

Title Page

Title: Cyclic Spell-Out and Modal Complement Ellipsis in Japanese

Author's Name: Yosuke Sato

Author's Affiliation: National University of Singapore

Cyclic Spell-Out and Modal Complement Ellipsis in Japanese *

Abstract: This paper investigates the syntax of modal complement ellipsis in Japanese. This language exhibits a curious root-epistemic asymmetry with respect to MCE: root modals, but not epistemic modals, license this ellipsis. I propose that this root-epistemic asymmetry in Japanese, an issue left unresolved in the existing literature (Aelbrecht 2009; Fortin 2012), naturally falls into place from the Cyclic Spell-Out Theory of Ellipsis, where only the complement of a strong phase head can be targeted for ellipsis at PF. My proposed analysis also correctly predicts a similar asymmetry between the two types of modals with respect to VP-topicalization in Japanese. The results of this investigation thus provide strong empirical support for a recent phase-theoretic approach to PF-deletion.

1. Introduction

This paper investigates the syntax of modal complement ellipsis (hereafter MCE) in Japanese, a Western Malayo-Polynesian language of the Austronesian family, within Phase Theory (Chomsky 2000, 2001, 2004, 2007, 2008, 2013). The central empirical issue investigated here is that MCE is possible under root modals, but not under epistemic modals. I propose that this curious asymmetry is a direct consequence of the Cyclic Spell-Out Theory of Ellipsis; see van Craenenbroeck (2004, 2010), Gengel (2008), Gallego (2009), Yoshida and Gallego (2012) and Bošković (To appear). This theory suggests that only the complement domain of a strong phase head, such as C and v^* , can be targeted for PF-deletion. I further show that our proposed analysis also

correctly predicts that the complement of a root modal, but not of an epistemic modal, can undergo VP-topicalization in Javanese, given the recent proposal, made by Johnson (2001) and Szczegielniak (2004), that VP-ellipsis is licensed by VP-topicalization.

The paper is organized as follows. In section 2, I provide examples illustrating MCE in Javanese, with reference to the existing literature on similar constructions in Dutch (Aelbrecht 2009) and Indonesian (Fortin 2012). I show that this elliptic pattern is possible when it is licensed by root modals such as *oleh* ‘may, be allowed to’ and *kudu* ‘must, have to’, but not by epistemic modals such as *mesti* ‘must, it should be’. In section 3, I investigate the syntax of MCE in Javanese. Adapting the traditional asymmetric analysis of the root vs. epistemic modals originally developed for English (Ross 1969; Roberts 1985; Drubig 2001) to Javanese, I argue that root modals evoke a control structure whereas epistemic modals evoke a raising structure. I further identify the syntactic category and the structural position of the two types of modals in Javanese, using a variety of diagnostics concerning stacked modal auxiliaries, the position of modals with respect to negation, and the presentational construction headed by the existential verb *ana* ‘to exist’. In section 4, I propose that the asymmetry between root and epistemic modals with respect to MCE directly falls out from the Cyclic Spell-Out Theory of PF-ellipsis. In section 5, I provide the conclusion together with some residual issues concerning the cross-linguistic variability of the syntactic representation of root vs. epistemic modals.

2. Modal Complement Ellipsis in Javanese

As is well-known in the literature, modality in natural language is divided into two distinct sub-categories: root modality and epistemic modality (Palmer 1990). Root modals express forces such as permission, obligation, and ability whereas epistemic modals express the evaluation of the likelihood of a proposition in light of our beliefs and knowledge about the facts, backgrounds, situations and the world. Aelbrecht (2009) makes an important observation that this semantic distinction plays a crucial role in licensing MCE in Dutch. The contrast between (1) and (2) shows that modal elements such as *moet* can license the ellipsis of their syntactic complements under the root interpretation (i.e., “have to”) but they cannot license this ellipsis under the epistemic interpretation (i.e., “certain”).¹

- (1) Jessica wil niet gaan werken morgen, maar ze **moet**
Jessica wants NEG go work tomorrow but she must
[~~gaan~~—~~werken~~—~~morgen~~].
go work tomorrow
‘Jessica doesn’t want to go to work tomorrow, but she has to.’

(Aelbrecht (2009: 50))

- (2) Arne zegt dat hij niet de hele taart heft opgegeten, maar
 Arne says that he NEG the whole pie has up.eaten but
 hij **moet** wel?*(de hele tart hebben opgegeten), want ze is weg.
 he must PRT the whole pie have up.eaten for she is away
 ‘Arne says that he didn’t eat the whole pie, but he must have, for it’s gone.’

(Aelbrecht (2009: 52))

Fortin (2012) observes that the root vs. epistemic distinction also applies to MCE in Indonesian. Thus, root modals such as *mesti* ‘have to’ allow their complement to be elided, unlike epistemic modals such as *pasti* ‘certain’. This contrast is illustrated in (3) and (4).

- (3) Saya tidak mau latihan piano, tapi saya **mesti**.
 1SG NEG want practice piano but 1SG must
 ‘I do not want to practice piano, but I must.’

(Fortin (2012: 13))

- (4) * Siti selalu bekerja. Dia bilang dia tidak capai, tapi saya pikir dia **pasti**.
 Siti always work 3SG say 3SG NEG tired but I think 3SG certain
 ‘Siti is always working. She says she isn’t tired, but I think she must be.’

(Fortin (2012: 14))

Javanese, the language which is the primary investigation of the present paper, also exhibits the same asymmetry. (5) shows that the complement of the root modal *oleh* ‘may, be allowed to’ can be elided. (6) shows, however, that the complement of the epistemic modal *mesti* ‘must, certain’ cannot be elided.²

- (5) Aku kepengin tuku klambi anyar tapi Ibu ngomong ora **oleh**.
 1SG want buy dress new but mother say NEG may
 ‘I want to buy a new dress, but my mother says that I may not.’

- (6) * Siti ngomong dheweke ora kesel tapi tak kira dheweke **mesti**
 Siti say 3SG NEG tired but 1SG think she must
 amarga dheweke lara.
 because 3SG sick
 ‘Siti says that she is not tired, but I think that she must be because she is sick.’

