A second surprising fact is that imperatives can be embedded under *to*, but if *to* is removed, the same sentences become unacceptable (Kuno, 1988; Oshima, 2006b; Saito, 2017; Kim, 2018). Consider (29), which is perfectly acceptable, but which would not be if *to* were removed.

(29) Jooshi-ga [[**kanojo-ni ashita** made-ni shorui-o das-**e**] to] getsuyoo-ni
boss-NOM she-DAT tomorrow by-DAT document-ACC submit-**IMP** TO Monday-on
ii-mashi-ta.
say-POL-PST
'My boss said (to me) on Monday to submit the document **to her** by **tomorrow**.'

Again, the pronoun shows that acceptability is not due to direct quotation. Moreover, matrix *wh*-question formation from imperatives embedded under *to* is possible:

(30) Jooshi-wa [[kanojo-ni **itsu** made-ni shorui-o das-**e**] to] getsuyoo-ni
boss-NOM she-DAT when by-DAT document-ACC submit-**IMP** TO Monday-on
ii-mashi-ta ka?
say-POL-PST Q
'By when did your boss say (to you) on Monday, to submit the document to her *t*?'

Again, analyzing *to* as a declarative complementizer incorrectly predicts unacceptability in (29) and (30). We believe analyzing *to* as embedding speech acts can begin to explain these facts.

3.3 'Unselected' *to* clauses

A third interesting property of *to*, demonstrated schematically in (31), is that while *to*-led clauses are often 'selected' by matrix predicates in the foregoing examples (see (31a)), they can also be embedded in sentences in which the matrix predicate does *not* select for a clausal complement (see (31b)), as demonstrated by (32) (Oshima, 2015; Tomioka & Kim, 2016).

(31) a. Subject [[Speech Act] TO] Clause-selecting-predicate (Selected)
b. Subject [[Speech Act] TO] [Object-NP] NP-selecting-predicate (Unselected)

(32) Hanako-wa [yuki-ga hurikomu ka to] mado-o shimeta.
Hanako-TOP snow-NOM fall.enter Q TO window-ACC closed
'Hanako closed the window, thinking that the snow might come in.'

Similar examples of unselected embedded clauses can be found in Korean (33) and Turkish (34).

(33) [Yongton-i chwungpwunha-nya-ko] halmeni-ka ton-ul na-eykey
allowance-NOM be.enough-Q-QUOT grandma-NOM money-ACC 1sg-DAT
cwu-ess-ta.
give-PST-DECL
'Grandma gave me money, saying/wondering if my allowance is enough.' (Kim, 2018)

with the question particle *ka* 'Q'? One might expect *ka* to create an island effect. We return to this in the conclusion.

(34) Ali [anne-si gel-di mi diye] kapı-yı aç-tı.
Ali mother-3s.POSS arrive-PST.3S POLQ DIYE door-ACC open-PST.3S
'Ali opened the door, wondering whether his mother had arrived.' (Özyıldız, 2018, 2019)

As the English translations of these examples indicate, the unselected *to*/*ko*/*diye*-clauses are interpreted as speech or thought, attributed to the matrix subjects. These interpretations can be understood if these complementizers embed speech acts, but a declarative complementizer analysis leaves more to be said.

It is also possible, in colloquial speech or writing, for a *to*-led clause to occur on its own with no full matrix clause. In this 'insubordination'-type phenomenon (Evans, 2007; Mithun, 2008; Evans & Watanabe, 2016), we can see that the contribution of *to* is to mark its sister constituent as speech or thought. The agent of speech or thought can be expressed as in (35), or can be determined by context as in (36), the speaker being one possibility (see, for example, Sharvit, 2008; Oshima, 2010; Saito, 2018, 2019).

(35) Zibun-no musume-no chiimu-ga kats-u to, Yoko-san.
self-GEN daughter-GEN team-NOM win-NPST TO Yoko-HON
'Her daughter's team will win, said Yoko.'

(36) Yumi-no chiimu-ga kats-u daroo, to.
Yumi-GEN team-NOM win-npst MOD TO
'Yumi's team is likely to win, x says/thinks.'

Again, the speech act analysis of *to* seems to have an advantage here.

3.4 *To* requires attitude holders to be aware of their attitude's content

A fourth relevant fact about *to* embedding is that it seems to be degraded in contexts where the attitude holder is unaware that they have the attitude described in the *to*-clause. Consider the two examples in (37), which contrast embedded *to*-clauses with embedded *koto*- and *no*-clauses:

(37) Even though Yoko in (37a) and the speaker in (37b) support the NHL hockey team the Montreal Canadiens, they do not like the noisy parties that happen in their neighbourhood after every game the team wins.

a. Yoko-wa zibun-de-wa mattaku kizui-te-nai kedo, jitsuwa [[Canadiens-ga
Yoko-WA self-by-WA at.all realize-TE-ASP.NEG though in.fact Canadiens-NOM
makeru {{koto/no}-o/??to}] kitaishi-te ru-n-da to] omou
lose.NPST KOTO/NO-ACC/TO hope-TE ASP.NPST-NO-COP.NPST TO think.NPST
yo.
PRT
'Though she hasn't realized it at all herself, Yoko is in fact hoping that the Canadiens will lose, (I) think.'

b. Zibun-de-wa sono toki mattaku kizuka-nakat-ta kedo, jitsu-wa
self-by-WA that moment at.all realize-NEG-PST though in.fact
[[Canadiens-ga makeru {{koto/no}-o/??to}] kitaishi-te ta-n-da
Canadiens-NOM lose.NPST KOTO/NO-ACC/TO hope-TE ASP.PST-NO–COP.NPST
to] omou.
TO think.NPST
'Though (I) didn't realize it at all myself at the time, (I) think (I) was in fact hoping that the Canadiens would lose.'

An informal judgment survey with eight native speakers of Japanese suggests that while the *koto*- and *no*-clauses are perfectly acceptable in these sentences, the *to*-clauses are degraded.[16] The intuitions are somewhat delicate. But for the speakers who have a clear contrast, it can be explained by the analysis of *to* we will propose: *to* attributes the content of its sister constituent to the embedding subject (Yoko in (37a) and the speaker in (37b)) as a verbal or mental utterance, while the preceding part of the sentence claims the subject's ignorance of the attitude expressed. A declarative complementizer like English *that* imposes no such restriction because it does not require the clause it embeds to be an utterance of the embedding subject, thus the translations in (37) are perfectly natural.

3.5 *To* + 'hope' is a stronger attitude than *koto* + 'hope' and English *that* + *hope*

A fifth relevant fact is that *to*-clause embedding under *kitaisuru* 'hope' as in (38) exhibits some effects distinguishing Japanese from clausal embedding under *hope* in English.

(38) Yoko$_1$-wa [[kanojo$_1$-no jooshi-ga hannin da] to] kitaishi-te ir-u.
Yoko-top she-GEN boss-NOM culprit COP.NPST TO hope-TE ASP-NPST
'Yoko$_1$ hopes that her$_1$ boss is the culprit.'

In the English translation, Yoko merely needs to believe that her boss being the culprit is a possibility, while with *to*-embedding in Japanese, the likelihood that her boss is the culprit must be much higher. This can be shown by evaluating the felicity of (38) in a context in which Yoko has no idea whether her boss is the culprit or not, but she hopes he is. In such a context, the English translation in (38) is a perfectly normal way to report this. But the Japanese sentence is not because it implies that Yoko takes the prejacent to be a stronger likelihood than her evidence would support if she had no idea either way. This descriptive generalization is further supported by the contrast in the minimal pair in (39). The use of *to*, as opposed to *koto*, requires a higher degree of confidence on the part of Yoko that the rain will stop, and it makes the continuation 'she's now almost given up' inappropriate.

