

The same contrast holds with an idiomatic subject such *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.

- (5) 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)

Non-nominal subjects are also possible with raising verbs, as in the following:

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

But they would not be possible with control verbs.

- (7) 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 which allow them, 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'):

- (8) a. weil gearbeitet wurde
 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 subject (or the object) of a raising verb is only selected by the non finite verb.

A related difference is that 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 it is not possible with raising verbs:

- (9) a. Kim hoped [to impress Sandy] / [that he impressed Sandy].
b. Kim seemed [to impress Sandy] / *[that he impressed Sandy].
- (10) a. Kim promised Sandy [to come] / [that he will come].
b. Kim expected Sandy [to come] / *[that she will come].

With some raising verbs, on the other hand, a sentential complement is possible with an expletive subject (11a), or with no postverbal object (11b).

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

This shows that the control verbs can have a subject (or an object) different from the subject of the embedded verb, but not the raising verbs.²

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 (1992) (see also Jackendoff & Culicover 2003). Verbs of influence (*permit*, *forbid*) are object-control while verbs of commitment (*promise*, *try*) as in (12a) and orientation (*want*, *hate*) as in (12b) are subject-control, as shown by the reflexive in the following examples:

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

The 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.

²Another contrast proposed by Jacobson (1990) 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 (*She just started.*) as well as some auxiliaries (*She doesn't.*) which can be analysed as raising verbs (see Section 4 below).

- (13) a. Marie dit ne pas être convaincue.
 Mary says NEG be convinced
 ‘Mary 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):

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

Bresnan (1982), who attributes the generalization to Visser, also suggests that object-control verbs may passivize (and become subject-control) while subject-control verbs do not (with a verbal complement).

- (15) a. Mary was persuaded to leave (by John).
 b. * Mary was promised to leave (by John).

However, the generalization does not seem to hold crosslinguistically (see Müller (2002: 129) for counterexamples in German).

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:

- (16) a. John started to like himself.
 b. 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; Chomsky 1981). With subject-raising verbs, the embedded clause’s subject is supposed to move to the position of matrix verb subject, hence the term ‘raising’. They 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 of *expect* verbs). In this approach, both subject and object raising verbs have a sentential complement:

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

As observed by [Bresnan \(1982\)](#) and [Sag & Pollard \(1991\)](#), the putative correspondence between source and target for raising structures is not systematic: *seem* may take a sentential complement (with an expletive subject) (11a) but the other subject-raising verbs (aspectual and modal verbs) do not.

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

Similarly, while some object-raising verbs (*expect*, *see*) may take a sentential complement (11b), others do not (*let*, *make*, *prevent*).

- (19) a. We expect Paul to understand.
 b. We expect [that Paul understands].

- (20) 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 raises 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 (6b). Data from languages with “quirky” case such as Icelandic, also show that subjects of raising verbs in fact keep the quirky case assigned by the embedded verb ([Zaenen et al. 1985](#)), contrary 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* (21b). With a control verb (*hope*), on the other hand, the subject must be nominative (34).

- (21) a. Mig vantar peninga.
 I.ACC need money.ACC

- b. Mig virdast vanta peninga.
I.ACC seem need money.ACC
- c. Eg vonast till ad vanta ekki peninga.
I.NOM hope for to need not money.ACC
'I hope I won't need money.'

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 shift is possible with a non-finite complement, and not with a sentential complement [Bresnan \(1982\)](#): this shows that *expect* has two complements in (19a) and only one in (19b).

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

Fronting also shows that the NP VP sequence does not behave as a single constituent, contrary to the finite complement:

- (23) a. That Paul understood, I did not expect.
- b. * Paul to understand, I did not expect.

This shows that object-raising verbs are better analysed as ditransitive and 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*) and it can passivize, like the object of an object-control verb (25).

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

To conclude, the movement-based raising analysis for subject-raising verbs, as well as the ECM analysis of object-raising verbs are motivated by semantic considerations: 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 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 do not select the category of their subject, nor assign it a semantic role, contrary 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).

- (26) a. It is likely to rain.
b. John is eager / likely 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 do not select the category of their subject, nor assign it a semantic role, contrary 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*.

- (27) 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 all the syntactic argument that function 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 is taking place in HPSG analyses.

As a result, control involves identity of semantic indices (discourse referents) while raising means full identity of syntactic and semantic information (*synsem*) (Abeillé & Borsley 2020, Chapter 1 of this volume). Co-indexing is compatible with the controller and the controlled subject not bearing the same case (34) or having different parts of speech (14), as it is the case for pronouns and antecedents

(see Müller & Branco 2020, Chapter 20 of this volume). 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 (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) ((28) from Müller (2002: 47–48)):

- (28) 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
 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 weglaufen.
 other run.away
 ‘The watchman allowed the burglars to run away, one after the other.’

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.

As in Abeillé & Borsley (2020: Section), 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. Constraints on types *subj-rsg-lx* and *obj-rsg-lx* are as follows:³

- (29) a. $subj-rsg-lx \Rightarrow \left[ARG-ST \ 1 \oplus \left(\left[SUBJ \ 1 \right] \right) \right]$

³The category of the complement is not specified as a VP since it may be a V 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 (2020a), Chapter 10 of this volume on constituent order). Furthermore, the same lexical types will also be used for copular verbs that take non-verbal predicative complements, see Section 3.

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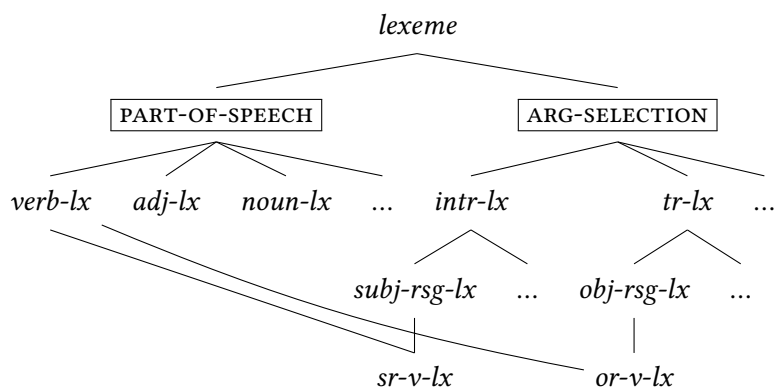


