

# A constructional account of English small and nonfinite clauses

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**Kim, Jong-Bok and Rui P. Chaves. 2020. A constructional account of English small and nonfinite clauses.** *Linguistic Research* 37(3): 389–438. The proper treatment of so-called Small Clauses (SC) including nonfinite clauses has been rather controversial in theories of English grammar. There are arguments for – as well as arguments against – the postulation of SCs, and multiple analytical alternatives thereof. Drawing from Pollard and Sag (1994) and Culicover and Jackendoff (2005), we argue that only a small set of English verbs allow SC complements, and that there is a large family of constructions where [NP Predicate] sequences form a constituent. We depart from the latter, however, in including in this set of constructions gerundive phrases, absolute constructions, and – most notably – subject-auxiliary inversion constructions and SCs. We formalize a general account of these families of constructions in HPSG (Head-Driven Phrase Structure Grammar). (Kyung Hee University · University at Buffalo)

**Keywords** small clause, nonfinite, construction-based, Subject-Aux Inversion, predicative, absolute, gerundive, HPSG

## 1. Introduction

Verbs like *consider*, *prove*, and *imagine* have traditionally been taken to select as complements a constituent made up of a subject and a predicate including a non-finite verb, as in (1). See for example Haegeman and Gueron (1999: 111f), and many others since.

- (1) a. Kim considered [<sub>SC</sub> [Pat] [a good friend]].  
b. Kim proved [<sub>SC</sub> [the theorem] [false]].  
c. Kim saw [<sub>SC</sub> [Fred] [leaving]].  
d. Kim believes [<sub>SC</sub> [Mary] [to be alive]].

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\* We thank two anonymous reviewers of the journal for the constructive comments and suggestions. The usual disclaimer applies here.

There are two major issues at stake. First, there is the matter of whether there are empirical and theory-independent means for determining if the bracketed structures in (1) truly form constituents or not. In this work we argue that English licenses such nonfinite sentential constituents, and further that Pollard and Sag (1994: 111, 131-132) and Culicover and Jackendoff (2005: 132-135) are correct in proposing that such structures form constituents in only a limited set of constructions, and only in a very restricted set of verbs, of the *imagine* type (e.g., *visualize*, *conceive*, etc.), but not for the *consider*-type of verbs (*judge*, *find*, etc.).

The second issue is to establish how best to analyze such clausal constituents. A particularly widespread analysis assumes that the bracketed constituents in (1) are clausal in nature, usually dubbed as Small Clauses (SC). In this paper, we critically review the arguments for and against the existence of SCs, and argue that there is good empirical evidence for them, though in a much narrower environment than the literature has assumed. Our claim is that such constructions are a special case of a broader class of clause types, and offer a construction-based analysis of these and other types of non-finite clauses.

This paper is structured as follows. In Section 2 we provide a brief overview of the history of the SC analysis, and its controversies. Section 3 discusses various arguments for the SC analysis, and their strengths and weaknesses. Next, Section 4 discusses various standard arguments against the SC analysis, and provides various counter-arguments. Section 5 provides empirical evidence that there is a family of SC constructions of various types. It suggests that the most straightforward account of the various constructions is one that recognizes the existence of constructional families, as does HPSG and other types of construction-based grammar. In Section 6 we formalize such an account, and in Section 7 we conclude the paper.

## 2. Background

The Small Clause (SC) analysis is motivated by the Projection Principle, since the latter requires that all mappings between levels of linguistic representation be homomorphic with respect to argument structure (Chomsky 1981). For example,

the verb *consider* logically requires two arguments and this property is kept intact in all levels of representations, including syntax, in the analysis in (1). However, Stowell (1981, 1991) noted that such assumptions about isomorphism are fragile once a wider range of data is considered, as in (2). In these examples, the PP or AP is not licensed as the predicate of the assumed SC.

- (2) a. \*I consider [John [off my ship]].  
 b. \*I proved [the weapon [in his possession]].  
 c. \*I feared [John [unfriendly]].  
 d. \*I expect [that man [stupid]].

This is not by any means an idiosyncratic pattern. Many other verbs exhibit similar partially overlapping distributions, as illustrated in (3) and (4).

