

Chapter 12

Control and Raising

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The distinction between raising predicates and control predicates has been a hallmark of syntactic theory since the 60s. Unlike transformational analyses, HPSG treats the difference as mainly a semantic one: raising verbs (*seem*, *begin*, *expect*) do not semantically select their subject (or object) nor assign them a semantic role, while control verbs (*want*, *promise*, *persuade*) semantically select all their syntactic arguments. On the syntactic side, raising verbs share their subject (or object) with the unexpressed subject of their non-finite complement, while control verbs only coindex them. The distinction between raising and control lexeme types is also relevant for non-verbal predicates such as adjectives (*likely* vs. *eager*). The analysis of the complement of both control and raising verbs as phrasal, rather than clausal (or small clause), will be supported by creole data. The distinction between subject and first syntactic argument will be discussed together with data from ergative languages, and the HPSG analysis will be extended to cover cases of obligatory control of the expressed subject of some finite clausal complements in certain languages. The raising analysis naturally extends to copular constructions (*become*, *consider*) and most auxiliary verbs.

1 The distinction between raising and control predicates

1.1 The main distinction between raising and control verbs

In a broad sense, *control* refers to a relation of referential dependence between an unexpressed subject (the controlled element) and an expressed or unexpressed constituent (the controller); the referential properties of the controlled element, including possibly the property of having no reference at all, are determined by those of the controller (Bresnan 1982: 372). Verbs taking non-finite complements



usually determine the interpretation of the unexpressed subject of the non-finite verb. With *want*, the subject is understood as the subject of the infinitive, while with *persuade* it is the object, as shown by the reflexives in (1). They are called “control verbs”, and *John* is called the “controller” in (1a) while *Mary* is the controller in (1b).

- (1) a. John wants to buy himself a coat.
- b. John persuaded Mary to buy herself / * himself a coat.

Another type of verb also takes a non-finite complement and identifies its subject (or its object) with the unexpressed subject of the non-finite verb. Since Postal (1974), they have been called “raising verbs”. What semantic role the missing subject has, if any, is determined by the lower verb, or if that is a raising verb, an even lower verb. In (2a) the subject of the infinitive (*like*) is understood to be the subject of *seem*, while in (2b) the subject of the non-finite verb (*buy*) is understood to be the object of *expect*. Verbs like *seem* are called “subject-to-subject-raising verbs” (or “subject-raising verbs”), while verbs like *expect* are called “subject-to-object-raising verbs” (or “object-raising verbs”).

- (2) a. John seemed to like himself.
- b. John expected Mary to buy herself / * himself a coat.

Raising and control constructions differ from other constructions in which the missing subject remains vague (3) and which are a case of “arbitrary” or “anaphoric” control (Chomsky 1981: 75–76; Bresnan 1982: 379).¹

- (3) Buying a coat can be expensive.

A number of syntactic and semantic properties distinguish control verbs like *want*, *hope*, *force*, *persuade*, *promise* from raising verbs like *see*, *seem*, *start*, *believe*, *expect* (Rosenbaum 1967; Postal 1974; Bresnan 1982).²

The key point is that there is a semantic role associated with the subject of verbs like *want* but not of verbs like *seem* and with the first complement of verbs like *persuade* but not of verbs like *expect*. The consequence is that more or less any NP is possible as subject of *seem* and as the first NP after *expect*. This includes expletive *it* and *there* and non-referential parts of idioms.

¹Bresnan (1982) proposes a non-transformational analysis and renames “raising” to “functional control” and “control” (obligatory) to “anaphoric control”. See also Wechsler & Asudeh (2021: Section 11), Chapter 30 of this volume.

²The same distinction is available for verbs taking a gerund-participle complement: *Kim remembered seeing Lee*. (control) vs. *It started raining*. (raising).

Let us first consider expletive subjects: meteorological *it* is selected by predicates such as *rain*. It can be the subject of *start*, *seem*, but not of *hope*, *want*. It can be the object of *expect*, *believe* but not of *force*, *persuade*:

- (4) a. It rained this morning.
- b. It seems/started to rain this morning.
- c. We expect it to rain tomorrow.
- (5) a. # It wants/hopes to rain tomorrow.
- b. # The sorcerer persuaded it to rain.

The same contrast holds with an idiomatic subject such as *the cat* in the expression *the cat is out of the bag* ‘the secret is out’. It can be the subject of *seem* or the object of *expect*, with its idiomatic meaning. If it is the subject of *want* or the object of *persuade*, the idiomatic meaning is lost and only the literal meaning remains.

- (6) a. The cat is out of the bag.
- b. The cat seems to be out of the bag.
- c. We expected the cat to be out of the bag.
- d. # The cat wants to be out of the bag. (non-idiomatic)
- e. # We persuaded the cat to be out of the bag. (non-idiomatic)

Let us now look at non-nominal subjects: *be obvious* allows for a sentential subject (7b) and *be a good place to hide* allows for a prepositional subject (8b). They are possible with raising verbs, as in the following:

- (7) a. [That Kim is a spy] is obvious.
- b. [That Kim is a spy] seemed to be obvious.
- (8) a. [Under the bed] is a good place to hide.
- b. Kim expects [under the bed] to be a good place to hide.

But they would not be possible with control verbs:

- (9) a. # [That Kim is a spy] wanted to be obvious.
- b. # Kim persuaded [under the bed] to be a good place to hide.

In languages such as German, subjectless constructions can be embedded under raising verbs but not under control verbs (Müller 2002: 48); subjectless passive *gearbeitet* ‘worked’ can thus appear under *scheinen* ‘seem’ but not under *versuchen* ‘try’:

- (10) a. weil gearbeitet wurde (German)
 because worked was
 ‘because work was being done’
 b. Dort schien noch gearbeitet zu werden.
 there seemed yet worked to be
 ‘Work seemed to still be being done there.’
 c. * Der Student versucht, gearbeitet zu werden.
 the student tries worked to be
 Intended: ‘The student tries to get the work done.’

All this shows that the kind of subject (or object) that a raising verb may take depends only on the embedded non-finite verb.

Let us now look at possible paraphrases: when control and raising sentences have a corresponding sentence with a finite clause complement, they have rather different related sentences. With control verbs, the non-finite complement may often be replaced by a sentential complement (with its own subject), while this is not possible with raising verbs:

- (11) a. Bill hoped [to impress Sandy] / [that he impressed Sandy].
 b. Bill seemed [to impress Sandy] / *[that he impressed Sandy].
 (12) a. Bill promised Sandy [to come] / [that he would come].
 b. Bill expected Sandy [to come] / *[that she would come].

With some raising verbs, on the other hand, a sentential complement is possible with an expletive subject (13a) or with no postverbal object (13b).

- (13) a. It seemed [that Kim impressed Sandy].
 b. Kim expected [that Sandy would come].

This shows that the control verbs can have a subject (or an object) different from the subject of the embedded verb, but that the raising verbs cannot.³

1.2 More on control verbs

For control verbs, the choice of the controller is determined by the semantic class of the verb (Pollard & Sag 1994: Chapter 3 and also Jackendoff & Culicover

³ Another contrast proposed by Jacobson (1990: 444) is that control verbs may allow for a null complement (*She tried.*) or a non-verbal complement (*They wanted a raise.*), while raising verbs may not (**She seemed.*). However, some raising verbs may have a null complement (*It just started (to rain).*) as well as some auxiliaries (*She doesn't.*) which can be analyzed as raising verbs (see Section 4 below).

2003). Verbs of influence (*permit*, *forbid*) are cases of object control while verbs of commitment (*promise*, *try*) as in (14a) and orientation (*want*, *hate*) as in (14b) display subject control, as shown by the reflexive in the following examples:⁴

- (14) a. John promised Mary to buy himself / * herself a coat.
b. John permitted Mary to buy herself / * himself a coat.

This classification of control verbs is cross-linguistically widespread (Van Valin & LaPolla 1997), but Romance verbs of mental representation and speech report are an exception in being subject-control without having a commitment or an orientation component.

- (15) a. Marie dit ne pas être convaincue. (French)
Marie says NEG be convinced
'Marie says she is not convinced.'
b. Paul pensait avoir compris.
Paul thought have understood
'Paul thought he understood.'

It is worth noting that for object-control verbs, the controller may also be the complement of a preposition (Pollard & Sag 1994: 139):

- (16) Kim appealed [to Sandy] to cooperate.

Bresnan (1982: 401), who attributes the generalization to Visser, also suggests that object-control verbs may passivize (and become subject-control) while subject-control verbs cannot (with a verbal complement). However, there are counterexamples like (17c) adapted from Hust & Brame (1976: 255), and the generalization does not seem to hold crosslinguistically (see Müller 2002: 129 for counterexamples in German).

- (17) a. Mary was persuaded to leave (by John).
b. * Mary was promised to leave (by John).
c. Pat was promised to be allowed to leave.

⁴Some verbs may be ambiguous and allow for subject control (*John proposed to come later*), object control (*John proposed to Mary to wash herself*), and joint control (*John proposed to Mary to go to the movies together*). For the joint control case, a cumulative (i+j) index is needed, as is also the case with long distance dependencies; see Chaves & Putnam (2020: Chapter 3) and Borsley & Crysmann (2021: 549), Chapter 13 of this volume:

(i) Setting aside illegal poaching for a moment, how many sharks_{i+j} do you estimate [[i died naturally] and [j were killed recreationally]]?

1.3 More on raising verbs

From a cross-linguistic point of view, raising verbs usually belong to other semantic classes than control verbs. The distinction between subject-raising and object-raising also has some semantic basis: verbs marking tense, aspect, modality (*start*, *cease*, *keep*) are subject-raising, while causative and perception verbs (*let*, *see*) are usually object-raising:

- (18) a. John started to like himself.
 b. It started to rain.
 c. John let it appear that he was tired.
 d. John let Mary buy herself / * himself a coat.

Transformational analyses posit distinct syntactic structures for raising and control sentences: subject-raising verbs select a sentential complement (and no subject), while subject-control verbs select a subject and a sentential complement (Postal 1974: 33–39; Chomsky 1981: 55–64).⁵ With subject-raising verbs, the embedded clause's subject is supposed to move to the position of matrix verb subject, hence the term “raising”. Transformational analyses also posit two distinct structures for object-control and object-raising verbs: while object-control verbs select two complements, object-raising verbs only select a sentential complement, and an exceptional case marking (ECM) rule assigns case to the embedded clause's subject. In this approach, both subject- and object-raising verbs have a sentential complement:

- (19) a. subject-raising:
 [_{NP} *e*] seems [_S John to leave] \leadsto [_{NP} John] seems [_S John to leave]
 b. object-raising (ECM):
 We expected [_S John to leave]

However, the putative correspondence between source structure (before movement) and target structure (after movement) for raising verbs is not systematic: *seem* may take a sentential complement (with an expletive subject) as in (13a), but the other subject-raising verbs (aspectual and modal verbs) do not.