[16] Informants were asked to rate the acceptability of sentences (37a) and (37b) on the scale of 1 (not acceptable) to 4 (fully acceptable). The result was: (37a) with *koto*: 4.0; *no*: 3.9; *to*: 2.2, and (37b) with *koto*: 4.0; *no*: 4.0; *to*: 2.6. A more systematic laboratory study investigating various potential factors may shed further light on the nature of these contrasts.

(39) Yoko-wa [ame-ga yam-u {**koto**-o/??**to**}] kitaishi-te-wa i-ru-kedo, moo
Yoko-WA rain-NOM stop-NPST KOTO-ACC/TO hope-TE-WA ASP-NPST-though already
hotondo akirame-te i-ru.
almost give.up-TE ASP-NPST
'Though Yoko does hope that the rain will stop, she's now almost given up.'

Despite that *to* under *kitaisuru* conveys that the subject is more certain about the prejacent than in the English translation or with *koto* under *kitaisuru*, at the same time, the subject cannot be fully certain about the prejacent or maximally believe it. That is, in (38) Yoko cannot fully believe, or believe that she knows, that her boss is the culprit (as is the case also for English translation). We will argue that these patterns follow from a standard semantics for *kitaisuru/hope* and the view that *to* embeds speech acts.[17]

3.6 *ka* vs. *kadooka*

A sixth fact emerges from the different behaviors of interrogative complementizers *ka* and *kadooka*. Consider the interrogative embedding in (40). *To* is not present; only *ka* or *kadooka* appears.

(40) Yoko$_1$-wa [kanojo$_1$-no jooshi-ga hannin {**ka**/**kadooka**}] tazuneta.
Yoko-TOP she-GEN boss-NOM culprit Q/whether ask.PST
'Yoko$_1$ asked whether her$_1$ boss was the culprit.'

When we add *to* in (41), only *ka* is fully acceptable.

(41) Yoko$_1$-wa [kanojo$_1$-no jooshi-ga hannin {**ka**/??**kadooka**} **to**] tazune-ta.
Yoko-TOP she-GEN boss-NOM culprit Q/whether TO ask-PST
'Yoko$_1$ asked whether her$_1$ boss was the culprit.'

Furthermore only *ka* can appear in matrix questions; *kadooka* is unacceptable:

(42) kanojo-no jooshi-ga hannin {**ka**/***kadooka**}?
she-GEN boss-NOM culprit Q/whether
'Is her boss the culprit?'

We believe that part of the explanation for this pattern is that *kadooka* is a garden variety interrogative complementizer. As such, it needs to appear in the C position of an interrogative clause embedded under an interrogative-selecting predicate, and thus is acceptable in (40) but not (42). If our view of *to* as a speech act embedder is correct, then it can explain the pattern in (41): Since *kadooka* cannot appear as a marker of questionhood in main clauses, it cannot appear in the main clause phenomena that *to* embeds either.[18]

We also believe that we learn something interesting about *ka* from this data. That *ka* is acceptable in genuine interrogative embedding environments like (40) as well as in matrix questions

[17] As observed in Sode & Sugawara (2021), the verb *kiku* 'hear' with a *to*-clause is interpreted as a verb of communication, while it is interpreted as a perception verb when it combines with a nominalized clause with *no*. We thank Frank Sode (p.c.) for raising this point as another argument for *to* as an utterance embedder.

[18] The use of *kadooka* in (41) is not completely ungrammatical, as indicated by "??". How exactly the choice of a matrix predicate affects the acceptability of *kadooka+to* needs to be investigated. For example, *shinpaisuru* 'worry' seems to sound better with *kadooka+to* than *kitaisuru* 'hope'.

like (42) and in questions embedded under *to* like (41) suggests that *ka* lives a double life: one as an interrogative complementizer interchangeable with *kadooka* in C-position as in (40), and another that sits higher in the structure where it functions as a kind of discourse particle in both (41) and (42). In other words, *ka* is not always an overt realization of C[+Q] as assumed in Bhatt & Dayal (2020). When it is in a matrix question or embedded under *to*, *ka* may well be an interrogative discourse particle, similar to Hindi-Urdu *kyaa* in Bhatt & Dayal's analysis. This view will be further supported by evidence that *ka* can embed NPQs as in (44) in the next subsection. The pattern thus lends further support to the idea that *to* embeds speech act phrases, a syntactic projection larger than interrogative CPs.

3.7 The interaction of NPQs with *ka*, *kadooka*, and *to*

The final set of facts relates to the behavior of NPQs embedded under *to*, and builds in part on the last set of facts about *ka* vs. *kadooka*. First note that unlike the embedded positive polar interrogatives in (40), NPQs cannot embed under rogative predicates with just *ka* or *kadooka*, as exhibited by (43).

(43) *Yoko-wa [kanojo-no jooshi-ga hannin nan ja nai$_{tc}$ {ka/kadooka}] tazune-ta.
Yoko-TOP she-GEN boss-NOM culprit COP.NO COP.WA NEG$_2$ Q/whether ask-PST
'(Lit.) Yoko asked whether [isn't it that her boss is the culprit].'
'(Intended) Yoko asked whether her boss {is/might be} the culprit.'

However, a NPQ can appear under *to*:

(44) Yoko-wa [kanojo-no jooshi-ga hannin nan ja nai$_{tc}$ ka to] tazune-ta.
Yoko-TOP she-GEN boss-NOM culprit COP.NO COP.WA NEG$_2$ Q TO ask-PST
'(Lit.) Yoko asked [isn't her boss the culprit].'
'Yoko asked whether her boss {is/might be} the culprit.'

Recall from section 2.1 that we take NPQs to involve negation scoping over a speech act or common ground management operator high in the structure. If *to* embeds speech acts, then this data can be explained: NPQs are large structures, main clause phenomena that include speech act structure. The embedded interrogative clause in (43) is too small to contain the structure necessary for an NPQ. But since *to* embeds larger structures, the NPQ fits just fine in (44). Embedded NPQs then are another empirical fact pointing toward our analysis in section 4.

We can provide further evidence that these embedded expletive negations are negations in embedded NPQs by comparing them to another well known main clause phenomenon, namely verb second (V2) in German. German V2 is infelicitous under negated matrix predicates, as (45) demonstrates (Truckenbrodt, 2006; Djärv, 2022).[19]

(45) Ken sagte (#nicht) zu Yoko, [er bewundert Kim].
Ken said not to Yoko he admires Kim
'Ken {told/#didn't tell} Yoko, he admires Kim.' *German*

[19]Thanks to Frank Sode (p.c.) for bringing this up to our attention. See also McCloskey (2006) for examples of embedded question acts with Subject-Aux inversion, and how their felicity depends on the properties of the matrix predicate and the presence of negation.

In Japanese, the genuine interrogative embedding in (46) is felicitous under a negated matrix predicate:

(46) Yoko-wa [ame-ga hut-te ru kadooka] {shinpaishi-te iru/shinpaishi-te
Yoko-TOP rain-NOM fall-TE ASP.NPST whether worried-TE ASP.NPST/not.worried-TE
i-na'i}.
ASP-NEG$_1$
'Yoko is {worried/not worried} about whether it's raining.'

By hypothesis, (47) contains an embedded main clause phenomenon, a NPQ. If so, negating the matrix predicate should sound infelicitous, and it does:

(47) Yoko-wa [ame-ga hut-te-**nai**$_{tc}$ ka to] {shinpaishi-te iru/#shinpaishi-te
Yoko-TOP rain-NOM fall-TE-**NEG**$_2$.NPST Q TO worried-TE ASP/worried-TE
i-na'i}.
ASP-NEG$_1$
'(Lit.) Yoko is {worried/not worried} isn't it raining.'
'Yoko is {worried/#not worried} that it might be raining.'