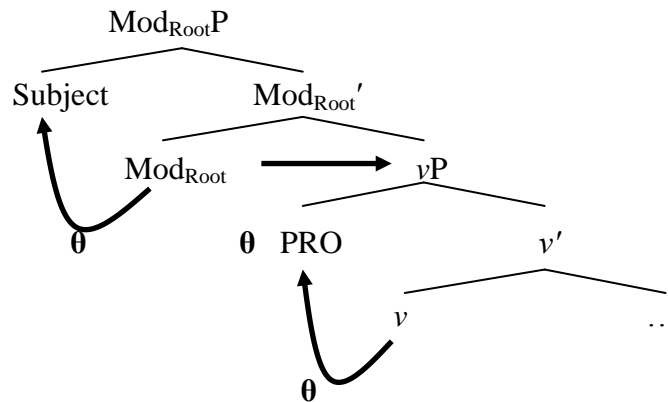
Aelbrecht (2009) observes a wide variety of syntactic properties observed in Dutch MCE, including the subject-object asymmetry with regards to extraction under MCE (i.e., subjects, not objects, can be extracted from the elided complement of root modals), the licensing of pleonastic subjects, and voice mismatches between antecedent clauses and the ellipsis site. She argues that the head selecting the ellipsis site as its complement bears an ellipsis feature [E] (see Merchant 2001 for the semantic and phonological functions of this feature) which has to be checked via Agree against the categorial feature of an

independent ellipsis-licensing head higher up in the syntactic derivation in order to induce PF-deletion. Aelbrecht further argues that PF-ellipsis – which she construes as sending part of the syntactic structure to PF for non-pronunciation – is derivationally licensed; it takes place as soon as the checking relation is established in the phase-driven derivation (see section 3 for more discussion on Phase Theory). According to this theory, MCE is licensed by Agree between the [E] feature on the embedded T and a root modal head once the latter is introduced to the syntactic workspace. However, it should be noted that Aelbrecht’s theory of PF-ellipsis leaves open the pressing question why it is that only root modals allow for MCE in Dutch. Similarly, Fortin (2012) hypothesizes that MCE in Indonesian involves the ellipsis of VP licensed by an overtly-filled Mod_{Root} , but she also leaves the question unresolved. The primary objective of this paper is thus to propose an explicit answer to this cross-linguistically prevalent root vs. epistemic asymmetry with respect to MCE from Phase Theory, using Javanese as a case study. Before doing so, however, in the next section, I provide evidence that in Javanese, root and epistemic modals are associated with control and raising configurations, respectively.

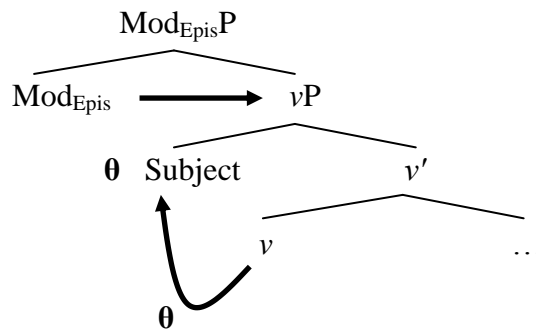
3. Raising vs. Control in Javanese and the Cyclic Spell-Out Theory of Ellipsis

I propose, following the traditional analysis of root vs. epistemic modals in English (Ross 1969; Roberts 1985; Zubizarreta 1982; Drubig 2001), that in Javanese, root modals have control structure whereas epistemic modals have raising structure. According to this asymmetrical analysis, the two types of modals are syntactically represented as in (7) and (8).

(7) Root Modals



(8) Epistemic Modals



In (7), the root modal assigns two θ -roles, one to its external argument in $[\text{Spec}, \text{Mod}_{\text{Root}}]$ and the other to its $v\text{P}$ complement. In (8), on the other hand, the epistemic modal assigns only one θ -role to its $v\text{P}$ complement and lacks an external argument.

Several diagnostics have been proposed in the literature that serve to distinguish between raising and control predicates in languages such as English. Firstly, when the complement of a raising verb is passivized, the truth condition of the proposition remains unaffected, but this is not the case with a control verb (Rosenbaum 1967; Sag

and Wasow 1999; Davies and Dubinsky 2004; Hornstein et al. 2005). Thus, the active-passive pair in (9) is not truth-conditionally synonymous whereas the active-passive pair in (10) is truth-conditionally synonymous.

- (9) a. The doctor wants to examine John. (control verb)
b. \neq John wants to be examined by the doctor.

- (10) a. John seems to have visited Mary. (raising verb)
b. = Mary seems to have been visited by John.

This control vs. raising contrast under passivization also holds true for the root vs. epistemic modals in English, as shown in (11) and (12). Thus, in (11a), it is the doctor who has the obligation to examine Mary, but in (11b) it is Mary who has the obligation to undergo examination by the doctor. Such a contrast, however, is not observed in the active-passive pair in (12a) and (12b).

- (11) a. The doctor **must** examine Mary. (root modal)
b. \neq Mary **must** be examined by the doctor.

- (12) a. Mary **may** visit John. (epistemic modal)
b. = John **may** be visited by Mary.

Similarly, in Javanese, the same active-passive synonymy under passivization is observed with epistemic modals, but not with root modals. Thus, the active sentence in (13a) with the epistemic modal *mungkin* ‘may’ is truth-conditionally equivalent to its passive counterpart in (13b). This synonymy is not preserved within the active-passive pair with the root modal *kudu* ‘must, have to’, as illustrated in (14a) and (14b).

(13) a. Mary **mungkin** ketemu John. (epistemic modal)

Mary may meet John

‘Mary may be meeting John.’

b. = John **mungkin** ditemoni karo Mary.

John may PV.meet by Mary

‘John may be met by Mary.’

(14) a. Dokter kuwi **kudu** mriksa Mary. (root modal)

doctor DET must AV.examine Mary

‘The doctor must examine Mary.’

b. ≠ Mary **kudu** dipriksa karo dokter kuwi.

Mary must PV.examine by doctor DET

‘Mary must be examined by the doctor.’

