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Note on Japanese Epistemic Verb Constructions:
A Surface-Compositional Analysis⋆

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Abstract. This paper offers a new analysis of the raising to object construction in Japanese. This has been extensively discussed following Kuno (1976) for the case where the matrix predicate is an epistemic verb. Under CCG analysis an *o*-marked phrase is a surface-compositional object rather than a raised argument. This new approach correctly predicts the thetic and categorical judgments of epistemic verb constructions, which have hitherto only been accounted for by the studies which emphasize only the syntactic aspects of the construction.

Keywords: raising to object (RTO), epistemic verbs, the thetic and categorical judgments, surface-compositional, Combinatory Categorial Grammar (CCG)

1   Introduction

In some languages, an argument that belongs semantically to an embedded clause is realized syntactically as an object of a matrix clause, this "raising to object" (RTO) is schematized as follows:

(1) $[_{matrix}$ subject ... object$_i$ ... $[_{embedded}$ t_i ...] ...]

The term "raising" has its origin in the transformational analysis of such constructions in which the subject of the lower clause is "raised" to become the object of the matrix verb.

English has many examples of RTO verbs (*consider*, *believe*, *think*, etc.), which can be classified together as "epistemic verbs" (verbs of thinking, feeling, perceiving, etc.) in semantic terms. The RTO epistemic verbs take three kinds of complement clause, a fully-fledged clause as in (2a), an infinitive clause as in (2b), and a small clause as in (2c) below:

(2)   a. I considered [(that) she was intelligent.]
        b. I considered [her to be intelligent.]
        c. I considered [her intelligent.]

Although *her* in (2b) and (2c) is understood semantically to be the subject of *to be intelligent* referring to the equivalence of propositional contents against (2a), they are both syntactic objects of *consider*. In this analysis, the argument *her* is "raised" from its initial position as the subject of the embedded clause to its final position as the main clause object as illustrated in (1).

There has been much debate about the derivation of RTO constructions such as that of (2b). In English, Postal (1974), Lasnik and Saito (1991), and others argue that (2b) involves the RTO movement illustrated in (1). Chomsky, on the other hand, argues that the derivation is either by the Exceptional Case-marking (ECM) process under S̄-deletion (Chomsky, 1981) or by IP-complementation (Chomsky, 1986). However, his motivation for not accepting the RTO analyses is mainly theoretical.

In Japanese, it has often been noted in the literature on transformational syntax that examples such as (3) below share syntactic properties with the example sentences listed in (2).

(3) a. Watasi-wa kanozyo-ga kasiko-i   to   minasi-ta.
       I-TOP   she-NOM   intelligent-PRES COMP consider-PAST
       'I considered that she was intelligent.'

     b. Watasi-wa kanozyo-o kasiko-i   to   minasi-ta.
       I-TOP   her-ACC   intelligent-PRES COMP consider-PAST
       'I considered her to be intelligent.'

     c. (?)?Watasi-wa kanozyo-o kasiko-ku   minasi-ta.
       I-TOP   her-ACC   intelligent-INFL   consider-PAST
       'I considered her intelligent.'

The propositional contents of (3a), (3b), and (3c) are virtually equivalent and the differences between them lie in the case of the argument *kanozyo* 'she/her': nominative in (3a) and accusative in both (3b) and (3c). As those glosses indicate, (3) shows the same case alternation patterns that English exhibits in (2). It has been argued that (3b) is also derived by the RTO movement (Kuno (1976), Tanaka (2002), and others) or the ECM process (Kaneko (1988) and Ueda (1988)).

In this paper, we firstly examine Japanese data and their analysis for RTO leaving aside theoretical concerns about the transformation. Secondly we discuss the semantic and pragmatic properties of epistemic verb construction considering some facts which have been ignored by previous studies. Lastly, we propose an alternative analysis of the construction whose accusative object should be treated as a surface-compositional object rather than as a raised argument.

2 Raising to Object? in Japanese

Most of the transformational approaches to Japanese epistemic verbs (*minas(u)* 'consider', *omow(u)* 'think', *sinzir(u)* 'believe', etc.) advocate the RTO analysis. For example:[1]

(4) a. Ken-wa Mari-o_i [t_i tensai da   to   ] omot-ta.
       Ken-TOP Mary-ACC   genius COP COMP   think-PAST
       'Ken thought Mary to be a genius.'

     b. Ken-wa [Mari-ga   tensai da   to   ] omot-ta.
       Ken-TOP Mary-NOM genius COP COMP   think-PAST
       'Ken thought that Mary was a genius.'   (Kuno (1976): pp. 23-24, Slightly altered.)