Other embedding verbs such as *omoitsuita* 'realized/occurred to' vs. #*omoitsukanakatta* 'did not realize/occur to'; *kitaishita* 'hoped' vs. #*kitaishinakatta* 'did not hope' show the same pattern as (47), further lending support to our view.

4 How to interpret *to* embedding

By now we have seen several properties of *to*-clause embedding: i) In cases like (17), *to* embedding looks similar to familiar cases of clausal embedding under attitude predicates. ii) *To*-embedded interrogatives embed under antirogative predicates (section 3.1). iii) *To* embeds imperatives (section 3.2). iv) Embedding different kinds of clauses under *to* has a graded hedging effect on interpretation (discussion following (19)). v) *To*-clauses embedded under *kitaisuru* result in a stronger interpretation than *koto*-clauses under *kitaisuru* or clausal embedding under English *hope* (section 3.5). vi) *To*-clauses appear to be degraded in contexts in which the attitude holder is unaware of their attitude (section 3.4). vii) *Ka* can embed under *to*, but *kadooka* cannot (section 3.6). viii) NPQs can appear under *to*, but not under genuine interrogative embedders (section 3.7). ix) *To*-embedded NPQs can appear under some predicates like *kitaisuru* 'hope', but not others like *sakeru* 'avoid' ((1) and (4)). x) *To*-clauses can appear in sentences in which the matrix predicate does not select for a clausal complement at all (section 3.3), such as in (32):

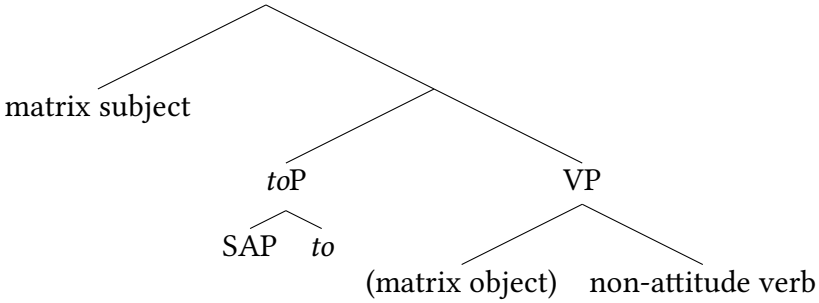
(32) Hanako-wa [yuki-ga hurikomu ka to] mado-o shimeta.
Hanako-TOP snow-NOM fall.enter Q TO window-ACC closed
'Hanako closed the window, thinking that the snow might come in.'

4.1 *To*-clauses as adjuncts

The data we have discussed suggests that *to*-clauses are not combined with matrix predicates in a standard way. In unselected cases like (32), it seems that they must be adjuncts. If *to*-clauses are

adjuncts, it might also explain how it is possible for an antirogative predicate to combine with a polar question, since the question wouldn't actually be the complement of the predicate. Yamada (2019) further notes that *to*-clauses cannot serve as clausal subjects, and uses this to argue that they are always adjuncts. We propose the schematic structure in (48) for 'unselected' *to*-clause embedding (cf. similar structures in Kim 2018; Yamada 2019).

(48) Structure for 'unselected' *to*-clauses



In (48), *to* combines with a speech act phrase (SAP) to produce a *to*-clause that adjoins to the matrix VP.

4.2 *To* as a speech report predicate

We will use an event semantics that synthesizes various ideas in the prior literature (building on Hacquard 2010 and others).[20] We take *to* to be a function that takes a SAP as input ('S'), and acts as a speech report predicate, as in (49) (building on Kim's (2018, p. 65) proposal for unselected cases). We assume that utterance events can be verbal or mental, and that their content is the content of the speech act (cf. Maier (2017)).

(49) $[\![\text{to}]\!] = \lambda S.\lambda x.\lambda e.\lambda w.\ \exists e'[\text{utterance}(e', w)\ \&\ \text{agent}(e', x)\ \&\ \text{content}(e', w) = \text{content}(S)\ \&\ e' \star e]$

(49) introduces an existentially bound event e' that is the event of the embedded speech act. The '$\star$' in the final conjunct imposes a restriction on how e' relates to the matrix event e. Kim (2018) argues that the two events need to overlap temporally.[21] However, the temporal overlap relation is too weak. Consider the following example (cf. ex. (22) from Kim & Tomioka 2014, p. 282):

(50) ??Yoko-wa [[kyoo shokuba-de yatta koto-wa tadashikatta (no) ka] to] saba-o
Yoko-WA today work.place-at do.PST thing-WA right.PST NO Q TO mackerel-ACC
oobun-ni ireta.
oven-in put.in.PST
'Yoko put the mackerel in the oven, (while) wondering whether she did the right thing at work today.'

[20] See ideas that are related both semantically and syntactically in Pietroski 2000; Kratzer 2006, 2013; Hacquard 2006; Moulton 2009, 2015; Elliott 2020.

[21] Definition of temporal overlap '$\circ$' (Kim, 2018, p. 64):

(i) $\forall e, e' \in D_v[e \circ e' \Leftrightarrow \exists e''[\tau(e'') \subseteq \tau(e)\ \&\ \tau(e'') \subseteq \tau(e')]]$

In (50), the matrix event and the mental utterance event overlap temporally. And yet (50) is infelicitous. Comparing the infelicitous (50) to the felicitous (32), the key difference seems to be that, in (32), the mental utterance event causes the matrix event, while in (50) there is no causal relationship between the two events. Kim & Tomioka (2014, p. 282ff.) suggest that the relationship between the two clauses is a causal one (which they cash out as the rhetorical relation of "explanation"). One could imagine replacing '$e' \star e$' with 'e' causes e'. However we refrain from doing this because our aim is to propose a unified account of *to*'s semantics in unselected and selected cases, and in selected cases like (38), it seems that Yoko thinking her boss is the culprit *does not cause* (or explain) her hoping that her boss is the culprit.

Instead, we suggest that the relationship between the two clauses symbolized by $\star$ is determined pragmatically.[22] This pragmatic determination of the relation is not maximally free, as Kim & Tomioka point out (they say that the relation cannot simply be "underspecified"). After all, (50) shows that a relation of mere temporal overlap is not sufficient. It seems that in unselected cases, the relation between the two clauses may always be that the *to*-clause event causes the embedding clause event, although we believe a wider array of examples needs to be examined to settle this. As for selected cases, we will see below that *to*-clauses provide content to a verb in the embedding clause.

Given the structure in (48) and the semantics for *to* in (49) (along with other standard assumptions), the *to*P and VP nodes will be of the same type, $\langle e\langle v\langle st\rangle\rangle\rangle$.[23] Thus, they can be combined via predicate modification. Once combined with the matrix subject, and with the event existentially closed, the predicted interpretation for the unselected case in (32) will be:

(51) $[\![(32)]\!] = \lambda w.\ \exists e[\text{closing}(e, w)\ \&\ \text{agent}(e, yoko)\ \&\ \text{patient}(e, \textit{the window})\ \&$
$\exists e'[\text{utterance}(e', w)\ \&\ \text{agent}(e', yoko)\ \&\ \text{content}(e', w) = \text{content}([\![[_{SAP}\ \text{yuki-ga hurikomu ka?}]]\!])\ \&\ e' \star e]]$

(51) provides an adequate interpretation: there is an event corresponding to the matrix clause, and a speech act event corresponding to the *to*-clause, and the speech act event is a cause of the matrix event. We have not given an interpretation for SAPs here, instead leaving them unanalyzed in denotation brackets in (51). Nor have we specified the semantic type of the speech act variable 'S'. While these are important issues, we will not settle them here as they aren't directly relevant. All that matters is that speech acts are contentful events that can be attributed to an agent.[24]

4.3 Potentially covert propositional complements

Turning now to the interpretation of selected cases, consider the use of the propositional proform (or clausal ellipsis), *soo* 'so' in (52).