This contrast follows straightforwardly if root modals are associated with a control structure where they assign an external θ -role (Agent or Obligation), as shown in (7), unlike epistemic modals, which are associated with a raising structure, as shown in (8).

3.1. *The Syntactic Positions of Epistemic and Root Modals in Javanese*

One important question that has remained unaddressed thus far is the syntactic position of the two types of modals in Javanese. For relatively better-studied languages such as English, it has been commonly held that modal auxiliaries occupy the position of (finite) Ts (Chomsky 1957; Jackendoff 1972; Akmajian et al. 1979). However, the issue of category identification of the modal expressions has yet been addressed in Javanese; see Vander Klok (2012a), however, for a recent comprehensive discussion of the modal system in the Paciran dialect of Javanese. A number of independent diagnostics internal to Javanese presented below show, however, that modals in this language are most likely to constitute an independent modal head rather than auxiliaries under T.

Firstly, as is well known, modals in English cannot be stacked, as shown in (15), which has long been taken as evidence that they occupy the designated inflectional head position under T (Akmajian et al. 1979).

(15) * Esti must can cook.

INTENDED: ‘Esti must be able to cook.’

In Javanese, however, two modal verbs (one being a root modal and the other being an epistemic modal) can be stacked without any loss of grammaticality, as shown in (16a), though in such a case, the epistemic modal must occur in a structurally higher position than the root modal, as the ungrammaticality of (16b) indicates.

(16) a. Esti **mungkin kudu** masak. (epistemic > root)

Esti may must cook

‘INTENDED: It is possible that Esti has to cook.’

b. * Esti **kudu mungkin** masak. (*root > epistemic)

Esti must may cook

‘INTENDED: Esti has to potentially cook.’

The pattern illustrated in (16a) and (16b) would not be accounted for if modals in Javanese were simply under Ts, as in English. Thus, (16a) indicates instead that the two types of modals are likely to be under separate Mod heads.

Secondly, let us consider the relative position of the two types of modals with respect to negation in Javanese. Examples (17) and (18) show that both epistemic and root modals may occur above and below negation.

(17) a. Esti **mungkin ora** masak saiki. (epistemic modal > negation)

Esti may NEG cook now

‘INTENDED: Esti may not be cooking now.’

- b. Esti **ora mungkin** masak saiki. (negation > epistemic modal)

Esti NEG may cook now

‘INTENDED: It is not possible that Esti is cooking now.’

- (18) a. Esti **kudu ora** masak saiki. (root modal > negation)

Esti must NEG cook now

‘INTENDED: Esti must not cook today.’

- b. Esti **ora kudu** masak saiki. (negation > root modal)

Esti NEG must cook now

‘INTENDED: Esti doesn’t have to cook today.’

Assuming the cross-linguistically prevalent $T > \text{Neg} > V$ order, the acceptable order of the two modals below or above negation suggests that they are base-generated under two distinct Mod heads, but are allowed to undergo head-movement into a higher position (arguably T) which structurally dominates negation; see also discussion below on modal fronting. Recall that the contrast between (16a) and (16b) indicates that the epistemic modal must be structurally higher than the root modal in the base position. I therefore assume that Javanese has the following partial hierarchy of functional projections encompassing $\text{Mod}_{\text{Epistemic}}$ and Mod_{Root} ; see Cinque (1999: 130) and Butler (2003) for a more elaborated series of functional projections across languages; see also Fortin (2012) for the hierarchic structure of functional projections in Indonesian.³

(19) C > T > Negation > Mod_{Epis} > Mod_{Root} > V

Finally, Nomoto (2006) investigates the nominal complement of the presentational *ada* ‘to exist’ construction in Malay and reports that this construction lacks independent tense. Javanese also has a similar construction headed by the verb of existence *ana* ‘to exist’. Some examples of this construction are provided in (20a) and (20b).

- (20) a. ? Ana wong **mungkin** masak saiki.
 exist person may cook today
 ‘INTENDED: There is someone who may cook today.’
- b. ? Ana wong **kudu** masak saiki.
 exist person must cook today
 ‘INTENDED: There is someone who must cook today.’

Assuming that the lack of the tense specification means the lack of the TP projection, the grammaticality of (20a) and (20b) with both the root and epistemic modals in Javanese shows that these elements are base-generated under the respective Mod heads, as shown in (19).

3.2. *Modal Elements in Javanese Are Not Main Verbs*

Let us now consider what syntactic category the two types of modal elements in Javanese belong to. Two independent pieces of evidence based on the distribution of

voice morphology and subject-auxiliary inversion show that modal expressions in Javanese such as *oleh* ‘may, be allowed to’ and *mudahan* ‘may’ are not main verbs. Firstly, many active transitive verbs in Javanese occur with a nasal prefix, which has been analyzed as the overt marker of the active voice (Cole, Jonczyk and Lilley 1999; Cole, Hermon and Yanti 2008; Sato 2010, 2012a), as shown in (21a) and (21b).⁴

- (21) a. Esti **ngomong** basa Inggris. (Main Verb)
 Esti AV.speak language English
 ‘Esti speaks English.’
- b. Esti **ngesun** Yulianto. (Main Verb)
 Esti AV.kiss Yulianto
 ‘Esti kisses Yulianto.’

However, modals in Javanese uniformly resist the nasal prefix, as shown in (22a) and (22b).

- (22) a. Esti {***ngoleh/oleh**} masak saiki. (Modal Element)
 Esti AV.may/may cook now
 ‘Esti may cook now.’
- b. Esti {***ngudu/kudu**} masak saiki. (Modal Element)
 Esti AV.must/must cook now
 ‘Esti must cook now.’

Secondly, modals in Javanese can undergo fronting to the sentence-initial position (cf. Cole, Hara and Yap 2008)) to make a *yes-no* question, as shown in (23b) and (24b).

(23) a. Esti **kudu** ngomong basa Inggris? (Modal Element)

Esti must AV.speak language English

‘Must Esti speak English?’

b. **Kudu** Esti ngomong basa Inggris? (Modal Element)

must Esti AV.speak language English

‘Must Esti speak English?’