Since Kuno's extensive discussion (Kuno, 1976) of RTO in Japanese, it has been noted that there are reasons that the accusative phrase in (4a) should not be treated on par with the embedded subject of ECM constructions in English, instead they should be treated as a matrix element leaving a "trace" in the embedded clause.[2] Before proceeding, let us closely examine evidence that Japanese epistemic verbs involve syntactic raising into the matrix clause from such diagnostics as adverb placement, word order, and pronominal coreference.[3]

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[1] In the following, the sentences cited from other papers are slightly altered mainly for consistency.

[2] The ECM analysis is not assumed in this paper. It also should be noted that the exact analysis Kuno proposed was "Subject Raising" in which the accusative object in (4a) is originally generated as the subject of the embedded clause as in (4b) and then "raises" into the matrix clause without "trace".

[3] Another piece of evidence that is often referred for the RTO analysis is scopal ambiguity. See (i) below:

(i) Dareka-ga   minna-o mihat-tei-ta.
    Someone-NOM all-ACC   watch-PROG-PAST
    'Someone was watching all.' [$\exists > \forall, \forall > \exists$]   (Kuno (1976): p.27, Judgment is his.)

On the basis of the judgment of (i) where the universal quantifier *minna* 'all' can take wider scope than the existential quantifier *dareka* 'someone' ($\forall > \exists$), Kuno (1976) among others claim that the following (iia) is scopally ambiguous since the accusative-marked universal quantifier *minna-o* patterns with a matrix object in (i), 'but (iib).

First, the matrix adverb *orokanimo* 'stupidly' may be placed after the accusative argument *Mari-o* as in (5a), but not after the nominative argument *Mari-ga* as in (5b) below:

(5) a. Ken-wa Mari-o$_i$ *orokanimo* [t_i tensai da   to   ] omot-ta.
         Ken-TOP Mary-ACC stupidly   genius COP COMP   think-PAST
         'Stupidly, Ken thought Mary to be a genius.'

     b. #Ken-wa [Mari-ga   *orokanimo* tensai da   to   ] omot-ta.
         Ken-TOP   Mary-NOM stupidly   genius COP COMP   think-PAST
         '(lit.) Ken thought that stupidly Mary was a genius.'

                                                    (Kuno (1976): p.25, Slightly altered.)

Owing to the relatively free word order in Japanese, the matrix adverb may appear in various positions as follows:

(6) a. *Orokanimo* Ken-wa Mary-ga/o tensai da to omot-ta.
         'Stupidly, Ken thought that Mary was a genius / Ken thought Mary to be a genius.'

     b. Ken-wa *orokanimo* Mary-ga/o tensai da to omot-ta.

     c. Ken-wa Mary-ga/o tensai da to *orokanimo* omot-ta.

                                                    (Kuno (1976): p.25, Slightly altered.)

The adverb in (5a) and (6) can modify the matrix subject in the intended reading, but this is not possible in (5b). This may be accounted for if the structures of the sentences are as shown in (5).

However, it should be noted that (5) just indicates that the subject-oriented adverb *orokanimo* 'stupidly' may be placed after an accusative argument, but not after a nominative argument.

Second, an accusative argument may be raised to the top of the matrix clause but a nominative argument may not be raised, this is shown in (7a) and (7b), respectively.

(7) a. Mari-o$_i$ Ken-ga t_i' [t_i tensai da   to   ] omot-ta.
         Mary-ACC Ken-NOM   genius COP COMP   think-PAST
         'Ken thought MARY to be a genius.'

     b. *Mari-ga$_i$ Ken-ga   [t_i tensai da   to   ] omot-ta.
         Mary-NOM Ken-NOM   genius COP COMP   think-PAST

                                                    (Kuno (1976): p.26, Slightly altered.)

As noted in the literature (e.g., Saito (1985)), Japanese does not allow long-distance scrambling of a subject NP, thus a nominative argument originally located in an embedded clause, as in (7b), cannot undergo scrambling. On the other hand, an accusative argument can undergo short-distance scrambling moving it from the matrix constituent position t' to the top of the clause if the structure of the sentence is as shown in (7a).