[22] Thanks to Takanobu Nakamura (p.c.) for suggesting this to us.

[23] We assume the following standard types: e = entities/individuals, v = events, s = world indices, t = truth values.

[24] Beyond this, we think of speech acts as functions from contexts to contexts that impose commitments, or that restrict possible future developments of a commitment space, as in Krifka 2015, 2017 (see also Farkas & Bruce 2010 for a different commitment based model of speech acts).

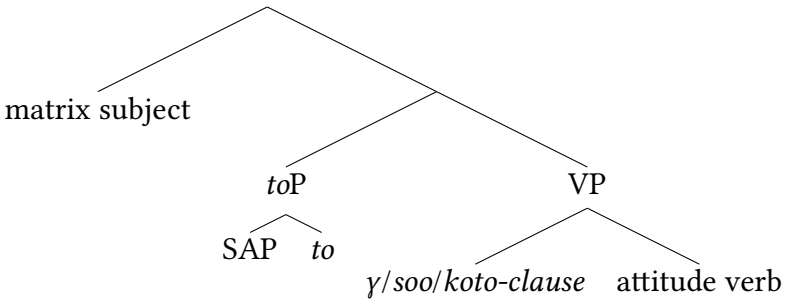
(52) [Yogen-no ko-wa ano ko-deat-te hoshii to] **soo** negaw-azu-ni-wa
prophecy-GEN child-WA that child-COP-TE want TO so wish-NEG-DAT-WA
or-e-n noo.
remain-can-NEG PRT
'(Lit.) (I) want the Child of Prophecy to be that kid, (I) can't help but hope so.'
'(I) can't help but hope that the Child of Prophecy is that kid.'[25]

Soo is in the complement position of the matrix attitude verb *negau* 'wish', despite that, semantically-speaking, the *to*-clause appears to provide the propositional argument of *negau*. It seems that *soo* is getting its content from the directly preceding *to*-clause and delivering it to the matrix attitude. (53) sharply contrasts with (52): using the nominalizing 'complementizer' *koto* makes the use of *soo* impossible because *soo* and the *koto*-clause compete to fill the complement position of the matrix verb.[26]

(53) [Yogen-no ko-wa ano ko-dearu koto]-o (***soo***) negaw-azu-ni-wa
prophecy-GEN child-WA that child-COP.NPST KOTO-ACC so wish-NEG-DAT-WA
or-e-n noo.
remain-can-NEG PRT
'(I) can't help but hope that the Child of Prophecy is that kid.'

We believe these facts reveal the general structure of sentences in which a matrix attitude seems to 'select' a *to*-clause like in (17), (18), (38), and (52), as well as cases in which it selects a *koto*-clause like (53) (see also (65) and (67) in section 5), which we schematize in (54):

(54) Structure for 'selected' *to*-clauses



The structure in (54) is similar that in (48), with the exception that the matrix VP contains an attitude predicate that needs to take a propositional complement. While this propositional complement is sometimes delivered overtly by *soo* or a *koto*-clause, we propose that it can also be delivered by a covert propositional pronoun γ that gets its content from the SAP embedded by the *to*-clause in the preceding part of the sentence (cf. the use of silent propositional anaphora in the focus literature, e.g. Rooth 1992, and the treatment of *yes/no* response particles as propositional anaphora in Krifka 2013; Roelofsen & Farkas 2015; Goodhue & Wagner 2018).[27]

[25] Gama-no Fukasaku, *Naruto Shippuden*, episode 153

[26] As pointed out by Frank Sode a contrast similar to the one between (52) and (53) is found in German 'adjoined' V2 clauses in reportative vs. indicative mood, in that the content of the latter cannot be picked up by a pronominal correlate (Schwabe, 2013; Sode & Truckenbrodt, 2018). This correlation should be investigated in future research.

[27] Yamada (2019) also proposes that V combines with a pronoun in such cases, but it is unclear what content the

4.3.1 *Omou* 'think' + *to*P

To see how this works for an example like (17), we need a semantics for *omou* 'think' as in (55).

(55) $[\![\text{omou}]\!] = \lambda p.\lambda x.\lambda e.\lambda w.\ \text{believe}(e, w)\ \&\ \exp(e, x)\ \&\ \forall w' \in \text{content}(e, w)[p(w') = 1]$

(55) requires that every world provided by the attitude's content must be one in which the prejacent is true. For assertions embedded under *to* like in (17), we assume that the content picked up by γ is the propositional content of the assertion. Similar to (32), the *to*P and VP nodes, having the same type $\langle e\langle v\langle st\rangle\rangle\rangle$, are combined via predicate modification. Once combined with the matrix subject, and with the event existentially closed, the resulting proposition derived for (17) is:

(56) $[\![(17)]\!] = \lambda w.\ \exists e[\text{believe}(e, w)\ \&\ \exp(e, yoko)\ \&\ \forall w' \in \text{content}(e, w)[\textit{Ken is the culprit in } w']$
$\&\ \exists e'[\text{utterance}(e', w)\ \&\ \text{agent}(e', yoko)\ \&\ \text{content}(e', w) = \text{content}([\![[_{SAP}$ Ken-ga hannin da$]\!]) \ \&\ e' \star e]]$

On its first line, (56) delivers a standard event semantics for a sentence with a matrix attitude predicate. The second line provides the semantics for the speech act event contributed by the *to*-clause, as well as the relation between the two events. In an example like (17), those two events are so closely related as to not produce any detectable difference from the English translation of it. But we will demonstrate below that this kind of semantics explains many of the novel properties of *to*-embedding listed above, such as embedding interrogatives under antirogatives, the unique interpretation of *to* combined with *kitaisuru* 'hope', and the interpretation and distribution of embedded expletive negation (i.e., of embedded NPQs). We can already see how this semantics will explain other facts. For example, *kadooka* cannot embed under *to* because *to* embeds speech acts, main clause phenomena, and *kadooka* cannot mark main clause questions. Moreover, *to*-clauses are inappropriate for matrix subjects who are unaware of their attitudes, since *to* attributes a related speech act to them, and speakers can't make speech acts they are unaware of.

4.3.2 *Kitaisuru* 'hope' + *to*P

Next, we will calculate the interpretation of *to* combined with *kitaisuru* 'hope' as in (38):

(38) Yoko$_1$-wa [[kanojo$_1$-no jooshi-ga hannin da] to] kitaishi-te ir-u.
Yoko-top she-GEN boss-NOM culprit COP.NPST TO hope-TE ASP-NPST
'Yoko$_1$ hopes that her$_1$ boss is the culprit.'

First, we need a semantics for *kitaisuru*. The following is a simplified semantics for emotive doxastics based on Anand & Hacquard 2013 (see also Heim 1992; Villalta 2008; Portner & Rubinstein 2013; Portner 2018).

(57) $[\![\text{kitaisuru}]\!] = \lambda p.\lambda x.\lambda e.\lambda w.\ \text{hope}(e, w)\ \&\ \exp(e, x)$
$\&\ \neg\forall w' \in \text{content}(e, w)[p(w') = 1]$ uncertainty requirement
$\&\ \exists w' \in \text{content}(e, w)[p(w') = 1]$ doxastic requirement
$\&\ p >_{DES_{x,w}} \neg p$ preference requirement

pronoun has on his view, if any.

