

A Constraint-based Grammar of Case: To Correctly Predict Case Phrases Occurring without Their Head Verb

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Abstract

The current paper argues that the phenomenon in Japanese that case phrases occur without their head verb before the finite complementizer would falsify the HPSG valence/content analysis, for example, in Sag 1997, Pollard and Sag 1994, if no phantom relation corresponding to a verb is used in the syntax or semantics. The HPSG valence/content analysis is that the content of a case phrase structure-shares with a part of the content of its immediately larger constituent *only* through the valence of its head verb. In the framework of Koga 2000, which does not assume this, a syntax & semantics phrasal rule is proposed to specify the *inherent* meaning of a case phrase plus the finite complementizer, and not more than that inherent meaning. The semantics of every case form is specified independently of its head verb in Koga 2000. Koga's 2000 constraint-based grammar of case was implemented on unicorn3 parser developed at University of Illinois at Urbana-Champaign.

1 A Problem to the HPSG Valence/Content Analysis on the Assumption of Compositionality

1.1. Case Phrases Occurring Without Their Head Verb before the Finite Complementizer

Case phrases occur without their head verb before the finite complementizer /to/ in Japanese, as in B's response to A's utterance in (1).

(1)

- A: hanako-ga koinu-o sigatu-kara sodate-ru.
Hanako-Nom puppy-Acc April-from raise-Nonpast
'Hanako will raise a puppy from April.'
- B: [kame-ó sigatu-kara]-to sensei-ga it-ta
[turtle-[Acc]_{FOCUS} April-from]-Comp [*finite*] teacher-Nom say-Past
'A teacher said that (she) (will raise) a turtle from April.'

Speaker B is here trying to reject Speaker A's claim by citing what a teacher said. The accusative morpheme /o/ of /kame-ó/ 'turtle-Acc' in B's response needs to receive sound stress as marked with a prime. B's response receives the interpretation with the predicate **raise**' recovered for the complement of the finite complementizer /to/ or of the matrix verb /itta/ 'said'.¹

¹ Some native speakers of Japanese say that the utterance /kame-o sigatu-kara/ 'turtle-Acc April-from' alone may be interpreted as meaning that (she will raise) a turtle from April even if it is not followed by the finite complementizer. However, there is a difference in the frequency of use in written Japanese. This kind of utterance rarely occurs in written Japanese, whereas the example with a finite complementizer /to/ following it in the text often occurs in written Japanese.

An accusative phrase can occur without its head verb before the finite complementizer /to/ even if the verb in the previous utterance takes a ‘nominative object’ or an ‘accusative object’ in Japanese, as in B’s response in (2).

(2)

- A: hanako-ga mareego-ga kodomo-no toki-kara wakar-u.
 Hanako-Nom Malay-Nom child-GEN-time-since understand-Nonpast
 ‘Hanako understands Malay since her childhood.’
- B: ?[suwahirigo-ó kodomo-no toki-kara]-to sensei-ga it-ta
 [Swahili-[Acc]_{FOCUS} child-GEN-time-since]-Comp [*finite*] teacher-Nom say-Past
 ‘A teacher said that (she) (understands) Swahili since her childhood.’

Some native speakers of Japanese say that B’s response in (2) sounds odd, and others say that the response sounds all right, and interpret it as meaning that a teacher said that (she) (understands) Swahili since her childhood, as given in (2). B’s response to A’s utterance in (2) sounds worse than that in (1).

1.2. A Problem for the HPSG Valence/Content Analysis if No Phantom Relation Corresponding to a Verb Is Used in Semantics

The HPSG accounts, e.g., Sag 1997, Manning, Sag, and Iida 1998, assume that the contents of case phrases structure-share with parts of the content of their immediately larger constituent *only* through the valence of their head verb. The phrasal rule *comp-head phrase* in the HPSG accounts identifies /kameo sodateru/ ‘turtle-ACC raise [*non-perfect*]’, for example, as a complement-head phrase, and the content of the phrase is identified with that of its head /sodateru/ ‘raise [*non-perfect*]’, as in (3).