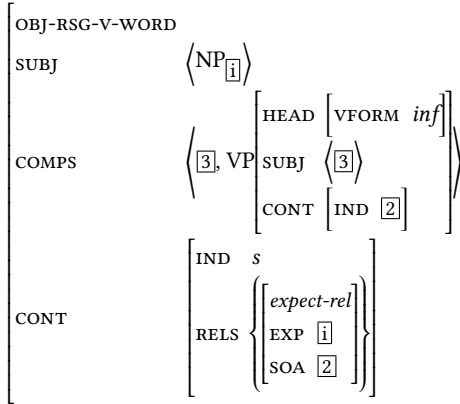
Figure 1: A type hierarchy for subject- and object-raising verbs

$$b. \text{ obj-rsg-lx} \Rightarrow \left[\text{ARG-ST} \left(\langle \text{NP} \rangle \oplus \boxed{1} \oplus \left(\left[\text{SUBJ} \boxed{1} \right] \right) \right) \right]$$

This means that the subject of the non finite complement shares its *synsems* with the subject of subject-raising verb, and with the object of object raising verb. This means that they share their syntactic and semantic features: they have the same semantic index, but also the same part of speech, the same case etc. Thus any subject appropriate for the non finite verb is appropriate as a subject (or an object) of the raising verb: this allows for expletive (3b,3c) or idiomatic (5b,5c) subjects, as well as non nominal subjects (6b). A subject-raising verb (*seem*) and an object-raising verb (*expect*) inherit from *subj-rsg-v* and *obj-rsg-v* respectively; their lexical descriptions look as follows, assuming a MRS semantics (Copestake et al 2005, and Koenig and Richter, chapter on semantics):

(30) *seem*:

$$\left[\begin{array}{l} \text{SUBJ-RSG-V-WORD} \\ \text{SUBJ} \\ \text{COMPS} \\ \text{CONT} \end{array} \right. \left. \begin{array}{l} \langle \boxed{1} \rangle \\ \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{VFORM} \text{ inf} \end{array} \right] \\ \text{SUBJ} \langle \boxed{1} \rangle \\ \text{CONT} \left[\text{IND} \boxed{2} \right] \end{array} \right] \\ \left[\begin{array}{l} \text{IND} \text{ s} \\ \text{RELS} \left\{ \left[\begin{array}{l} \text{seem-rel} \\ \text{SOA} \boxed{2} \end{array} \right] \right\} \end{array} \right] \end{array} \right]$$

(31) *expect*:

They take a VP and not a clausal complement, which means that the complements expected by the infinitive are realized but not its subject. The corresponding simplified trees are as shown in Figures 68c and 3. Notice that the syntactic structures are the same.

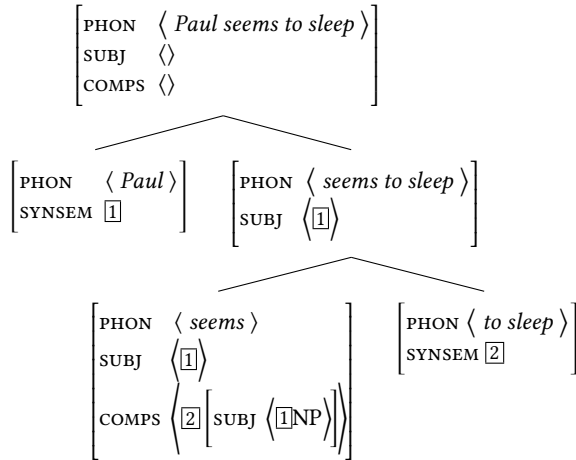


Figure 2: A sentence with a subject-raising verb

Raising verbs have in common some kind of 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 of the raising verb). To constrain this type of mismatch, Pollard & Sag (1994: 140) propose the Raising Principle.

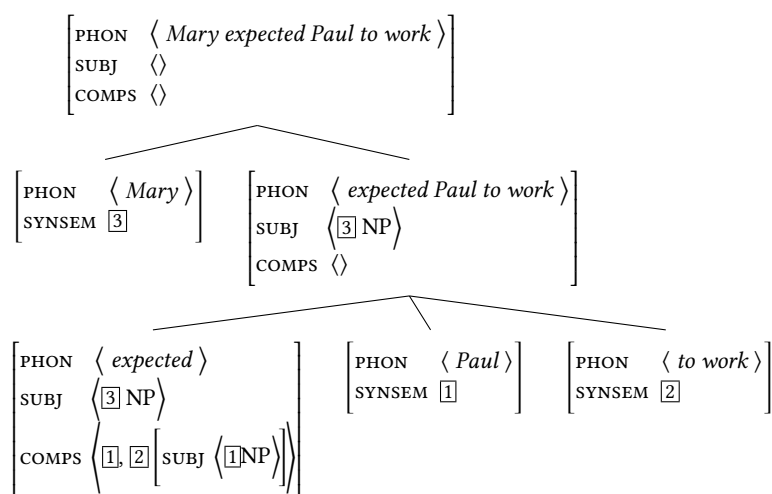


Figure 3: A sentence with an object-raising verb

- (32) 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 a complement which has X as its first argument.

This principle was meant to prevent raising verbs from omitting their VP complement, contrary to control verbs (Jacobson 1990). 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 with some subject raising verbs as well as VP ellipsis with English auxiliaries, which are analysed as subject-raising verbs (see section 4 below and Nykiel and Kim this volume chapter on ellipsis). So the Raising principle should be reformulated in terms of Argument-structure and not Valence features.

- (33) 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) (11a), another lexical description is needed, and the same holds for object-raising verbs which allow a sentential complement (with no object) (11b). These can be seen as valence alternations, which are available for some items (or some classes of items) but not all (see Wechsler, Koenig and

Davis, chapter on arg structure).

seem: arg-st <NP[it], S>

expect: arg-st <NP, S>

2.2 The HPSG analysis of control verbs

Sag & Pollard (1991) propose a semantics-based control theory. The semantic class of the verb determines whether it is subject-control or object-control: they distinguish verbs of orientation (*want*, *hope*), verbs of comitment (*promise*, *try*) and verbs of influence (persuade, forbid) based on the type of relation and semantic roles of their arguments.