- (3) a. Robin seemed (to be) [happy] / [near the house].  
 b. Robin continued \*(to be) [happy] / [near the house].  
 c. Robin remained \*(to be) [happy] / [near the house].  
 (4) a. Robin considered her (to be) [a friend].  
 b. Robin expected her \*(to be) [a friend].  
 c. Robin called her \*(to be) [a friend].

Such data suggest that syntactic properties play an important role in SC c-selection (categorial selection), and that main verbs like *consider* can apparently impose c-selectional constraints on the embedded predicate.<sup>1</sup>

Similarly, as noted by Kitagawa (1985), Hornstein and Lightfoot (1987), Pollard and Sag (1994), and many others, there is evidence that s-selection (semantic selection) also plays a fundamental role in the licensing of such structures. For example, sentences like (2a), cited by Stowell (1981: 259) as evidence supporting his analysis, become impeccable provided an adequate supporting context, as shown in (5).

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1 For the discussion of c-selection and s-selection, refer to Grimshaw (1979), showing that both c-selection (subsumed by subcategorization) and s-selection are autonomous subsystems of grammar.

- (5) a. I consider John off my ship as soon as he sets foot on the gangway.  
(Hornstein and Lightfoot 1987)  
b. Unfortunately, our pilot considers that island off the route.  
(Kitagawa 1985)

Another example is provided by Pollard and Sag (1994: 103, ft.3), who argue that (6a) becomes more acceptable in certain contexts. Suppose that the manager of a cruise ship company suddenly discovers that a coup d'état is about to take place on an island that is currently on the route of the company's premier cruise ship. In such a situation, it would be perfectly acceptable for the captain to utter (6b):

- (6) a.\* I expect that island off the route.  
b. I expect that ship off the route by tomorrow.

Pollard and Sag (1994: 103, ft.3) also suggest that the oddness of cases like (7a) is due to the semantics of *consider*. The sentence involves a judgement that a certain state of affairs holds at the moment of considering, which necessarily conflicts with the semantics of *tomorrow*. We thus find acceptable examples like (7b) with no such semantic conflict.

- (7) a.\* The doctor considers that patient dead tomorrow.  
b. The doctor considers that patient cured.

Kitagawa (1985) proposes that such sentences involve no categorial selection and can be explained in terms of semantic constraints, an analysis that is compatible with the widely accepted IP analysis for SCs (see Hornstein and Lightfoot (1987) and Radford (1988)). Whereas *consider* selects a complement expressing a state of affairs, the verb *expect* selects a complement describing a change of state. Further evidence for the role of semantics comes from verbs like *expect*, which resist SC = [NP NP] complements as shown in (8).

- (8) a. I consider/\*expect [that island] [a good vacation spot].  
b. I consider/expect [that island] [to be a good vacation spot].

But as Pollard and Sag (1994: 103) show, this position is not tenable. If *expect* selects a complement describing a change of state, then nothing explains why (9a) is bad, given that (9b) is good. Rather, the evidence suggests that the distribution of SC constituents is not purely semantic and is at least in part syntactically restricted by the main verb.

- (9) a.\* I expect that island a good vacation spot.  
 b. I expect that island to be a good vacation spot

As implied by the previous discussion, the status and structure of SCs still remains an unresolved issue within most theories of grammar, including the Principles and Parameters and the Minimalist Program. In an IP analysis of such constituents, the absence of a VP predicate is a mystery, and is usually dealt with via non-trivial stipulations. For example, Hornstein and Lightfoot (1987: 28) stipulate that if INFL is [+/- tense], the complement must be a VP; if INFL is empty ( $I_0$ ) then the complement may be NP, PP or AP but not VP. In other words, in an  $IP_0$  'Small Clause' complement the sister of the head  $I_0$  may only be an AP, PP or NP. Conversely, the head of a normal IP clause can only be a sister of a VP. These stipulations offer no account for why the distribution of the relevant categories is the way it is. Hornstein and Lightfoot propose an internal structure for null IP's which is different from that of other clausal constituents, without offering a principled reason for why this should be so. As Aarts (1992: 179) argues, positing a null INFL node is also empirically problematic. Ordinary clauses contain an INFL constituent carrying tense and agreement, whereas SCs do not, so it follows that SCs may not contain verbs marked for tense and agreement. Hence, additional machinery is needed to account for the fact that there is agreement between subjects and predicates.