(3)

<i>kameo sodateru</i>	
HEAD	1
SUBJECT	2
COMPS	3
CONTENT	4
NON-HD-DAUGHTER	
<i>kameo</i> 5	
HEAD	<i>n</i> [[CASE <i>acc</i>][MOD <i>no</i>]]
SUBJECT	<i>end</i>
COMPS	<i>end</i>
CONTENT	[INDEX 6][RESTR <[RELN <i>turtle</i>][INSTANCE 6]>]
HD-DAUGHTER	
<i>sodateru</i>	
HEAD	1 <i>v</i> [[VFORM <i>finite</i>][MOD <i>no</i>]]
SUBJECT	2 [HEAD <i>n</i> [CASE <i>nom</i>]][CONTENT [INDEX 7]]
COMPS	
FIRST	5 [HEAD <i>n</i> [CASE <i>acc</i>]][CONTENT [INDEX 6]]
REST	3 <i>end</i>
[CONTENT 4	
<i>raise-relation</i>	
ACTOR	7
UNDERGOER	6

The lexical entry /sodateru/ ‘raise [*non-perfect*]’ specifies that the CONTENT | INDEX of the first complement in the valence specification (= COMPS | FIRST value) structure-shares with the semantic role UNDERGOER, as corresponded between the occurrences of 6 in (3). Note that no other feature specification than the valence specification makes it possible for the content of the noun phrase in the case phrase /kameo/ ‘turtle-Acc’ to structure-share with a part of the content of the immediately larger constituent /kameo sodateru/ ‘will raise a turtle’.

Suppose the head daughter /sodateru/ ‘raise [*non-perfect*]’ did not occur in the verb phrase (3), as it actually does not in B’s response in (1). Then, since the contents of case phrases structure-share with parts of the content of the immediately larger constituent ONLY through their head verb, the content of the noun phrase in the accusative phrase /kameo/ ‘turtle-Acc’ could not structure-share with a part of the content of the immediately larger constituent /kameo to/ ‘turtle-Acc Comp [*finite*]’. However, the accusative phrase /kameo/ ‘turtle-Acc’ is actually interpreted independently even if its head verb is not occurring in the complementizer phrase in (1). Similarly, the accusative phrase /suhahirigoo/ ‘Swahili-Acc’ in (2) is also actually interpreted even if its head predicate is not occurring in the complementizer phrase. There may be two plausible solutions in the HPSG accounts, as given below:

Ivan A. Sag’s Analysis: As pointed out by Ivan A. Sag, one plausible solution to the problem in (1) is as follows: One use of the finite complementizer /to/ is analyzed as similar to a finite transitive verb, and the content of the complementizer phrase is an abstract relation *R-relation* holding between its actor for the subject, and its undergoer for the object, as follows:²

² The finite complementizer /to/ that occurs immediately after a verb may be analyzed as a bound morpheme to the verb on this analysis.

(4)

<i>to</i>	
HEAD	<i>comp</i> [VFORM <i>fin</i>]
SUBJECT	<NP[<i>nom</i>][INDEX 1]>
COMPS	<NP[<i>acc</i>][INDEX 2]>
CONTENT	<i>R-relation</i>
ACTOR	1
UNDERGOER	2

The content of the finite complementizer /to/ inherently contains the meaning of the empty verb as an abstract relation in this analysis, and is thus more than the meaning of the form in this analysis. Sag's analysis would be motivated if any glimpse of the form of a finite verb or a verbal pro-form occurred immediately before the finite complementizer /to/ in B's response in (1), as in the HPSG account of tense. However, no part of a finite verb or the verbal pro-form occurred between the accusative phrase and the finite complementizer in (1).³ That is, *in Sag's analysis, a phantom relation corresponding to a verb (a relation of a verb not occurring but its meaning existent) is postulated in syntax or semantics.*

