

Chapter 13

Control and Raising

Anne Abeillé

Université de Paris

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1 Introduction

The distinction between raising and control predicates has been a hallmark of syntactic theory since Postal (1974). Contrary to transformational analyses, HPSG treats the difference as mainly a semantic one: raising verbs (*seem*, *begin*, *start*) do not semantically select their subject (or object) nor assign them a semantic role, while control verbs (*want*, *promise*, *try*) semantically select all their syntactic arguments. On the syntactic side, raising verbs share their subject (or object) with the subject of their non-finite complement while control verbs only coindex them. The distinction is also relevant for non-verbal predicates such as adjectives (*likely* vs *eager*). We will see how the raising analysis naturally extends to copular constructions (*become*, *expect*) and auxiliary verbs.

2 The distinction between control and raising predicates

2.1 Obligatory and arbitrary control

Verbs taking non-finite complements usually determine the interpretation of the missing subject of the non-finite verb. With *promise*, the subject is understood as the subject of the infinitive, while with *permit* it is the object, as shown by the reflexives. In (1a) the controller is the main verb subject, while it is the object in (1b).



- (1) a. John promised Mary to buy himself / * herself a coat.
- b. John permitted Mary to buy herself / * himself a coat.
- c. Buying a coat can be expensive.

This is “obligatory” control, or “equi”, while other constructions in which the missing subject remains vague (1c) are called “arbitrary” control (Bresnan 1982). Verbs taking such non-finite complements may also take nominal or sentential complements. For a discussion whether constructions such as (1a), (1b) involve some form of sentential complement or a VP, see below.

- (2) John promised Mary a book / that she will be rewarded.

2.2 Control verbs and semantic classes

Following Pollard & Sag (1992) (see also Jackendoff & Culicover 2003), the choice of the controller is determined by the semantic class of the verb. Verbs of influence (*permit*, *forbid*) are object-control while verbs of commitment (*promise*, *try*) as in (3a) and orientation (*want*, *hate*) as in (3b) are subject-control, as shown by the reflexive in the following examples:

- (3) 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.

- (4) 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.’

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

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

2.3 Raising constructions

Another type of verbs also takes a non-finite complement and identifies its subject (or its object) with the missing subject of the non-finite verb. Since Postal (1974), they are called 'raising' verbs. Verbs like *seem* (6a) are subject-raising, while causative and perception verbs like *expect* (6b) are object-raising.

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

A number of syntactic and semantic tests show how they differ for subject-control and object-control verbs, respectively. As observed by Jacobson (1990), control verbs may allow for a null complement, or a non-verbal complement, while raising verbs may not (but *She just started* is fine):

- (7) a. Leslie wants this / a raise.
- b. Leslie tried.
- c. * Leslie seemed.
- d. * Leslie seemed this.

Different tests show that the subject (or the object) of a raising verb is only selected by the non finite verb. Let us first consider non-referential subjects: meteorological *it* is selected by predicates such as *rain*. It can be the subject of *start*, *seem*, but not of *try*, *want*. It can be the object of *expect*, *believe* but not of *force*, *persuade*.

- (8) a. It rains.
- b. It seems/started to rain.
- c. We expect it to rain tomorrow.
- (9) a. * It wants/tries to rain.
- b. * The sorcier forced it to rain.

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.

- (10) 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)

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:

- (11) a. John started to like himself.
- b. John let Mary buy herself / * himself a coat.

2.4 The problems with a “raising” analysis

Transformational analyses posit two distinct “deep structures”: 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). They also posit three distinct rules: a movement rule for “raising” the subject of *seem* verbs (the embedded clause’s subject move to the position of matrix verb subject); an exceptional case marking (ECM) rule for assigning case to the embedded clause’s subject of *expect* verbs); a co-indexing rule between the empty subject (PRO) of the infinitive and the subject (*promise*) or the object (*persuade*) of the matrix verb for control verbs. In this approach, both control and raising verbs have a sentential complement, but while the embedded subject is a PRO with control verbs, it is the trace left by “raising” of a full NP with raising verbs:

- (12) a. subject-raising:
 $[_{NP} e] \text{ seems } [_{S} \text{ John to leave }] \rightsquigarrow [_{NP} \text{ John}_i] \text{ seems } [_{S} e_i \text{ to leave }]$
- b. subject-control: $[_{NP} \text{ John}_i] \text{ wants } [_{S} \text{ PRO}_i \text{ to leave }]$
- (13) a. object-raising (ECM): We expected $[_{S} \text{ John to leave }]$
- b. object-control: We persuaded $[_{NP} \text{ John}_i] [_{S} \text{ PRO}_i \text{ to leave }]$

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) but the other subject-raising verbs (aspectual and modal verbs) do not.