- (20) a. Paul started to understand.
 b. * It started [that Paul understands].

⁵I disregard here the Movement Theory of Control (Hornstein 1999); see Landau (2000) for criticism.

Similarly, while some object-raising verbs (*expect, see*) may take a sentential complement as in (13b), others do not (*let, make, prevent*).

- (21) a. We let Paul sleep.
b. * We let [that Paul sleeps].

Furthermore, in transformational analyses, it is often assumed that the subject of the non-finite verb must raise to receive case from the matrix verb. But the subject of *seem* or *start* need not bear case, since it can be a non-nominal subject (8b). Data from languages with “quirky” case such as Icelandic also show that subjects of subject-raising verbs in fact keep the quirky case assigned by the embedded verb (Zaenen et al. 1985: 449), in contrast to the subject of subject-control verbs, which are assigned case by the matrix verb and are thus in the nominative. A verb like *need* takes an accusative subject, and a raising verb (*seem*) takes an accusative subject as well when combined with *need* (22b). With a control verb (*hope*), on the other hand, the subject must be nominative (22c).⁶

- (22) a. Hana vantar peninga. (Icelandic)
she.ACC lacks money.ACC
‘She lacks money.’
b. Hana virðist vanta peninga.
she.ACC seems to.lack money.ACC
‘She seems to lack money.’
c. Eg vonast till ad vanta ekki peninga.
I.NOM hope for to lack not money.ACC
‘I hope I won’t lack money.’

Finally, the possibility of an intervening PP between the matrix verb and the non-finite verb should block subject movement, according to Chain formation or Relativized Minimality (Rizzi 1986; 1990).

- (23) a. Carol seems to Kim to be gifted.
b. Carol_i seems to herself_i [e_i to have been quite fortunate].⁷

Turning now to object-raising verbs, when a finite sentential complement is possible, the structure is not the same as with a non-finite complement. Heavy NP

⁶The examples in (22) are from Sag, Wasow & Bender (2003: 386–387).

⁷McGinnis (2004: 50)

shift is possible with a non-finite complement, but not with a sentential complement (Bresnan 1982: 423; Pollard & Sag 1994: 113): this shows that *expect* has two complements in (24a) and only one in (24c).

- (24) a. We expected [all students] [to understand].
b. We expected [to understand] [all those who attended the class].
c. We expected [that [all those who attended the class] understand].
d. * We expected [that understand [all those who attended the class]].

This shows that object-raising verbs are better analyzed as two-complement verbs. This analysis predicts that the subject of the non-finite verb has all properties of an object of the matrix verb. It is an accusative in English (*him, her*) (25) and it can passivize, like the object of an object-control verb (26).

- (25) a. We expect him to understand.
b. We persuaded him to work on this.
(26) a. He was expected to understand.
b. He was persuaded to work on this.

To conclude, the movement (raising) analysis of subject-raising verbs and the ECM analysis of object-raising verbs are motivated by the idea that an NP which receives a semantic role from a verb should be a syntactic argument of this verb. But they lead to syntactic structures which are not motivated (assuming a systematic availability of a sentential complementation) and/or make wrong empirical predictions (that the postverbal sequence of an ECM verb behaves as one constituent instead of two).

1.4 Raising and control non-verbal predicates

Non-verbal predicates taking a non-finite complement may also fall under the raising/control distinction. Adjectives such as *likely* have raising properties: they neither select the category of their subject nor assign it a semantic role, in contrast to adjectives like *eager*. Meteorological *it* is thus compatible with *likely*, but not with *eager*. In the following examples, the subject of the adjective is the same as the subject of the copula (see Section 3 below).

- (27) a. It is likely to rain.
b. John is likely / eager to work here.
c. * It is eager to rain.

The same contrast may be found with nouns taking a non-finite complement. Nouns such as *tendency* have raising properties: they neither select the category of their subject nor assign it a semantic role, in contrast to nouns like *desire*. Meteorological *it* is thus compatible with the former, but not with the latter. In the following examples, the subject of the predicative noun is the same as the subject of the light verb *have*.

- (28) a. John has a tendency to lie.
 b. John has a desire to win.
 c. It has a tendency / * desire to rain at this time of year.

2 An HPSG analysis

In a nutshell, the HPSG analysis rests on a few leading ideas: non-finite complements are unsaturated VPs (a verb phrase with a non-empty SUBJ list); a syntactic argument need not be assigned a semantic role; control and raising verbs have the same syntactic arguments; raising verbs do not assign a semantic role to the syntactic argument that functions as the subject of their non-finite complement. I continue to use the term *raising*, but it is just a cover term, since no raising move is taking place in HPSG analyses.

In HPSG terminology, raising means full identity of syntactic and semantic information (*synsem*) (Abeillé & Borsley 2021: 18–19, Chapter 1 of this volume) with the unexpressed subject, while control involves identity of semantic indices (discourse referents) between the controller and the unexpressed subject. Co-indexing is compatible with the controller and the controlled subject not bearing the same case (22c) or belonging to different parts of speech (16), as is the case for pronouns and antecedents (see Müller 2021a, Chapter 20 of this volume on Binding Theory). This would not be possible with raising verbs, where there is full sharing of syntactic and semantic features between the subject (or the object) of the matrix verb and the (expected) subject of the non-finite verb. In German, the nominal complement of a raising verb like *sehen* ‘see’ must agree in case with the subject of the infinitive, as shown by the adverbial phrase *einer nach dem anderen* ‘one after the other’ which agrees in case with the unexpressed subject of the infinitive, but it can have a different case with a control verb like *erlauben* ‘allow’, as the following examples from Müller (2002: 47–48) show:

- (29) a. Der Wächter sah den Einbrecher und seinen Helfer
 the watchman saw the burglar.ACC and his accomplice.ACC

einen / * einer nach dem anderen weglaufen (German)
 one.ACC one.NOM after the other run.away
 ‘The watchman saw the burglar and his accomplice run away, one after the other.’

- b. Der Wächter erlaubte den Einbrechern, einer nach dem
 the watchman allowed the burglars.DAT one.NOM after the
 anderen wegzulaufen.
 other away.to.run
 ‘The watchman allowed the burglars to run away, one after the other.’

I will first present in more detail the HPSG analysis of raising and control verbs, then provide creole data (from Mauritian) which support a phrasal analysis of their complement, then discuss the implication of control/raising for pro-drop and ergative languages, to end up with a revised HPSG analysis, based on sharing XARG instead of SUBJ.

2.1 The HPSG analysis of “raising” verbs

Subject-raising-verbs (and object-raising verbs) can be defined as subtypes inheriting from *verb-lexeme* and *subject-raising-lexeme* (or *object-raising-lexeme*) types. Figure 1 shows parts of a possible type hierarchy. As in Abeillé & Borsley

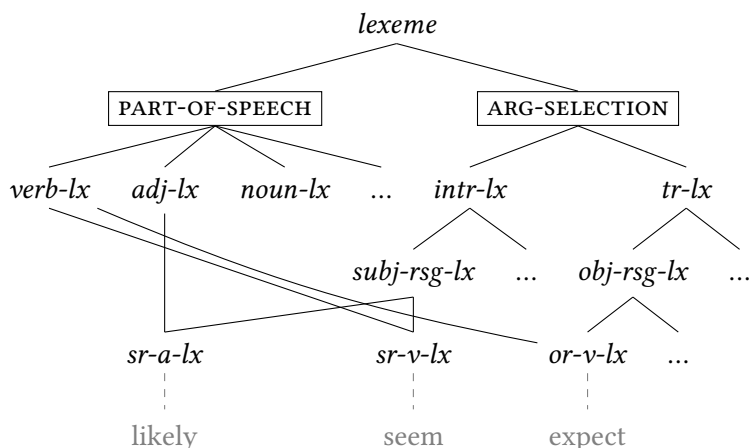


Figure 1: A type hierarchy for subject- and object-raising verbs

(2021: Section 4.1), Chapter 1 of this volume, upper case letters are used for the two dimensions of classification, and *verb-lx*, *intr-lx*, *tr-lx*, *subj-rsg-lx*, *obj-rsg-lx*, *or-v-lx* and *sr-v-lx* abbreviate *verb-lexeme*, *intransitive-lexeme*, *transitive-lexeme*, *subject-raising-lexeme*, *object-raising-lexeme*, *object-raising-verb-lexeme* and *subject-raising-verb-lexeme*, respectively. The figure also shows three examples (*likely*, *seem* and *expect*) inheriting from *sr-a-lx* (for *subject raising adjective lexeme*), *sr-v-lx*, and *or-v-lx*, respectively. The constraints on the types *subj-rsg-lx* and *obj-rsg-lx* are as follows:⁸

- (30) a. *subj-rsg-lx* \Rightarrow $[\text{ARG-ST } \boxed{1} \oplus \langle \dots, [\text{SUBJ } \boxed{1}] \rangle]$
 b. *obj-rsg-lx* \Rightarrow $[\text{ARG-ST } \langle \text{NP} \rangle \oplus \boxed{1} \oplus \langle [\text{SUBJ } \boxed{1}] \rangle]$

The SUBJ value of the non-finite verb is appended to the beginning of the ARG-ST and, provided $\boxed{1}$ contains an element, this means that the subject of the embedded verb is also the subject of the subject-raising verb in (30a). Similarly, if $\boxed{1}$ is a singleton list, the subject of the non-finite verb will be the second element of the ARG-ST list of the object-raising verb in (30b).

This means that both subject descriptions share their syntactic and semantic features: they have the same semantic index, but also the same part of speech, the same case, etc. Thus a subject appropriate for the non-finite verb is appropriate as a subject (or an object) of the raising verb: this allows for expletive ((4b), (4c)) or idiomatic ((6b), (6c)) subjects, as well as non-nominal subjects (8b). If the embedded verb is subjectless, as in (10), this information is shared too ($\boxed{1}$ can be the empty list). The dots in (30) account for a possible PP complement as in *Kim seems to Sandy to be smart.*, which we ignore in what follows.