Sag's analysis is inconsistent with compositionality in syntax and semantics, where no phantom relation corresponding to a verb is postulated in syntax or semantics.⁴ The compositionality in syntax and semantics, as in Montague 1973, is that the meaning of a syntactic relation SR between form A and form B is the meaning/function of the syntactic relationship between the meaning of A and the meaning of B. Formally, the meaning of (SR (A, B)) is SR' (A', B'), where SR is a 2-place syntactic relationship, and X' is the meaning of form X. In the case of the example (1), the meaning of the accusative phrase plus the finite complementizer /kameo to/ 'turtle-Acc Comp [*finite*]' is the function or meaning of the construction or concatenation between the meaning of the accusative phrase and the meaning of the finite complementizer. According to the compositionality in syntax and semantics, the function or meaning of the construction or concatenation should not contain the phantom relation corresponding to an empty verb, but is at most such that the meaning of the accusative phrase is an argument or relation for the argument of the relation defined by the finite complementizer.

Ginzburg, Gregory, and Lappin's 2001 analysis of ellipsis in dialogue: Ginzburg, Gregory, and Lappin 2001, as its implementation articulated in Ebert, Lappin, and Gregory 2001, also appears to explain a clause with its head verb elided in the Japanese phenomena in (1) as well as (2). They propose a phrasal rule *bare-arg-ph*, which identifies, as a finite sentence (= [CAT(egory) *s[fin]*]), **a case phrase that the verb of a previous sentence can select as subject or object.** This is implemented as the structure-sharing between [C(o)NT(e)XT [SAL(ient)-UTT(erance) [CAT [6]]]] and [NHD-DTR (= non-head daughter) <[CAT [6]]>], and as the structure-sharing between the PHON(eme) value of the phrase and that of the non-head daughter. Here the phrase contains, in its context CNTXT | MAX(imal)_Q(uestion)U(nder)D(iscussion) specification, the syntax and semantics of the verb in the previous sentence, including its valence specification and content specification. Note that the context specification contains not only the semantics information but also the syntax information. The phrasal rule identifies, for example, the elliptical clause of the answer /suwahiligoga to senseiga itta/ 'some teacher said that (she) (understands) Swahili' to the question /hanako-ga nanigoga wakaru-ka 'What language does Hanako understand?' (Ebert et al.'s 2001), as follows:

³ Some people might say that there is a pause or sound contrast there. Whatever the speaker intends to mean by that pause or sound contrast, the hearers cannot interpret the content of that can be any relation corresponding to a verb.

⁴ The compositionality in syntax and semantics can be consistent with the idea that the meaning of a phantom verb is postulated in *pragmatics*.

(5)

PHON 1 <suwahiligo 'Swahili', ga 'Nom'>
CAT s [fin]
CONT [NUCLEUS 2] [RESTR 3 ∪ 4]
CNTXT
MAX-QUD <i>question</i>
PARAMS 6
SOA
NUCLEUS 2 <i>understand-rel</i>
UNDERSTANDER 5
UNDERSTOOD 6 [RESTR 4 {named(6 , Swahili)}]
SAL-UTT
PHON <nanigo 'what language', ga 'nom'>
CAT 7 [NP[nom]]
CONTENT [INDEX 6] [RESTR {language(6)}]
NHD-DTR
<
PHON 1 <suwahiligo, ga>
CAT 7
CONT [INDEX 6] [RESTR 3 {Swahili(6)}]
>

By the HPSG valence/content assumption, the content of the nominative phrase /nanigoga/ 'what language-Nom' structure-shares with a part of the content of the immediately larger constituent /nanigoga wakarū/ 'what language understand [non-perfect]' through the valence specification of the verb in the previous sentence.