(24) a. Esti **mungkin** masak saiki? (Modal Element)

Esti may cook now

‘May Esti cook now?’

b. **Mungkin** Esti masak saiki? (Modal Element)

may Esti cook now

‘May Esti cook now?’

This is not the case with main verbs, as shown in (25b) and (26b).

(25) a. Esti **ngomong** basa Inggris? (Main Verb)

Esti AV.speak language English

‘Does Esti speak English?’

b. * **Ngomong** Esti basa Inggris? (Main Verb)

AV.speak Esti language English

‘Does Esti speak English?’

(26) a. Esti **masak** saiki? (Main Verb)

Esti cook now

‘Does Esti cook now?’

b. * **Masak** Esti saiki? (Main Verb)

cook Esti now

‘Does Esti cook now?’

The examples in (23) and (24) indicate that the two types of modals – *kudu* ‘must’ and *mungkin* ‘may’ – can both undergo subject-auxiliary inversion. This fact, thus, suggests that these auxiliaries can move up to T positions, further supporting the proposed hierarchy of functional projections encompassing Mod_{Epis} and Mod_{Root} in (19). The examples in (25) and (26) illustrate that main verbs such as *ngomong* ‘to speak’ and *masak* ‘to cook’ cannot undergo head-movement to Ts positions and hence to C positions to yield a subject-auxiliary version. The contrast between (23) and (24), on one hand, and (25) and (26), on the other hand, therefore, provide further evidence for our view that modals in Javanese are not to be equated with main verbs.

Based on the diagnostics above, I conclude that in Javanese, root modals are under Mod_{Root} which project a control structure whereas epistemic modals are under

Mod_{Epi} which project a raising structure. This conclusion has an important consequence for our analysis of MCE in Japanese presented in the following section.

4. A Phase-Theoretic Analysis of Modal Complement Ellipsis in Japanese

This section presents an answer to the question why root modals, but not epistemic modals, allow their complement to be elided in Japanese from a phase-theoretic viewpoint of ellipsis.

4.1. Ellipsis by Phase and Modal Complement Ellipsis in Japanese

Within the recent development of Phase Theory (Chomsky 2000, 2001, 2004, 2007, 2008, 2013), syntactic derivation proceeds in a series of small cycles known as *phases*, which Chomsky takes to be headed by C or v^* . More specifically, at the point of the derivation where the v^*P or CP have been assembled in the syntactic workspace, the complement domain of the phase heads are transferred and evaluated at the phonological and semantic components. Chomsky proposes that this phase-theoretic derivation is conceptually natural and meets the best design consideration in the sense that the syntactic computation can periodically forget about material once it has been transferred to the interpretive components. One direct theoretical consequence of this derivational system is the Phase Impenetrability Condition (hereafter, PIC). One commonly cited definition of the PIC is given in (27).

(27) Phase Impenetrability Condition/PIC

[Given structure $[_{ZP} Z \dots [_{HP} \alpha [H YP]]]$, with H and Z the heads of phases]:

The domain of H is not accessible to operations at ZP; only H and its edge are accessible to such operations.

(Chomsky 2001: 13)

This condition essentially prohibits manipulation of the complement domain of a phase head when a higher phase head is introduced, because the domain has already been transferred to the interface components. The edge in (27) refers to (any number of) specifiers of a phase head.

A growing number of recent works within Phase Theory has presented theoretical and empirical arguments for the best case scenario that the complement domain of a strong phase head corresponds to a significant domain for the purposes of post-syntactic phonological interpretation as well. For example, Kahnemuyipour (2004, 2009) proposes a reformulation of the Nuclear Stress rule (Chomsky and Halle 1968) within Phase Theory and proposes that the default nuclear sentential stress falls on the structurally highest constituent within the complement domain of C and v^* ; see also Adger (2007), Krazter and Selkirk (2007) and Sato (2012b) for a phase-theoretic analysis of nuclear stress. Dobashi (2003) proposes a similar hypothesis for phonological phrasing. Given this best case scenario, we expect that ellipsis, which can be understood as non-parsing of a certain syntactic constituent on the PF component of grammar (Merchant 2001), should also be sensitive to the complement domain of a strong phase head. Indeed,

several researchers, including van Craenenbroeck (2004, 2010), Gengel (2008), Gallego (2009), Yoshida and Gallego (2012) and Bošković (To appear) suggest that PF-ellipsis be formulated precisely in this fashion. (28) is one characterization of this “ellipsis-by-phase” approach.

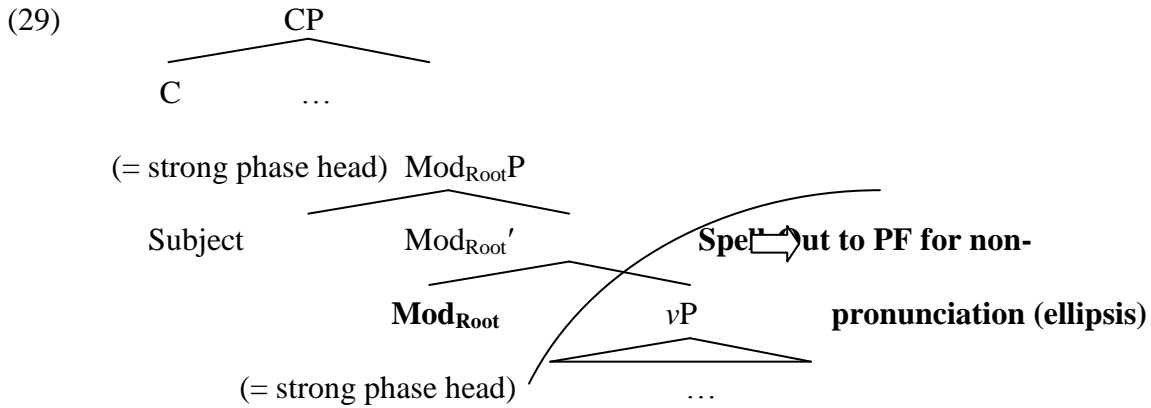
(28) PF-Ellipsis at the Syntax-Phonology Interface

Only strong phase heads can license the non-pronunciation of their complement at PF.