- (14) a. Paul seems to understand.
b. It seems [that Paul understands].

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

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

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

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

Even when a finite sentential complement is attested with a raising verb, it is not the same structure 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 (16a) and only one in (16b).

- (18) a. We expected [to understand] [all those who attended the class].
b. * 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:

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

Furthermore, if the subject of the non-finite verb is supposed to raise to receive case from the matrix verb, we expect it to be nominative. But the subject of *seem* or *start* need not be in the nominative since it can be a verbal subject.

- (20) [Drinking one liter of water each day] seems to benefit your health.

Data from languages with “quirky” case such as Icelandic, also show this prediction not to be borne out. Subjects of raising verbs in fact keep the quirky case assigned by the embedded verb in Icelandic ([Zaenen et al. 1985](#)), contrary to the

subject of subject control verbs which are 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 (26).

- (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, 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 (23).

- (22) a. We expect him to understand.
 b. We persuaded him to work on this.
 (23) 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 is motivated by semantic considerations: an NP which receives a semantic role from a verb should be a syntactic argument of this verb. But it leads to syntactic structures which are not motivated and/or make wrong empirical predictions.

3 An HPSG analysis

3.1 Coindexing or full sharing?

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 their syntactic arguments. 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 supposes identity of semantic indices (discourse referents) while raising means identity of *synsems*. Co-indexing is compatible with the controller and the controlled subject not bearing the same case (26) or having different parts of speech (24). 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.

(24) Paul appealed [to Mary] to stay.

Subject-raising-verbs (and object-raising verbs) can be defined as subtypes inheriting from verb-lexeme and subject-raising- (or object raising-) lexeme types.

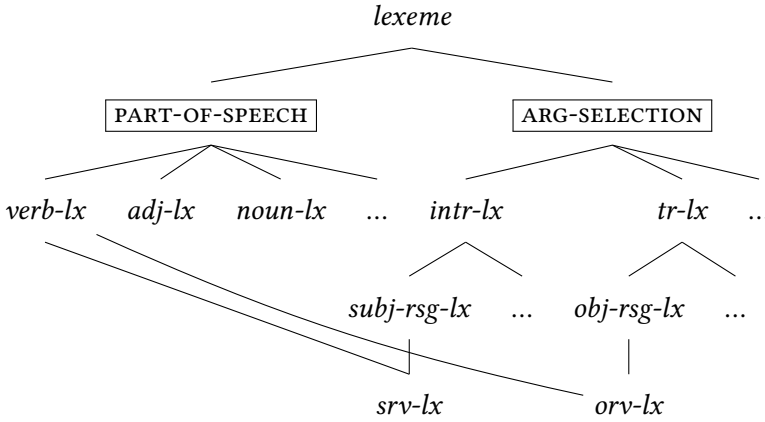


Figure 1: A type hierarchy for subject- and object-raising verbs

As in Abeillé & Borsley (2020), 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*, *orv-lx* and *srv-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:¹

$$(25) \quad \textit{subj-rsg-lx} \Rightarrow \left[\text{ARG-ST} \left\langle \left[\text{I}, \left[\text{SUBJ} \left\langle \left[\text{I} \right] \right] \right] \right] \right\rangle \right]$$

¹The category of the complement is not specified as a VP since the same lexical types will also be used for copular verbs that take non-verbal predicative complements, see Section 4.

$$(26) \text{ obj-rsg-lx} \Rightarrow \left[\text{ARG-ST} \left\langle \left[\underline{0}, \underline{1} \right], \left[\text{SUBJ} \left\langle \left[\underline{1} \right] \right\rangle \right] \right\rangle \right]$$