However, Ginzburg, Gregory, and Lappin 2001 incorrectly predicts that the case form value of a phrase occurring without its head verb is limited only to the case phrases that the previous verb selects. This is an incorrect prediction for Japanese since an accusative phrase /suwahiligoo/ 'Swahili-Acc' can occur without its head verb occurring before the finite complementizer /to/ as a response to the utterance the verb of which takes a *nominative object* as in B's utterance in (2), as well as /suwahirigoga/ as in (5). Suppose Ginzburg, et al.'s analysis 2001 were revised in such a way that only the CONTENT specification of the non-head daughter, but not the CAT(egory) specification, structure-shares with that of the CNTXT|SAL-UTT specification in order to correctly predict the phenomenon in (2). There would be no CAT(egory) specification that associates the index value of the salient noun phrase with the wanted semantic role of the verb of the previous sentence **understand**'. Thus, a noun phrase with its case form accusative alone /suwahiligoo/ 'Swahili-Acc' can be interpreted as the subject of the verb of a previous sentence in the context of (2) on this analysis. This is not a desirable consequence. The discussion here implies that the content of the accusative phrase /suwahirigoga/ in (5) 'Swahili-Nom' or the content of the nominative phrase /suwahiligoo/ 'Swahili-Acc' in (2) must structure-share with a part of the recovered content of the verb from the previous sentence without any mediation of its valence specification.

2. An Analysis

2.1. A Framework: Koga 2000

Koga 2000 proposes an argument & adjunct-head phrase rule. The basic idea of the phrasal rule is that case phrases are all syntactically adjunct, contrary to the HPSG accounts, Pollard and Sag 1994, Sag

1997, and Gunji and Hasida 1998, and yet semantically serve as argument.⁵ For example, accusative phrases modify a verb, as implemented as the HEAD | MOD | MAJ (= Major Category) value of the accusative phrase being *v(erb)*.⁶ The phrasal rule identifies, for example, the sequence /kame o sodateru/ 'will raise a turtle' as an argument & adjunct-head phrase as follows:

(6)

kame o sodateru	
MAJ	9
HEAD	10
COMPS	12
ARG_ST	11
CONTENT	11
NON-HEAD-DAUGHTER	
kame o	
MAJ	3 <i>k</i>
HEAD	
KFORM <i>acc</i>	
MOD	8
MAJ	9 <i>v</i>
ARG_ST	11
[REL __ ACC [ARG turtle'(x __ quan)] [REL __ QUAN {(X, Y) X ∩ Y ≠ ∅}]]	
COMPS	5 <i>end</i>
ARG_ST	6 ⁻⁷
CONTENT	7 <i>no</i> ⁸
NON-HEAD-DAUGHTER ... ⁹	
HEAD-DAUGHTER ...	
HEAD-DAUGHTER	
sodateru 8	
MAJ	9 <i>v</i>
HEAD	10 [VFORM <i>finite</i>]
COMPS	12 <i>end</i>
ARG_ST	11
CONTENT	11 [ARG raise'(x __ nom)(y __ acc)]

⁵ A form is an adjunct if and only if the rest alone occurs in the language. For /tabe rare/ 'eat-Pass or suffer', the verbal element /tabe/ 'eat' is the complement of the verb /rare/ 'Passive' or 'suffer' since the form /rare/ 'Pass or suffer' itself does not occur in the language. For /kame o/, the noun /kame/ is the complement of the case form /o/ 'Acc' since the case form itself does not occur in the language, whereas for /kame o kawu/ 'keep a turtle as a pet', the accusative phrase /kame-o/ 'turtle-Acc' is not a complement, but an adjunct to the verb /kawu/ 'keep ... as a pet' since the form /kawu/ 'keep ... as a pet' occurs in the language.

⁶ See Koga 2000 for other consequences of the idea that an accusative phrase modifies any verb, and the explanations of the consequences within the theory.

⁷ There is no ARG_ST feature specification of a case phrase.