The content of a hoping event, like a believing event, is a set of doxastically accessible worlds. Thus the uncertainty requirement in (57) is that the prejacent p doesn't hold throughout the doxastically accessible worlds (p is not maximally believed). The doxastic requirement in (57) is that the prejacent p is doxastically possible (not believed to be false). The preference requirement in (57) is that p is preferred to $\neg p$ by x in w.[28] The predicted interpretation for (38) is as follows:

(58) $[\![(38)]\!] = \lambda w.\ \exists e[\text{hope}(e, w)\ \&\ \text{exp}(e, yoko)$
$\&\ \neg\forall w' \in \text{content}(e, w)[\textit{her boss is the culprit in } w']$ uncertainty requirement
$\&\ \exists w' \in \text{content}(e, w)[\textit{her boss is the culprit in } w']$ doxastic requirement
$\&\ \textit{her boss is the culprit} >_{DES_{x,w}} \neg\ \textit{her boss is the culprit}$ preference requirement
$\&\ \exists e'[\text{utterance}(e', w)\ \&\ \text{agent}(e', yoko)$
$\&\ \text{content}(e', w) = \text{content}([\![[_{SAP}\ \text{kanojo-no jooshi-ga hannin da}]]\!])\ \&\ e' \star e]]$

Recall the asymmetry between the Japanese (38) and the English translation of it, that the prejacent merely needs to be doxastically possible in English, but that Yoko must believe it to be a stronger likelihood than that in Japanese. Anand & Hacquard's semantics in (57) doesn't capture this fact about Japanese, since it merely requires the prejacent to be doxastically possible. However, we argue that it would be hasty to revise the semantics for *kitaisuru* 'hope': If we were to change *to* in (38) to *koto*, then the doxastic requirement for the prejacent would weaken to something indistinguishable from English, a fact that was further confirmed by the minimal pair in (39). This suggests that the weak doxastic requirement in the semantics in (57) is correct for Japanese *kitaisuru* after all.[29]

We believe that the intuitive strength of *to* combined with *kitaisuru* can be explained by the contribution of the *to*-clause in (58), since it attributes an assertion of "Yoko's boss is the culprit" to Yoko. Assertion requires the agent asserting to have a relatively strong doxastic attitude about the proposition asserted, certainly stronger than the doxastic requirement of (57), making *to* combined with *kitaisuru* in (38) doxastically stronger than its English translation as well as *koto* combined with *kitaisuru*, as desired.

At the same time, Yoko's doxastic attitude about the prejacent in (38) is not maximally strong. This is required by the uncertainty requirement of (57). Apparently then, the assertion conveyed by the *to*-clause does not require Yoko to maximally believe the prejacent. To explain how this works, we need to say a bit more about the relationship between assertion and belief. We assume

[28] Definition of $>_{DES_{x,w}}$ (Anand & Hacquard, 2013, p. 20):

(i) $\forall w, w', w'' \in \text{content}(e, w)[w' >_{DES_{x,w}} w'' \Leftrightarrow w' \text{ is more desirable to } x \text{ in } w \text{ than } w'']$

(ii) $\forall p, q \subseteq W[p >_{DES_{x,w}} q \Leftrightarrow \forall w'' \in q[\exists w' \in p[w' >_{DES_{x,w}} w'']]\ \&\ \exists w' \in p[\forall w'' \in q[w'' \not>_{DES_{x,w}} w']]]$

[29] One might wonder if the strengthened doxastic commitment seen in Japanese *hope* embedding can be explained by Portner & Rubinstein's (2013) observation that *hope* conveys an "intellectual" as opposed to "glandular" desire, requiring the subject to commit to defending the preference expressed. However this won't be sufficient. One reason is that Portner & Rubinstein demonstrate that this fact holds in languages like English and French, so it can't be what distinguishes Japanese from English in (38) (indeed, Portner & Rubinstein seem to predict, probably correctly, this implication for any use of a predicate meaning *hope* in any language). Another reason is that we have demonstrated, internally to Japanese, that *hope+to* conveys that the subject has a stronger doxastic commitment to the truth of the prejacent than *hope+koto*. So this strengthened commitment must be about the nature of *to* embedding rather than *hope*, and it seems to be about the strength of the doxastic commitment, rather than a commitment to defend the preference.

a commitment-based view of assertion (MacFarlane 2011, Krifka 2021), which bears an indirect relationship with the agent's beliefs. In most cases, an agent's choice to assert a proposition p, and therefore to commit to vindicate the truth of p will coincide with the agent's belief in/full certainty about p. This has a social explanation—speakers want to be trusted by their communities, and the safest way to build trust is to commit to propositions that one believes to be true. But nothing about commitment requires the speaker to fully believe p (or even believe p at all). The agent can commit to p, and so assert it, even if p is merely very likely to hold according to their beliefs. In (59), we model this relationship between an agent's commitments and their beliefs by claiming that if an agent commits to a proposition, then the proposition at least holds throughout an optimal subset of their doxastically accessible worlds.[30]

(59) If A commits to p, then $\exists O$ such that O is an optimal subset of A's doxastically accessible worlds & $\forall w' \in O[p(w') = 1]$

This relationship between commitment and belief produces the desired result: First, (59) ensures that an agent who asserts p has a much stronger doxastic attitude about p than mere doxastic possibility. So, combining a *to*-assertion with *kitaisuru* swamps the doxastic requirement of (57), making the utterance intuitively stronger than its English translation, as well as a counterpart utterance with *koto* in place of *to*. Second, (59) does not require p to hold throughout A's doxastically accessible worlds. Thus, if a *to*-assertion is combined with *kitaisuru*, O will be a *proper* subset of A's doxastically accessible worlds, so that the uncertainty requirement of (57) will be met. Put another way, if a *to*-assertion is combined with *kitaisuru*, the uncertainty requirement of (57) forces O to be a proper subset of A's doxastically accessible worlds.

Finally, we note that our view of the interaction between *to*-assertions and *kitaisuru* enables an interesting explanation of the behavior of epistemic necessity modals embedded under *kitaisuru*. (60) demonstrates that Japanese falls into the pattern that Anand & Hacquard (2013) demonstrate for Romance: epistemic necessity is unacceptable under the attitude of hope:

(60) ??Jo-wa [Bo-ga katsu-ni **chigainai** koto]-o kitaisiteiru.
Jo-TOP Bo-NOM win-NI **must** KOTO-ACC hope
(lit.) #'Jo hopes that Bo must win.'

Anand & Hacquard argue that the reason for this is that epistemic necessity modals embedded under representational attitudes quantify over the worlds made accessible by those attitudes. Thus, *chigainai* 'must' quantifies universally over Jo's doxastically accessible worlds, and requires that the proposition *that Bo must win* (p) holds throughout them. But the semantics for *kitaisuru* in (57) requires some of those worlds to be non-p worlds, thus there is a clash between the semantics of *chigainai* and *kitaisuru*, and the result is unacceptable. Interestingly, if we change the complementizer in (60) from *koto* to *to*, the result is acceptable:

(61) Jo-wa [Bo-ga katsu-ni **chigainai** to] kitaisiteiru.
Jo-TOP Bo-NOM win-NI **must** TO hope
(lit.) #'Jo hopes that Bo must win.' (Mizuno, 2022, 420)

[30]The optimal subset O in (59) can be calculated using an ordering source semantics familiar from the modality literature (Kratzer, 1991). An alternative would be to say that commitment to p requires the likelihood of the truth of p to surpass a high threshold conditioned on the agent's beliefs and evidence (Lassiter, 2017).