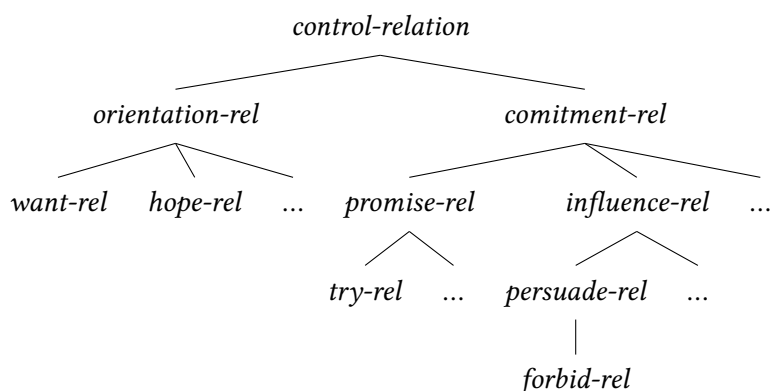


Figure 4: A type hierarchy for control predicates

For example, *want*, *promise* and *persuade* have a semantic content such as the following, with SOA meaning state-of-affairs and denoting the content of the non-finite complement:

- (34) *want*:
- $$\left[\begin{array}{l} \text{want-rel} \\ \text{EXPERIENCER} \left[\begin{array}{l} \boxed{1} \end{array} \right] \\ \text{SOA} \left[\begin{array}{l} \text{RELATION} \\ \text{ARG} \left[\begin{array}{l} \boxed{1} \end{array} \right] \end{array} \right] \end{array} \right]$$

$$(35) \quad \text{promise:} \quad \left[\begin{array}{l} \text{promise-rel} \\ \text{COMMITTOR} \quad [1] \\ \text{COMMITTEE} \quad [2] \\ \text{SOA} \quad \left[\begin{array}{l} \text{RELATION} \\ \text{ARG} \quad [1] \end{array} \right] \end{array} \right]$$

$$(36) \quad \text{persuade:} \quad \left[\begin{array}{l} \text{persuade-rel} \\ \text{INFLUENCER} \quad [1] \\ \text{INFLUENCED} \quad [2] \\ \text{SOA} \quad \left[\begin{array}{l} \text{RELATION} \\ \text{ARG} \quad [2] \end{array} \right] \end{array} \right]$$

According to this theory, the controller is the experiencer with verbs of orientation, the committor with verbs of comitment, 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:

$$(37) \quad \begin{array}{ll} \text{a. } \text{subj-cont-lx} \Rightarrow \left[\text{ARG-ST} \left\langle \text{NP}_{[1]}, \dots \left[\text{SUBJ} \left\langle \left[\text{IND} \quad [1] \right] \right\rangle \right] \right\rangle \right] \\ \text{b. } \text{obj-cont-lx} \Rightarrow \left[\text{ARG-ST} \left\langle [0], [1] \left[\text{IND} \quad [1] \right], \left[\text{SUBJ} \left\langle \left[\text{IND} \quad [1] \right] \right\rangle \right] \right\rangle \right] \end{array}$$

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 (29), the controller here is simply coindexed with the subject of the non finite complement. This means it must have a semantic role (since it has a semantic index), thus expletives and idiom parts are not allowed ((4a), (4b), (5d), (5e)). 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 ((14), (34)).

Verbs of orientation and comitment inherit from the type *subj-cont-lx*, while verbs of influence inherit from the type *subj-cont-lx*. A subject-control verb (*want*) and an object-control verb (*persuade*) inherit from *subj-cont-v* and *obj-cont-v* respectively; their lexical descriptions are as follows: ⁴.

⁴To account for Visser's generalization (object-control verbs passivize while subject-control

(38) *want:*

	SUBJ-CONT-V-WORD	
SUBJ	$\langle \text{NP}_{\boxed{1}} \rangle$	
COMPS	$\left\langle \text{VP SUBJ } \left\langle \left[\text{IND } \boxed{1} \right] \right\rangle \right\rangle$	$\left[\text{HEAD } \left[\text{VFORM } \textit{inf} \right] \right]$
	$\left[\text{CONT } \left[\text{IND } \boxed{2} \right] \right]$	
CONT	$\left[\text{IND } s \right]$	$\left[\text{RELS } \left\{ \left[\textit{want-rel} \right] \right\} \right]$
		$\left[\text{EXP } \boxed{1} \right]$
		$\left[\text{SOA } \boxed{2} \right]$

(39) *persuade:*

	OBJ-CONT-V-WORD	
SUBJ	$\langle \text{NP}_{\boxed{1}} \rangle$	
COMPS	$\left\langle \text{NP}_{\boxed{j}}, \text{VP SUBJ } \left\langle \left[\text{IND } \boxed{j} \right] \right\rangle \right\rangle$	$\left[\text{HEAD } \left[\text{VFORM } \textit{inf} \right] \right]$
	$\left[\text{CONT } \left[\text{IND } \boxed{2} \right] \right]$	
CONT	$\left[\text{IND } s \right]$	$\left[\text{RELS } \left\{ \left[\textit{persuade-rel} \right] \right\} \right]$
		$\left[\text{AGENT } \boxed{1} \right]$
		$\left[\text{PATIENT } \boxed{j} \right]$
		$\left[\text{SOA } \boxed{2} \right]$

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

In some Slavic languages (Russian, Czech, Polish), some subject-control verbs may allow case sharing as well, as shown by predicate case agreement with quan-

verbs do not), [Sag & Pollard \(1991\)](#) analyse the subject of the infinitive as a reflexive, which must be bound by the controller. According to Binding Theory (see [Müller & Branco 2020](#), Chapter 20 of this volume), the controller must be less oblique than the reflexive, hence less oblique than the VP complement which contains the reflexive: the controller can be the subject and the VP a complement as in (??); it can be the first complement when the VP is the second complement as in (15a), but it cannot be a *by*-phrase, which is more oblique than the VP complement, as in (15b) (the *by*-phrase should not be bound according to principle C, and the subject of infinitive should be bound according to principle A).

