

Embedded moods in Japanese*

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ABSTRACT

Different embedding predicates select different embedded clauses. Attempts have been made to reveal which predicate takes which embedded clauses. Despite the detailed descriptive generalization, few studies have provided a theoretical analysis that predicts the variation — with two important exceptions; Portner (2018b) and Mari and Portner (2018), who, by examining the subjunctive-indicative distinction in Romance languages, claim that the mood selection is a consequence of compositional semantics. Inheriting fundamental insights from these previous studies, this paper argues that a clause selection in Japanese — the contrast between *koto*-clauses and *to*-clauses — is also understood as a result of compositional semantics; i.e., the embedded moods of these clauses are different, which determine the type of embedding predicate that they can combine with. First, *to*-clauses are equipped with an embedded mood which has a built-in requirement that the relevant modal background with which the embedded proposition is associated is doxastic. As a result, the proposition expressed by the *to*-clause is interpreted as what the subject of the main clause thinks is true. Second, the embedded mood of *koto*-clauses does not have any particular requirement on the modal background(s); instead, the nature of modal background is specified by the meaning of the embedding predicate. As a result, *koto*-clauses are compatible with a wider range of embedding predicates.

1. Introduction

Different embedding predicates select different embedded clauses and researchers have documented descriptive tendencies of such clause selections. For instance, research on verbal mood (e.g., indicative vs. subjunctive morphology in Romance/Balkan languages) has revealed conditions under which each mood form is selected. It has been said that preferential predicates, such as bouletic predicates (e.g., Spanish *querer* ‘want’ and French *vouloir* ‘want’) and directive predicates (e.g., Spanish *aconsejar* ‘advise’ and French *conseiller* ‘advise’), are subjunctive selectors while doxastic predicates (e.g., Greek *ksero* ‘know’ and French *savoir* ‘know’) and epistemic predicates (e.g., Greek *nomizo* ‘think’ and French *penser* ‘think’) are indicative selectors (Villalta 2008; Portner 2018a).

Choice of Japanese subordinate markers is another example of clause selection. Japanese is equipped with three subordinate markers, i.e., *koto*, *no* and *-to* and it is known that different predicates take different subordinate markers (Inoue 1976; Kuno 1983 [1973]; Yamada 2018). Amongst all, *no* is perhaps the easiest to characterize; it is typically selected by perception verbs (and some miscellaneous predicates such as *tetudaw-* ‘help’ and *huseg-* ‘prevent,’ most of which are expressed as bare infinitives or gerunds if translated in English).

It has been said that, when compared to *no*-clauses, *koto*-clauses and *to*-clauses denote a more ‘abstract concept’ (Kuno 1983 [1973]; Joseph 1976; Hara et al. 2013). But, previously, the emphasis has been put on the difference between *koto* and *no* and the difference between *koto* and *to* has not been extensively discussed.

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The goal of this study is to give a formal analysis to the difference between *koto*-clauses and *to*-clauses. This study inherits the idea recently developed by Portner (2018b) and Mari and Portner (2018) that (i) each mood in the embedded clause has a particular meaning and (ii) embedding predicates are used with these moods if and only if their denotations are compatible with the semantics of such mood indicators. By extending their analysis to Japanese, I claim that the clause selection is reduced to the problem of embedded moods.

2. Differences between *koto*-clauses and *to*-clauses

2.1 Difference 1: Embedding predicates

It is known that different embedding predicates select different clauses (Kuno 1983 [1973]; Noda 1995; Yamada 2018; Yamada forthcoming; *amo*). First, *to*-clauses specialize in verbs-of-thinking/saying (e.g., *iw-* ‘say,’ *omow-* ‘think,’ *omoikom-* ‘wrongly assume’). For example, the verb *omow-* ‘think, feel’ cannot be used with *koto*-clauses; it is exclusively used with *to*-clauses as shown in (1).

- (1) [*Kyoo-ga getuyoobi-de ar-u*]{*-to/*koto-o*} *omot-te i-ta*.
 today-NOM Monday-COP be-PRSC/C-ACC think-CV PRG-PST
 ‘I was thinking that today was Monday.’

Second, *koto*-clauses are used with other attitude predicates (e.g., bouletic, *nozom-* ‘desire,’ directive *meezur-* ‘command,’ dynamic modal *deki-* ‘can,’ and deontic *hituyoo da* ‘be necessary’). For example, the verb *deki-* cannot be used with *-to* and, as in (2); it only selects *koto*-clauses.