Aarts (1992: 185) proposes that IP contains a null verb and copula, and introduces a special type of government (indirect government) in order to stipulate that the accusative case is assigned to the subject. Because the INFL node is *-tense*, it does not assign Case. Further stipulations are needed, however, in order to prevent these null elements from occurring elsewhere in English, as seen in (10). The grammar must somehow prohibit null copulas in such environments.

- (10) a. Robin considers/\*wants [Kim ~~to be~~ his friend].  
       b.\* Robin considers/wants [Kim to be his friend].  
       c.\* Robin considers/wants [Kim to be a genius].  
       d.\* Robin considers Kim to have overreached.

We note that another problem for null copula accounts is the fact that some predicative phrases are incompatible with overt copulas as in (11). This casts doubts on the putative existence of null copulas, since they would have to have different syntactic properties than their overt counterparts. A simpler interpretation of the facts is that there are no null copulas in (11a,c).

- (11) a. I never pictured myself as a lawyer.  
       b.\* I never pictured myself be(ing) as a lawyer.  
       c. The decision left people with no place to go to vote.  
       d.\* The decision left people being with no place to go to vote.

For a variety of similar mechanisms and functional projections postulated within the SC, see Raposo and Uriagereka (1995), den Dikken and Naess (1993), Svenonius (1994), Sportiche (1995), Basilico (1997), Basilico (2003), and references cited. In what follows, we will survey the empirical arguments against and in favor of the existence of SCs and conclude that their existence is much more restricted than the above research assumes, drawing from insights by Pollard and Sag (1994) and Culicover and Jackendoff (2005).

### 3. Arguments for the Small Clause

#### 3.1 Constituency

Radford (1988) and Safir (1983) argue for distinguishing between the finite S and SC, based on the fact that SCs cannot take an overt complementizer as illustrated in (12). In (12b), the focused expression is the SC constituent.

- (12) a.\* It is [<sub>SC</sub> that Bob in the Army] that I can't imagine.

- b. It is [<sub>SC</sub> Bob in the Army] that I can't imagine.

Moreover, such constituents can appear as subjects, as noted by Culicover (1997: 48) and Culicover and Jackendoff (2005: 134) with data like (13).

- (13) a. [<sub>SC</sub> [Susan] [angry]] is a terrible sight.  
b. [<sub>SC</sub> [Susan [in the Vatican]]] made history.  
c. [<sub>SC</sub> [So many people drunk]] would really ruin my party.  
d. [<sub>SC</sub> [Too many people] [drunk]] would really ruin my party.

There is much empirical evidence that directly supports the constituency of such complements, noted by Hukari and Levine (1991), Aarts (1992), Pollard and Sag (1994), Basilico (2003), and Culicover and Jackendoff (2005). In the examples in (14) the complements behave like a unit in cleft, topicalization, right node raising, and coordination constructions.

- (14) a. What I imagined/found/visualized/conceived of was [Robin drunk].  
b. What I can't imagine is [Bob in the army].  
c. [Bob in the army], I can't imagine.  
d. [Bob drunk], I can't imagine.  
e. I imagined both [Bob in the army and Sam in the navy].  
f. I CAN'T imagine – but Frank CAN imagine – [Bob in the army and Kim in the navy] respectively.

However, verbs like *consider*, *judge*, and *find* do not exhibit such constituency evidence, as seen in (15). As argued by Pollard and Sag (1994: 111) and Culicover and Jackendoff (2005: 132), this evidence indicates that there is no reason to assume that the complements in (15) are constituents, contrary to widespread assumption.

- (15) a. \*What I considered was [Robin in the army].  
b. \*What I judged was [Bob in the army].  
c. \*What I found was [Robin stupid].  
d. \*What I judged was [Bob drunk].

- e. \*[Robin in the army], I judged.
- f. \*[Robin stupid], I didn't find.
- g. \*I considered both [Robin stupid and Sam an idiot].
- h. \*I CONSIDERED – and Robin FOUND – [Robin in the army and Sam in the navy] respectively.

Culicover and Jackendoff (2005: 132) claim that there is some lexical variation within the *consider*-class of verbs, in that only *find* allows pseudocleft focus in general, but we disagree with that claim. As shown in (16), all such verbs allow pseudoclefts with CPs, as evidenced from the following corpus examples.