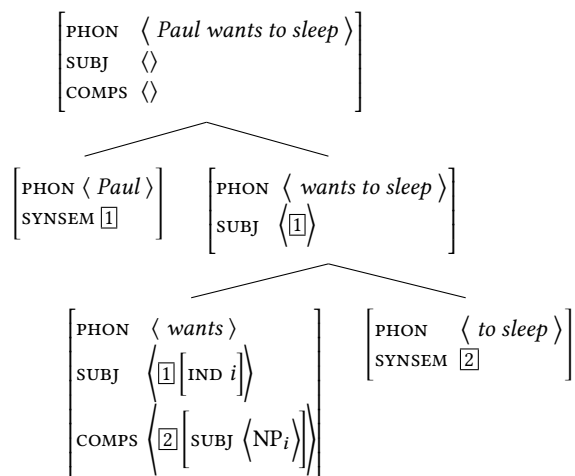


Figure 5: A sentence with a subject-control verb

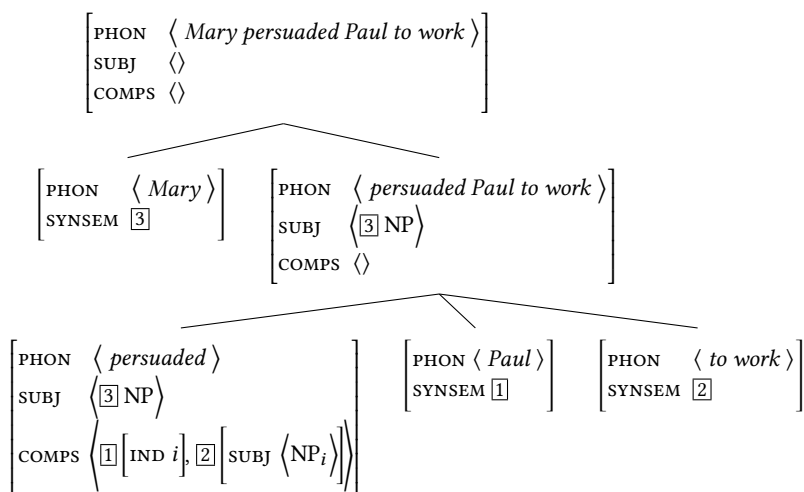


Figure 6: A sentence with an object-control verb

tified (non nominative) subjects. As observed by *Przepiórkowski (2004)*, *Przepiórkowski & Rosen (2005)*, coindexing does not prevent full sharing: so the analysis may allow for both cases, and a specific constraint may be added to enforce only case sharing and prevent default (instrumental) case assignment to the embedded predicate.

- (40) a. Janek chce byé miły.
 Janek.NOM wants be.INF nice.NOM
 ‘Janek wants to be nice.’
 b. Pięć dziewcząt chce być miłe / miłych.
 five.ACC girls.GEN wants be.INF nice.ACC nice.GEN
 ‘Five girls want to be nice.’ (*Przepiórkowski 2004*: ex (6)–(7))

For control verbs which allow for a sentential complement as well ((9a), (10a)), another lexical description is needed. These can be seen as valence alternations, which are available for some items (or some classes of items) but not all (see Wechsler, Koenig and Davis, chapter on arg structure).

- (41) a. *want*: ARG-ST <NP, S>
 b. *persuade*: ARG-ST <NP, NP, S>

2.3 Raising and control in Mauritian

Henri & Laurens (2011: 197) argue that “while Mauritian data can be brought in accordance with the open complement analysis, both morphological data on the control or raising verb and the existence of genuine verbless clauses put up a big challenge for both the clause and small clause analysis.” Mauritian is a French-based creole, which has raising and control verbs, belonging 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 differ from TMA (tense modality aspect) markers by different properties: they are preceded by the negation, which follows TMA; they can be coordinated unlike TMA (*Henri & Laurens 2011: 209*):

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

- 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, contrary 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.'

Unlike French, its superstrate, Mauritian verbs neither inflect 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 % verbs showing a syncretic form (*bwar*). 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 \(2010\)](#), the verb form is determined by the construction: the short form is required before a phrasal complement and the long form appears otherwise.⁵

- (45) a. Zan sant sega / manz pom / trov so mama / pans Paris.
 Zan sing.SF sega eat.SF apple find.SF POSS mother think.SF 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.'

⁵yer 'yesterday' is an adjunct. See [Hassamal \(2017\)](#) for an analysis of Mauritian adverbs which treats as complements those triggering the verb short form.

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

Henri (2010) proposes to define two possible values (SF and LF) for the head feature *VFORM*, with the following lexical constraint (*nelist* stands for non-empty list):

$$(46) \left[\text{VFORM } sf \right] \Rightarrow \left[\text{COMPS } nelist \right]$$

Interestingly, clausal complements do not trigger the verb short form (Henri (2010) 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 *SF* 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 *subj-rsg-v* and *subj-cont-v* respectively (Henri & Laurens use Sign-based Construction Grammar (SBCG) (see Abeillé & Borsley 2020, Chapter 1 of this volume and Müller 2020b, Chapter 33 of this volume), but their analyses can be adapted to the feature geometry of Constructional HPSG (Sag 1997) assumed in this volume).

2.4 XARG and the control of some saturated complements

Sometimes, obligatory control is also attested for verbal complements with an expressed subject. It is the case in English with *look like* which has been called “copy raising” (Rogers 1974; Hornstein 1999 a.o.): it takes a finite complement with an overt subject, but this subject must be coindexed with the matrix subject; it is a raising predicate, as shown but the possibility of the expletive *it*:

- (50) a. Peter looks like he’s tired. / # Mary is coming.
 b. There looks like there’s going to be a storm. (Sag 2007: ex 17)

This may be a challenge for the theory of control and raising 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. This is why Sag (2007) 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 usefull for handling Englisg tag questions, for example since the subject of the tag question must be coindexed with that of the matrix clause: *Paul left, did’nt he?*. The verb *look like* can thus have the subject of its sentential complement be shared with its own subject:

look like: ARG-ST ⟨ $\bar{1}$, S[XARG $\bar{1}$] ⟩

As noted by Zec (1987); Farkas (1988) and Gerdtts & Hukari (2001: 115–116), in some languages the expressed subject of a verbal complement may display obligatory control.

It is the case in Romanian or Persian (Karimi 2008), and in Mauritian for instance. As shown by Henri & Laurens (2011), after some subject-control verbs like *pans* ‘think’, the VP complement may have an optional pronominal 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 above).

- (51) Zan_i pans pou (li_i) vini. (p. 202)
 Zan think.SF COMP 3SG come.LF
 ‘Zan thinks about coming.’