We claim that (61) is acceptable because *chigainai* is embedded in an assertion under *to*, which provides a distinct domain of quantification, O. This view takes its lead from Hacquard (2010, p. 107), who argues that even necessity modals in matrix clauses quantify over a set of worlds made available by the speech event, i.e. the assertion. On our commitment-based view of assertion, that set of worlds is O in (59). In examples like (61), O is forced by the uncertainty requirement of *kitaisuru* to be a proper subset of Jo's doxastically accessible worlds. Thus, O provides a domain for *chigainai* 'must' to safely quantify over universally without creating a clash with the uncertainty requirement of *kitaisuru*, and so (61) is acceptable.

4.3.3 Hedging effects

Now consider again the paradigm in (17)-(19) demonstrating the scale of hedging effects, repeated here:

(17) Yoko-wa [[Ken-ga hannin **da**] **to**] omot-te i-ru.
Yoko-TOP Ken-NOM culprit COP.NPST TO think-TE ASP-NPST
'Yoko thinks that Ken is the culprit.'

(18) Yoko-wa [[Ken-ga hannin **ka**] **to**] omot-te i-ru.
Yoko-TOP Ken-NOM culprit Q TO think-TE ASP-NPST
'(Lit.) Yoko thinks, is Ken the culprit.'
'Yoko thinks Ken might be the culprit.'

(19) Yoko-wa [[Ken-ga hannin ja nai$_{tc}$ **ka**] **to**] omot-te i-ru.
Yoko-top Ken-nom culprit COP.WA NEG$_2$ Q TO think-TE ASP-NPST
'(Lit.) Yoko thinks, isn't Ken the culprit.'
'Yoko thinks that there is a good possibility that Ken is the culprit.'[31]

(18), in which a *to*-embedded polar question combines with the anti-rogative predicate *omou* 'think', and the result is a hedging effect, roughly translatable as "Yoko thinks that Ken might be the culprit." This hedging makes intuitive sense. If Yoko mentally utters "Is Ken the culprit?" instead of "Ken is the culprit", we would expect the former to express Yoko's weaker attitude toward the proposition *that Ken is the culprit*. Sentences like (17) and (18) might even be in direct competition with one another, so that adding *ka* becomes a standard means of introducing a hedge. Consider the naturally occurring example in (62).

(62) ..., [aru shu sooshita shakaitekina sumai to yuu gainen-o dashite iku
some kind that.way social living.space TO YUU concept-ACC put.forward go
hitsuyoo-ga aru **ka to**] omoimasu.
need-NOM exist Q TO think.POL
'(Lit.) ..., (I) think [is there a need to put forward some such concept as social living space].'
'I think there's probably a need to put forward some such concept as social living space.'
(OM68_00001, The National Diet transcript, BCCWJ)

Building on the discussion in section 2.2, we propose that γ picks up the speaker's bias. For an ex-

[31] Another natural translation is 'Yoko *suspects* that Ken is the culprit'.

ample like (18), the idea is that the matrix subject's mental utterance of the question is motivated by positive evidential bias of the sort discussed in the literature on biased questions, which takes this bias to be a pragmatic inference (Büring & Gunlogson, 2000; Romero & Han, 2004; Sudo, 2013; Krifka, 2015; Goodhue, 2018). We model the bias here as a modalized proposition, *that Ken might be the culprit.* We do not necessarily believe that the bias actually *is* a modalized proposition (though such an analysis could be given in principle); rather, bias is a pragmatic implicature, and a modalized proposition is a reasonable approximation of the bias implicature's meaning that allows us to explore the compositional interpretation of the matrix clause. Following Yalcin (2007); Hacquard (2010); Anand & Hacquard (2013), when a modal is embedded under a representational attitude, the worlds made accessible by the attitude serve as the domain for the modal. *Might* then imposes existential quantification on that domain, leading to the following interpretation for (18):

(63) $[\![(18)]\!] = \lambda w.\, \exists e[\text{believe}(e, w)\ \&\ \text{exp}(e, yoko)\ \&\ \exists w' \in \text{content}(e, w)[\textit{Ken is the culprit in } w']$
$\&\ \exists e'[\text{utterance}(e', w)\ \&\ \text{agent}(e', yoko)$
$\&\ \text{content}(e', w) = \text{content}([\![[_{SAP}\ \text{Ken-ga hannin ka?}]]\!])\ \&\ e' \star e]]$

(56), the interpretation for a declarative embedded under *omou*, is repeated for comparison:

(56) $[\![(17)]\!] = \lambda w.\, \exists e[\text{believe}(e, w)\ \&\ \text{exp}(e, yoko)\ \&\ \forall w' \in \text{content}(e, w)[\textit{Ken is the culprit in } w']$
$\&\ \exists e'[\text{utterance}(e', w)\ \&\ \text{agent}(e', yoko)$
$\&\ \text{content}(e', w) = \text{content}([\![[_{SAP}\ \text{Ken-ga hannin da}]]\!])\ \&\ e' \star e]]$

The only difference (besides the embedded speech act) is in the force of quantification over of the doxastically accessible worlds made available by the matrix attitude *omou* (bolded '$\exists w'$' in (63) and '$\forall w'$' in (56)). This difference in strength captures the intuitive difference discussed above, and in section 2.2, thus providing the desired interpretational difference between (17) and (18).

Finally, we turn to embedded positively biased negative polar questions, as in (19). As we pointed out in section 2.2, (19) intuitively conveys that Yoko's commitment to the proposition *that Ken is the culprit* is weaker than in (17), but stronger than in (18), thus forming a scale of hedging effects. This is expected on our view, since a NPQ conveys a stronger bias than a positive polar question, but is nevertheless weaker than a full assertion. We will cash out these strength distinctions via the graded modality of Kratzer 1981, 1991 (the graded distinction could just as well be cast in terms of a probability semantics for modals, as in Lassiter 2017). Again, we do not mean to imply that the positive bias of NPQs actually is a modalized proposition. It's a pragmatic implicature that is conveniently modeled by a modalized proposition. As the bias of NPQs is stronger than that of positive polar questions, we model the bias of the embedded NPQ in (19) as the English modal *good possibility*. The interpretation of (19) then requires that there is a world w' among the doxastically accessible worlds such that the propositional prejacent of the question holds in all of the accessible worlds w'' that are more optimal than w'.[32]

[32]Following Kratzer (1991), the context c provides the function g, which takes the world of evaluation w as input, and produces the ordering source necessary to induce an ordering on the accessible worlds (being lower on the ordering means being more optimal):

(i) $\forall w, w' \in \text{content}(e, w)[w \leq_{g(w)} w' \Leftrightarrow \{p \in g(w) \mid w \in p\} \supseteq \{p \in g(w) \mid w' \in p\}]$.

(64) $[\![(19)]\!] = \lambda w.\ \exists e[\text{believe}(e, w)\ \&\ \exp(e, yoko)$
$\&\ \exists w' \in \text{content}(e, w)[\forall w'' \in \text{content}(e, w)[w'' \leq_{g(w)} w' \rightarrow \textit{Ken is the culprit in } w'']]$
$\&\ \exists e'[\text{utterance}(e', w)\ \&\ \text{agent}(e', yoko)$
$\&\ \text{content}(e', w) = \text{content}([\![[_{SAP}\ \text{Ken-ga hannin ja nai}_{tc}\ \text{ka?}]]\!])\ \&\ e' \star e]]$

The result is as desired: the truth conditions for (19) in (64) entail the truth conditions for (18) in (63) since, if every accessible w'' that is at least as optimal as a specific w' is one in which Ken is the culprit, then there is an accessible world in which Ken is the culprit, namely w'. And the truth conditions for (17) in (56) entail those in (64) since they say that every accessible world is one in which Ken is the culprit, thus there is one such that every world at least as optimal as it is one in which Ken is the culprit. So we have derived the graded hedging effect described in section 2.2.[33]

5 The puzzling distribution of embedded expletive negation is no longer a puzzle

We can now go back to the puzzles we introduced in section 1. On the view where the negation in (1) is related to embedded expletive negation in languages like French (e.g., Yoon 2011, 2013), it is puzzling why such negation can occur under predicates like *kitaisuru* 'hope', but not under negative or adversative predicates like *sakeru* 'avoid' as in (4).