- (2) *Kare-wa [hayaku hasir-u]*{**-to/koto-ga*} *deki-ru*.
 he-TOP fast run-PRS-C/C-ACC be able to-PRS
 ‘He can run fast.’

A caveat. In some cases, the same predicate appears to take both clauses. For example, the sentences in (3) are both grammatical, which makes us wonder if they are both selected by the verb. However, below, we will see that, despite the similarity, they have a different grammatical status.

- (3) a. *Kare-wa [okane-o nusun-da-to] mitome-ta*.
 he-TOP money-ACC steal-PST-C confess-PST
 ‘He confessed saying that he stole the money.’
 b. *Kare-wa [okane-o nusun-da koto-o] mitome-ta*.
 he-TOP money-ACC steal-PST C-ACC confess-PST
 ‘He confessed that he stole the money.’

2.2 Difference 2: Bare quotatives

To-clauses have an adjunct use, aka., a BARE QUOTATIVE (Kamada 2000; Fujita 2000; Fujii 2015; Kim 2018; Tomioka and Kim 2019). For example, the *to*-clause in (4) is considered as an adjunct because corresponding embedding predicates in other languages ((*te-o*) *age-* ‘(hand-ACC) raise’) do not select a proposition or a property. Such a *to*-clause describes the agent’s inner belief/voice that motivates the action described in the main clause. In contrast, *koto*-clauses cannot be used as a bare quotative construction.

- (4) [*Ore-ga yar-u*]{*-to/*koto*}, *kare-wa te-o age-ta*.
 I-NOM do-PRSC/C he-TOP hand-ACC raise-PST
 ‘He raised his hand “(thinking/saying) I will do it”.’

2.3 Difference 3: Grammatical relation

Koto-clauses can stand in the subject position but *to*-clauses are not allowed to appear in the same position. Observe the contrast in (5).

- (5) [*Kare-ga kur-u*]{*-*to(-ga)/koto-ga*} *zyuuyoo da*.
 he-NOM come-PRS-C-NOM/C-NOM importance COP
 ‘[That he comes] is important.’

2.4 Difference 4: Doubt-denoting predicate

Verbs-of-doubt (such as *utagaw-* ‘doubt’ and *ibukasim-* ‘doubt’) exhibit a sharp contrast in meaning depending on the choice of the embedded clause; when used with *-to*, the verb is better-translated as ‘suspect.’ When used with *koto* it is translated as ‘doubt.’ Observe the contrast below:

- (6) a. *Kare-wa [hannin-ga kanozyo-de ar-u koto-o] utagat-teir-u*.
 he-TOP culprit-NOM I-COP be-PRS koto-ACC doubt-PRG-PRS
 ‘He is **doubting** that she is the culprit (→ he does not think that she is the culprit).’
 b. *Kare-wa [hannin-ga kanozyo-de ar-u-to] utagat-te ir-u*.
 he-TOP culprit-NOM she-COP be-PRS-to doubt-PRG-PRS
 ‘He is **suspecting** that she is the culprit (→ he thinks that she is the culprit).’

3. Analysis

3.1 Spurious cases: adverbial *to*-clauses

Apparently, the sentences in (3) suggest that some verbs can select two clauses. However, the following data cast doubts on this generalization. First, these two clauses can be juxtaposed without any coordinating marker inbetween. For example, the sentence in (7) is grammatical. If they are both selected by the same predicate, this is an unexpected data.

- (7) *Kare-wa [okane-o nusun-da-to] [doroboo-ni hait-ta-koto-o] mitome-ta*.
 he-TOP money-ACC steal-PST-C thief-for enter-PST-C-ACC confess-PST
 ‘He confessed [that he burglarized] [(saying) that he stole the money].’

Second, when a coordinating marker *sosite* is present, a *to*-clause and a *koto*-clause cannot coexist within the same sentence as demonstrated in (8), despite the fact that *to*-clauses and *koto*-clauses are able to be coordinated as shown in (9) and (10).

- (8)**Kare-wa [okane-o nusun-da-to] sosite [doroboo-ni hait-ta-koto-o] mitome-ta*.
 he-TOP money-ACC steal-PST-C and thief-for enter-PST-C-ACC confess-PST
 ‘He confessed [that he burglarized] [(saying) that he stole the money].’
 (9) *Kare-wa [okane-o nusun-da-to] sosite [doroboo-ni hait-ta-to] mitome-ta*.
 he-TOP money-ACC steal-PST-C and thief-for enter-PST-C confess-PST
 ‘He confessed (saying) [that he burglarized] and [that he stole the money].’
 (10) *Kare-wa [okane-o nusun-da-koto-o] sosite [doroboo-ni hait-ta-koto-o]*
 he-TOP money-ACC steal-PST-C-ACC and thief-for enter-PST-C-ACC
mitome-ta.
 confess-PST
 ‘He confessed [that he burglarized] and [that he stole the money].’