Using XARG, they propose for *pans* ‘think’ the following description. 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 clausal complement (with an empty SUBJ list) or a VP complement (with a non-empty SUBJ list).

- (52) *pans* ‘think’:
- $$\left[\begin{array}{l} \text{SUBJ} \left\langle \text{NP}_{\bar{1}} \right\rangle \\ \text{COMPS} \left\langle \begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{VERB} \\ \text{XARG} \left[\text{IND} \left[\bar{1} \right] \right] \right] \right] \\ \text{MARKING } pou \end{array} \right\rangle \end{array} \right]$$

See also SagKay2009 for the obligatory control of possessive determiners in English expressions such *to keep one’s cool*, *to lose one’s temper*, with an XARG feature on nouns and NPs:

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

2.5 Raising and control in Balinese

Balinese offers an intriguing case of syntactic ergativity. It displays rigid SVO order, regardless of the verb’s voice form (Wechsler & Arka 1998). In the “Objective Voice” (OV), the verb is transitive, and the subject is the initial NP, although it is not the first argument. In the “Agentive Voice” (AV), the subject is the ARG-ST initial member (see Wechsler, Koenig & Davis 2020: Section 3.3, Chapter 9 of this volume):

- (54) a. Bawi adol ida.
 pig ov.sell 3sg
 ‘He/She sold a pig.’
 b. Ida ng-adol bawi.
 3sg AV-sell pig
 ‘He/She sold a pig.’

Different properties argue in favor of a subject status of the first NP in the objective voice. For binding properties that show that the agent is always the first element on the ARG-ST list, see Wechsler & Arka (1998) and Manning & Sag (1999) and for Binding Theory in general see Müller & Branco (2020), Chapter 20 of this volume. The objective voice is also different from the passive: the passive may have a passive prefix, an agent by-phrase, and does not constrain the thematic role of its subject.

In many languages, only a subject can be controlled (Zaenen et al. 1985). In Balinese, only the pre-verbal argument, whether the Theme of an OV verb or the Agent of an AV verb, can be a controllee:

- (55) a. Tiang edot [_ teka]. (Wechsler & Arka 1998: ex 25)
 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.’

Turning to *majanji* ‘promise’, in this type of commitment relation, the promiser must have semantic control over the action promised (Farkas 1988; Kroeger 1993; Sag & Pollard 1991). The promiser should therefore be the actor of the downstairs verb. This semantic constraint interacts with the syntactic constraint that the controllee must be the subject to predict that the controlled VP must be in AV voice, which places the Agent in subject role. The same facts obtain for other control verbs such as *paksa* ‘force’.

- (56) a. Tiang majanji maang Nyoman pipis. (Wechsler & Arka 1998: ex 27)
 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

Cross-linguistically, only the embedded subject can be “raised”. In Balinese, with an intransitive verb, the subject *ia* ‘(s)he’ can be raised to the position to the left of the matrix predicate *ngenah* ‘seem’:

- (57) a. Ngenah ia mobog. (Wechsler & Arka 1998: ex 7)
 seem 3 lie
 ‘It seems that (s)he is lying.’
 b. Ia ngenah mobog.
 3 seem lie
 ‘(S)he seems to be lying.’

The same applies to a transitive verb in the agentive voice: the agent can appear as the subject of *ngenah* ‘seem’ but not the patient.

- (58) a. Ngenah sajan [ci ngengkebang kapelihan-ne]. (Wechsler & Arka
 seem much 2 AV.hide mistake-3POSS
 1998: ex 9)
 ‘It is very apparent that you are hiding his/her wrongdoing.’
 b. Ci ngenah sajan ngengkebang kapelihan-ne.
 2 seem much AV.hide mistake-3POSS
 ‘You seem to be hiding his/her wrongdoing.’
 c. ?*Kapelihan-ne ngenah sajan ci ngengkebang.
 mistake-3POSS seem much 2 AV.hide

On the other hand, only the patient can be “raised” in the objective voice:

- (59) a. Ngenah sajan [kapelihan-ne engkebang ci]. (Wechsler & Arka
 seem much mistake-3POSS ov.hide 2
 1998: ex 8)
 ‘It is very apparent that you are 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.’
 c. ?*Ci ngenah sajan kapelihan-ne engkebang.
 2 seem much mistake-3POSS ov.hide

The conclusion of the authors is that the preverbal NP is always the syntactic subject, regardless of its thematic role and of the verbal voice (see also Manning & Sag 1999).

Balinese also displays object-raising. While the subject of *mulih* ‘go home’ has been “raised” to the subject of *tawang* ‘know’ in the objective voice, it can be analysed as the object of *nawang* ‘know’ in the agentive voice.

- (60) a. Nyoman Santosa *tawang* tiang *mulih*. (Wechsler & Arka 1998: ex
 Nyoman Santosa ov.know 1 go.home
 22)
 ‘I knew that Nyoman Santosa went home.’
 b. Tiang *nawang* Nyoman Santosa *mulih*.
 1 AV.know Nyoman Santosa go.home
 ‘I knew that Nyoman Santosa went home.’

In Balinese, the semantic difference 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, while control verbs (which select an agentive argument) can only take a verbal complement in the agentive voice. As a result, it is always the subject of the embedded predicate that is coindexed or shared with an argument of the matrix verb, but the subject is not always the first syntactic argument.

to be revised

- (61) a. $subj-rsg-lx \Rightarrow \left[\text{ARG-ST} \left\langle \left[\boxed{1}, \left[\text{SUBJ} \left\langle \boxed{1} \right\rangle \right] \right] \right\rangle \right]$
 b. $obj-rsg-lx \Rightarrow \left[\text{ARG-ST} \left\langle \left[\boxed{0}, \boxed{1}, \left[\text{SUBJ} \left\langle \boxed{1} \right\rangle \right] \right] \right\rangle \right]$

3 Copular constructions

Copular verbs can also be considered as “raising” verbs (Chomsky 1981). 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 ??), 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* com-

bined with *expensive* only takes a nominal subject, and *consider* combined with the same adjective only takes a nominal object.