Similarly, for control verbs, *subject-cont-lx* and *object-cont-lx* types can be defined as follows:

$$(27) \text{ subj-cont-lx} \Rightarrow \left[\text{ARG-ST} \left\langle \text{NP}_{\underline{1}}, \left[\text{SUBJ} \left\langle \left[\text{IND } \underline{1} \right] \right\rangle \right] \right\rangle \right]$$

$$(28) \text{ obj-cont-lx} \Rightarrow \left[\text{ARG-ST} \left\langle \left[\underline{0}, \underline{1} \right], \left[\text{IND } \underline{i} \right], \left[\text{SUBJ} \left\langle \left[\text{IND } \underline{i} \right] \right\rangle \right] \right\rangle \right]$$

Thus a subject-raising verb (*seem*) and a subject-control verb (*want*) inherit from *subj-rsg-v* and *subj-cont-v* respectively; their entries look as follows:

$$(29) \text{ seem:} \left[\begin{array}{l} \text{SUBJ} \left\langle \left[\underline{1} \right] \right\rangle \\ \text{COMPS} \left\langle \text{VP} \left[\begin{array}{l} \text{HEAD} \left[\text{VFORM } \textit{inf} \right] \\ \text{SUBJ} \left\langle \left[\underline{1} \right] \right\rangle \\ \text{CONT} \left[\text{IND } \underline{2} \right] \end{array} \right] \right\rangle \\ \text{CONT} \left[\begin{array}{l} \text{IND } s \\ \text{RELS} \left\{ \left[\textit{seem-rel} \right] \right\} \right. \\ \left. \left[\text{ARG } \underline{2} \right] \right] \end{array} \right]$$

$$(30) \text{ want:} \left[\begin{array}{l} \text{SUBJ} \left\langle \text{NP}_{\underline{1}} \right\rangle \\ \text{COMPS} \left\langle \text{VP} \left[\begin{array}{l} \text{HEAD} \left[\text{VFORM } \textit{inf} \right] \\ \text{SUBJ} \left\langle \left[\text{IND } \underline{i} \right] \right\rangle \\ \text{CONT} \left[\text{IND } \underline{2} \right] \end{array} \right] \right\rangle \\ \text{CONT} \left[\begin{array}{l} \text{IND } s \\ \text{RELS} \left\{ \left[\textit{want-rel} \right] \right\} \right. \\ \left. \left[\begin{array}{l} \text{EXP } \underline{1} \\ \text{ARG } \underline{2} \end{array} \right] \right] \end{array} \right]$$

The corresponding simplified trees are as follows. Notice that the syntactic structures are the same.

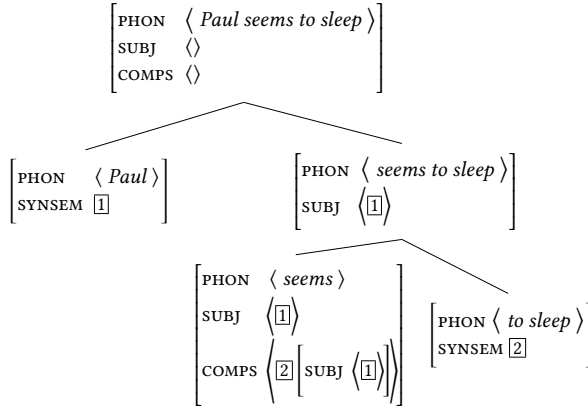


Figure 2: A sentence with a subject-raising verb

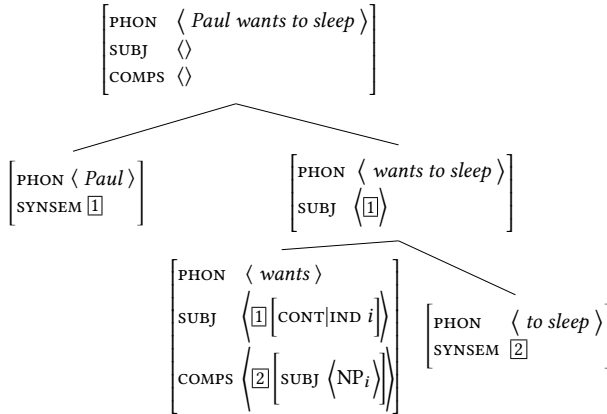


Figure 3: A sentence with a subject-control verb

An object-raising verb (*expect*) and an object-control verb (*persuade*) inherit from *obj-rsg-v* and *obj-cont-v* respectively. Their lexical entries look as follows:

(31) *expect*:

$$\left[\begin{array}{l} \text{SUBJ} \left\langle \text{NP}_{\boxed{i}} \right\rangle \\ \text{COMPS} \left\langle \boxed{3}, \text{VP} \left[\begin{array}{l} \text{HEAD} \left[\text{VFORM} \text{ inf} \right] \\ \text{SUBJ} \left\langle \boxed{3} \right\rangle \\ \text{CONT} \left[\text{IND} \boxed{2} \right] \end{array} \right] \right\rangle \\ \text{CONT} \left[\begin{array}{l} \text{IND} \text{ s} \\ \text{RELS} \left\{ \begin{array}{l} \left[\text{expect-rel} \right] \\ \text{ARG} \boxed{i} \\ \text{ARG} \boxed{2} \end{array} \right\} \end{array} \right] \end{array} \right]$$

(32) *persuade*:

$$\left[\begin{array}{l} \text{SUBJ} \left\langle \text{NP}_{\boxed{i}} \right\rangle \\ \text{COMPS} \left\langle \text{NP}_{\boxed{j}}, \text{VP} \left[\begin{array}{l} \text{HEAD} \left[\text{VFORM} \text{ inf} \right] \\ \text{SUBJ} \left\langle \left[\text{IND} \boxed{j} \right] \right\rangle \\ \text{CONT} \left[\text{IND} \boxed{2} \right] \end{array} \right] \right\rangle \\ \text{CONT} \left[\begin{array}{l} \text{IND} \text{ s} \\ \text{RELS} \left\{ \begin{array}{l} \left[\text{persuade-rel} \right] \\ \text{AGENT} \boxed{i} \\ \text{ARG} \boxed{j} \\ \text{ARG} \boxed{2} \end{array} \right\} \end{array} \right] \end{array} \right]$$

The corresponding trees are given in Figure 4 and 5. Notice that the syntactic structures are the same.

Sag & Pollard (1991) propose a semantic-based control theory. The semantic class of the verb determines whether it is subject-control or object-control: verbs of comitment and verbs of influence have a semantic content such as the following, with SOA meaning state-of-affairs and denoting the content of the non-finite complement:

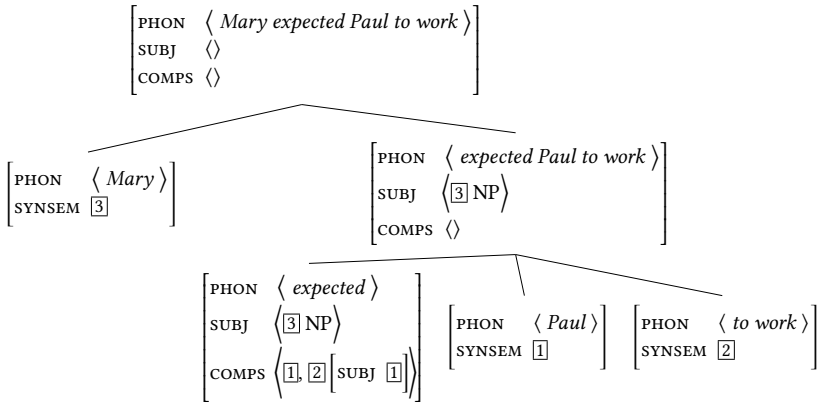


Figure 4: A sentence with an object-raising verb

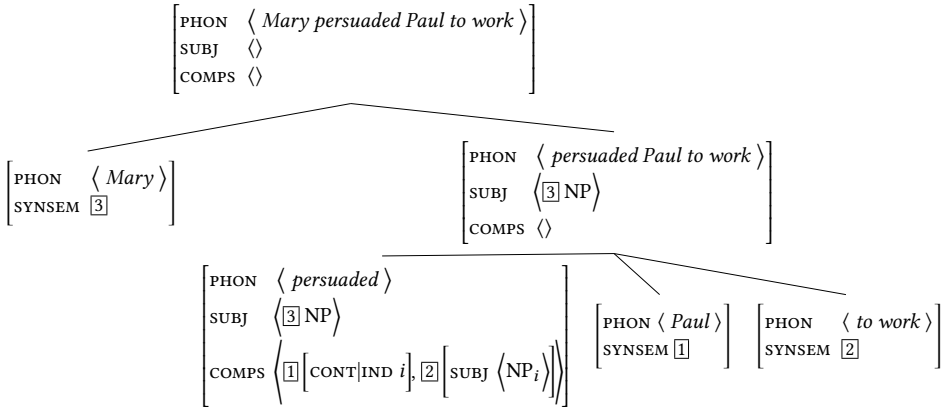
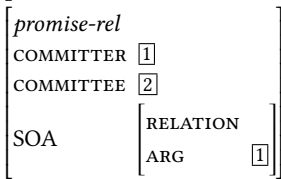