It should also be noted that the scramblability fact in (7a) shows that the clause's initial accusative argument may be moved from the position t' at best, and does not show that it was raised from the embedded clause constituent position t to t' beforehand.

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(ii) a. Dareka-ga   minna-o$_i$ [t_i baka da   to   ] omot-tei-ru.
          Someone-NOM all-ACC   fool COP COMP   think-PROG-PRES
          'Someone thinks all to be fools.' [∃ > ∀, ∀ > ∃]

      b. Dareka-ga   [minna-ga baka da   to   ] omot-tei-ru.
          Someone-NOM   all-NOM fool COP COMP   think-PROG-PRES
          'Someone thinks that all are fools.' [∃ > ∀]   (Kuno (1976): p.28, Judgment is his.)

However, with regard to the scope relation of the two quantifier phrases in (i) and (iib), it is unambiguous for the authors of this paper. That is, the scope of *dareka-ga* 'someone' is wider than the one of *minna-o* 'all' [∃ > ∀], as is discussed in the literature (e.g., Hoji (1985)).

Moreover, it is important to note that even if we accept Kuno's (1976) judgment and reasoning, that cannot be a direct evidence for the accusative argument raising as well as the other evidence that we examine in the following of this section.

Finally, the accusative pronoun *kare-o* 'him' may not be coreferential with the matrix subject *Ken-ga*, but the nominative pronoun *kare-ga* 'he' may, this is illustrated in (8a) and (8b), respectively:

(8) a. # ($_{GC}$ Ken$_j$-ga   kare$_j$-o$_i$ [t_i tensai da   to   ] omot-ta.)
           Ken-NOM he-ACC   genius COP COMP   think-PAST

      'Ken$_j$ thought him$_{(*j/k)}$ to be a genius.'

    b. ? Ken$_j$-ga   ($_{GC}$ [kare$_j$-ga tensai da   to   ]) omot-ta.
         Ken-NOM   he-NOM genius COP COMP   think-PAST

      'Ken$_j$ thought that he$_{(?j/k)}$ was a genius.'   (Kuno (1976): p.29, Slightly altered.)

Example (9) below shows that the Japanese pronoun, *kare* 'he/him', is subject to so called Binding Condition B (a pronoun is free in its governing category (GC), Chomsky (1981)).

(9) #Ken$_j$-wa kare$_j$-o hihansi-ta.
      Ken-TOP he-ACC criticize-PAST

      'Ken$_i$ criticized him$_{*j/k}$.'   (Kuno (1976): p.28, Slightly altered.)

The referentiality in (8) is expected if the structure is as shown, because the GC is different between (8a) and (8b), and the pronoun can have an antecedent only in the latter case where the antecedent *Ken-ga* is not local.

Note that binding fact in example (8) only shows that the accusative pronoun *kare-o* is also located in the GC containing its potential antecedent *Ken-ga*, and does not show that the pronoun is raised to such a position.

Putting all of this evidence together, most transformational approaches claim that Japanese epistemic verb construction involves the RTO movement. However, each piece of evidence that they adduce is indirect and shows that the accusative argument may undergo raising from an embedded clause. The evidence only indicates that the argument is located in the matrix clause, as examined above.

3 Semantic and Pragmatic Properties of Epistemic Verb Constructions

Kuno (1976) argues that the "Subject Raising" rule relates the sentence as in (10a) to as in (10b):

(10)   a. Ken-wa   [Mari-ga   tensai da   to   ] omot-ta.
            Ken-TOP   Mary-NOM genius COP COMP   think-PAST

        b. Ken-wa Mari-o   [tensai da   to   ] omot-ta.
            Ken-TOP Mary-ACC   genius COP COMP   think-PAST

        'Ken thought that Mari was a genius.'   (Kuno (1976): pp. 23-24, Slightly altered.)

This legacy transformation rule was thought to change the syntactic structure of (10a) to (10b) and to preserve the meaning. The current syntactic theories and their RTO analyses no longer claim that (10a) and (10b) have the same underlying structure and the latter is derived from the former. But they still implicitly assume that the propositional meaning of these sentences is equivalent.

However, there is a subtle difference in meaning between the sentences above. In (10a), the sentence speaker emphasizes with *Ken-wa*, while in (10b) he takes a detached view.