- (62) a. [A storm] / [That it rains] seems likely.
 b. [This trip] / * [That he comes] seems expensive.
- (63) a. I consider [a storm] likely / likely [that it rains].
 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 (64a), *werden* takes no subject when combined with a subjectless predicate like *schlecht* (bad) in German (64b):

- (64) a. [Under the bed] is a good place to hide
 b. Ihm wurde schlecht (Müller 2002: 72)
 him.DAT got bad
 ‘He got sick.’

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

3.1 The problems with a small clause analysis

To account for these properties, Transformational Grammar since Stowell (1983) and Chomsky (1986) has proposed a clausal or *small clause* analysis: the predicative adjective heads a (small) clause; the subject of the adjective raises to the subject position of the embedding clause (65) or stays in its subject position and receives accusative case from the matrix verb via so-called Exceptional Case Marking (ECM) (66).

- (65) $[_{NP} e] \text{ be } [_S \text{ John sick}] \rightsquigarrow [_{NP} \text{ John}] \text{ is } [_S e_i \text{ sick}]$
 (66) We consider $[_S \text{ John sick}]$

It is true that the adjective may combine with its subject to form a verbless sentence. It is the case in AAVE (Bender 2001), in French Laurens (2008) and creole languages Henri & Abeillé (2007), in Slavic languages (Zec 1987), in Semitic languages (see Alqurashi & Borsley 2014), among others.

- (67) Magnifique ce chapeau !
 beautiful this hat
 ‘what a beautiful hat’

[French]

give language in brackets: is this French? yes

But this does not entail that *be* takes a sentential complement.

Pollard & Sag (1994: Chapter 3) present several arguments against a (small) clause analysis. The putative sentential source is sometimes attested (68c) but more often ungrammatical:

- (68) a. John is / gets / becomes sick.
b. * It is / 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. Pseudoclefting shows that *Lou a friend* is not a constituent in (69a).

- (69) 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].

Following Bresnan (1982), 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 ditransitive verb:

- (70) a. We would consider [any candidat] [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:

- (71) a. We consider him / * he guilty.
b. We consider that he / * him is guilty.
c. He was proved 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 violates the locality of subcategorization. The verb *expect* takes a predicative adjective but not a preposition or a nominal predicate (72), *get* selects a predicative adjective or a preposition (73), but not a predicative nominal, while *prove* selects a predicative noun or adjective but not a preposition (74).

- (72) a. I expect that man (to be) dead by tomorrow. (p. 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)
- (73) John got political / * a success. (p. 105)
- (74) a. Tracy proved the theorem (to be) false. (p. 100)
 b. I proved the weapon *(to be) in his possession. (p. 101)

Who is
cited here?
Make a
footnote
AA:pollardand

3.2 An HPSG analysis of copular verbs

Copular verbs such as *be* or *consider* are analysed as subtypes of subject-raising verbs and object-raising verbs respectively (29). They share their subject (or object) with the expected subject of their predicative complement. Instead of taking a VP complement, they take a predicative complement (PRD +), which they may select the category of. The two lexical types for verbs that take a predicative complement are as follows:

$$(75) \text{ subj-pred-}v \Rightarrow \left[\text{ARG-ST } \boxed{1} \oplus \left\langle \left[\begin{array}{c} \text{SUBJ } \boxed{1} \\ \text{PRD } + \end{array} \right] \right\rangle \right]$$

$$(76) \text{ obj-pred-}v \Rightarrow \left[\text{ARG-ST } \left\langle \boxed{0} \right\rangle \oplus \boxed{1} \oplus \left\langle \left[\begin{array}{c} \text{SUBJ } \boxed{1} \\ \text{PRD } + \end{array} \right] \right\rangle \right]$$

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) and Müller (2002: Section 2.2.7), Müller (2009); Van Eynde (2015). The lexical descriptions for predicative *seem* and predicative *consider* inherit from the *subject-pred-v* type and *object-pred-v* type respectively, and are as follows:

fix these
lexical
items.
Raise ev-
everything?
Use ap-
pend for
consider.

(77) *seem*:

	SUBJ-PRED-V-WORD	
	SUBJ	$\boxed{1}$
	COMPS	$\left\langle \begin{array}{l} \text{HEAD} \left[\text{PRD} \ + \right] \\ \text{SUBJ} \ \boxed{1} \\ \text{CONT} \left[\text{IND} \ \boxed{2} \right] \end{array} \right\rangle$
	CONT	$\left[\begin{array}{l} \text{IND} \ s \\ \text{RELS} \left\{ \begin{array}{l} \text{seem-rel} \\ \text{SOA} \ \boxed{2} \end{array} \right\} \end{array} \right]$

(78) *consider*:

	OBJ-PRED-V-WORD	
	SUBJ	$\langle \text{NP}_i \rangle$
	COMPS	$\boxed{1} \oplus \left\langle \begin{array}{l} \text{HEAD} \left[\text{PRD} \ + \right] \\ \text{SUBJ} \ \boxed{1} \\ \text{CONT} \left[\text{IND} \ \boxed{2} \right] \end{array} \right\rangle$
	CONT	$\left[\begin{array}{l} \text{IND} \ s \\ \text{RELS} \left\{ \begin{array}{l} \text{consider-rel} \\ \text{EXP} \ i \\ \text{SOA} \ \boxed{2} \end{array} \right\} \end{array} \right]$

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*: it can be any category selected by the predicative complement (see examples (62) 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 (79).

(79)

happy:

PHON	$\langle happy \rangle$
HEAD	$\begin{bmatrix} adj \\ PRD + \end{bmatrix}$
SUBJ	$\langle NP_i \rangle$
COMPS	$\langle \rangle$
CONT	$\begin{bmatrix} IND & s \\ RELS & \left\{ \begin{bmatrix} happy-rel \\ EXP & i \end{bmatrix} \right\} \end{bmatrix}$

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*.⁶

fix figures. Is $\boxed{1}$ a list or an element of a list? If the complete SUBJ value is supposed to be raised, my fix is technically not correct. AA seems ok to me, the numbers are synsem descriptions

Pollard & Sag (1994) 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.

(80) John feels tired / in a good mood.