Figure 5: A sentence with an object-control verb

(33) *promise*:

- (34) *persuade*:
- | | | | | | |
|--|---|----------|-----|-----|-----|
| <i>persuade-rel</i>
INFLUENCER [1]
INFLUENCED [2]

SOA | <table style="border-collapse: collapse; width: 100%;"> <tr> <td style="border-right: 1px solid black; padding-right: 5px; vertical-align: top;">RELATION</td> <td style="padding-left: 5px; vertical-align: top;">[2]</td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 5px; vertical-align: top;">ARG</td> <td style="padding-left: 5px; vertical-align: top;">[2]</td> </tr> </table> | RELATION | [2] | ARG | [2] |
| RELATION | [2] | | | | |
| ARG | [2] | | | | |

To account for Visser's generalization (object-control verbs passivize while subject-control verbs do not), Sag & Pollard (1991) analyse the missing subject of the infinitive as a reflexive, which must be bound by the controller. According to Binding Theory (see Müller & Branco 2020, Chapter 21 of this volume), the controller must be less oblique than the reflexive, hence less oblique than the controlled complement which contains the reflexive: the controller can be the subject and the VP a complement as in (35a); it can be the first complement when the VP is the second complement as in (35b), but it cannot be a *by*-phrase, which is more oblique than the VP complement, as in (35c).

- (35) a. Kim was persuaded to leave (by Lee).
 b. Lee persuaded Kim to leave.
 c. *Kim was promised to leave (by Lee).

Thus, the ungrammaticality of (35c) is predicted by the Binding Theory (*Lee* should not be bound according to principle C, and the subject of *leave* should be bound according to principle A).

Turning now to raising verbs, they exhibit some kind of mismatch between syntactic arguments and semantic arguments: the raising verb has a subject or an object which is not one of its semantic arguments (it 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.

- (36) 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 accounts for the fact that most raising verbs cannot have a null complement, nor a non-verbal 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.

- (37) a. *John seems.

- b. * John seems this.
- c. John tried.
- d. John tried this.

3.2 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. Verbs marking aspect or modality (*continue*, *stop*) are subject-raising verbs and causative and perception verbs are object-raising. Raising verbs differ from TMA markers by different properties: they are preceded by the negation, which follows TMA; they can be coordinated unlike TMA (Henri & Laurens 2011: 209):

- (38) 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’:

- (39) 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. The following list of examples provides pairs of short and long forms respectively:

- (40) 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.²

- (41) 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.’
 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):

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

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

- (43) 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.

²yer ‘yesterday’ is an adjunct. See Hassamal (2017) for an analysis of Mauritian adverbs which treats as complements those triggering the verb short form.

- (44) 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.’

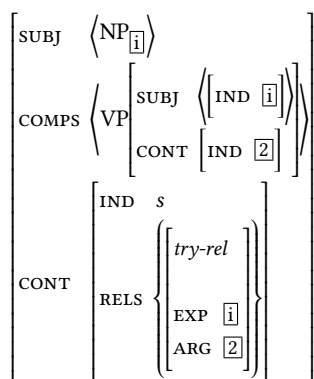
The same is true with object-control and object-raising verbs:

- (45) 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 and have the following lexical entries (Henri & Laurens use SBCG, we adapt their analyses to the feature geometry of Constructional HPSG (Sag 1997) assumed in this volume):