3.1 Point of View and Speaker-centered Adverb

Regarding such a semantic or pragmatic distinction above, Tomoda (1976-77) proposes that Subject Raising is not meaning-preserving in a strict sense and the rule changes the "point-of-view" relationship between pairs of sentences as (10a) and (10b). See Tomoda's examples in (11) below:

(11)   a. #Ken-wa Mari-ga   Mari de-nai to   omot-tei-ru.
            Ken-TOP Mary-NOM Mary is-NEG COMP think-PROG-PRES

        b. Ken-wa Mari-o   Mari de-nai to   omot-tei-ru.
            Ken-TOP Mary-ACC Mary is-NEG COMP think-PROG-PRES

        'Ken thinks that Mary is not Mary.'   (Tomoda (1976-77): p.362, Slightly altered.)

Example (11a) is semantically anomalous in that *Ken's thinking* is illogical. The sentence recovers its grammaticality only when *Ken* is known to be insane or irrational. In example (11b), on the other hand, the speaker states the situation in which *Ken* does not know the fact that the woman whom he believes not to be *Mari* is indeed *Mari*. This shows that (11a) represents *Ken's* point of view and (11b) represents the speaker's own point of view.

Tomoda's another example with an epistemic verb *kantigaisuru* 'mistake' makes the same point. Consider (12) below:

(12) a. #Ken-wa Mari-ga Naomi da to kantigaisi-ta.
    Ken-TOP Mary-NOM Naomi COP COMP mistake-PAST

   b. Ken-wa Mari-o   Naomi da to kantigaisi-ta.
    Ken-TOP Mary-ACC Naomi COP COMP mistake-PAST

    'Ken made a wrong conjecture that Mary was Naomi.'

<div align="right">(Tomoda (1976-77): p.362, Slightly altered.)</div>

Kantigaisuru is a verb representing the speaker's judgment. Such verbs are incompatible with the sentence from *Ken's* point of view as in (12a), whilst being compatible with the sentence from the speaker's own point of view as in (12b).

One of the implications of Tomoda's analysis referring to "point of view" mentioned above is that it provides us with yet another account of "adverb placement" discussed in Section 2. The relevant examples are repeated in (13):

(13) a. #Ken-wa [Mari-ga *orokanimo* tensai da to] omot-ta.
    Ken-TOP Mary-NOM stupidly genius COP COMP think-PAST

   b. Ken-wa Mari-o$_i$ *orokanimo* [t_i tensai da to] omot-ta.
    Ken-TOP Mary-ACC stupidly genius COP COMP think-PAST

    'Stupidly, Ken thought Mary to be a genius.'

In examples (13a) and (13b), the adverb *orokanimo* 'stupidly' may be placed after the accusative argument *Mari-o*, but not after the nominative *Mari-ga* in the intended reading. The RTO approaches argue that such a subject-oriented adverb can modify the matrix subject *Ken-wa* in (13b) but not in (13a) because of their structural difference.

However, in this position the adverb *orokanimo* is speaker-centered. Example (13b) sounds perfect because it is a description from the speaker's point of view, and the speaker-centered adverb can easily occur in the sentence. In (13a), on the other hand, the speaker emphasizes with *Ken* i.e., a subject-centered interpretation where the occurrence of the adverb in this position forces speaker-centered interpretation. Thus those two interpretations conflict and this is why the sentence sounds awkward.

3.2 Embedded Predicates and the Judgment of Embedded Clauses

Kuno (1976) observes that the embedded predicate of RTO constructions in Japanese is limited to nominal + copula form as shown in the previous examples and for adjectives below (14):

(14) a. Ken-wa Mari-ga/o   kawai-i to omot-ta.
    Ken-TOP Mary-NOM/ACC pretty-PRES COMP think-PAST

    'Ken thought that Mary was pretty. / Ken thought Mary to be pretty.'

   b. Ken-wa Mari-ga/*o Nihon-ni ku-ru to omot-ta.
    Ken-TOP Mary-NOM/ACC Japan-to come-PRES COMP think-PAST

    'Ken thought that Mary came to Japan.' (Ueda (1988): pp. 42-43, Slightly altered.)

Ueda (1988) argues that *-i* ending of adjectives in (14a) and copula, *da*, are not present tense markers and claims that the construction's embedded clause is infinitival. Sakai (1996) points out that the embedded predicates are not regulated by their form and proposes the semantic constraint that the predication in complements is a characteristic or an attribute of the entity represented by a raised NP, which is originally suggested by Borkin (1984). Compare examples (15a) and (15b):

(15) a. Ken-wa   ooame-ga/*o   hut-tei-ru   to   omot-ta.
          Ken-TOP   heavy rain-NOM/ACC   rain-PROG-PRES   COMP   think-PAST
          'Ken thought that it was raining heavily.'

     b. Ken-wa   kono tomato-ga/o   yoku zyukusi-tei-ru   to   omot-ta.
         Ken-TOP   this tomato-NOM/ACC   well ripen-PROG-PRES   COMP   think-PAST
         'Ken thought that this tomato ripened well.'