A subject-raising verb (*seem*) and an object-raising verb (*expect*) inherit from *sr-v-lx* and *or-v-lx* respectively, which are subtypes of *subj-rsg-lx* and *obj-rsg-lx* (see Figure 1); their lexical descriptions are as follows, assuming an MRS-inspired semantics (Copestake et al. 2005 and Koenig & Richter 2021: Section 6.1, Chapter 22 of this volume):

⁸ \oplus is used for list concatenation. The category of the complement is not specified as a VP because it may be a V in some Romance languages with a flat structure (Abeillé & Godard 2003) and in some verb-final languages where the matrix verb and the non-finite verb form a verbal complex (German, Dutch, Japanese, Persian, Korean; see Müller 2021b, Chapter 10 of this volume on constituent order and Godard & Samvelian 2021, Chapter 11 of this volume on complex predicates). Furthermore, other subtypes of these lexical types will also be used for copular verbs that take non-verbal predicative complements; see Section 3.

(31) Lexical description of *seem* (*sr-v-lx*):

SUBJ	$\langle [1] \rangle$
COMPS	$\left\langle [2] \text{ VP } \left[\begin{array}{l} \text{HEAD } [\text{VFORM } \textit{inf}] \\ \text{SUBJ } \langle [1] \rangle \\ \text{CONT } [\text{IND } [3]] \end{array} \right] \right\rangle$
ARG-ST	$\langle [1], [2] \rangle$
CONT	$\left[\text{RELS } \left\langle \left[\begin{array}{l} \textit{seem-rel} \\ \text{SOA } [3] \end{array} \right] \right\rangle \right]$

(32) Lexical description of *expect* (*or-v-lx*):

SUBJ	$\langle [1] \text{ NP}_i \rangle$
COMPS	$\left\langle [2], [3] \text{ VP } \left[\begin{array}{l} \text{HEAD } [\text{VFORM } \textit{inf}] \\ \text{SUBJ } \langle [2] \rangle \\ \text{CONT } [\text{IND } [4]] \end{array} \right] \right\rangle$
ARG-ST	$\langle [1], [2], [3] \rangle$
CONT	$\left[\text{RELS } \left\langle \left[\begin{array}{l} \textit{expect-rel} \\ \text{EXP } i \\ \text{SOA } [4] \end{array} \right] \right\rangle \right]$

Raising verbs take a VP and not a clausal complement, which means that the embedded infinitive has its complements realized locally (if any) but not its subject. The corresponding simplified trees are as shown in Figures 2 and 3. Notice that the syntactic structures are the same as for control verbs (Figures 5 and 6).

Raising verbs have in common a mismatch between syntactic and semantic arguments: the raising verb has a subject (or an object) which is not one of its semantic arguments (its INDEX does not appear in the CONT feature value of the raising verb). To constrain this type of mismatch, Pollard & Sag (1994: 140) propose the Raising Principle.

(33) Raising Principle: Let X be a non-expletive element subcategorized by Y; X is not assigned any semantic role by Y iff Y also subcategorizes for a complement which has X as its first argument.

This principle was meant to prevent raising verbs from omitting their VP complement, unlike control verbs (Jacobson 1990: 444). Without a non-finite complement, the subject of *seem* is not assigned any semantic role, which violates the Raising principle. However, some unexpressed (null) complements are possible

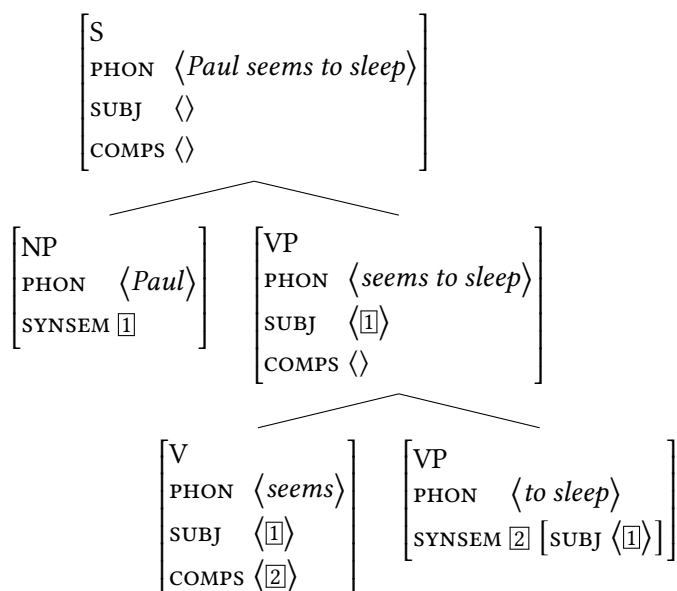


Figure 2: A sentence with a subject-raising verb

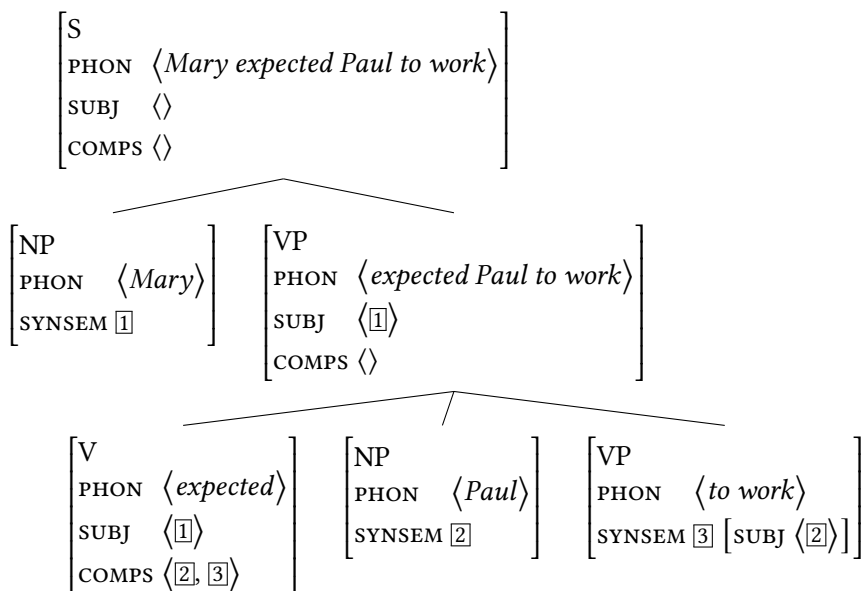


Figure 3: A sentence with an object-raising verb

with some subject-raising verbs as well as VP ellipsis with English auxiliaries, which are analyzed as subject-raising verbs (see Section 4 below and Nykiel & Kim 2021: Section 5, Chapter 19 of this volume on predicate/argument ellipsis). So the Raising Principle should be reformulated in terms of argument structure (which includes unexpressed arguments) and not valence features.

- (34) a. John tried / * seems.
 b. John just started.
 c. John did.

For subject-raising verbs which allow for a sentential complement as well (with an expletive subject) (13a), another lexical description is needed (see (35a)), and the same holds for object-raising verbs which allow a sentential complement (with no object) ((13b); see (35b)). These can be seen as valence alternations, which are available for some items (or some classes of items) but not all (see Davis, Koenig & Wechsler 2021, Chapter 9 of this volume on argument structure).

- (35) a. *seem*: [ARG-ST ⟨ NP[*it*], S ⟩]
 b. *expect*: [ARG-ST ⟨ NP, S ⟩]

2.2 The HPSG analysis of control verbs

Sag & Pollard (1991) propose a semantics-based control theory in which the semantic class of the verb determines whether it is subject-control or object-control. They distinguish verbs of orientation (*want*, *hope*), verbs of commitment (*promise*, *try*) and verbs of influence (*persuade*, *forbid*) based on the type of relation and semantic roles of their arguments. Relational types for control predicates can be organized in a type hierarchy like the one given in Figure 4, adapted from Sag & Pollard (1991: 78).⁹

For example, *want*, *promise* and *persuade* have semantic content such as the following, where *soa* means state-of-affairs and denotes the content of the non-finite complement.¹⁰

⁹For further semantic classification of main predicates in order to account for optional control in languages such as Modern Greek and Modern Standard Arabic, see Greshler et al. (2017).

¹⁰The fact that *soa* has a value of type *relation* follows from the general setup of AVMs that is specified as the so-called signature of the grammar and need not be given here (see Richter 2021: Section 3, Chapter 3 of this volume). I state it nevertheless for reasons of exposition.

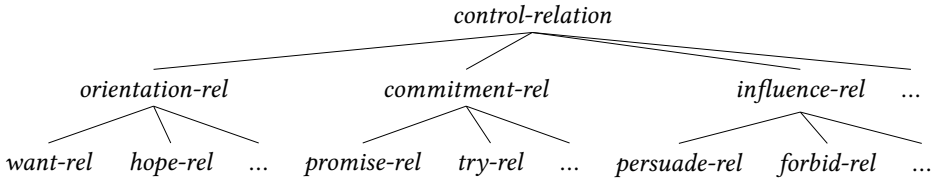


Figure 4: A type hierarchy for control predicates

- (36) a.
$$\left[\begin{array}{l} \text{want-rel} \\ \text{EXPERIENCER } \boxed{1} \\ \text{SOA } \left[\begin{array}{l} \text{relation} \\ \text{ARG } \boxed{1} \end{array} \right] \end{array} \right]$$
- b.
$$\left[\begin{array}{l} \text{promise-rel} \\ \text{COMMITOR } \boxed{1} \\ \text{COMMITTEE } \boxed{2} \\ \text{SOA } \left[\begin{array}{l} \text{relation} \\ \text{ARG } \boxed{1} \end{array} \right] \end{array} \right]$$
- c.
$$\left[\begin{array}{l} \text{persuade-rel} \\ \text{INFLUENCER } \boxed{1} \\ \text{INFLUENCED } \boxed{2} \\ \text{SOA } \left[\begin{array}{l} \text{relation} \\ \text{ARG } \boxed{2} \end{array} \right] \end{array} \right]$$

According to this theory, the controller is the experiencer with verbs of orientation, the commitor with verbs of commitment, and the influencer with verbs of influence. From the syntactic point of view, two types of control predicates, *subject-cont-lx* and *object-cont-lx*, can be defined as follows:

- (37) a. *subj-contr-lx* \Rightarrow

$$[\text{ARG-ST } \langle \text{NP}_i, \dots, [\text{SUBJ } \langle [\text{IND } i] \rangle] \rangle]$$
- b. *obj-contr-lx* \Rightarrow

$$[\text{ARG-ST } \langle [], \text{XP}_i, [\text{SUBJ } \langle [\text{IND } i] \rangle] \rangle]$$

The controller is the first argument with subject-control verbs, while it is the second argument with object-control verbs. Contrary to the types defined for raising predicates in (30), the controller here is simply coindexed with the subject of the non-finite complement. Since the controller is referential and since it is coindexed with the controlee, the controlee has to be referential as well. This

means it must have a semantic role (since it has a referential index), thus expletives and (non referential) idiom parts are not allowed ((5a), (5b), (6d), (6e)). This also implies that its syntactic features may differ from those of the subject of the non-finite complement: it may have a different part of speech (a NP subject can be coindexed with a PP controller) as well as a different case ((16), (22c)).