- (46) *kontign* ‘continue’:
- $$\left[\begin{array}{l} \text{SUBJ} \left\langle \boxed{1} \right\rangle \\ \text{COMPS} \left\langle \text{VP} \left[\begin{array}{l} \text{SUBJ} \left\langle \boxed{1} \right\rangle \\ \text{CONT} \left[\text{IND} \boxed{2} \right] \end{array} \right] \right\rangle \\ \text{CONT} \left[\begin{array}{l} \text{IND} \quad s \\ \text{RELS} \left\{ \left[\begin{array}{l} \text{continue-rel} \\ \text{ARG} \boxed{2} \end{array} \right] \right\} \end{array} \right] \end{array} \right]$$

- (47) *sey* ‘try’:



3.3 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):

- (48) 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 21 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:

See Chapter on linking for the two verbal types?

- (49) 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 down-stairs 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'.

- (50) a. Tiang majanji maang Nyoman pipis. (W & A 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':

- (51) a. Ngenah ia mobog. (W & A 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.

- (52) a. Ngenah sajan [ci ngengkebang kapelihan-ne]. (W & A ex 9)
 seem much 2 AV.hide mistake-3POSS
 ‘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:

- (53) a. Ngenah sajan [kapelihan-ne engkebang ci]. (W & A ex 8)
 seem much mistake-3POSS ov.hide 2
 ‘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.

- (54) a. Nyoman Santosa tawang tiang mulih. (W & A ex 22)
 Nyoman Santosa ov.know 1 go.home
 ‘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.

3.4 XARG and the control of some saturated complements

As noted by Farkas (1988), in certain 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).

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

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. This is why KaySag2009 and Sag2010-check 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. Under such an analysis, the entry for *pans* ‘think’ looks like the following. The VP complement must have an XARG coindexed with the subject of *pans* ‘think’ but it can have a clausal complement (and an empty SUBJ list) or a VP complement (and a non-empty SUBJ list).

- (56) *pans* ‘think’:
- $$\left[\begin{array}{l} \text{SUBJ} \left\langle \text{NP}_{\boxed{1}} \right\rangle \\ \text{COMPS} \left\langle \text{VP} \left[\begin{array}{l} \text{HEAD} \left[\text{XARG} \left[\text{IND} \boxed{1} \right] \right] \right] \right. \right. \\ \quad \left. \left. \begin{array}{l} \text{MARKING} \textit{pou} \\ \text{CONT} \left[\text{IND} \boxed{2} \right] \end{array} \right] \right\rangle \\ \text{CONT} \left[\begin{array}{l} \text{IND} \textit{s} \\ \text{RELS} \left\{ \left[\begin{array}{l} \textit{think-rel} \\ \text{ARG} \boxed{1} \\ \text{ARG} \boxed{2} \end{array} \right] \right\} \end{array} \right] \end{array} \right]$$

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

- (57) a. John lost his / * her temper.

- b. Mary lost * his / her temper.

4 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 1), 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.

- (58) a. A storm / [That it rains] seems likely.
 b. This trip / * [That he comes] seems expensive.
- (59) a. I consider a storm likely / likely [that it rains].
 b. I consider this trip expensive/ * expensive [that he comes].

In English, copular *be* also has the properties of an auxiliary, see Section 4.2.

4.1 The pro and cons of a clausal 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 (60) or stays in its subject position and receives accusative case from the matrix verb via so-called Exceptional Case Marking (ECM) (61).

- (60) [NP e] be [S John sick] \rightsquigarrow [NP John] is [S e_i sick]
 (61) We consider [S 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 Borsley on Arabic), among others.

provide
reference

provide
reference

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

(French)

give language in brackets:
 is this French?

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 (63c) but more often ungrammatical:

- (63) 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 (64a).

- (64) 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 (page 113):

- (65) a. We would consider [acceptable] [any candidate who supports the proposed amendment].
 b. 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:

- (66) 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 (67), *get* selects a predicative adjective or a preposition (68), but not a predicative nominal, while *prove* selects a predicative noun or adjective but not a preposition (69).

Who is
cited here?
Make a
footnote

- (67) a. I expect that man (to be) dead by tomorrow. (p. 103)
b. I expect that island *(to be) off the route.
c. I expect that island *(to be) a good vacation spot.