The grammaticality of the accusative case in (15b) is problematic for Kuno and Ueda's analyses because the sentence involves a gerundive form, *tei-ru*, with a present tense marker, *ru*.

We may assume that Individual-level predicates, in the sense of Carlson (1977), are highly preferred for the embedded predicates of RTO constructions. However, not all such predicates are compatible with the construction. Compare examples (16) and (17) below:

(16) a. Watasi-wa Sahara sabaku-ga/?(?)o   atu-i   to   kantigaisi-ta.
          I-TOP   the Sahara desert-NOM/ACC   hot-PRES   COMP   mistake-PAST
          'I made a wrong conjecture that the Sahara desert is hot.'

     b. Watasi-wa Sahara sabaku-ga/o   *yoru-de-mo*   atu-i   to   kantigaisi-ta.
         I-TOP   the Sahara desert-NOM/ACC   night-at-even hot-PRES   COMP   mistake-PAST
         'I made a wrong conjecture that the Sahara desert is hot even at night.'

(17) Watasi-wa sono sihuku keekan-ga/o   husinsya da   to   kantigaisi-ta.
      I-TOP   the plainclothes policeman-NOM/ACC   suspect   COP   COMP   mistake-PAST
      'I made a wrong conjecture that the plainclothes policeman was a suspect.'

The predicate *atui* 'hot' in (16a) is the state of affairs that the speaker perceives. On the other hand, *husinsya da* 'is a suspect' in (17) concerns the speaker's judgment. That is, he recognizes *sihuku keekan* 'the plainclothes policeman' at first, then judges the man to be a suspect. The adverbial *yoru-demo* 'even at night' in (16b) may change the judgment of the sentence from intuitive as in (16a) to reflective as in (17), and an accusative marked argument can easily occur in the latter.[4]

In a series of works Kuroda (Kuroda, 1992) has defended the relevance of a distinction in "judgment forms". The important point for our observation on examples (16) and (17) above is that there are two different types of "judgments", the thetic and the categorical. These are reflected in the root sentence by the markers of subject, *ga* and *wa*, respectively. Consider (18) below:

(18) Neko-ga/wa   asoko-de nemut-tei-ru.   .
      cat-NOM/TOP there-at   sleep-PROG-PRES
      'The/a cat is sleeping there. / The cat is sleeping there'

<div align="right">(Kuroda (1992): p.13, Slightly altered.)</div>

A sentence with a *ga*-marked subject expresses *a thetic judgment*, reporting perception of a situation in which *the/a cat is sleeping in a certain place*. It simply affirms the existence of an eventuality of a certain type and represents the recognition or rejection of material of a judgment.

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[4] With regard to Japanese small clauses (SCs) shown in (3c), Mihara (1998) mentions, referencing Fujita (1981), that there is the same selectional preference of embedded predicates and its judgment as shown in (i) below:

(i) a. Boku-wa   tyuusya-o   ??(*itumo-yori*) ita-ku   kanzi-ta.
         Boku-TOP injection-ACC   usual-than   painful-INFL feel-PAST
         'Ken felt the injection (more) painful (than usual).' [Intuitive]

    b. Boku-wa   kare-no hanasi-o   usankusa-ku kanzi-ta.
        I-TOP   his-GEN story-ACC   fishy-INFL   feel-PAST
        'Ken felt his story fishy.' [reflective]   (Mihara (1998): pp. 78-79, English is ours.)

There is no distinction between RTO and SC constructions from the viewpoint of a few traditional Japanese descriptive linguistics. They suggest that the epistemic verb is a three-place predicate whose arguments are *experiencer*, *theme*, and *predicative complement* of *theme* (e.g., Masuoka (1987)). However, these two constructions show their respective characters, then we will leave open the possibility of a unified account of these constructions.

A sentence with a *wa*-marked subject is, on the other hand, used to describe the same situation as a thetic judgment. As *a categorical judgment*, this draws attention first to the *neko* 'cat', and then says of the *neko* that it is sleeping there. We assume that the *o*-marked phrase in examples (16b) and (17) share the properties of the logical subject of a categorical judgment for embedded sentence and that *o* is a marker for such a subject, and discuss this point in the next section.