Verbs of orientation and commitment inherit from the type *subj-contr-lx*, while verbs of influence inherit from the type *obj-contr-lx*. A subject-control verb (*want*) and an object-control verb (*persuade*) inherit from *sc-v-lx* and *oc-v-lx* respectively; their lexical descriptions are as follows:

(38) Lexical description of *want* (*sc-v-lx*):

SUBJ	$\langle [1] NP_i \rangle$
COMPS	$\left\langle [2] VP \left[\begin{array}{l} \text{HEAD } [VFORM \textit{inf}] \\ \text{SUBJ } \langle [IND \textit{i}] \rangle \\ \text{CONT } [IND \textit{3}] \end{array} \right] \right\rangle$
ARG-ST	$\langle [1], [2] \rangle$
CONT	$\left[\begin{array}{l} \text{RELS } \left\langle \left[\begin{array}{l} \textit{want-rel} \\ \text{EXP } i \\ \text{SOA } [3] \end{array} \right] \right\rangle \end{array} \right]$

(39) Lexical description of *persuade* (*oc-v-lx*):

SUBJ	$\langle [1] NP_i \rangle$
COMPS	$\left\langle [2] NP_j, [3] VP \left[\begin{array}{l} \text{HEAD } [VFORM \textit{inf}] \\ \text{SUBJ } \langle [IND \textit{j}] \rangle \\ \text{CONT } [IND \textit{4}] \end{array} \right] \right\rangle$
ARG-ST	$\langle [1], [2], [3] \rangle$
CONT	$\left[\begin{array}{l} \text{RELS } \left\langle \left[\begin{array}{l} \textit{persuade-rel} \\ \text{AGENT } i \\ \text{PATIENT } j \\ \text{SOA } [4] \end{array} \right] \right\rangle \end{array} \right]$

The corresponding structures for subject-control and object-control sentences are illustrated in Figures 5 and 6.

In some Slavic languages (Russian, Czech, Polish), the predicative adjective must share case with the subject of the copular verb (40a): some subject-control verbs may allow case sharing like subject-raising verbs (40b), unlike object-control verbs (40c). As proposed by Przepiórkowski (2004) and Przepiórkowski &

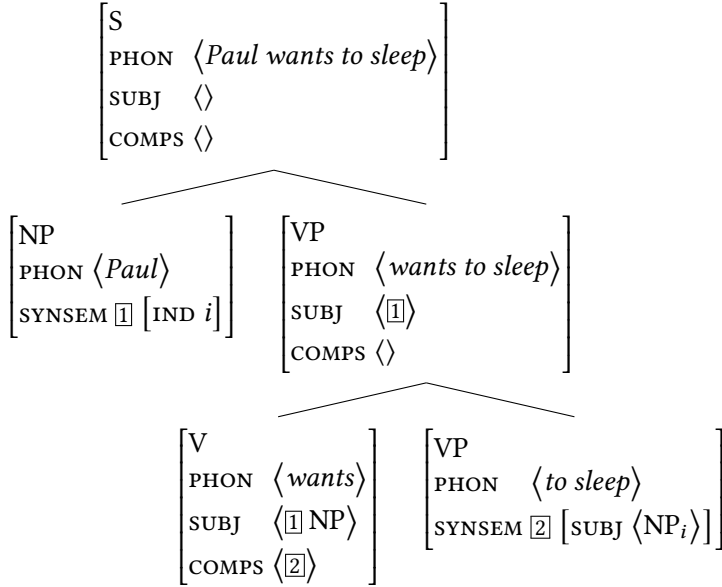


Figure 5: A sentence with a subject-control verb

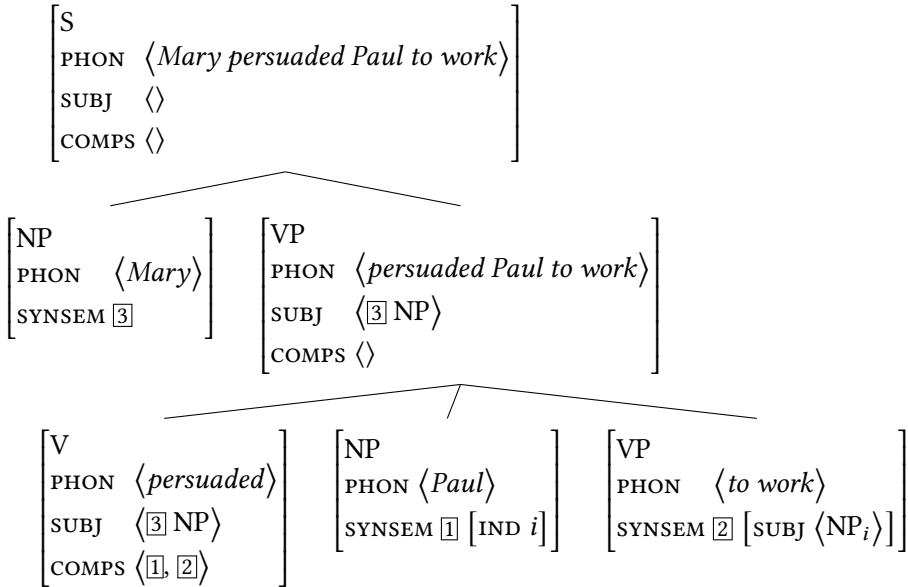


Figure 6: A sentence with an object-control verb

Rosen (2005), coindexing does not prevent full sharing, so the analysis may allow for both (shared) nominative and (default) instrumental case for the unexpressed subject and the predicative adjective, and a specific constraint may be added to enforce only (nominative) case sharing with the relevant set of verbs.¹¹

- (40) a. Janek jest miły. (Polish)
 Janek.NOM is nice.NOM
 ‘Janek is nice.’
 b. Janek zaczął / chce by’c miły.
 Janek.NOM started wants be.INF nice.NOM
 ‘Janek started / wants to be nice.’
 c. Janek kazal Tomkowi by’c miłym / *milemu.
 Janek.NOM ordered Tomek.DAT be.INF nice.INST nice.DAT
 ‘Janek ordered Tomek to be nice.’

For control verbs which allow for a sentential complement as well ((11a), (12a)), another lexical description of the kind in (41) is needed. These can be seen as valence alternations, which are available for some items (or some classes of items) but not all (see Davis, Koenig & Wechsler 2021, Chapter 9 of this volume on argument structure).

- (41) a. *want*: [ARG-ST ⟨ NP, S ⟩]
 b. *promise*: [ARG-ST ⟨ NP, NP, S ⟩]

2.3 Raising and control verbs in Mauritian

Mauritian, which is a French-based creole, provides some evidence for a phrasal (and not sentential) analysis of the verbal complement of raising and control verbs. Mauritian raising and control verbs belong roughly to the same semantic classes as in English or French. Verbs marking aspect or modality (*kontign* ‘continue’, *aret* ‘stop’) are subject-raising verbs, and causative and perception verbs (*get* ‘watch’) are object-raising. Raising verbs have different properties from TMA (tense modality aspect) markers: they are preceded by the negation, which follows TMA, and they can be coordinated, unlike TMA (Henri & Laurens 2011: 209):

- (42) a. To pou kontign ou aret bwar? (Mauritian)
 2SG IRR continue.SF or stop.SF drink.LF
 ‘You will continue or stop drinking?’

¹¹The examples in (40) are taken from Przepiórkowski (2004: ex (6)–(7)).

- b. * To'nn ou pou aret bwar?
 2SG'PRF OR IRR stop.SF drink.LF
 'You have or will stop drinking?'

If their verbal complement has no external argument, as is the case with impersonal expressions such as *ena lapli* 'to rain', then the raising verb itself has no external argument, in contrast to a control verb like *sey* 'try':

- (43) a. Kontign ena lapli.
 continue.SF have.SF rain
 'It continued to rain.'
- b. * Sey ena lapli.
 try have.SF rain
 Literally: 'It tries to rain.'

Verb morphology in Mauritian provides an argument for the phrasal (and not clausal) status of the complement of both control and raising verbs. Unlike in French, its superstrate, in Mauritian, verbs inflect neither for tense, mood and aspect nor for person, number, and gender. But they have a short form and a long form (henceforth SF and LF), with 30% of verbs showing a syncretic form (as for example *bwar* 'drink'). The following list of examples provides pairs of short and long forms respectively:

- (44) a. manz/manze 'eat', koz/koze 'talk', sant/sante 'sing'
 b. pans/panse 'think', kontign/kontigne 'continue', konn/kone 'know'

As described in Henri (2010: Chapter 4), the verb form is determined by the construction: the short form is required before a non-clausal complement, and the long form appears otherwise.¹²

- (45) a. Zan sant [sega] / manz [pom] / trov [so mama] / pans
 Zan sing.SF sega eat.SF apple find.SF POSS mother think.SF
 [Paris].
 Paris
 'Zan sings a sega / eats an apple / finds his mother / thinks about Paris.'
- b. Zan sante / manze.
 Zan sing.LF eat.LF
 'Zan sings / eats.'

¹²*yer* 'yesterday' is an adjunct. See Hassamal (2017) for an analysis of Mauritian adverbs which treats as complements those that trigger the verb short form.

- c. Zan ti zante yer.
 Zan PRF sing.LF yesterday
 ‘Zan sang yesterday.’

Henri (2010: 258) proposes to define two possible values (*sf* and *lf*) for the head feature *VFORM*, with a lexical constraint on verbs simplified as follows (*nelist* stands for non-empty list):

$$(46) \left[\begin{array}{c} v\text{-word} \\ VFORM \text{ } sf \end{array} \right] \Rightarrow [\text{COMPS } nelist]$$

Interestingly, clausal complements do not trigger the verb short form (Henri 2010: 131 analyses them as extraposed). The complementizer (*ki*) is optional.