(68) John got political / * a success. (p. 105)

- (69) a. Tracy proved the theorem (to be) false. (p. 100)
b. I proved the weapon *(to be) in his possession. (p. 101)

4.2 An HPSG analysis of copular verbs

Copular verbs such as *be* or *consider* may be analysed as subtypes of subject-raising and object-raising verbs respectively. 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. 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. The structure of (transitive) verbs that take a predicative complement is as follows:

(70) NP V NP AP_{PRD+}/NP_{PRD+}/PP_{PRD+}

For more details, see Pollard & Sag (1994) and Van Eynde (2015). The lexical entries for predicative (subject-raising) *seem* and predicative (object-raising) *consider* inherit from the *subject-raising-v* type and *object-raising-v* type respectively, and are as follows:

(71) *seem*:

fix these
lexical
items.
Raise ev-
erything?
Use ap-
pend for
consider.
Should
this be
ARG-ST?

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

(72) *consider:*

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

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 (58) 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 a non-empty SUBJ feature: it subcategorizes for a nominal subject and assigns a semantic role to it, as shown in (73).

(73) *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 6 and 7, the SUBJ feature of *happy* is shared with the SUBJ feature of *seem* and the first element of the COMPS list of *consider*.

fix figures. Is [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.

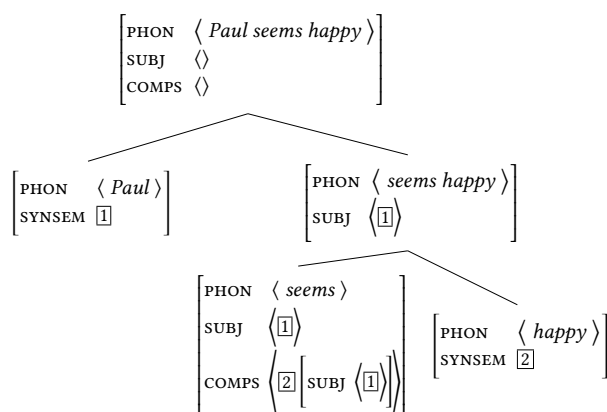


Figure 6: A sentence with an intransitive copular verb

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.

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

It inherits from the subject-control-type; its lexical entry is as follows:

(75) *feel*:

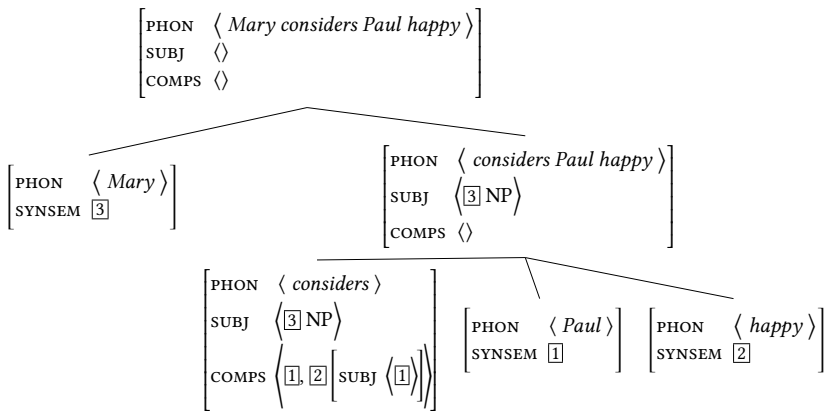
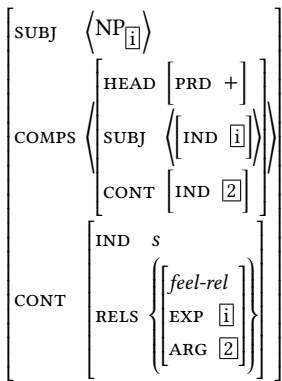


Figure 7: A sentence with a transitive copular verb



4.3 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 is a strong pronoun (*mwa* ‘me’, *twa* ‘you’).

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

- (76) 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. 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.”

4.4 Control and raising adjectives

Adjectives taking a non-finite complement can themselves be divided between subject-raising and subject-control adjectives. 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*.

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

Like control and raising verbs, both types of adjectives take a non-saturated VP complement; the subject of *likely* shares its SYNSEM value with the expected subject of that VP complement, while the subject of *eager* is coindexed with it. Such adjectives thus inherit from subj-rsg-lexeme and subj-control-lexeme type, respectively, as well as from adjective-lexeme type.