All these data show that the *to*-clause and the *koto*-clause in (3) have a different grammatical status. Given the fact that *to*-clauses have a bare quotative use, I assume that the verb *mitome* ‘admit, confess’ only takes a *koto*-clause as its complement and the *to*-clause in (3) is, in fact, an adjunct with the direct object of *mitome* ‘admit, confess’ unpronounced (= a little *pro*).

3.2 Previous approaches (Romance languages): Portner (2018b) and Mari and Portner (2018)

Examining embedded moods in Romance languages, Portner (2018b) and Mari and Portner (2018)

propose that (i) verbal moods serve as a functor that specifies how the embedded proposition is interpreted with respect to the modal background(s) identified by the main clause predicate and (ii) that different verbal moods have a different requirement on the semantics of the embedding predicate — the indicative verbal mood requires that there be provided a single modal background whereas the subjunctive verbal mood requires an extra modal background for the ordering.

Formalizing these ideas in terms of a version of the SIM semantics for desiderative and emotive predicates originally due to Stalnaker (1984) and Heim (1992), they provide the following denotations for the verbal moods.

- (11) $\llbracket \textit{indic} \rrbracket = \lambda p. \lambda T. \lambda x. \lambda w. \cap T(x, w) \subseteq p$.
i.e., the proposition p expressed by the embedded clause is compatible with x 's (the main clause subject) Modal background T provided by the embedding predicate in w .
- (12) $\llbracket \textit{subj} \rrbracket = \lambda p. \lambda \langle T, O \rangle. \lambda x. \lambda w. \{ \langle \text{SIM}(p)(w), \text{SIM}(\neg p)(w) \rangle : w \in \cap T(x, w) \} \subseteq \leq_{O(x, w)}$.
i.e., the proposition p expressed by the embedded clause is preferred wrt the Target modal background T and the Ordering source O of x in w .

3.3 Embedded moods in Japanese

If the conclusion in Section 3.1 is right, the criterion for the Japanese clause selection is much simpler than it appears; it is sensitive to the distinction between doxastic (e.g., (1)) and non-doxastic (e.g., (2)). Since the set of doxastic predicates is a subset of the set of non-preferential predicates, the difference between Japanese and Romance languages (e.g., French) is summarized as in (13).

	declarative clauses	subjunctive clauses
Romance (e.g., French):	non-preferential predicates	preferential predicates
	Line A	Line B
Japanese:	doxastic predicates	non-doxastic predicates
	<i>to</i> -clauses	<i>koto</i> -clauses

Line B is what differentiates subjunctive-taking predicates from indicative-taking predicates. The verbal moods in (11) and (12) create this dividing line. Maintaining the main insight of Portner (2018b) and Mari and Portner (2018), I propose that Line A reflects a system of embedded moods slightly different from the verbal mood system in Romance languages.¹ The proposed denotations are given below.

(14) Embedded moods

- a. $\llbracket \text{MOOD-}_{to} \rrbracket^c = \lambda p \in \wp(D_w). \lambda x \in D_e. \lambda e \in D_v. \lambda w \in D_w. \text{DOX}(x)(e)(w) \subseteq p$.
b. $\llbracket \text{MOOD-}_{koto} \rrbracket^c = \lambda p \in \wp(D_w). \lambda M. \lambda x \in D_e. \lambda e \in D_v. \lambda w \in D_w. \text{BEST}(M(x)(e)(w)) \subseteq p$.

Japanese embedded moods are concerned not with the number of modal backgrounds as assumed for Romance languages, but with the prespecification of the nature of the modal background. More specifically, the mood indicator of *to*-clauses has a precondition that the modal background must be doxastic while this restriction is absent in *koto*-clauses.

3.2.3 Implimentation

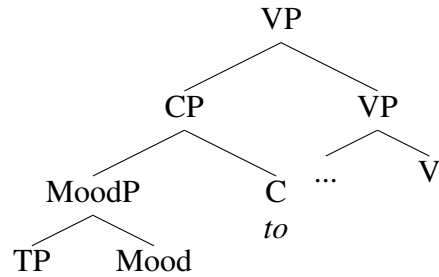
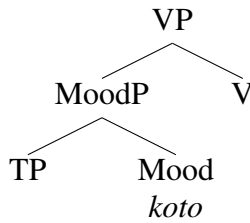
In order to see how this analysis works, let us examine how the derivation proceeds.