- (47) a. Zan panse [(ki) Mari pou vini].
 Zan think.LF that Mari FUT come.LF
 ‘Zan thinks that Mari will come.’
 b. Mari trouve [(ki) so mama tro manze].
 Mari find.LF that POSS mother too.much eat.LF
 ‘Mari finds that her mother eats too much.’

On the other hand, subject-raising and subject-control verbs occur in a short form before a verbal complement.

- (48) a. Zan kontign [sante]. (subject-raising verb, p. 198)
 Zan continue.SF sing.LF
 ‘Zan continues to sing.’
 b. Zan sey [sante]. (subject-control verb)
 Zan try.SF sing.LF
 ‘Zan tries to sing.’

The same is true with object-control and object-raising verbs:

- (49) a. Zan inn fors [Mari] [vini]. (object-control verb)
 Zan PRF force.SF Mari come.LF
 ‘Zan has forced Mari to come.’
 b. Zan pe get [Mari] [dormi]. (object-raising verb, p. 200)
 Zan PROG watch.SF Mari sleep.LF
 ‘Zan is watching Mari sleep.’

Raising and control verbs thus differ from verbs taking sentential complements. Their *sr* form is predicted if they take unsaturated VP complements. Assuming the same lexical type hierarchy as defined above, verbs like *kontign* ‘continue’ and *sey* ‘try’ inherit from *sr-v-lx* and *sc-v-lx* respectively.¹³

2.4 Raising and control in pro-drop and ergative languages

The theory of raising and control presented above naturally extends to pro-drop and ergative languages. But a distinction must be made between subject and first syntactic argument. Since Bouma, Malouf & Sag (2001), it is widely assumed that syntactic arguments are listed in ARG-ST and that only canonical ones are present in the valence lists (SUBJ, SPR and COMPS). See the Argument Realization Principle (ARP) in Abeillé & Borsley (2021: 17), Chapter 1 of this volume. For pro-drop languages, it has been proposed, e.g., in (Manning & Sag 1999: 65), that null subject verbs have a first argument having the non-canonical *synsem* type *pro*, representing the unexpressed subject in the ARG-ST list, but nothing in their SUBJ list.

- (50) a. Vengo. (Italian)
 come.PRS.1SG
 ‘I come.’
 b. Posso venire.
 can.1SG come.INF
 ‘I can come.’
 c. Voglio venire.
 want.1SG come.INF
 ‘I want to come.’

Assuming the lexical types for *sr-v-lx* and *sc-v-lx* in (30) and (37), the verbal descriptions for (50b) and (50c) are as follows:

- (51) a. *posso* ‘can’ (*sr-v-lx*):
- $$\left[\begin{array}{l} \text{SUBJ} \quad \langle \rangle \\ \text{COMPS} \quad \langle [2] \rangle \\ \text{ARG-ST} \quad \langle [1][pro], [2][\text{SUBJ } [1]] \rangle \end{array} \right]$$

¹³Henri & Laurens use Sign-based Construction Grammar (SBCG) (see Abeillé & Borsley 2021: Section 7.2, Chapter 1 of this volume and Müller 2021c: Section 1.3.2, Chapter 32 of this volume), but their analyses can be adapted to the feature geometry of Constructional HPSG (Sag 1997) assumed in this volume. The analysis of control verbs sketched here will be revised in Section 2.5 below.

- b. *voglio* ‘want’ (*sc-v-lx*):

$$\left[\begin{array}{l} \text{SUBJ} \quad \langle \rangle \\ \text{COMPS} \quad \langle [2] \rangle \\ \text{ARG-ST} \quad \langle \text{NP}_i [\textit{pro}], [2] [\text{SUBJ} \langle [\text{IND } i] \rangle] \rangle \end{array} \right]$$

Balinese, an ergative language, provides another example of non-canonical subjects. Wechsler & Arka (1998) argue that the subject is not necessarily the first syntactic argument in this language. A transitive verb has two verb forms, called “voice”, and there is rigid SVO order, regardless of the verb’s voice form. In the agentive voice (AV), the subject is the ARG-ST initial member, while in the objective voice (OV), the verb is transitive, and the subject is the initial NP, although it is not the first element of the ARG-ST list. (see Davis, Koenig & Wechsler 2021: Section 3.3, Chapter 9 of this volume):

- (52) a. *Ida ng-adol bawi.* (Balinese)
 3SG AV-sell pig
 ‘He/She sold a pig.’
 b. *Bawi adol ida.*
 pig ov.sell 3SG
 ‘He/She sold a pig.’

Different properties argue in favor of a subject status of the first NP in the objective voice. Binding properties show that the agent is always the first element on the ARG-ST list; see Wechsler & Arka (1998), Manning & Sag (1999) and Müller (2021a: Section 5), Chapter 20 of this volume. The objective voice is also different from the passive: the passive may have a passive prefix and an agent *by*-phrase, and it does not constrain the thematic role of its subject. The two verbal types can be defined as follows (see Davis, Koenig & Wechsler 2021: Section 3.3, Chapter 9 of this volume):

- (53) a. *av-verb* \Rightarrow
 $\left[\begin{array}{l} \text{SUBJ} \quad [1] \\ \text{COMPS} \quad [2] \\ \text{ARG-ST} \quad [1] \oplus [2] \end{array} \right]$
 b. *ov-verb* \Rightarrow
 $\left[\begin{array}{l} \text{SUBJ} \quad [1] \\ \text{COMPS} \quad [2] \\ \text{ARG-ST} \quad [2] \oplus [1] \end{array} \right]$

Together with a constraint stating that the SUBJ list has at most one element, these constraints license the following two verb forms:

- (54) a. Lexical description of
- ng-adol*
- ‘sell.AV’:

SUBJ	$\langle NP_i \rangle$
COMPS	$\langle NP_j \rangle$
ARG-ST	$\langle NP_i, NP_j \rangle$

- b. Lexical description of
- adol*
- ‘sell.OV’:

SUBJ	$\langle NP_j \rangle$
COMPS	$\langle NP_i \rangle$
ARG-ST	$\langle NP_i, NP_j \rangle$

In this analysis, the preverbal argument, whether the theme of an OV verb or the agent of an AV verb, is the subject, and as in many languages, only a subject can be raised or controlled (Chomsky 1981; Zaenen et al. 1985). Thus the first argument of the verb is controlled when the embedded verb is in the agentive voice, and the second argument is controlled when the verb is in the objective voice.¹⁴

- (55) a. Tiang edot [teka]. (Balinese)
 1 want come
 ‘I want to come.’
- b. Tiang edot [meriksa dokter].
 1 want AV.examine doctor
 ‘I want to examine a doctor.’
- c. Tiang edot [periksa dokter].
 1 want OV.examine doctor
 ‘I want to be examined by a doctor.’

Similarly, only the agent can be “raised” when the embedded verb is in the agentive voice, since it is the subject. And only the patient can be “raised” (because that is the subject) when the embedded verb is in the objective voice.¹⁵

- (56) a. Ci ngenah sajan ngengkebang kapelihan-ne. (Balinese)
 2 seem much AV.hide mistake-3POSS
 ‘You seem to be hiding his/her wrongdoing.’
- b. Kapelihan-ne ngenah sajan engkebang ci.
 mistake-3POSS seem much OV.hide 2
 ‘His/her wrongdoings seem to be hidden by you.’

¹⁴The examples in (55) are taken from Wechsler & Arka (1998: ex 25).

¹⁵The examples in (56) are taken from Wechsler & Arka (1998: 391–392).

Turning now to ditransitive verbs, *majanji* ‘promise’ denotes a commitment relation, so the promiser must have semantic control over the action promised (Farkas 1988; Kroeger 1993: Section 2.4; Sag & Pollard 1991: 78). The promiser should therefore be the agent of the lower verb. This semantic constraint interacts with the syntactic constraint that the controllee must be the subject, predicting that the lower verb must be in agentive voice, with an agentive subject:¹⁶

- (57) a. Tiang majanji maang Nyoman pipis. (Balinese)
 1 promise AV.give Nyoman money
 ‘I promised to give Nyoman money.’
 b. *Tiang majanji Nyoman baang pipis.
 1 promise Nyoman OV.give money
 c. *Tiang majanji pipis baang Nyoman.
 1 promise money OV.give Nyoman

The same facts obtain for other control verbs such as *paksa* ‘force’. Turning now to object-raising verbs like *tawang* ‘know’, these can occur in the agentive voice with an embedded AV verb (58a) and with an embedded OV verb (58c), unlike control verbs like *majanji* ‘promise’. They can also occur in the objective voice when the subject of the embedded verb is raised. In (58b), the embedded verb (*nangkep* ‘arrest’) is in the agentive voice, and its subject (*polisi* ‘police’) is raised to the subject of *tawang* ‘know’ in the objective voice; in (58d), the embedded verb (*tangkep* ‘arrest’) is in the objective voice, and its subject (*Wayan*) is raised to the subject of *tawang* ‘know’ in the objective voice (Wechsler & Arka 1998: ex 23).

- (58) a. Ia nawang polisi laku nangkep Wayan. (Balinese)
 3 AV.know police FUT AV.arrest Wayan
 ‘He knew that the police would arrest Wayan.’
 b. Polisi tawang=a laku nangkep Wayan.
 police OV.know=3 FUT AV.arrest Wayan
 c. Ia nawang Wayan laku tangkep polisi.
 3 AV.know Wayan FUT OV.arrest police
 ‘He knew that the police would arrest Wayan.’
 d. Wayan tawang=a laku tangkep polisi.
 Wayan OV.know=3 FUT OV.arrest police

In Balinese, the subject is always the controlled (or “raised”) element, but it is not necessarily the first argument of the embedded verb. The semantic difference

¹⁶The examples in (57) are taken from Wechsler & Arka (1998: 398–399).

between control verbs and raising verbs has a consequence for their complementation: raising verbs (which do not constrain the semantic role of the raised argument) can take verbal complements either in the agentive or objective voice, like subject-control verbs, while object-control verbs (which select an agentive argument) can only take a verbal complement in the agentive voice. This difference is a result of the analysis of raising and control presented above, and nothing else has to be added.