In section 3, I have provided independent arguments based on the active-passive synonymy that in Javanese, root modals invoke a control structure which select an agent and a proposition in their specifier and complement, respectively, whereas epistemic modals invoke a raising structure which only require a propositional complement. Let us propose then that root modals constitute a strong phase head whereas epistemic modals constitute a weak phase head. According to Chomsky (2000, 2001, 2004), there are two types of ν with respect to phasehood. One is the strong phase head (indicated by ν^*) instantiated by transitive and unergative verbs. The other is the weak phase head (indicated by ν) instantiated by raising, passive and unaccusative verbs. The proposal above that root modals are strong phases is then in compliance with Chomsky’s original conception of a strong phase wherein the presence or absence of a specifier is taken as the primary difference between weak and strong verbal phases. Furthermore, root modals in Javanese are a kind of transitive verbs instantiating a “full argument structure”

(with both a specifier and a complement) whereas epistemic modals are intransitive verbs lacking an external argument.

The contrast between root and epistemic modals with respect to MCE now straightforwardly falls out from our working hypothesis in (28). Consider the point of the derivation illustrated in (29) where a strong phase head marked by Mod_{Root} is merged with a higher phase head (namely, C).



At the point when the higher phase head C is introduced into the syntactic workspace, the complement of the lower phase head Mod_{Root} undergoes Spell-Out to PF for non-pronunciation in compliance with the PIC. This Spell-Out operation does not occur, however, if the head selecting the $v\text{P}$ complement is occupied by an epistemic modal because it is not a strong phase head.

Our present analysis leads us to one interesting prediction. Johnson (2001) has recently argued that VP-ellipsis is derived through VP-topicalization on the basis of his observation that the licensing conditions on VP-ellipsis closely mirror those on VP-

topicalization; see also Szczegielniak (2004), who argues that VP-ellipsis in Polish and Russian is licensed via VP-topicalization. Now, given this analysis, our current analysis predicts that VP-topicalization in Javanese should be licensed by root modals, but not by epistemic modals. This prediction is indeed borne out, as shown in (30) and (31); see also Vander Klok (2012a, b) for relevant discussion.

(30) A: Opo mbak Jozina **oleh** [_{VP} nganggo celono ning pasar]?
 Q older sister Jozina may(root) AV.wear pant to market
 ‘May Jozina wear pants to the market?’

B: [_{VP} Nganggo celono ning pasar]_i, mbak Jozina **oleh** *t_i*.
 AV.wear pant to market older sister Jozina may (root)
 ‘*Lit.* To wear pants to the market, Jozina may.’

(31) A: Opo mbak Jozina **mungkin** [_{VP} nganggo celono ning pasar]?
 Q older sister Jozina may (epistemic) AV.wear pant to market

B: * [_{VP} nganggo celono ning pasar], mbak Jozina **mungkin** *t_i*.
 AV.wear pant to market older sister Jozina may (epistemic)
 ‘*Lit.* ‘To wear pants to the market, Jozina may.’

The example in (30B) shows that the root modal *oleh* ‘may, be allowed to’ permits VP-topicalization. The example in (31B), on the other hand, shows that the epistemic modal *mungkin* ‘may’ does not permit VP-topicalization.

There are a number of technical questions which arise under our phase-theoretic analysis of MCE in Javanese. For example, one might ask what the status of vP -complements is in Javanese if the Mod_{Root} , which directly merges with it, is also a phase head, as shown in (29)? In other words, is v itself a strong phase head in Javanese? Recent work on the syntax of Javanese (Sato (2010, 2012); see also Cole, Jonczyk and Lilley (1999) and Vander Klok (2012a, b)) argue, on the basis of the distribution of the homorganic nasal active voice prefix in this language, that v constitutes a strong phase in the sense of Chomsky (2000, 2001, 2004, 2007, 2008, 2013). The question then becomes how Spell-Out works in the derivation like the one shown in (29). I suspect that Mod_{Root} and v constitute a single phase head for the purposes of Spell-Out so that Spell-Out applies at the Mod_{Root} level when the higher phase head C is introduced into the syntactic workspace. The intuition here is that Mod_{Root} creates some sort of the extended projection of v 's in Javanese so that the entire Mod_{Root} counts as a derived phase for Spell-Out to apply. This intuition is also in conformity with the well-known cross-linguistic observation that modal elements are “semi-lexical heads”. At any rate, the issue raised here is part of the broader question of how modal elements fit into the phase-based syntactic derivation model, and I leave a more careful exploration of this issue for another occasion. See also section 4.2 for a related discussion on the phasal status of modal elements in English.

4.2. *Root vs. Epistemic Modals Revisited: Modal Complement Ellipsis in English?*

I end this section by pointing out one important consequence of our proposed analysis of MCE for English modals. Our current analysis leads us to predict that other languages including English should exhibit the same asymmetry with respect to MCE as observed in Japanese. Indeed, McDowell (1987) and Drubig (2001) observe that VP-ellipsis in English excludes epistemic interpretations, as shown in (32a) and (32b).

- (32) a. * John must wash his car every day and Peter must [_{VP} e], too. (epistemic modal)
b. John must wash his car every day and Peter must [_{VP} e], too. (root modal)
(Drubig (2001: 30))

Furthermore, Drubig (2001) observes that VP-topicalization in English is also sensitive to the root vs. epistemic interpretation. Thus, the contrast between (33a) and (33b) shows that this operation is only licensed by a root interpretation of the modal auxiliary *must*.

- (33) a. Peter said that Max must work for the KGB and [_{VP} work for the KGB]_i Max must *t_i*. (root modal)
b.?? Peter said that Max must work for the KGB and [_{VP} work for the KGB]_i Max must *t_i*. (epistemic modal)
(Drubig (2001: 31))

Recall that the central idea behind our proposed analysis of MCE in Japanese was that root modals are associated with a control structure while epistemic modals are associated with a raising structure. It is thus telling in this regard that control verbs, but not raising verbs, allow VP-ellipsis in English, as shown by the contrast between (34a) and (34b).

(34) a. Mary's mother says that she cannot leave, but Mary actually wants to [_{VP} e].

b. * John seems to have left, and Mary seems to [_{VP} e].