Syntactic configurations. In order to capture the data in (5) and (7), I assume that *to*-clauses are inherently adjunct, whereas *koto*-clauses occupy positions where nouns can appear; e.g., the

¹**Verbal moods and embedded moods:** Since Japanese does not encode the verbal inflection to denote the mood distinction, I use the term EMBEDDED MOODS to refer to a functor that relates the embedded proposition with the relevant modal background(s).

complement position of the verb (Fujita 2000).² Since *koto* and *-to* can appear within the same embedded clause (= (16); Yamada forthcoming), I assume the structures in (15), where *-to* is located in a position higher than *koto*.

(15) a. *koto*-clause



b. *to*-clause

(16) [*O-kawari-naku sugosi-te irassyar-u* *koto-to omoi-mas-u*.
 HON-change-without live-CV PRG.HONS-PRS C-C think-HON_A-PRS
 ‘I think you are leading your life as you were.’

Derivation. For example, the sentences in (3) are analyzed as follows. First, the embedded TP is assumed to denote a proposition. Here, it is modeled as a set of worlds (= (17)a). Second, as with Portner (2018b) and Mari and Portner (2018), it is assumed that the embedding predicate provides modal background(s) against which the embedded proposition is interpreted. However, I assume that embedding predicates have two jobs; they (i) not only give us modal backgrounds but (ii) they also introduce event variables. This is necessary when we discuss aspectual properties of embedding predicates. Inheriting the idea of multidimensional semantics (Potts 2005; Potts and Kawahara 2004; McCready 2019; amo), I assume that these two pieces of information lie in different dimensions. For the sake of convenience, I use $\boxed{1}$ to refer to the at-issue dimension and $\boxed{2}$ to point to the dimension of modal backgrounds.

(17) a. $\llbracket \text{TP} \rrbracket^c = \{w : \text{she is the culprit in } w\}$

b. $\llbracket \begin{array}{c} \text{VP}_1 \\ (\text{utagaw-}) \end{array} \rrbracket^c = \lambda x. \lambda e. \lambda w. \left[\begin{array}{l} \text{doubt}(e, w) \wedge \text{EXP}(x, e, w) : \boxed{1} (\text{at-issue}) \\ \bullet \\ \{p : x \text{ doubts } p \text{ in } e \text{ in } w\} : \boxed{2} (\text{modal backgrounds}) \end{array} \right].$

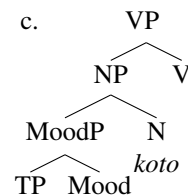
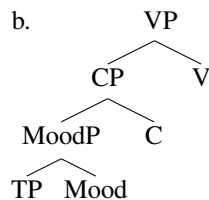
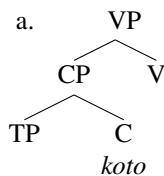
Third, the Head, MoodP_{to} is combined with the embedded TP, resulting in the semantics in (18)a. Being an adjunct, this MoodP gets combined with the meaning of VP_1 and (18)c.

(18) *to*-clause

a. $\llbracket \text{MoodP}_{-to} \rrbracket^c = \lambda x \in D_e. \lambda e \in D_v. \lambda w \in D_w. \text{DOX}(x)(e)(w) \subseteq \{w : \text{she is the culprit in } w\}.$

²**Derivation based on other structures:** Though, for simplicity’s sake, I adopt the structures in (15), the analysis is compatible with all the structures shown in (i). If we adopt the tree in (i)a, the Head, CP is assumed to have the denotations in (14). As for (i)b and (i)c, we may assume that C and N are semantically transparent (i.e., act as an identity function) or assign the meaning to these elements in such a way that they do not disturb the role of $\llbracket \text{Mood} \rrbracket$.

(i)



$$\text{b. } \llbracket \text{VP}_2 \rrbracket^c = \lambda x. \lambda e. \lambda w. \left[\begin{array}{l} \text{DOX}(x)(e)(w) \subseteq \{w : \text{she is the culprit in } w\} \\ \wedge \text{doubt}(e, w) \wedge \text{EXP}(x, e, w) \end{array} \right]$$

Finally, in the case of *koto*-clauses, the modal background is provided by the embedding predicate (more specifically, the secondary dimension of the meaning of *utagaw*- ‘doubt’). In this case, the modal background is the the set of propositions that the agent doubts.