5 Auxiliaries as raising verbs

Following pioneering work in GPSG (Gazdar et al. 1982), *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 (78):

$$(78) \left[\text{HEAD} \left[\text{AUX} + \right] \right]$$

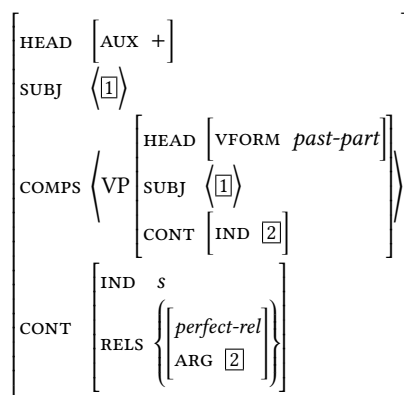
Auxiliaries take VP complements and do not select their subjects, just like subject-raising verbs. They are thus compatible with non-referential subjects, such as meteorological *it* and existential *there*. They select the verb form of their non-finite complements: *have* selects a past participle, *be* a gerund, *can* and *will* a bare form.

- (79) 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 complement and share their subject with the expected subject of the non-finite verb. The entries for the auxiliaries *will* and *have* look as follows:

$$(80) \text{ will: } \left[\begin{array}{l} \text{HEAD} \left[\text{AUX} + \right] \\ \text{SUBJ} \left\langle \boxed{1} \right\rangle \\ \text{COMPS} \left\langle \text{VP} \left[\begin{array}{l} \text{HEAD} \left[\text{VFORM } bse \right] \\ \text{SUBJ} \left\langle \boxed{1} \right\rangle \\ \text{CONT} \left[\text{IND } \boxed{2} \right] \end{array} \right] \right\rangle \\ \text{CONT} \left[\begin{array}{l} \text{IND } s \\ \text{RELS} \left\{ \left[\begin{array}{l} \text{future-rel} \\ \text{ARG } \boxed{2} \end{array} \right] \right\} \end{array} \right] \end{array} \right]$$

$$(81) \text{ have:}$$



To account for their NICE (negation, inversion, contraction, ellipsis) properties, Pollard and Sag use a binary head feature *AUX*, so that only [*AUX* +] verbs may allow for subject inversion (82a), sentential negation (82c), contraction or VP ellipsis (82e). See Müller (2020a: Section 5), Chapter 10 of this volume on subject inversion, Kim (2020: Section 2.3), Chapter 19 of this volume on negation and Nykiel & Kim (2020), Chapter 20 of this volume on ellipsis.³

- (82) 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* −].⁴

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 34 of this volume). The descriptions used below were translated into the feature geometry of Constructional HPSG (Sag 1997), which is used

³Copular *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*.

⁴See Kim & Sag (2002) for a comparison of French and English auxiliaires, 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 12 of this volume.

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 $[AUX -]$:

$$(83) \text{ non-auxiliary-verb} \Rightarrow \left[\text{HEAD} \begin{bmatrix} \text{AUX} & - \\ \text{INV} & - \end{bmatrix} \right]$$

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.

- (84) 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 specific (non-binary) construction, of which other constructions such as *polar-interrogative-clause* are subtypes, and whose head must be $[INV +]$.

$$(85) \text{ initial-aux-cx} \Rightarrow \left[\begin{array}{ll} \text{SUBJ} & \langle \rangle \\ \text{COMPS} & \langle \rangle \\ \text{HEAD-DTR} & \boxed{0} \begin{bmatrix} \text{AUX} & + \\ \text{SUBJ} & \boxed{1} \\ \text{COMPS} & \boxed{2} \end{bmatrix} \\ \text{DTRS} & \langle \boxed{0} \oplus \boxed{1} \oplus \boxed{2} \rangle \end{array} \right]$$

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 $[INV -]$):

- (86) 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 (Miller & Hemforth 2014).

- (87) 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 (88a), no such possibility is afforded to non-auxiliary verbs (88b):

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

Such an analysis captures a very wide range of facts, and expresses both generalizations and lexical idiosyncrasies.

6 Conclusion

Complements of raising and control verbs have been either analyzed as clauses (Chomsky 1981) or small clauses (Stowell 1981; Stowell 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). 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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