⁸ The content of a case phrase does not have to be, for example, the content of its complement noun phrase. The content of the complement noun phrase structure-shares with the relation abstractly-case-registered as the case form value through the MOD value of the case phrase.

⁹ See Koga 2000 for how a phrasal rule *comp-head phrase* identifies an accusative phrase as a complement-head phrase of a noun phrase as its non-head daughter (or the complement) and the case form as its head daughter.

A case phrase specifies that a relation abstractly case-registered as its case form either nominative or accusative of the argument structure of the verb that it modifies or adjoins to is the content of the complement noun phrase through its HEAD | MOD | ARG_ST specification in Koga 2000, as /kame o/ 'turtle Acc' implemented as its HEAD | MOD | ARG_ST | [REL_ACC [ARG turtle'(x__quan)] [REL__QUAN {(X, Y) | X ∩ Y ≠ ∅}]]. The interpretation of a case form is based on Hale's 1982 analysis of Case.^{10,11,12} The interpretation of noun phrases is based on the GQT analysis of quantified noun phrases by Barwise and Cooper 1981 and Montague 1973. The CONTENT value of the verb /sodateru/ 'will raise', as structure-sharing with its ARG_ST value, is specified in its lexical entry as containing [ARG raise'(x__nom)(y__acc)]. The content of the argument & adjunct-head phrase structure-shares with that of the head daughter, as in the complement-head phrasal rule in the HPSG accounts. The content of the phrase /kame-o sodateru/ 'turtle-Acc will raise', for example, structure-sharing with that of the verb and the values on all the occurrences of [11], is summarized as follows: [ARG raise'(x__nom)(y__acc)] [REL__ACC [ARG turtle'(x__quan)] [REL__QUAN {(X, Y) | X ∩ Y ≠ ∅}]]. This verb phrase is interpreted as meaning that {x | turtle'(x)} ∩ {y | raise'(x__nom)(y)} ≠ ∅ by the Linking Rule (Koga 2000: 113), which states that a set of individuals each of which substitutes for the *quan(tifier)*-associated or *nom* or *acc*-associated free variable of the ARG value to make the respective ARG value true is a member of the corresponding REL_QUAN value or the REL_{*nom* or *acc*}-value.

2.2.A Phrasal Rule in Syntax and Semantics together with Pulman 1997 for Elided Verb Recovery

2.2.1. A Phrasal Rule in Syntax and Semantics

A phrasal rule is proposed in the framework of Koga 2000 that identifies the sequence of a form A and a form B as a phrase with the form A modifying the not-occurring complement of the form B, for example, /kame o to/ 'turtle-Acc Comp [*finite*]', as in (7).

¹⁰ I leave open which set of notions among the notions of subject and object on one hand, and the notions of the nominative argument and the accusative argument on the other hand works better for languages. The following well-known example in the linguistic literature is relevant to this discussion.

- (i) kodomo ga naki-sou-da
 child Nom cry [*present participle*]-seem [adjective]-Copular [*non-past*]
 'The child seems to cry.'

The nominative phrase /kodomo/ cannot be the 'subject' of the verb phrase /sou-da/ 'seem', but can be a nominative argument of the predicate *seem'*(x__event). In the latter analysis, the nominative argument of the predicate *seem'*(x__event) is the nominative argument of the predicate that describes that event, and the argument of *seem'* is abstractly-event-registered.

¹¹ The ARG_ST feature specification in Koga 2000 is different from that in the conventional HPSG accounts, and is relevant in that only 'subject' or 'object', as opposed to non-argument adjuncts, specifies the ARG_ST specification of the verb that it modifies.

¹² Gunji and Hasida 1998 specifies a noun phrase with its case form nominative as subject of the verb that it modifies, for example.