2.5 xARG and an alternative HPSG analysis

Sometimes, obligatory control is also attested for verbal complements with an expressed subject. As noted by Zec (1987), Farkas (1988) and Gerdts & Hukari (2001: 115–116), in some languages, such as Romanian, Japanese (Kuno 1976; Iida 1996) or Persian (Karimi 2008), the expressed subject of a verbal complement may display obligatory control. This may be a challenge for the theory of control presented here, since a clausal complement is a saturated complement with an empty SUBJ list, and the matrix verb cannot access the SUBJ value of the embedded verb. Sag & Pollard (1991: 89) proposed a semantic feature *external-argument* (EXT-ARG), which makes the index of the subject argument available at the clausal level. Sag (2007: 409) proposed to introduce a Head feature XARG that takes as its value the first syntactic argument of the head verb and is accessible at the clause level.

This is adopted by Henri & Laurens (2011: Section 6) for Mauritian. After some subject-control verbs like *pans* ‘think’, the embedded verb may have an optional clitic subject which must be coindexed with the matrix subject. It is not a clausal complement since the matrix verb is in the short form (sf) and not in the long form (see (46) above).

- (59) Zan_i pans (*ki) (li_i) vini.¹⁷ (Mauritian)
 Zan think.SF that 3SG come.LF
 ‘Zan thinks about coming.’

Using XARG, Henri & Laurens (2011: 214) propose a description for *pans* ‘think’ that is simplified in (60). The complement of *pans* must have an XARG coindexed with the subject of *pans*, but its SUBJ list is not constrained: it can be a saturated verbal complement (whose SUBJ value is the empty list) or a VP complement (whose SUBJ value is not the empty list).

¹⁷Henri & Laurens (2011: 202)

- (60) Lexical description of *pans* ‘think’:

$$\left[\begin{array}{l} \text{SUBJ} \langle \text{NP}_i \rangle \\ \text{COMPS} \left\langle \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{verb} \\ \text{XARG} [\text{IND } i] \end{array} \right] \end{array} \right] \right\rangle \end{array} \right]$$

See also Sag (2007: 408–409) and Kay & Sag (2009) for the obligatory control of possessive determiners in English expressions such as *keep one’s cool*, *lose one’s temper*, with an XARG feature on nouns and NPs:

- (61) a. John lost his / * her temper.
b. Mary lost * his / her temper.

This coindexing can also be extended to some subject-raising verbs such as *look like*, which have been called “copy raising” (Rogers 1974; Hornstein 1999 a.o.): *look like* takes a finite complement with an overt subject, and this pronominal subject must be coindexed with the matrix subject; it is a raising predicate, as shown by the possibility of the expletive *there*:

- (62) a. Peter looks like he’s tired. / # Mary is coming.
b. There looks like there’s going to be a storm.¹⁸

This bears some similarity with English tag questions: the subject of the tag question must be pronominal and coindexed with that of the matrix clause (see Bender & Flickinger 1999, and this chapter Section 4 on auxiliary verbs):

- (63) a. Paul left, didn’t he?
b. It rained yesterday, didn’t it?

To account for such cases, the types for subject-raising and subject-control verb lexemes in (30a) and (37a) can thus be revised as follows. Assuming a tripartition of *index* into *referential*, *there* and *it* (Pollard & Sag 1994: 138), the only difference between subject raising and subject control being that the INDEX of the subject of control verbs must be a referential NP:¹⁹

- (64) a. *sr-v-lx* \Rightarrow $[\text{ARG-ST} \langle \text{XP}_i, \dots, [\text{XARG} [\text{IND } i]] \rangle]$
b. *sc-v-lx* \Rightarrow $[\text{ARG-ST} \langle \text{NP}_i, \dots, [\text{XARG} [\text{IND } i]] \rangle]$

¹⁸Sag (2007: 407)

¹⁹This coindexing follows from the fact that control verbs assign a semantic role to their subject and the subject is coindexed with the subject of the controlled verb. Some authors have independently argued that some verbs have either a control-like or a raising-like behavior depending on the agentivity of their subject; see Perlmutter (1970) for English aspectual verbs (*begin*, *stop*) and Ruwet (1991: 56) for French verbs like *menacer* (‘threaten’) and *promettre* (‘promise’).

Note that this approach does not work for those languages allowing subjectless verbs (see example (10)).

3 Copular constructions

Copular verbs can also be considered as “raising” verbs (Chomsky 1981: 106). While attributive adjectives are adjoined to N or NP, predicative adjectives are complements of copular verbs and share their subject with these verbs. Like raising verbs (Section 1.3), copular verbs come in two varieties: subject copular verbs (*be*, *get*, *seem*), and object copular verbs (*consider*, *prove*, *expect*).

Let us review a few properties of copular constructions. The adjective selects for the verb’s subject or object: *likely* may select a nominal or a sentential argument, while *expensive* only takes a nominal argument. As a result, *seem* combined with *expensive* only takes a nominal subject, and *consider* combined with the same adjective only takes a nominal object.

- (65) a. [A storm] / [That it will rain] seems likely.
 b. [This trip] / * [That he comes] seems expensive.
- (66) a. I consider [a storm] likely / likely [that it will rain].
 b. I consider [this trip] expensive / * expensive [that he comes].

A copular verb thus takes any subject (or object) allowed by the predicate: *be* can take a PP subject in English with a proper predicate like ‘a good place to hide’ (67a), and *werden* takes no subject when combined with a subjectless predicate like *schlecht* ‘sick’ in German (67b):

- (67) a. [Under the bed] is a good place to hide
 b. Ihm wurde schlecht.²⁰ (German)
 him.DAT got sick
 ‘He got sick.’

In English, *be* also has the properties of an auxiliary; see Section 3.2.

3.1 The problems with a small clause analysis

To account for the above properties, Transformational Grammar since Stowell (1983) and Chomsky (1986: Chapter 4) has proposed a clausal or *small clause* analysis: the second predicate (the predicative adjective) heads a (small) clause;

²⁰Müller (2002: 72)

its subject raises to the subject position of the matrix verb (68a) or stays in its embedded position and receives accusative case from the matrix verb via exceptional case marking, ECM, as seen above (68b).

- (68) a. $[_{NP} e] \text{ be } [_S \text{ John sick}] \rightsquigarrow [_{NP} \text{ John}] \text{ is } [_S \text{ John sick}]$
 b. We consider $[_S \text{ John sick}]$.

It is true that the adjective may combine with its subject to form a verbless sentence; this happens in African American Vernacular English (AAVE) (Bender 2001), in French (Laurens 2008), in creole languages (Henri & Abeillé 2007: 134), in Slavic languages (Stassen 1997: 62) and in Semitic languages (see Alotaibi & Borsley 2020: 20–26), among others.

- (69) Magnifique ce chapeau ! (French)
 beautiful this hat
 ‘What a beautiful hat!’

But this does not entail that copular verbs like *be* take a sentential complement.

Several arguments can be presented against a (small) clause analysis. The putative sentential source is sometimes attested (70c) but more often ungrammatical:

- (70) a. John gets / becomes sick.
 b. *It gets / becomes that John is sick.
 c. John considers Lou a friend / that Lou is a friend.
 d. Paul regards Mary as crazy.
 e. *Paul regards that Mary is crazy.

When a clausal complement is possible, its properties differ from those of the putative small clause. Pseudo-clefting shows that *Lou a friend* is not a constituent in (71a). (71a) does not mean exactly the same as (71c). Furthermore, as pointed out by Williams (1983), the embedded predicate can be questioned independently of the first NP, which would be very unusual if it were the head of a small clause (71e).

- (71) a. We consider Lou a friend.
 b. *What we consider is Lou a friend.
 c. We consider [that Lou is a friend].
 d. What we consider is [that Lou is a friend].
 e. What do you consider Lou?

Following Bresnan (1982: 420–423), Pollard & Sag (1994: 113) also show that Heavy-NP shift applies to the putative subject of the small clause, exactly as it applies to the first complement of a two-complement verb:

- (72) a. We would consider [any candidate] [acceptable].
 b. We would consider [acceptable] [any candidate who supports the proposed amendment].
 c. I showed [all the cookies] [to Dana].
 d. I showed [to Dana] [all the cookies that could be made from betel nuts and molasses].

Indeed, the “subject” of the adjective with object-raising verbs has all the properties of an object: it bears accusative case and it can be the subject of a passive:

- (73) a. We consider him / * he guilty.
 b. We consider that he / * him is guilty.
 c. He was proven guilty (by the jury).

Furthermore, the matrix verb may select the head of the putative small clause, which is not the case with verbs taking a clausal complement, and which would violate the locality of subcategorization (Pollard & Sag 1994: 102; Sag 2007) under a small clause analysis. The verb *expect* takes a predicative adjective but not a preposition or a nominal predicate (74); *get* selects a predicative adjective or a preposition (75), but not a predicative nominal; and *prove* selects a predicative noun or adjective but not a preposition (76).

- (74) a. I expect that man (to be) dead by tomorrow. (Pollard & Sag 1994: 102)
 b. I expect that island *(to be) off the route. (p. 103)
 c. I expect that island *(to be) a good vacation spot. (p. 103)
- (75) John got political / * a success. (p. 105)
- (76) a. Tracy proved the theorem (to be) false. (p. 100)
 b. I proved the weapon *(to be) in his possession. (p. 101)

3.2 An HPSG analysis of copular verbs

Copular verbs such as *be* or *consider* are analyzed as subtypes of subject-raising verbs and object-raising verbs respectively and hence, the constraints in (30) apply. They share their subject (or object) with the unexpressed subject of their

predicative complement. Instead of taking a VP complement, they take a predicative complement (PRD +), which they may select the category of. We can thus define a general type for verbs taking a predicative complement as in (77), and then two subtypes of verbs taking a predicative complement: *s-pred-v-lx* for verbs like *be*, which also inherit from subject-raising verbs, and *o-pred-v-lx* for verbs like *consider*, which also inherit from object-raising verbs.

$$(77) \text{ pred-lx} \Rightarrow [\text{ARG-ST} \langle \dots, [\text{PRD } +] \rangle]$$

A copular verb like *be* or *seem* does not assign any semantic role to its subject, while verbs like *consider* or *expect* do not assign any semantic role to their object. For more details, see Pollard & Sag (1994: Chapter 3), Müller (2002: Section 2.2.7; 2009) and Van Eynde (2015). The lexical descriptions for predicative *seem* and predicative *consider* inherit from the *s-pred-v-lx* type and *o-pred-v-lx* type respectively, and are simplified as shown below.