((34b) from Drubig 2001: 33)

Examples (35a) and (35b) and examples (36a) and (36b) further support the view that VP-ellipsis is permissible under control verbs but not under raising verbs (Takahashi 1994; Martin 1996, 2001).

(35) a. * I consider Pam to like soccer, and I believe Rebecca to [_{VP} e] as well.

b. * Bill believes Sarah to be honest, and he believes Kim to [_{VP} e] as well.

(Martin (2001: 154))

(36) a. Kim isn't sure she can solve the problem, but she will try to [_{VP} e].

b. Rebecca wanted Jill to join the team, so Pam persuaded her to [_{VP} e].

(Martin (2001: 154))

Our analysis further expects that VP-topicalization in English is also sensitive to the root vs. raising difference, a prediction which is indeed borne out by the contrast between (37a) and (37b) (Rizzi 1990; see also Martin 1996, 2001).

- (37) a. $[_{vP} \text{Fix the car}]$, John tried to $[_{vP} e]$.
 b. * $[_{vP} \text{Know the answer}]$, I believe Bill to $[_{vP} e]$.

(Martin (2001: 154))

The issue raised at the end of section 4.1 also arises at this point. Given the evidence shown in (32) and (33), our current analysis might lead us to indicate that the Mod_{Root} constitutes a strong phase head in English as well. Again, this will add this head to the inventory of phase heads in English which are currently assumed to be either C or v . For English, at least, this conclusion is not necessarily warranted since it is traditionally assumed that modal auxiliaries in English are base-generated under Ts (see section 3.1). However, we also know that having all auxiliaries uniformly under Ts is unable to explain the contrast exhibited in (32) and (33), which clearly shows that the modal force of an auxiliary makes a crucial difference on the acceptability of vP -ellipsis/fronting. One analytic possibility here is that the two types of modal auxiliaries in English are generated under independent Mod heads, just as in Japanese, but they have to undergo obligatory head movement to T positions. Under this view, the T head constitutes a derived phase head when the Mod_{Root} moves to the T and licenses its vP complement to be elided/fronted. This deletion/fronting is impossible, on the other hand, with the T head which has the

$\text{Mod}_{\text{Epistemic}}$ head moved up to it. Note that the scenario sketched here is minimally different from the one I outlined at the end of section 4.1 for Javanese, where I argued that the Mod_{Root} and the v heads constitute a single phase head. It remains to be seen whether we can derive this contrast between English and Javanese from some other independent parameter in the two languages, but I leave this issue as a topic of further investigations.

4.3. *Modal Complement Ellipsis across Languages*

The results obtained in this section thus provide preliminary indication that our phase-theoretic analysis of MCE originally developed in Javanese is in principle applicable to an ostensibly similar construction in English, which does exhibit the raising/epistemic vs. control/root asymmetry with respect to deletion and topicalization alike. For this story to go through, however, a couple of important questions need to be settled. The most pressing question is the fine-grained syntax of root and epistemic modals in English. Recent works on the syntax of modal auxiliaries in English (Barbiers 1995; Bhatt 1998; Wurmbrand 1999) argue that both epistemic and root modals have a uniform symmetric raising structure, contrary to the traditional asymmetric analysis advocated by Ross (1969), Roberts (1989) and Zubizarreta (1982). Wurmbrand (1999), for example, supports the symmetric analysis drawing on a wide variety of facts, including expletive insertion under root modals, quirky case marking in Icelandic, passivization of modals' complements and lower scope/reconstruction effects under root modals. Aelbrecht (2009) also points out that both root and epistemic modals in Dutch exhibit signs characteristic of uniform raising syntax despite the fact that only root modals allow MCE in this language.

However, it is important to note that the syntactic structures of modal expressions differ radically across languages. Thus, Taleghani (2006) observes that in Persian, complex root modals such as *majbur budan* ‘to be obliged’ and *majbur šodan* ‘to become forced’ and *ejâze dâštan* ‘to have permission’ all instantiate control constructions where they assign an external θ -role and case to their surface subject, whereas complex epistemic modals such as *šâyad* ‘may’, *momken budan* ‘to be possible’, and *ehtemâl/emkân dâštan* ‘to have possibility’ all instantiate pseudo-raising constructions where they do not assign case or external θ -role to their surface subject, which originates from the lower clause. Fleisher (2006) also shows that whether or not modals are raising or control verbs varies across languages, noting that English and Hindi have raising modals but Russian has control modals. Thus, the important typological issue left open in this paper is how to reconcile the empirical arguments for the uniform raising syntax in languages such as English and Dutch, as presented by Wrumbrand (1999), Aelbrecht (2009) and others, with the present phase-theoretic analysis of MCE which crucially depends on the control syntax exclusively reserved for root modals in languages such as Javanese. I leave this important question as well as the further investigations of the cross-linguistic typology of MCE for further research.

4. Conclusions

In this paper, I have addressed the question why MCE is acceptable under root modals but not under epistemic modals, an issue that Aelbrecht (2009) has left for future research. Restricting my attention to Javanese modals, I have argued that this question

receives a principled explanation under the Cyclic Spell-Out Theory of ellipsis, whereby only the complement of a strong phase head can undergo PF-deletion. Specifically, I have presented various empirical arguments that in Javanese, root modals such as *oleh* ‘may, be allowed to’ and *kudu* ‘must, have to’ are strong phase heads while epistemic modals such as *mesti* ‘must, certain’ and *mungkin* ‘may’ are weak phase heads. Under this assumption, the root vs. epistemic contrast with respect to MCE naturally falls out from the very architecture of the phase-based syntactic computation. I have further shown that the proposed analysis receives independent support from the new observation that root modals, but not epistemic modals, allow their complement to undergo VP-topicalization in Javanese. I have also provided supporting evidence that the proposed analysis is applicable to a similar construction in English, which indeed exhibits the sensitivity to the root/control vs. epistemic/raising contrast with regards to both VP-ellipsis and VP-topicalization.