(7)

kame o to

MAJ 1
HEAD 2
COMPS 3
ARG_ST 4
CONTENT 5
NON-HEAD-DAUGHTER
kame o
MAJ <i>k</i>
HEAD
KFORM <i>acc</i>
MOD 6
MAJ <i>v</i>
ARG_ST 7
REL_ACC
ARG turtle'(x__quan)
REL_QUAN {(x,y) x ∩ y ≠ ∅}
COMPS <i>end</i>
ARG_ST -
CONTENT <i>no</i>
HEAD-DAUGHTER
to
MAJ 1 <i>c</i>
HEAD 2
VFORM <i>finite</i>
MOD [MAJ <i>v</i>] [ARG_ST [REL_FIN_COMP 7]]
COMPS 3
FIRST 6
MAJ <i>v</i>
HEAD [VFORM <i>finite</i>]
ARG_ST 7
CONTENT 7
REST <i>end</i>
ARG_ST 4 -
CONTENT 5 [REL_X <i>no</i>]

The HEAD | MOD value of the non-head daughter structure-shares with the complement (COMPS | FIRST value) of the head daughter in the phrase, as the structure-sharing between the occurrences of 6 in (7). Each of the feature specifications (MAJ value, HEAD value, COMPS value, ARG_ST value, and CONTENT value) of the phrase structure-shares with each of those of the head daughter in the phrase, as the structure-sharing between each of the occurrences of 1, 2, 3, 4, and 5 in (7). Similarly to an accusative phrase, the phrase of the finite complementizer /to/ specifies the REL_FIN_COMP value of the verb to modify as having the content of its complement. Note that with case phrases analyzed as adjunct, even if there is no ARG value like [ARG raise'(x__nom)(y__acc)] in that REL_FIN_COMP value, the REL_ACC value [ARG turtle'(x__quan)] [REL_QUAN {(X,Y) | X ∩ Y ≠ ∅}] can be specified in the REL_FIN_COMP value in (7). This point made possible in Koga

2000 is the key of the analyses of the relevant phenomena like (1), (2), and another in footnote 1. The content of B's response in (1) is summarized as follows:

(8)

kame o to sensei ga itta	
CONTENT	
ARG	said'(x__fin_comp)(x__nom)
REL_NOM	[ARG teacher'(x__quan)] [REL_QUAN {(x,y) x ∩ y ≠ ∅}]
REL_FIN_COMP	
REL_ACC	
ARG	turtle'(x__quan)
REL_QUAN	{(x,y) x ∩ y ≠ ∅}

Note that the phrasal rule in Koga 2000 specifies the least possible meaning of the form /kame o to sensei ga itta/ 'turtle Acc Comp [*finite*] teacher Nom said', and the construction itself (the phrasal rule itself) specifies that the content of the accusative phrase is one of the relations in the complement of the finite complementizer. See Kay 2002 for the meaning or function of a construction. The relevant verb from the context is recovered in pragmatics; otherwise, it is not logically well-formed. The fact that the REL_ACC value of B's response in (1) is in focus is used in pragmatics in the following section. The analysis of an accusative phrase alone as one utterance in spoken Japanese, as given in footnote 1, is easy to formulate in the framework of Koga 2000 since case phrases alone have a meaning or function independently of their head verb in this framework.¹³

2.2.2. Pulman 1997 for an Recovery of the Elided background of a Focus

Pulman 1997, which is an application of Dalrymple, Shieber, and Pereira (1991) to a focus-background articulation of an utterance, is sufficient to predict the recovery of the elided verb in B's response to A's utterance in (1) as follows:

(9)

A source proposition (or an antecedent proposition) in the context is partitioned into two with a functional application holding between the two: one, the *parallel* element corresponding to the focus of the target clause, and the other, the rest corresponding to the background of the target clause.