As in Section 2.1, I ignore here a possible PP complement (*John seems smart to me*). With the assumption that the SUBJ list contains exactly one element in English, the following lexical descriptions result:

(78) Lexical description of *seem* (*s-pred-v-lx*):

$$\left[\begin{array}{ll} \text{SUBJ} & \langle [1] \rangle \\ \text{COMPS} & \left\langle [2] \left[\begin{array}{l} \text{HEAD} [\text{PRD } +] \\ \text{SUBJ} \langle [1] \rangle \\ \text{CONT} [\text{IND } 3] \end{array} \right] \right\rangle \\ \text{ARG-ST} & \langle [1], [2] \rangle \\ \text{CONT} & \left[\text{RELS} \left\langle \left[\begin{array}{l} \textit{seem-rel} \\ \text{SOA } [3] \end{array} \right] \right\rangle \right] \end{array} \right]$$

(79) Lexical description of *consider* (*o-pred-v-lx*):

$$\left[\begin{array}{ll} \text{SUBJ} & \langle [1] \text{ NP}_i \rangle \\ \text{COMPS} & \left\langle [2], [3] \left[\begin{array}{l} \text{HEAD} [\text{PRD } +] \\ \text{SUBJ} \langle [2] \rangle \\ \text{CONT} [\text{IND } 4] \end{array} \right] \right\rangle \\ \text{ARG-ST} & \langle [1], [2], [3] \rangle \\ \text{CONT} & \left[\text{RELS} \left\langle \left[\begin{array}{l} \textit{consider-rel} \\ \text{EXP } i \\ \text{SOA } [4] \end{array} \right] \right\rangle \right] \end{array} \right]$$

The subject of *seem* is unspecified: it can be any category selected by the predicative complement; the same holds for the first complement of *consider* (see examples in (65) above). *Consider* selects a subject and two complements, but only takes two semantic arguments: one corresponding to its subject, and one

corresponding to its predicative complement. It does not assign a semantic role to its non-predicative complement.

Let us take the example *Paul seems happy*. As a predicative adjective, *happy* has a HEAD feature [PRD +] and its SUBJ feature is not the empty list: it subcategorizes for a nominal subject and assigns a semantic role to it, as shown in (80).

(80) Lexical description of *happy*:

PHON	$\langle happy \rangle$
HEAD	$\left[\begin{array}{c} adj \\ PRD + \end{array} \right]$
SUBJ	$\langle NP_i \rangle$
COMPS	$\langle \rangle$
CONT	$\left[\begin{array}{c} RELS \left\langle \left[\begin{array}{c} happy-rel \\ EXP i \end{array} \right] \right\rangle \end{array} \right]$

In the trees in the Figures 7 and 8, the SUBJ feature of *happy* is shared with the SUBJ feature of *seem* and the first element of the COMPS list of *consider*.²¹

Pollard & Sag (1994: 133) mention a few verbs taking a predicative complement which can be considered as control verbs. A verb like *feel* selects a nominal subject and assigns a semantic role to it.

(81) John feels tired / at ease.

It inherits from the subject-control-verb type (37); its lexical description is given in (82):

(82) *feel* (sc-v-lx):

SUBJ	$\langle [1] NP_i \rangle$
COMPS	$\left\langle [2] \left[\begin{array}{c} HEAD [PRD +] \\ SUBJ \langle [IND i] \rangle \\ CONT [IND [3]] \end{array} \right] \right\rangle$
ARG-ST	$\langle [1], [2] \rangle$
CONT	$\left[\begin{array}{c} RELS \left\langle \left[\begin{array}{c} feel-rel \\ EXP i \\ SOA [3] \end{array} \right] \right\rangle \end{array} \right]$

²¹In what follows, I ignore adjectives taking complements. As noted in Section 1, adjectives may take a non-finite VP complement and fall under a control or raising type: as a subject-raising adjective, *likely* shares the SYNSEM value of its subject with the expected subject of its VP complement; as a subject-control adjective, *eager* coindexes both subjects. Such adjectives thus inherit from *subj-rsg-lexeme* and *subj-control-lexeme*, respectively, as well as from *adjective-lexeme*. In some languages, copular constructions are complex predicates, which means that the copular verb inherits the complements of the adjective as well; see Abeillé & Godard (2001) and Godard & Samvelian (2021: Section 4.4 and 5.1.3), Chapter 11 of this volume.

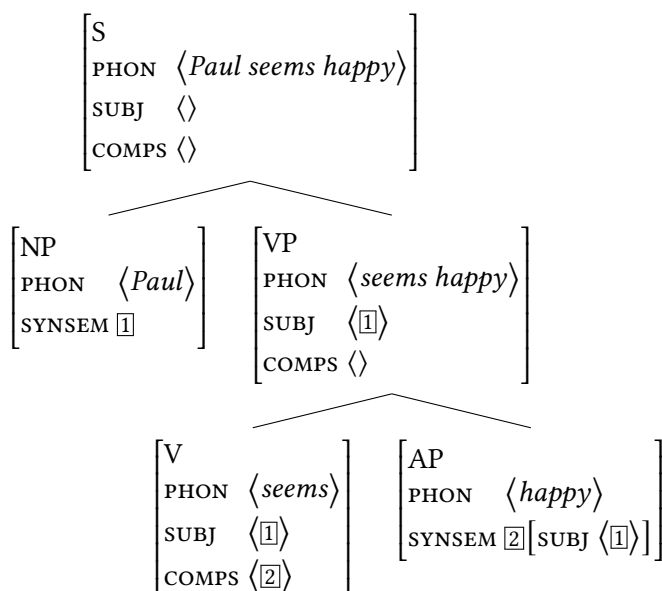


Figure 7: A sentence with an intransitive copular verb

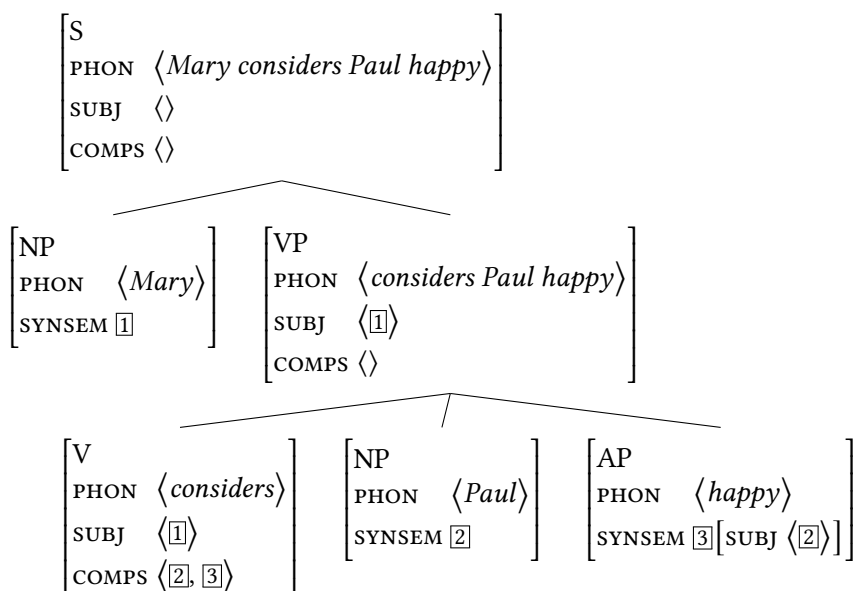


Figure 8: A sentence with a transitive copular verb

3.3 Copular verbs in Mauritian

As shown by Henri & Laurens (2011), and as was the case for other raising verbs (see Section 2.3), Mauritian data provide a strong argument in favor of a non-clausal analysis. A copular verb takes a short form before a predicative complement and a long form before a clausal one. Despite the lack of inflection on the embedded verb and the possibility of subject pro-drop, clausal complements differ from non-clausal complements by the following properties: they do not trigger the matrix verb short form, they may be introduced by the complementizer *ki* and their subject is a weak pronoun (*mo* ‘I’, *to* ‘you’). On the other hand, a VP or AP complement cannot be introduced by *ki*, and an NP complement must be realized as a strong pronoun (*mwa* ‘me’, *twa* ‘you’). So *malad* ‘sick’ is an adjectival complement in (83a), (83b) and (83d) and not a small clause and *trouv* ‘find’ takes two complements in (83b) and (83d) and *trouve* ‘find’ one clausal complement in (83c). See Section 2.3 above for the alternation between short form (SF) and long form (LF) of verbs.

- (83) a. Mari ti res malad. (Henri & Laurens 2011: 198)
 Mari PST remain.SF sick
 ‘Mari remained sick.’
- b. Mari trouv so mama malad
 Mari find.SF POSS mother sick
 ‘Mari finds her mother sick.’
- c. Mari trouve (ki) mo malad
 Mari find.LF that 1SG.WK sick
 ‘Mari finds that I am sick.’
- d. Mari trouv mwa malad
 Mari find.SF 1SG.STR sick
 ‘Mari finds me sick.’

Henri & Laurens (2011: 218) conclude that “Complements of raising and control verbs systematically pattern with non-clausal phrases such as NPs or PPs. This kind of evidence is seldom available in world’s languages because heads are not usually sensitive to the properties of their complements. The analysis as clause or small clauses is also problematic because of the existence of genuine verbless clauses in Mauritian which pattern with verbal clauses and not with complements of raising and control verbs”.

4 Auxiliaries as raising verbs

Following Ross (1969), Gazdar et al. (1982) and Sag et al. (2020), *be*, *do*, *have* and modals (e.g., *can*, *should*) in HPSG are not considered to have a special part of speech (*Aux* or *Infl*)²² but are verbs with the head feature [AUX +].

English auxiliaries take VP (or XP) complements and neither impose categorial restrictions on their subject nor assign it a semantic role, just like other subject-raising verbs. They are thus compatible with non-referential subjects, such as meteorological *it* and existential *there*. They select the verb form of their non-finite complements: *have* selects a past participle, *be* a gerund-participle and *can* and *will* a bare form.

- (84) a. Paul has left.
 b. Paul is leaving.
 c. Paul can leave.
 d. It will rain.
 e. There can be a riot.

In this approach, English auxiliaries are subtypes of subject-raising verbs and thus take a VP (or XP) complement and share their subject with the unexpressed subject of the non-finite verb (see Section 2.1).²³ The lexical descriptions for the auxiliaries *will* and *have* are given in (85) and (86).