4 A Surface-Compositional Analysis of Epistemic Verb Construction

Combinatory Categorial Grammar (CCG) (Steedman, 1996; Steedman, 2000), is a grammatical theory which provides a surface-compositional interface between syntax and semantics, in the sense of Hausser (1984), such that each syntactic derivation corresponds directly to an interpretable semantic representation including long-distance dependencies that arise through control, raising, and so on. In what follows, we propose that the epistemic verb *omow* 'think' is a control verb, which makes the interpretation of its complement's subject a pro-term of the same type *ana'* *mary'* as an anaphor bound to the interpretation, *Mary*, of the object of anticipation of such a verb.

4.1 Status of *O*-marked Phrase

It is important to note at first that the *o*-marked phrase in epistemic verb constructions as in (19) is different from an accusative-marked object NP with regard to the optional appearance of *no koto* '(someone)'s matter'. Compare examples (20a) and (20b) below:

(19) Ken-wa Mari-ga/o   tensai da   to   omot-ta.
      Ken-TOP Mary-NOM/ACC   genius COP COMP think-PAST

      'Ken thought that Mary was a genius. / Ken thought Mary to be a genius.'

(20) a. Ken-wa Mari-*no koto-*ga/o   tensai da   to   omot-ta.
         Ken-TOP Mary-'s matter-NOM/ACC genius COP COMP think-PAST

         '   N/A   / Ken thought *of* Mary to be a genius.'

      b. Ken-wa Mari-(*no koto*)-ga/o   suki-mitai-da.
         Ken-TOP Mary-('s matter)-NOM/ACC like-seem-COP

         'Ken seems to like Mary. (lit. Ken seems to be fond of Mary.)'

As shown in (20a) above, an *o*-marked phrase *N-o* may be realized as *N-no koto-o* 'of N'. As originally pointed out by Kuno (1976), when the object of feeling, thinking, or saying verbs is human, *no koto* '(someone)'s matter' appears optionally after the noun phrase for the human:

(21) a. Ken-wa Mari-(*no koto*)-o   aisi-tei-ru.
         Ken-TOP Mary-('s matter)-ACC love-PROG-PRES

         'Ken loves Mary. (lit. Ken feels love of Mary.)' (Kuno (1976): p. 42, Slightly altered.)

      b. Ken-wa Mari-(*no koto*)-o   waru-ku omot/it-ta.
         Ken-TOP Mary-('s matter)-ACC ill-INFL think/say-PAST

         'Ken thought ill of Mary. / He spoke ill of Mary.'

Kuno argues that in order to derive the sentence with *N-no koto-o* in (20a) as a grammatical entity, it is necessary to hypothesize that *no koto* is not in the deep structure for the sentence, but that it is optionally added to the object of those matrix verbs in the surface structure if it refers to a person.

However, we suggest that the case particle *o* in those constructions is a part of an adjunct particle *no koto-o* 'of (someone)', which is a "complex particle" like *no tame-ni* 'for (someone)', *ni tuite-no* 'about (someone)', etc. See below:

(22) a. Naomi-wa   Ken-(*no tame*)-ni baasudee keeki-o   yai-ta.
         Naomi-TOP Ken-(sake)-for   birthday cake-ACC bake-PAST

         'Naomi baked a birthday cake for Ken. (Naomi baked a birthday cake for Ken's sake.)'

      b. Naomi-wa   Mari-(*ni tuite*)-no   warui uwasa-o   kii-ta.
         Naomi-TOP Mary-(concern)-GEN bad   rumor-ACC hear-PAST

         'Naomi heard Mary's bad rumor. (Naomi heard a bad rumor concerning Mary.)'

Example (22) shows that a part of a complex particle may be phonetically omitted when such a contracted form holds the same meaning as the full form. With regard to the sentences with *Mari-o* 'Mari' in (19) and with *Mari-no koto-o* 'Mary's matter' in (20a), they are synonymous, although it seems that the latter is a more indirect way of expressing what the former means. Thus, we conclude that *o* in (19) is the contraction of *no koto-o* in (20a).