(1) Yoko-wa [Sota-ga uta-o utawa-**nai**-**ka**-to] **kitaishi**-te i-ru.
Yoko-TOP Sota-NOM song-ACC sing-**NEG**-**KA**-TO **hope**-TE ASP-NPST
(lit.) 'Yoko hopes, wouldn't Sota sing a song.'
'Yoko hopes that Sota might sing a song.'

(4) *Watashi-wa [sono shirase-ga Yoko-no mimi-ni haira-**nai**-ka-to] **sake**-ta.
I-TOP that news-NOM Yoko-GEN ear-DAT enter-**NEG**.NPST-Q-TO **avoid**-PST
'I avoided that the news would not reach Yoko's ear.'

Such asymmetries are not puzzling on our analysis since the negation in question is part of a NPQ and therefore does not need to be licensed by an adversative predicate. As we saw in section 3, *to* marks its sister as a direct or indirect report of speech or mental utterance, so the *to*-clause is expected to combine with predicates that are compatible with such content, including non-adversative predicates such as *omou* 'think', *kitaisuru* 'hope', *teiansuru* 'suggest', *shinjiru* 'believe', and *kakushinsuru* 'be certain'. They are speech verbs (including manner of speech verbs) and propositional attitude predicates.

On the other hand, given that *to* attributes a speech or thought report to the embedding subject, our account predicts some predicates to be incompatible with *to*-clauses. In a sense, we can say that such predicates are not 'selected' by *to*-clauses. This is exemplified in (65) via the matrix predicate *hiteisuru* 'deny'. With *to*, the embedded propositional content *that Sota is still asleep* is attributed as speech or thought to the matrix subject *Yoko*. The matrix predicate *hiteisuru* 'deny', however, combines with that same subject and propositional content to convey *that Yoko*

[33] Our use of modals in the interpretation of these embedded polar questions raises the question of how examples like (18) and (19) compare intuitively and theoretically to examples in which the *to*-clause contains an overt modal, like those in section 4.3.2. We leave a full exploration of modality embedded under *to* to future work.

denies that Sota is still asleep. These two meanings are inconsistent, and thus our account explains why a *to*-clause cannot combine with *hiteisuru* 'deny'.[34, 35]

(65) Yoko-wa [[Sota-ga mada ne-te iru] {*to/koto-o/no-o}] hiteishi-ta.
Yoko-TOP Sota-NOM still sleep-TE ASP.NPST TO/KOTO-ACC/NO-ACC deny-PST
'Yoko denied that Sota was still asleep.'

Given this, it is not surprising that NPQs cannot be embedded under *hiteisuru* 'deny', as in (66). Similarly to (65), *to* attributes the speech/thought act 'Isn't Sota still asleep?' to the matrix subject, Yoko. This means that Yoko is biased toward the proposition that Sota is still asleep, and that is not compatible with the matrix predicate here, *hiteisuru* 'deny'.[36]

(66) *Yoko-wa [[Sota-ga mada ne-te iru-n ja nai$_{tc}$ ka] to] hiteishi-ta.
Yoko-TOP Sota-NOM still sleep-TE ASP.NPST-NO DE.WA NEG$_{tc}$ Q TO deny-PST
'(Lit.) Yoko denied, isn't Sota still asleep.'

This explains why embedded expletive negation cannot occur with negative or adversative predicates such as *hiteisuru* 'deny', *kyoshisuru* 'refuse', *sakeru* 'avoid, prevent' and *kinjiru* 'prohibit'. Though it is standard to talk about predicates selecting their complement types, one could also describe *to*-led embedded clauses as *selecting upward* those predicates that are compatible with the notion of reported speech or thought, such as *iu* 'say', *omou* 'think', *kitaisuru* 'hope', *shinpaisuru* 'worry/fear', *tazuneru* 'ask', *jimonsuru* 'ask oneself/wonder', and so on.

Two more notes about (65) and (66): First, while (65) with *to* cannot mean that Yoko denied that Sota was still asleep, it is possible to interpret *to*'s sister constituent as a report of Yoko's speech or mental utterance, in which case, the example as it stands sounds as if the thing that Yoko is denying is left unexpressed. We can fill in that information as in (67) and save the sentence by adding what Yoko is denying in the form of a *koto*-clause.[37]

[34]The judgment pattern, **to/koto/no*, remains the same if we negate the matrix verb *hiteisuru* 'deny', even though one might expect that adding negation would save the *to*-embedding. We find the same pattern with embedded Verb Second in German, as in (i) (Bernhard Schwarz (p.c.)).

(i) #Yoko bezweifelt (nicht), Sota schläft noch.
Yoko doubts not Sota sleeps still
'Yoko {doubts/doesn't doubt}, Sota still sleeps.' *German*

This makes sense given the observation in section 4 that main clause phenomena cannot be embedded under negated predicates. That said, more work is needed, as *to*-clauses that embed imperatives can sometimes be embedded under negated predicates in Japanese.

[35]Thanks to Michela Ippolito, Ivona Kučerová and Frank Sode (p.c.) for drawing our attention to connections to embedded Verb Second and embedded epistemic modals (Gärtner, 2002; Truckenbrodt, 2006; Anand & Hacquard, 2013; Ippolito, 2018; Sode & Truckenbrodt, 2018).

[36]Example (66) differs from (65) in that the other 'complementizers' *koto, no* would also be bad here. This is caused independently by the interrogative shape of the embedded clause. See also (69) below.

[37]In a context that very clearly establishes the thing denied (e.g. *that Sota is playing loud music*, as expressed by the *koto*-clause in (67)), it may even be possible to use (65) with *to*, with the understanding that an implicit *koto*-clause has been elided. However this judgment is subtle and marginal, and would need to be established under more robust scrutiny.

(67) Yoko-wa [Sota-wa mada neteiru to] [kare-ga ookii oto-de ongaku-o kake-te
Yoko-TOP Sota-TOP still asleep TO he-NOM large volume-with music-ACC play-TE
iru koto]-o hiteishi-ta.
ASP.NPST KOTO-ACC deny-PST
'Yoko denied that Sota is playing loud music, saying/thinking that Sota is still asleep.'

Second, the embedded *to*-clauses in examples such as (65) and (66) can be saved by using the grammaticalized verb of saying *yuu* (Shimamura, 2018; Saito, 2019) as in (68) and (69). The layer of *yuu koto/no* 'the thing that says' makes it possible for the embedded speech/thought act event to not get attributed to the matrix subject, hence no discourse inconsistency arises.

(68) Yoko-wa [[[Sota-ga mada neteiru] **to**] **yuu** {**koto/no**}]-o hiteishi-ta.
Yoko-TOP Sota-NOM still asleep TO SAY KOTO/NO-ACC deny-PST
'Yoko denied (the thing/claim that says) that Sota was still asleep.'

(69) Yoko-wa [[[Sota-ga mada neteiru-n-ja nai$_{tc}$ ka] **to**] **yuu** {**koto/no**}]-o
Yoko-TOP Sota-NOM still asleep-NO-DE.WA NEG$_{tc}$ Q TO SAY KOTO/NO-ACC
hiteishi-ta.
deny-PST
'Yoko denied (the thing that says) that there's a good possibility that Sota was still asleep.'