Works Cited

1. Adger, D. 2007. Stress and Phasal Syntax. *Linguistic Analysis* 33: 238-266.
2. Aelbrecht, L. 2009. *You Have the Right to Remain Silent: The Syntactic Licensing of Ellipsis*. Catholic University Brussels doctoral dissertation.
3. Akamajian, A., S. Steele and T. Wasow. 1979. The Category AUX in Universal Grammar. *Linguistic Inquiry* 10: 1-64.

4. Barriers, S. 1995. *The Syntax of Interpretation*. Leiden University doctoral dissertation.
5. Bhatt, R. 1998. Obligation and Possession. In *The Proceedings of the Upenn/MIT Workshop on Argument Structure and Aspect*, ed. by H. Harley, 21-40. Department of Linguistics and Philosophy, M.I.T: MITWPL.
6. Bošković, Ž. To appear. Now I'm a Phase, Now I'm Not a Phase: On the Variability of Phases with Extraction and Ellipsis. *Linguistic Inquiry*.
7. Butler, J. 2003. A Minimalist Treatment of Modality. *Lingua* 113: 967-996.
8. Chomsky, N. 1957. *Syntactic Structures*. Mouton: The Hague.
9. Chomsky, N. 2000. Minimalist Inquiries: The Framework. In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, ed. by R. Martin, D. Michaels and J. Uriagereka, 89-155. Cambridge: M.I.T. Press.
10. Chomsky, N. 2001. Derivation by Phase. In *Ken Hale: A Life in Language*, ed. by M. Kenstowicz, 1-52. Cambridge: M.I.T. Press.
11. Chomsky, N. 2004. Beyond Explanatory Adequacy. In *Structures and Beyond: The Cartography of Syntactic Structures, Volume 3*, ed. by A. Belletti, 104-131. Oxford: Oxford University Press.
12. Chomsky, N. 2007. Approaching UG from Below. In *Interfaces + Recursion = Language?* ed. by U. Sauerland and H. M. Gärtner, 1-29. New York: Mouton de Gruyter.

13. Chomsky, N. 2008. On Phases. In *Foundational Issues in Linguistic Theory: Essays in Honor of Jean-Roger Vergnaud*, ed. by R. Freidin, C. Otero and M.-L. Zubizarreta, 133-166. Cambridge: M.I.T. Press.
14. Chomsky, N. 2013. Problems of Projection. *Lingua* 130: 33-49.
15. Chomsky, N. and M. Halle. 1968. *The Sound Pattern of English*. New York: Harper and Row.
16. Cinque, G. 1999. *Adverbs and Functional Heads: A Cross-linguistic Perspective*. Oxford: Oxford University Press.
17. Cole, P., Y. Hara and N. T. Yap. 2008. Constraints on Auxiliary Fronting in Peranakan Javanese. *Journal of Linguistics* 44: 1-43.
18. Cole, P., G. Hermon and Yanti. 2008. Voice in Malay/Indonesian. *Lingua* 118: 1500-1553.
19. Cole, P., E. Jonczyk and J. Lilley. 1999. A Note on Extraction from Object Position in Javanese and Other Javanic Languages. In *Proceedings of AFLA VI*, ed. by C. Smallwood and C. Kitto, 87-93. Department of Linguistics: University of Toronto.
20. Conners, Thomas. 2008. *Tengger Javanese*. Yale University doctoral dissertation.
21. Craenenbroeck, J. van. 2004. *Ellipsis in Dutch Dialects*. Utrecht: LOT Dissertation Series.
22. Craenenbroeck, J. van. 2010. *The Syntax of Ellipsis: Evidence from Dutch Dialects*. Oxford: Oxford University Press.
23. Davies, W. and S. Dubinsky. 2004. *The Grammar of Raising and Control: A Course in Syntactic Argumentation*. Oxford: Blackwell.

24. Dobashi, Y. 2003. *Phonological Phrasing and Syntactic Derivation*. Cornell University doctoral dissertation.
25. Drubig, H. B. 2001. On the Syntactic Form of Epistemic Modality. Ms., University of Tübingen.
26. Fleisher, N. 2006. The Syntax of Possession-Obligation Modals: Evidence from Expletives. Paper presented at the LSA Annual Meeting. Albuquerque, New Mexico. January 5.
27. Fortin, C. 2012. The Syntax of Indonesian Modals. Paper presented at the 19th Annual Meeting of the Austronesian Formal Linguistics Association. Academia Sinica, Taipei, Taiwan. June 26-30.
28. Gallego, Á. 2009. Ellipsis by Phase. Paper presented at the XIX Colloquium on Generative Grammar, Euskal Herriko Unibertsitatea. April 1-3.
29. Gengel, K. 2008. Phases and Ellipsis. *Linguistic Analysis* 35: 21-42.
30. Hornstein, N., J. Nunes and K. Grohmann. 2005. *Understanding Minimalism: An Introduction to Minimalist Syntax*. Cambridge: Cambridge University Press.
31. Jackendoff, R. 1972. *Semantic Interpretation in Generative Grammar*. Cambridge: M.I.T. Press.
32. Johnson, K. 2001. What VP-ellipsis can do, and what it can't, but not why. In *The Handbook of Contemporary Syntactic Theory*, ed. by M. Baltin and C. Collins, 439-479. Oxford: Blackwell.
33. Kahnemuyipour, A. 2004. *The Syntax of Sentential Stress*. University of Toronto doctoral dissertation.

34. Kahnemuyipour, A. 2009. *The Syntax of Sentential Stress*. Oxford: Oxford University Press.
35. Kratzer, A. and E. Selkirk. 2007. Phase Theory and Prosodic Spellout: The Case of Verbs. *The Linguistic Review* 24: 93-135.
36. Lechner, W. 2007. Interpretive Effects of Head Movement. Ms., National and Kapodistrian University of Athens.
37. Martin, R. 1996. *A Minimalist Theory of PRO and Control*. University of Connecticut doctoral dissertation.
38. Martin, R. 2001. Null Case and the Distribution of PRO. *Linguistic Inquiry* 32: 141-166.
39. McDowell, J. 1987. *Assertion and Modality*. University of Southern California doctoral dissertation.
40. Merchant, J. 2001. *The Syntax of Silence: Sluicing, Islands, and the Theory of Ellipsis*. Oxford: Oxford University Press.
41. Nomoto, Hiroki. 2006. *A Study on Complex Existential Sentences in Malay*. Tokyo University of Foreign Studies Master's Thesis.
42. Palmer, F. 1990. *Modality and the English Modals*. London: Longman.
43. Rizzi, L. 1990. *Relativized Minimality*. Cambridge: M.I.T. Press.
44. Roberts, I. 1985. Oblique Case in the History of English. In *Studies in Syntax*, ed. by G. Gilligan, M. Mohammad and I. Roberts, 143-160. University of Southern California: Department of Linguistics.
45. Robson, S. 1992. *Javanese Grammar for Students*. Clayton: Centre of Southeast Asian Studies, Monash University.