4.2 Judgment of *O*-marked Phrases

It is also important to note that there is the difference between example (19) with *Mari-ga* 'Mari' and examples (19) and (20a) with *Mari-(no koto)-o* 'Mary's matter', which lies in the judgment of the sentences mentioned in Section 3.2. The former example with *Mari-ga* expresses *a thetic judgment* that represents the recognition of a situation in which *Mary is a genius*. Its CCG derivation is as follows:[5]

(23)

$$
\frac{
\frac{Ken\ ga}{NP_n : ken'}\quad
\frac{
\frac{Mari\ ga}{NP_n : mary'}\quad
\frac{
\frac{tensai\ da\ to}{S_{to}\backslash NP_n : \lambda x\ genius'(x)}\quad
\frac{omo\ u}{(S\backslash NP_n)\backslash S_{to} : \lambda q\lambda y\ think'(q)y}
}{
\frac{S_{to} : genius'(mary')}{}
}<}
{
S\backslash NP_n : \lambda y\ think'(genius'(mary'))y
}<
}{
S : think'(genius'(mary'))ken'
}<
$$

The latter example with *Mari-(no koto)-o* describes the same situation as a thetic judgment, but, as *a categorical judgment*, it draws attention first to *Mari* 'Mary', and then says of *Mari* that *she is a genius.*

(24)

$$
\frac{Ken\ ga}{NP_n : ken'}\quad
\frac{
\frac{
\frac{Mari}{N : mary'}\quad
\frac{(no\ koto)\ o}{((S\backslash NP_n)/(S\backslash NP_n\backslash NP_a))\backslash N : \lambda v\lambda p\lambda w\ p(of'v)wv}
}{(S\backslash NP_n)/(S\backslash NP_n\backslash NP_a) : \lambda p\lambda y\ p(of'mary')y}<\quad
\frac{
\frac{tensai\ da\ to}{S_{to}\backslash NP_n : \lambda x\ genius'(x)}\quad
\frac{omo\ u}{(S\backslash NP_n\backslash NP_a)\backslash(S_{to}\backslash NP_n) : \lambda q\lambda y\lambda z\ think'(q(ana'y))yz}
}{S\backslash NP_n\backslash NP_a : \lambda y\lambda z\ think'(genius'(ana'y))yz}<
}{
\begin{array}{c}
S\backslash NP_n : \lambda z\ think'(genius(ana'mary'))(of'mary')z \\
S : think'(genius'(ana'mary'))(of'mary')ken'
\end{array}
}
$$

Example (23) simply affirms the existence of an eventuality of a certain type. Example (24), on the other hand, presupposes the existence of a human object for the recognition of material of a judgment. The basis of these two different types of the judgment is reflected in the semantic representation which corresponds directly to each syntactic derivation under CCG as shown above.

The analysis is identical to that proposed in Steedman (1996) as an alternative to ECM for the parallel English sentences, modulo word order. Of course, this analysis is also *semantically* identical to the interpretation that would result from a traditional RTO analysis, or a Principles and Parameters analysis using PRO, for anything else would simply be linguistically incorrect.

The distinctive property of the CCG analysis is that the binding/control relation is established "surface-compositionally", at the level of logical form, without non-monotonic syntactic operations of "action at a distance" such as movement, coindexing, or copying. The only operation of syntactic projection is adjacent categorial merger.

Takeo Kurafuji (p.c.) points out that *kii-tei-ru* 'have heard' is a verb clearly representing the difference mentioned above. Consider example (25) below:

(25) Ken-wa Mari-ga/(no koto)-o   tensai da to   *kii-tei-ru.*
      Ken-TOP Mary-NOM /('s matter)-ACC genius COP COMP hear-PROG-PRES
      'Ken has heard that Mary is a genius. / Ken has heard of Mary to be a genius.'

Example (25) represents the situation in which someone made *Ken* acquainted with the eventuality that *Mary is a genius*. Moreover, the sentence with *Mari(-no koto)-o* implies *Ken's* familiarity with *Mary*, as a casual acquaintance, the sentence with *Mari-ga* carries no such implication.

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[5] The subscript *n* and *a* on *NP*s are abbreviations for nominative and accusative case feature for nominal categories. The application of complementizer $S_{to}\backslash S$ (*to* 'that') to a complement clause *S* is omitted from the derivations.

5 The Scramblability of *(No-Koto-)O*-marked NP and the Complement Clause

Example (26) below indicates that a complement clause cannot be scrambled over an *o*-marked NP.