To account for their NICE (negation, inversion, contraction (*isn't*, *won't*), ellipsis) properties, Kim & Sag (2002) use a binary head feature *AUX*, so that only [AUX +] verbs may allow for subject inversion (87a), sentential negation (87c), contraction or VP ellipsis (87e). See Müller (2021b: Section 5), Chapter 10 of this volume on subject inversion, Kim (2021: Section 2.3), Chapter 18 of this volume

²²Having Infl as a syntactic category and sentences defined as IP does not account for languages without inflection, nor for verbless sentences; see for example Laurens (2008).

²³*Be* is an auxiliary and a subject-raising verb with a PRD + complement (see Section 3.2 above) or a gerund-participle VP complement, different from the identity *be* which is not a raising verb (see Van Eynde 2008 and Müller 2009 on predication). A verb like *dare*, shown to be an auxiliary by its postnominal negation, is not a raising verb but a subject-control verb:

- (i) a. He is lazy and sleeping.
 b. I dare not be late.
 c. # It will not dare rain.

(85) Lexical description of *will* (*sr-v-lx*):

HEAD	[AUX +]
SUBJ	⟨[1]⟩
COMPS	⟨[2] VP [HEAD [VFORM <i>bse</i>]]⟩
	SUBJ ⟨[1]⟩
	CONT [IND [3]]
ARG-ST	⟨[1], [2]⟩
CONT	[IND <i>s</i>
	RELS ⟨[<i>future-rel</i>]]⟩
	SOA [3]

(86) Lexical description of *have* (*sr-v-lx*):

HEAD	[AUX +]
SUBJ	⟨[1]⟩
COMPS	⟨[2] VP [HEAD [VFORM <i>past-part</i>]]⟩
	SUBJ ⟨[1]⟩
	CONT [IND [3]]
ARG-ST	⟨[1], [2]⟩
CONT	[IND <i>s</i>
	RELS ⟨[<i>perfect-rel</i>]]⟩
	SOA [3]

on negation and Nykiel & Kim (2021: Section 5), Chapter 19 of this volume on post-auxiliary ellipsis.²⁴

- (87) a. Is Paul working?
 b. * Keeps Paul working?
 c. Paul is (probably) not working.
 d. * Paul keeps (probably) not working.
 e. John promised to come and he will.
 f. * John promised to come and he seems.

Subject raising verbs such as *seem*, *keep* or *start* are [AUX −].

²⁴Copular *be* has the NICE properties (*Is John happy?*); it is an auxiliary verb with a [PRD +] complement. Since *to* allows for VP ellipsis, it is also analyzed as an auxiliary verb: *John promised to work and he started to*. See Gazdar, Pullum & Sag (1982: 600) and Levine (2012).

Sag et al. (2020) revised this analysis and proposed a new analysis couched in Sign-Based Construction Grammar (Sag 2012; see also Müller 2021c: Section 1.3.2, Chapter 32 of this volume). The descriptions used below were translated into the feature geometry of Constructional HPSG (Sag 1997), which is used in this volume. In their approach, the head feature *AUX* is both lexical and constructional: the constructions restricted to auxiliaries require their head to be *[AUX +]*, while the constructions available for all verbs are *[AUX −]*. In this approach, non-auxiliary verbs are lexically specified as *[AUX −]* and *[INV −]*.

Auxiliary verbs, on the other hand, are unspecified for the feature *AUX* and are contextually specified, except for unstressed *do*, which is *[AUX +]* and must occur in constructions restricted to auxiliaries.

- (88) a. Paul is working. *[AUX −]*
 b. Is Paul working? *[AUX +]*
 c. * John does work. *[AUX −]*
 d. Does John work? *[AUX +]*

4.1 Subject inversion and English auxiliaries

Subject inversion is handled by a subtype of head-subject-complement phrase, which is independently needed for verb initial languages like Welsh (Borsley 1999: 285; Sag et al. 2003: 410).²⁵ It is a specific (non-binary) construction, of which other constructions such as *polar-interrogative-clause* are subtypes, and whose head must be *[INV +]*.

- (89) *initial-aux-ph* ⇒
- $$\left[\begin{array}{ll} \text{SUBJ} & \langle \rangle \\ \text{COMPS} & \langle \rangle \\ \text{HEAD-DTR } \boxed{1} & \left[\begin{array}{ll} \text{HEAD} & \left[\begin{array}{l} \text{AUX } + \\ \text{INV } + \end{array} \right] \\ \text{SUBJ} & \langle \boxed{2} \rangle \\ \text{COMPS} & \langle \boxed{3}, \dots, \boxed{n} \rangle \end{array} \right] \\ \text{DTRS} & \langle \boxed{1}, [\text{SYNSEM } \boxed{2}], [\text{SYNSEM } \boxed{3}], \dots, [\text{SYNSEM } \boxed{n}] \rangle \end{array} \right]$$

²⁵As noted in Abeillé & Borsley (2021: 28), Chapter 1 of this volume, in some HPSG work, e.g., Sag et al. (2003: 409–414), examples like (88b) and (88d) are analyzed as involving an auxiliary verb with two complements and no subject. This approach has no need for an additional phrase type, but it requires an alternative valence description for auxiliary verbs.

Most auxiliaries are lexically unspecified for the feature *INV* and allow for both constructions (non-inverted and inverted), while the first person *aren't* is obligatorily inverted (lexically marked as [*INV* +]) and the modal *better* obligatorily non-inverted (lexically marked as [*INV* -]):

- (90) a. Aren't I dreaming?
 b. *I aren't dreaming.
 c. We better be careful.
 d. *Better we be careful?

As for tag questions (*Paul left, didn't he?* (63a)), they can be defined as special adjuncts, coindexing their subject with that of the sentence they adjoin to, using the *XARG* feature (see above Section 2.5).

- (91) *tag-aux-lx* \Rightarrow
- $$\left[\begin{array}{l} \text{HEAD} \left[\begin{array}{ll} \text{INV} & + \\ \text{TENSE} & [2] \\ \text{POL} & \text{not}([1]) \\ \text{MOD} & \left[\begin{array}{ll} \text{XARG} & i \\ \text{TENSE} & [2] \\ \text{POL} & [1] \end{array} \right] \end{array} \right] \\ \text{SUBJ} \left\langle \text{CONT} \left[\begin{array}{l} \text{pron} \\ \text{IND } i \end{array} \right] \right\rangle \\ \text{COMPS} \langle \rangle \end{array} \right]$$

not is a function that returns '+' for the input '-' and '-' for the input '+'. I use coindexing of *TENSE* to ensure time concordance between the main verb and the tag auxiliary. *PRON* denotes a subject with a pronominal content.

4.2 English auxiliaries and ellipsis

While the distinction is not always easy to make between VP ellipsis (*Paul can*) and null complement anaphora (*Paul tried*), Sag et al. observe that certain elliptical constructions are restricted to auxiliaries, for example pseudogapping (see also Nykiel & Kim 2021: Section 2.2, Chapter 19 of this volume and Miller 2014).

- (92) a. John can eat more pizza than Mary can tacos. (Sag et al. 2020: ex. 52)
 b. Larry might read the short story, but he won't the play.
 c. *Ann seems to buy more bagels than Sue seems cupcakes.

This could be captured by having the relevant auxiliaries optionally inherit the complements of their verbal complement.²⁶ An additional lexical description of *will* with complement inheritance could be the following, using the non-canonical *synsem* type *pro* for the unexpressed VP:

(93) Lexical description of elliptical *will* (VPE or pseudogapping):

$$\left[\begin{array}{l} \text{SUBJ} \quad \langle [1] \rangle \\ \text{COMPS} \quad [2] \\ \text{ARG-ST} \quad \left\langle [1], \text{VP} \left[\begin{array}{l} \text{pro} \\ \text{SUBJ} \quad \langle [1] \rangle \\ \text{COMPS} \quad [2] \end{array} \right] \right\rangle \oplus [2] \end{array} \right]$$

If the list [2] is empty, this entry covers VP ellipsis (*I will*), if it is not empty, it covers pseudogapping (*I will the play*).

As observed by Arnold & Borsley (2008), auxiliaries can be stranded in certain non-restrictive relative clauses such as (94a), whereas no such possibility is open to non-auxiliary verbs (94b) (see also Arnold & Godard 2021: 635, Chapter 14 of this volume):

- (94) a. Kim was singing, which Lee wasn't.
 b. * Kim tried to impress Lee, which Sandy didn't try. (Sag et al. 2020: ex. 54a)

The HPSG analysis sketched here captures a very wide range of facts, and expresses both generalizations (English auxiliaries are subtypes of subject-raising verbs) and lexical idiosyncrasies (copula *be* takes non-verbal complements, first person *aren't* triggers obligatory inversion, etc.).

5 Conclusion

Complements of “raising” and control verbs have been either analyzed as clauses (Chomsky 1981: 55–63) or small clauses (Stowell 1981; 1983) in Transformational

²⁶See Kim & Sag (2002) for a comparison of French and English auxiliaries and Abeillé & Godard (2002) for a thorough analysis of French auxiliaries as “generalized” raising verbs, inheriting not only the subject but also any complement from the past participle. Such generalized raising was first suggested by Hinrichs & Nakazawa (1989; 1994) for German and has been adopted since in various analyses of verbal complexes in German (Kiss 1995; Meurers 2000; Kathol 2001; Müller 1999; 2002), Dutch (Bouma & van Noord 1998) and Persian (Müller 2010: Section 4). See also Godard & Samvelian (2021), Chapter 11 of this volume.

Grammar and Minimalism. As in LFG (Bresnan 1982), “raising” and control predicates are analyzed as taking non-clausal open complements in HPSG (Pollard & Sag 1994: Chapter 3), with sharing or coindexing of the (unexpressed) subject of the embedded predicate with their own subject (or object). This leads to a more accurate analysis of “object-raising” verbs as two-complement verbs, without the need for an exceptional case marking device. This analysis naturally extends to pro-drop and ergative languages; it also makes correct empirical predictions for languages that mark clausal complementation differently from VP complementation. A rich hierarchy of lexical types enables verbs and adjectives taking non-finite or predicative complements to inherit from a raising type or a control type. The Raising Principle prevents any other kind of non-canonical linking between semantic argument and syntactic argument. A semantics-based control theory predicts which predicates are subject-control and which object-control. The “subject-raising” analysis has been successfully extended to copular and auxiliary verbs, which are subtypes of raising verbs, without the need for an Infl category.

Abbreviations

AV	agentive voice
LF	long form
OV	objective voice
SF	short form
STR	strong
WK	weak

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