An interesting interpretive contrast emerges in sentences with another negative predicate *utagau* 'doubt'. Unlike *hiteisuru* 'deny' in (65), *utagau* 'doubt' can combine not only with *koto/no* as in (70a), but also with *to*, as in (70b). In the latter case, the verb *utagau* is interpreted as 'suspect'.[38]

(70) a. Yoko-wa [[Sota-ga mada neteiru] {**koto/no**}-o] **utagat**-ta.
Yoko-TOP Sota-NOM still asleep KOTO/NO-ACC **doubt**-PST
'Yoko doubted that Sota was still asleep.'
b. Yoko-wa [[Sota-ga mada neteiru] **to**] **utagat**-ta.
Yoko-TOP Sota-NOM still asleep TO **suspect**-PST
'Yoko suspected that Sota was still asleep.'

How does this interpretive shift arise? We think that the key lies in the property of *to* that signals its complement to be a report of speech or mental utterance attributed to the matrix subject. One might view the core meaning of the predicate *utagau* to be characterized as uncertainty. When it combines with a *koto/no*-led clause as in (70a), this gives rise to the interpretation of *doubting* that Sota is still asleep. When *utagau* combines with a *to*-led clause as in (70b), on the other hand, *to* attributes the thought that Sota is still asleep to the matrix subject, Yoko. In this case, the core meaning of uncertainty of the predicate *utagau* leads to Yoko's distancing herself from the proposition that Sota is still asleep with a meaning best translated as 'suspect'.[39]

So far in this section, we have shown that the two puzzles we identified in section 1 are no longer puzzles on our analysis. We add now a third puzzle faced by analyses that relate em-

[38]Yamada (2019) has also noted this type of meaning contrast with the verb *utagau* (and *ibukashimu* with a similar meaning) independently, as well as a data point similar to (67).

[39]This way of viewing the shift in the meaning of *utagau* 'doubt/suspect' was suggested by Elizabeth Bogal-Allbritten (p.c.), to whom we are grateful, as well as to Keir Moulton for subsequent discussions.

bedded expletive negation in Japanese to embedded expletive negation in, for example, French. Yoon (2011, 2013) proposes that the negation in question is a subjunctive mood marker, and the sequence *ka-to* 'Q-QUOT' is a non-factive complementizer and is also a type of subjunctive mood marker (Yoon, 2011, 190). Building on Yoon's analysis, Choi & Lee (2017) propose a type of hybrid analysis, which relies on the notion of nonveridicality in the licensing of the embedded expletive negation, while at the same time connecting such negation to the negation in NPQs.[40] This hybrid analysis is also subject to the two puzzles discussed above. Beyond that, the attempt to unify embedded expletive negation in biased NPQs with Romance expletive negation faces a challenge from embedded NPQs in French. Consider example (71), which features an embedded NPQ in French, slightly modified from a naturally occurring example.

(71) J'ai commandé la taille S mais je **me** **demande** si ce **n**'est **pas** plutôt XS.
I.have ordered the size S but I to.me ask if it NE.is NEG rather XS
'I ordered size S but I wonder if it isn't more like XS.' *French*

What is relevant here is the fact that *ne...pas* is used in (71), and not just *ne* as is standard in embedded expletive negation in French, as in (3). This makes Choi & Lee's claim that French embedded expletive negation *ne* is related to the negation in positively biased negative polar question *(ne)...pas* unconvincing. The takeaway message from (71) is that French has two phenomena, (i) NPQs, and (ii) embedded expletive negation, and these two phenomena are unrelated. Unlike French, Japanese only has (i), but *to* enables NPQs to be embedded productively in Japanese, giving rise to the false impression that Japanese also has (ii).

6 Conclusion

6.1 Summary

We have argued that the distribution and interpretation of embedded expletive negation in Japanese can be explained by analyzing it as the negation of a positively biased negative polar question, discussed in section 2. We saw in section 5 that our analysis resolved puzzles raised by prior attempts to unify embedded expletive negation in Japanese with that in French. In order to develop our analysis, we had to examine the role of the complementizer *to*, cataloguing its unique properties in section 3. An appreciation of these properties pointed us toward a quotative analysis of *to* that we cashed out as speech act embedding, building on prior work. We believe our analysis in section 4 makes some progress, both in helping us to understand embedded expletive negation, and in providing a syntax and semantics that unifies cases of 'selected' and 'unselected' *to*-clauses.

6.2 Future work

The account we have developed has several limitations that point the way to future work. First, our analysis of the relation between the embedded *to*-clause and the matrix clause in section 4.2 is preliminary. More work is needed to tease apart the relations between matrix and embedded

[40] In fact, Yoon (2011, §2.10) also briefly explores whether embedded expletive negation may be related to the negation in biased NPQs, but ultimately says that more evidence is needed and leaves it to future work.

clauses that *to* accepts and those it does not. Second, our explanation for the interpretation of modals in *to*-clauses combined with *kitaisuru* 'hope' in 4.3.2 is still not fully spelled out. In particular, O is not produced directly in the compositional semantics, so it is unclear how the modal is able to quantify over it. Third, and related to the last point, a broader exploration of the empirical facts is needed, not just of *to* embedding, but also of *koto* and *no* embedding, relative to many different classes of embedding predicates, as well as many different kinds of embedded clauses, both in terms of speech acts/clause types, and in terms of the modality contained within them (Anand & Hacquard, 2013, 2014; Bogal-Allbritten & Moulton, 2017; Yeom, 2018; Bogal-Allbritten et al., 2021).

Finally, as mentioned in footnote 15, there is a remaining puzzle about how *wh*-phrases can take matrix scope across *ka* 'Q', which one might expect to create an island, since interrogative complementizers *ka* or *kadooka* 'whether' are known to create an island. Consider (72), similar to (28b):

(72) Yoko-wa [[Sota-ga **nani**-o kat-ta **ka**] **to**]] omot-ta no?
Yoko-TOP Sota-NOM what-ACC buy-PST Q TO think-PST NO
'(Lit.) What did Yoko think, did Sota buy t?'
'What did Yoko think Sota might have bought?'

As we observed in section 3.6, *ka* lives a double life as an interrogative complementizer and as a kind of interrogative discourse particle, perhaps something like Hindi-Urudu *kyaa* (Bhatt & Dayal, 2020; Deo, 2023). When embedded in *to*-clauses like in (72), *ka* is likely to be an interrogative discourse particle and not an interrogative complementizer, thus it may not introduce island effects, which would explain why the *wh*-phrase can take matrix scope.

However, this picture is further complicated by the fact that the data on long-distance *wh*-dependencies in Japanese is known to be complicated . It may in fact be the case that a *wh*-phrase can even take matrix scope over *kadooka* 'whether', which we argued above can only be an interrogative complementizer. This is demonstrated by (73) (such examples may require emphatic prosody on the *wh*-prhase, followed by deaccenting up to the complementizer; Kitagawa et al. 2004).[41]

(73) Yoko-wa [[Sota-ga **nani**-o kat-ta **kadooka**] tazune-ta no?
Yoko-TOP Sota-NOM what-ACC buy-PST whether ask-PST NO
'(Lit.) What did Yoko ask whether Sota bought *t*?'

So, all that is clear at this point is that the matrix scope interpretation of embedded *wh*-phrases in Japanese is complicated and likely interacts with prosody (as discussed in *e.g.,* Kitagawa et al. 2004; Richards 2010; Kawahara et al. 2022). A complete exploration of the phenomenon's interaction with *to* embedding awaits future work.

[41] Since the *wh*-phrase occurs medially in the embedded clause, it would not be straightforward to attribute the matrix scope interpretation to prolepsis.

Abbreviations

ACC = accusative, ASP = aspect, COP = copula, DAT = dative, DECL = declarative, FUT = future, GEN = genitive, NEG = negation, NOM = nominative, NPST = nonpast, PST = past, PL = plural, SG = singular, SUBJ = subjunctive, TOP = topic

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