It inherits from the subject-control-verb type (37); its lexical description is as follows:

⁶In what follows, we ignore adjectives taking complements. As noted in section 1 ref 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 type, respectively, as well as from adjective-lexeme type. In some languages, copular constructions are complex predicates, which means that the copular verb inherits the complements of the adjective as well, see Abeillé and Godard 2000. Varieties of *esse* in Romance languages, 7th HPSG proceedings, 2-22

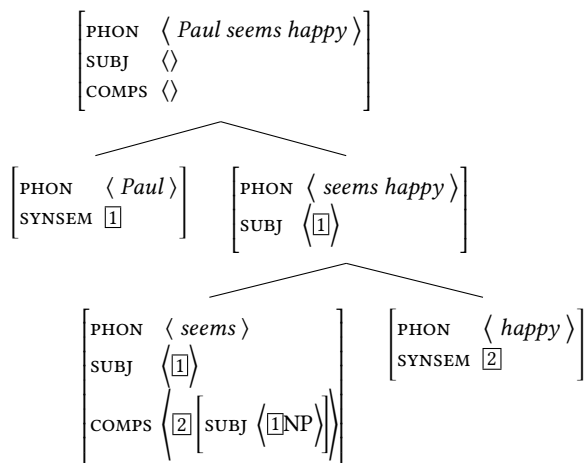


Figure 7: A sentence with an intransitive copular verb

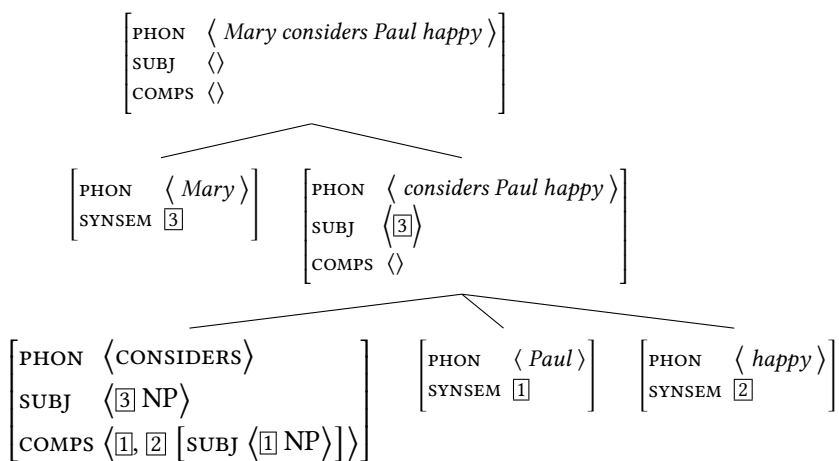
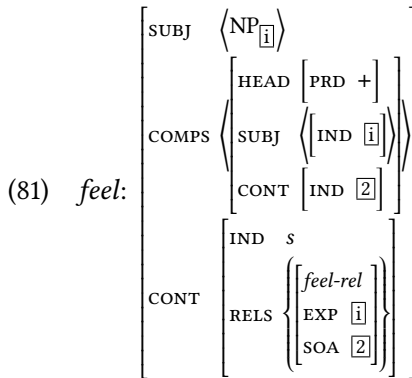


Figure 8: A sentence with a transitive copular verb



3.3 Copular verbs in Mauritian

As shown by [Henri & Laurens \(2011\)](#), Mauritian data also argue in favor of a non-clausal analysis. A copular verb takes a short form before an attributive complement, and a long form before a clausal one. Despite the lack of inflection on the embedded verb, and the possibility of subject prodrop, 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*, 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’).

- (82) 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 (*ki) mwa malad
 Mari find.SF that 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.

I edited these examples/glosses, please check. Unfold the brackets and stars?

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. 1982a), *be*, *do*, *have*, and modals (e.g., *can*, *should*) in HPSG are not considered a special part of speech (*aux*) but verbs with the head property in (83):

$$(83) \text{ auxiliary-verb} \Rightarrow \left[\text{HEAD} \left[\text{AUX} + \right] \right]$$

English auxiliaries take VP (or XP) complements and do not select their subjects, just like 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, *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 expected subject of the non-finite verb.⁷ The lexical descriptions for the auxiliaries *will* and *have* look as follows:

⁷Copular *be* is an auxiliary and a raising verb with a PRD + complement, see section below. It differs from the aspectual *be* taking a gerund-participle VP complement, which is also a raising verb, and from the identity *be* which is not a raising verb (Van Eynde 1995, MuellerPredication). A verb like *dare*, shown to be an auxiliary by its postnominal negation, is not a raising verb but a control verb:

- (i) a. I dare not be late.
 b. # It will not dare rain.

(85) *will*:

$$\left[\begin{array}{l} \text{HEAD} \left[\text{AUX} + \right] \\ \text{SUBJ} \left\langle \boxed{1} \right\rangle \\ \text{COMPS} \left\langle \text{VP} \left[\begin{array}{l} \text{HEAD} \left[\text{VFORM } bse \right] \\ \text{SUBJ} \left\langle \boxed{1} \right\rangle \\ \text{CONT} \left[\text{IND } \boxed{2} \right] \end{array} \right] \right\rangle \\ \text{CONT} \left[\begin{array}{l} \text{IND } s \\ \text{RELS} \left\{ \left[\begin{array}{l} \text{future-rel} \\ \text{ARG } \boxed{2} \end{array} \right] \right\} \end{array} \right] \end{array} \right]$$

(86) *have*:

$$\left[\begin{array}{l} \text{HEAD} \left[\text{AUX} + \right] \\ \text{SUBJ} \left\langle \boxed{1} \right\rangle \\ \text{COMPS} \left\langle \text{VP} \left[\begin{array}{l} \text{HEAD} \left[\text{VFORM } past-part \right] \\ \text{SUBJ} \left\langle \boxed{1} \right\rangle \\ \text{CONT} \left[\text{IND } \boxed{2} \right] \end{array} \right] \right\rangle \\ \text{CONT} \left[\begin{array}{l} \text{IND } s \\ \text{RELS} \left\{ \left[\begin{array}{l} perfect-rel \\ \text{ARG } \boxed{2} \end{array} \right] \right\} \end{array} \right] \end{array} \right]$$

To account for their NICE (negation, inversion, contraction, ellipsis) properties, Kim and 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 (2020a: Section 5), Chapter 10 of this volume on subject inversion, Kim (2020: Section 2.3), Chapter 18 of this volume on negation and Nykiel & Kim (2020), Chapter 19 of this volume on ellipsis.⁸

- (87) a. Is Paul working?
 b. * Keeps Paul working?
 c. Paul is (probably) not working.