In the case of (1), the source proposition can be that of the previous utterance /hanako-ga koinu-o sodateru/ 'Hanako Nom puppy Acc raise [*nonperf*]', i.e., $\{x \mid \text{raise}'(h)(x)\} \cap \{x \mid \text{puppy}'(x)\} \neq \emptyset$. The target clause can be /kame-ó/ with the verb elided before the finite complementizer /to/ in B's response in (1), i.e., $\{Y \mid \{x \mid Y(x_acc)\} \cap \{x \mid \text{turtle}'(x)\} \neq \emptyset\}$. $\{Y \mid \{x \mid Y(x_acc)\} \cap \{x \mid \text{puppy}'(x)\} \neq \emptyset\}$ corresponding to /koinu o/ 'puppy Acc' in the source proposition can be the parallel element

¹³ Such a general analysis of the example (1) in the text and an accusative phrase alone as one utterance in footnote 1 that an accusative phrase is considered as a sentence would be falsified by the ungrammaticality of the sequence of words (i) in contrast with (ii).

- (i) *koko wa [kame o] tokoro da.
this place Top turtle Acc place Copular [*nonperf*]
- (ii) koko wa [kame o **sodateru**] tokoro da.
'This place is the place where people raise turtles.'

An accusative phrase alone cannot be interpreted as a relative clause as in (i).

corresponding to the focus in the target clause. If this is the case, then the rest of the source proposition is computed as $\{x \mid \text{raise}'(\mathbf{h})(x_acc)\}$. This is because the fact that $\{x \mid \text{raise}'(\mathbf{h})(x_acc)\}$ can be a member of $\{Y \mid \{x \mid Y(x_acc)\} \cap \{x \mid \text{puppy}'(x)\} \neq \emptyset\}$, which is equivalent to $\{x \mid \text{raise}'(\mathbf{h})(x)\} \cap \{x \mid \text{puppy}'(x)\} \neq \emptyset$, which can be equivalent to that source proposition. Then, $\{x \mid \text{raise}'(\mathbf{h})(x_acc)\}$ is the elided background of the focus for the target clause. The focus-background structure of the target clause with the elided background recovered is thus as follows:

(10)

assert $\langle \{x \mid \text{raise}'(\mathbf{h})(x_acc)\}, \{Y \mid \{x \mid Y(x_acc)\} \cap \{x \mid \text{turtle}'(x)\} \neq \emptyset\} \rangle$, where its content is logically equivalent to $\{x \mid \text{raise}'(\mathbf{h})(x)\} \cap \{x \mid \text{turtle}'(x)\} \neq \emptyset$

B's response to A's utterance /kame o to sensei ga itta/ 'turtle-Acc Comp [*fin*] teacher-Nom said' in (1) is thus interpreted as being logically equivalent to the fact that a teacher said that Hanako **will raise** a turtle with *a turtle* in focus. See Krifka 1991 for a theory of focus. For the phenomenon in (2), if it is assumed that the verb /wakar/ 'understand' is lexically 'potentialized' as assumed in the literature similarly in the case that the potential form /e/ 'is able to' takes /yom/ 'read' to be a 'potential' verb, then the source proposition can be **understand'(\mathbf{h})(\mathbf{m})** for the sentence with a nominative 'object', /hanako ga mareego ga wakaru/ 'Hanako understands Malay'. The logical form $\{x \mid \text{understand}'(\mathbf{h})(x_acc)\}$ can be recovered for the target clause.

3. Conclusion

A phenomenon in Japanese falsifies the HPSG valence/content assumption if Sag 1997 is extended to Japanese on the assumption that no phantom relation is postulated in syntax or semantics. A grammar with an argument & adjunct phrasal rule, but without the HPSG valence/content assumption, is used as a framework. The grammar contains a phrasal rule for a complementizer phrase with its verb complement elided and a case phrase occurring as the subject or object of its verb, and specifies only the part of the meaning that a form or morpheme inherently has, and not more than that. Ellipsis recovery adds the contextual meaning to that inherent meaning. The study implies that a grammar without the HPSG valence/content assumption is needed for a grammar of Japanese, and invites research on how the previous accounts of other phenomena are modified in the new system for Japanese.

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