(19) *koto*-clause

$$\begin{array}{l} \text{a. } \llbracket \text{MoodP}_{koto} \rrbracket^c = \lambda M. \lambda x \in D_e. \lambda e \in D_v. \lambda w \in D_w. \text{BEST}(\llbracket \text{VP}_1 \rrbracket(x)(e)(w)\boxed{2}) \\ \quad \subseteq \{w : \text{she is the culprit in } w\} \wedge \llbracket \text{VP}_1 \rrbracket(x)(e)(w)\boxed{1}. \\ \text{b. } \llbracket \text{VP} \rrbracket^c = \lambda x. \lambda e. \lambda w. \left[\begin{array}{l} \cap \{p : x \text{ doubts } p \text{ in } e \text{ in } w\} \subseteq \{w : \text{she is the culprit in } w\} \\ \wedge \text{doubt}(e, w) \wedge \text{EXP}(x, e, w) \end{array} \right] \end{array}$$

Explanation. Based on the proposal, I analyze the puzzles in the following way. First, the *koto*-clause cannot be used with embedding predicates that do not provide modal backgrounds (e.g., ‘raise his hand’ in (4)) while the mood indicator of the *to*-clause already has its own modal base, so it does not need any modal background provided by the embedding predicate. This is why the meaning of thinking/saying emerges in (4) without an overt predicate (Section 2.2).

Second, *koto*-clauses have a nominal status. This is why they can be used in the subject position. In contrast, *to*-clauses are inherently adjunct. This is why they cannot stand in the subject position (Section 2.3).

Third, the embedded proposition of verbs-of-doubt is evaluated wrt the doxastic modal base in the *to*-clause — the proposition p is one of those that he thinks is true — while, in the *koto*-clause, it is interpreted wrt the modal background created based on the meaning of doubt (the propositions that he doubts) — p is one of those that he doubts (Section 2.4).

Fourth, the unacceptability of *koto* in (1) is easily explained if we assume that, unlike English *think*, Japanese *omow*- ‘think, feel’ provides no modal backgrounds. As we saw in (16), *koto* can be used with doxastic predicates. By analyzing that *-to* is the source of doxastic modal background, we can explain why *-to* ameliorates the grammaticality.³

Finally, *to*-clauses cannot be used when the main clause depicts a non-agentive event (e.g., *dekir*- ‘can,’ *okor*- ‘happen,’ and *yoo sur*- ‘need’). By extending the denotation in (14), we can understand this requirement as a consequence of a theta role-oriented restriction (= (20)) (Section 2.1).

$$(20) \llbracket \text{MOOD}_{-to} \rrbracket^c = \lambda p. \lambda x. \lambda e. \lambda w. \text{DOX}(x)(e)(w) \subseteq p \wedge \text{AGENTIVE}(x, e, w).$$

4. Conclusion and future directions

When we study clause selections in the natural language, we need to pay attention to the universality (= (21)a) and the variation (= (21)b).

(21) a. Every language exhibits a clause selection.

b. Criteria for the clause selection system of a given language are language-dependent.

Of course, Japanese does not have the indicative-subjunctive distinction. However, Japanese also exhibits a clause choice problem in embedded environments. What distinguishes Japanese from Romance languages is the semantics of embedded moods. In Romance languages, the relevant factor is the number of modal background(s) (Portner 2018b; Mari and Portner 2018) whereas

³**Compositional semantics for *koto-to* sentence:** Admittedly, the denotations in (14) are not ready for the well-formed semantics for the sentence in (16). One way out is to separate the modal background from the Mood by attributing the modal background to the meaning of *-to* (See, e.g., Yamada forthcoming).

what matters in Japanese is the nature of the modal background(s); i.e., whether it is prespecified as a doxastic modal background or not.

It is anticipated that, although different languages may exhibit different types of clause-choice pattern, the problem is understood as a semantic characterization of mood indicators, which serves as a useful view point when we run a cross-linguistic comparison of clause selection.

There are some lingering issues to be discussed in future studies. First, Japanese clause selection is not a binary system. In addition to the two markers discussed in this study, it is important for us to take into consideration the last subordinate marker *-no* (Yamada 2018; Yamada and Kubota 2018). Second, a bigger question still remains; do languages show infinitely many possible clause selection systems? Are there any limitations? Cross-linguistic studies are necessary.

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