(26) */??Ken-wa (t'_i) [t_i tensai da to] Mari-o$_i$ omot-ta.
  Ken-TOP genius COP COMP Mary-ACC think-PAST
  '(lit.) It is a genius that Ken thought Mari is.' (Kuno (1976): p.35, Slightly altered.)

This has been explained as the violation of Proper Binding Condition (PBC): trace must be bound, and the underlying structure is given above by the RTO analysis (e.g., Tanaka (2002)). One of Kuno's (1976) arguments concerning the scramblability of the clause is that a controlled complement can be scrambled over the dative NP, i.e., the controller, as shown in example (27) below:

(27) a. Ken-wa Mari$_i$-ni [e_i sore-o sitekureru] koto-o kitaisi-tei-ru.
  Ken-TOP Mary-DAT it-ACC do thing-ACC expect-PROG-PRES
  'Ken expects Mary to do it.' (Kuno (1976): p.33, 35, Slightly altered.)

  b. Ken-wa [e_i sore-o sitekureru] koto-o Mari$_i$-ni kitaisi-tei-ru.

The admission of scramblability shown above seems to be problematic for the surface-compositional analysis of epistemic verb construction in Section 4 since that postulates "control".

However, the argument is not decisive. The informants polled in Hoji (1991), for example, judged the sentences like that of example (26) as being "not so bad", and it is also not as bad as the case of PBC violation as in (28b):

(28) a. Ken-wa [Mari-ga Naomi-ni at-ta to] omot-ta.
  Ken-TOP Mary-NOM Naomi-DAT meet-PAST COMP think-PAST
  'Ken thought that Mary met Naomi.'

  b. * [Mari-ga t_j at-ta to]$_i$ Naomi-ni$_j$ Ken-wa t_i omot-ta.

The scramblability of the complement clause is (almost) grammatical in the cases where *no koto*, a part of complex particle representing the meaning '(someone)'s matter' is not omitted as in (29a) and where the scrambled clause is a emphatic part of the sentence as in (29b):

(29) a. (?)Ken-wa [tensai da to] Mari-*no koto*-o omot-ta.
  Ken-TOP genius COP COMP Mary-of think-PAST
  '(lit.) It was a genius that Ken thought Mari was.'

  b. Ken-wa [baka de-wa na-ku tensai da to] Mari(-no koto)-o omot-ta.
  Ken-TOP fool COP-TOP NEG-INFL genius COP COMP Mary-of think-PAST
  '(lit.) It was not a fool but a genius that Ken thought Mari was.' (p.c. Takeo Kurafuji)

The judgment of sentences in (26) and (29) shows, essentially, that the scramblability of the construction is significantly influenced by the semantics, and then we conclude that the grammaticality of (26) is affected by semantic factors rather than by syntactic factors as in (28b).

Another of Kuno's arguments for distinguishing control with RTO comes from 'selectional restriction'. In control cases, the matrix predicate poses some selectional restriction on the dative controller, this is not the case with RTO constructions. Consider examples (30) and (31a):

(30) *Ken-wa sono hon-ni yoku ureru koto-o kitaisi-tei-ru.
  Ken-TOP it book-DAT well sell thing-ACC expect-PROG-PRES
  'Ken expects the book to sell well.'

(31) a. Ken-wa sono hon-(??no koto)-o tumaranai to omot-tei-ru.
  Ken-TOP it book-(of)-ACC uninteresting COMP think-PROG-PRES
  'Ken thinks of the book to be uninteresting.' (Kuno (1976): p.34, Slightly altered.)

  b. (?)*Ken-wa tumaranai to sono hon-(no koto)-o omot-tei-ru.

It is important to note the contrast between (29) and (31b).[6] Kuno argue that *no-koto* is optionally added to the human object of RTO. However the contrast of the scramblability indicates that these constructions are different and thus we propose that the sentence with the human object could be a different construction, i.e., an epistemic verb construction whose underlying structure is control.

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[6] We are indebted to Takeo Kurafuji (personal communication) for calling this contrast to our attention.

6 Concluding Remarks

In this paper, we have argued that the so-called raising to object (RTO) construction in Japanese can be accounted for by assuming that the *o*-marked NP of the construction is a surface-compositional object as in English, which controls the semantic argument of complement clause. We have also proposed two types of epistemic verb construction (EVC) with human or non-human objects which account for the scramblability of the construction. We conclude that Japanese RTO/EVC is further affected by pragmatic factors with no obvious parallel in the English RTO construction.

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