46. Rosenbaum, P. 1967. *The Grammar of English Predicated Complement Constructions*. Cambridge: M.I.T. Press.
47. Ross, J. 1969. Auxiliaries as Main Verbs. In *Studies in Philosophical Linguistics*, ed. by W.Todd, 77-102. Evanston, IL: Great Expectations Press.
48. Sag, I. and T. Wasow. 1999. *Syntactic Theory*. Stanford: CSLI Publications.
49. Sato, Y. 2010. *Minimalist Interfaces: Evidence from Indonesian and Javanese*. Amsterdam: John Benjamins.
50. Sato, Y. 2012a. Successive Cyclicity at the Syntax-Phonology Interface: Evidence from Standard Indonesian and Kendal Javanese. *Studia Linguistica* 66: 32-57.
51. Sato, Y. 2012b. Phonological Interpretation by Phase: Nuclear Stress, Domain Encapsulation and Edge Sensitivity. In *Phases: Developing the Framework*, ed. by Á. Gallego, 283-307. Berlin: Mouton de Gruyter.
52. Szczegelnik, A. 2004. VP Ellipsis and Topicalization. In *Proceedings of NELS 35*, ed. by L. Bateman and C. Ussery, 615-630. University of Massachusetts, Amherst: GSLA Publications.
53. Takahashi, D. 1994. Sluicing in Japanese. *Journal of East Asian Linguistics* 3: 265-300.
54. Taleghani, A. 2006. *The Interaction of Modality, Aspect, and Negation in Persian*. University of Arizona doctoral dissertation.
55. Vander Klok, J. 2012a. *TAM Markers in Paciran Javanese*. McGill University doctoral dissertation.

56. Vander Klok, J. 2012b. Auxiliary Fronting in Javanese from an Austronesian Perspective. Paper presented at the 19th Annual Meeting of the Austronesian Formal Linguistics Association. Academia Sinica, Taipei, Taiwan. June 26-30.
57. Wurmbrand, S. 1999. Modal Verbs must be Raising Verbs. In *Proceedings of the 18th West Coast Conference on Formal Linguistics*, ed. by S. Bird, A. Carnie, J. Haugen and P. Norquest, 599-612. Somerville: Cascadilla Press.
58. Yoshida, M. and Á. Gallego. 2012. Ellipsis and Phases: Evidence from Antecedent Contained Sluicing. In *Local Modeling of Non-Local Dependencies in Syntax*, ed. by A. Alexiadou, T. Kiss and G. Müller, 353-370. Tübingen: Niemeyer.
59. Zubizarreta, M. L. 1982. *On the Relation of the Lexicon to Syntax*. M.I.T. doctoral dissertation.

ENDNOTES

* Acknowledgements to be inserted after reviews

¹ The following abbreviations are used in the data section of this paper: AV, active voice; DET, determiner; NEG, negation; PAST, past tense; PRT, particle; PV, passive voice; SG, singular; Q, question marker; 1/3, first/third persons.

² An anonymous reviewer points out that the root-epistemic contrast also holds in Russian, but interestingly, this contrast exhibits itself only in present tense. Consider examples (i) and (ii):

(i)a. Ivan ne xočet rabotat', no on dolžen [e]. (root modal)

Ivan NEG want to.work but he must

‘Ivan does not want to work, but he has to.’

b. * Ivan govorit čto on ne ljubit sobak, no on dolžen [e]. (epistemic modal)

Ivan say that he NEG like dog but he must

‘Ivan says that he does not like the dogs, but he must like them.’

(ii)a. Ivan ne xotel rabotat', no on dolžen *(byl) [e]. (root modal)

Ivan NEG want.PAST to.work but he must be.PAST

‘Ivan said that he did not want to work, but he had to.’

b. Ivan skazal čto on ne el apelsinove, no on dolžen*(byl) [*e*].(epistemic modal)

Ivan said that he NEG eat.PAST oranges but he must be.PAST

‘Ivan said that he did not eat the oranges, but he must have.’

The examples in (ia) and (ib) show that MCE in Russian is acceptable with the root interpretation, but not with the epistemic interpretation. The examples in (iia) and (iib) show that neither interpretation can yield the relevant ellipsis in past tense; the main verb *byl* ‘be.PAST’ has to be realized to support the ellipsis in such an environment. Obviously, the contrast observed above is related to the tense of the verb under ellipsis, but a full exploration of this pattern goes beyond the scope of this paper.

³ An anonymous reviewer asks what the trigger of the head movement of the modals to higher positions is in (17a) and (18a) where *mungkin* ‘may’ and *kudu* ‘must’ precede negation. I assume in this paper that *ora* ‘not’ in Javanese is generated in the specifier of NegP. Given that this movement yields a derived scope reading which otherwise won’t be available, I suspect that the movement is triggered by a semantic feature which affects interpretation at the semantic interface. See Lechner (2007) for independent evidence based on the scope interaction of quantifiers with modal expressions in English for semantically active cases of head movement. The same reviewer also points out that the hierarchy in (19) appears to contradict Cinque’s (1999: 78) observation that epistemic modals are higher than T (Past)/T (Future) and negation. (19) suggests that his observation does not extend to Javanese. Note also that the

evidence from the presentational construction illustrated in (20a) and (20b) independently supports this conclusion.

⁴ The nasal prefix assimilates in the place of articulation with the following consonant in Javanese. See Robson (1992) and Connors (2008) for a concise description of the assimilation patterns.