⁸Copular *be* has the NICE properties (*Is John happy?*), it is an auxiliary verb with [PRD +] complement. Since *to* allows for VP ellipsis, it is also analysed as an auxiliary verb: *John promised to work and he started to*. See Gazdar, Pullum & Sag (1982b).

- 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 −].⁹

Sag et al. (2020) revised this analysis and proposed a new analysis couched in Sign-Based Construction Grammar (Sag 2012; see also Müller 2020b: Section 1.4.2, Chapter 33 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 −]:

$$(88) \text{ non-auxiliary-verb} \Rightarrow \left[\text{HEAD} \begin{bmatrix} \text{AUX} & - \\ \text{INV} & - \end{bmatrix} \right]$$

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.

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

Subject inversion is handled by a subtype of head-subject-complement phrase, which is independently needed for verb initial languages like Welsh (Borsley)[SWB2003a]. It is a specific (non-binary) construction, of which other constructions such as *polar-interrogative-clause* are subtypes, and whose head must be [INV +].

⁹See Kim & Sag (2002) for a comparison of French and English auxiliaries, 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 (2020), Chapter 11 of this volume.

$$(90) \quad \text{initial-aux-cx} \Rightarrow \left[\begin{array}{cc} \text{SUBJ} & \langle \rangle \\ \text{COMPS} & \langle \rangle \\ \text{HEAD-DTR} & \boxed{0} \left[\begin{array}{cc} \text{AUX} & + \\ \text{SUBJ} & \boxed{1} \\ \text{COMPS} & \boxed{2} \end{array} \right] \\ \text{DTRS} & \langle \boxed{0} \rangle \oplus \boxed{1} \oplus \boxed{2} \end{array} \right]$$

Most auxiliaries are lexically unspecified for the feature INV and allow for both constructions (non-inverted and inverted), while the 1st person *aren't* is obligatory inverted (lexically marked as [INV +]) and the modal *better* obligatory non-inverted (lexically marked as [INV –]):

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

While the distinction is not always easy to make between VP ellipsis and Null complement anaphora (*Paul tried*), [Sag et al.](#) observe that certain elliptical constructions are restricted to auxiliaries, for example pseudogapping (see also [\(Miller 2014\)](#)).

- (92) a. John can eat more pizza than Mary can tacos.
 b. * Ann seems to buy more bagels than Sue seems cupcakes.

As observed by [Arnold & Borsley \(2008\)](#), auxiliaries can be stranded in certain non-restrictive relative clauses such as (93a), no such possibility is open to non-auxiliary verbs (93b) ([Arnold & Godard 2020](#), Chapter 14 of this volume):

- (93) a. Kim was singing, which Lee wasn't.
 b. * Kim tried to impress Lee, which Sandy didn't try.

The HPSG analysis sketched here captures a very wide range of facts, and expresses both generalizations and lexical idiosyncrasies.

5 Conclusion

Complements of 'raising' and control verbs have been either analyzed as clauses ([Chomsky 1981](#)) or small clauses ([Stowell 1981; 1983](#)) in Mainstream Generative

Grammar. Like in LFG (Bresnan 1982), 'raising' and control predicates are analysed as taking non-clausal open complements in HPSG (Pollard & Sag 1994), with sharing or coindexing 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 ditransitive, without the need for an exceptional case marking device. This also makes correct empirical predictions for languages marking 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 semantic-based control theory predicts which predicates are subject-control and which object-control. The "subject-raising" analysis has been successfully extended to auxiliary 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

Acknowledgements

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Chapter 13

Unbounded dependencies

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Unbounded dependencies of the kind that are found in *wh*-interrogatives, relative clauses, and other constructions have been a major focus of research in HPSG. They typically involve a gap of some kind and some distinctive higher structure, often involving a filler in a non-argument position with the properties of the gap. HPSG has developed detailed proposals about the bottom of the dependency, the middle, and the top. In the case of the top of the dependency, complex hierarchies of phrase types have been employed to handle the distinctive properties of the various unbounded dependency constructions. Analyses have also been developed for unbounded dependencies with a resumptive pronoun, the special properties of *wh*-interrogatives, extraposition phenomena, and filler-gap mismatches.

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1 Introduction

Since Ross (1967) and Chomsky (1977), it has been clear that many languages have a variety of constructions involving an unbounded (or long distance) dependency (henceforth UD). *Wh*-interrogatives and relative clauses are important examples, but, as we will see, there are many others. Typically these constructions contain a gap (in the sense that a dependent is missing) and some distinctive higher structure, and neither can appear without the other. The following illustrate:

- (1) a. What did you put _ on the table?

- b. * You put _ on the table?
- c. * What did you put it on the table?

In (1a) there is a gap (indicated by the underscore) in object position and the distinctive higher structure involves the interrogative pronoun *what* and the pre-subject auxiliary *did*. (1b), where the gap is present but not the distinctive higher structure, is ungrammatical, as is (1c), where the distinctive higher structure appears but not the gap. The interrogative pronoun *what* in (1a) is known as a filler, a constituent in a non-argument position with the properties of the gap. But the distinctive higher structure does not always include a filler. English relative clauses may or may not have a filler.

- (2) the book [(which) you put _ on the table]

As we will see below, there are also UD constructions which never have a filler. When there is a filler in a UD construction, it normally has all the properties of the associated gap. Thus, in the following, filler and the gap are of the same category:

- (3) a. [NP Who] did Kim talk to _ (NP)?
- b. [PP To whom] did Kim talk _ (PP)?
- c. [AP How long] is a piece of string _ (AP)?
- d. [AdvP How quickly] did you do it _ (AdvP)?

They typically match in other respects as well. For example, if they are nominal, they match in number, as the following illustrate:

- (4) a. [NP_[sg] Which student] do you think _ (NP_[sg]) knows the answer?
- b. [NP_[pl] Which students] do you think _ (NP_[pl]) know the answer?

In languages with grammatical gender or morphological case, they also share these properties. In addition to syntactic properties, unbounded dependencies also establish matching of semantic properties: i.e., in (1), the filler *what* is understood to fill an argument role of *put*, just as an in situ complement would. The term “unbounded” is used here because the gap and the distinctive higher structure with which it is associated can be indefinitely far apart. The following illustrate:

- (5) a. What does she regret that she put _ on the table?
- b. What did she say she regrets that she put _ on the table?