- (16) a. ... what nobody ever considered was that such huge buying cooperatives would use their market leverage against consumers, ... (COCA 1998 MAG)
- b. What your listeners should consider is that the business of intelligence really seems to be driven by a production aspect. (COCA 2012 SPOK)
- c. What Ted finds is that this world can't be sustained. (COCA 2012 MAG)
- d. What he totally mis-judged was that people cared more about Twickenham Riverside than him and his party. (Google, July 22, 2013)

Such naturally occurring data show us that there is no restriction to place the propositional complement of these verbs in the focus position of the cleft constructions. The same pattern arises in passivization, as in (17). Whereas *imagine*-type verbs do not allow passivization, all other verbs do. Again, this indicates that *imagine*-type verbs select one complement, and that all others select two complements.

- (17) a. \*Robin was imagined a rebel.
- b. \*Robin was imagined in peak condition.
- (18) a. Robin was considered in peak condition.
- b. Robin was needed in peak condition.
- c. Robin was wanted in peak condition.
- d. She was believed innocent.



### 3.2 Emphatic reflexives and binding

The usage of emphatic reflexives also supports the existence of a clausal constituent, which can appear in three main positions (see Kim 2012 and references therein):

- (19) a. We ourselves are having problems again at the moment.  
       b. I could myself have expressed it as well.  
       c. How did you manage to raise the money for this yourself?

The emphatic reflexive in (19a) is in the postnominal position associated with the preceding subject, the one in (19b) is in the sentence medial position linked to the subject, and the one in (19c) is in the sentence final position. The examples show us that emphatic reflexives can be floated, but note that their antecedents need to be the subject and cannot be linked to nominal or pronominal objects, as noted by Radford (1988) and Aarts (1992):

- (20) a. \*We put the president in our car himself.  
       b. \*I looked behind the president for guards himself.  
 (21) a. \*John says that Mary saw him himself.  
       b. \*John believes him himself to be in danger.

Now then, consider the behavior of emphatic reflexive in the SC candidate:

- (22) a. I consider the president entirely responsible himself.  
       b. I fear the president responsible himself.

The floated reflexive *himself* has the NP *the president* as its antecedent, supporting its subject status in the surface structure.

It has also been suggested that other binding facts support the SC analysis, and in particular that they show that SCs exist even in *consider*-type verb complements. If this were true, then such evidence would paradoxically not pattern with the constituency tests above. The argument goes as follows. The

examples in (23) illustrate the well-known fact that the reflexive here requires its antecedent within the same clause.

- (23) a. Mary believes that Bill<sub>i</sub> cleaned himself<sub>i</sub>.  
 b.\* Mary<sub>i</sub> believes that Bill cleaned herself<sub>i</sub>.

Crucially, the same pattern arises in *consider*-type of verb complement. This includes reciprocal reflexives, as shown in (24).

- (24) a. Mary considers Bill<sub>i</sub> kind to himself<sub>i</sub>.  
 b. Mary found Bill<sub>i</sub> cleaning himself<sub>i</sub>.  
 c. John expected the men<sub>i</sub> to like each other<sub>i</sub>.  
 d.\* The men<sub>i</sub> expected John to like each other<sub>i</sub>.

However, the binding facts are not a strong argument for the SC because they are theory-dependent. If we attribute the binding facts to the argument structure of the verb as proposed by Manning and Sag (1998) and Sag et al. (2003), then the binding facts become compatible with a flat analysis.

### 3.3 Modification

The expression '*not*-NP' also seems to support a SC analysis. As pointed out by Postal (1974), the *not*-NP can appear only in the subject position:

- (25) a. Not many people drove out that way except during the Fourth of July.  
 (COCA 2012 FIC)  
 b. Not many folks are going to consider that entrapment. (COCA 1992 SPOK)
- (26) a. \*Joe kissed not many models.  
 b. \*Jane fears not much money.  
 c. \*John talked to Bob about not many problems.

Examples like (26) are unacceptable since the *not*-NP appears in the non-subject

position. Consider again the SC candidate examples:

- (27) I consider [not many people suitable for the post].

The grammaticality of such examples implies that the expression *not*-NP here also functions as the subject, supporting the SC analysis.

An adverb interpolation can also argue for the supposition of the SC. No adverb can intervene between the lexical verb head and its NP complement:<sup>2</sup>

- (28) a. \*John lost carelessly his book.  
b. \*John considers seriously Bill foolish.

Consider the following:

- (29) a. John found Bill repeatedly annoying.  
b. John considers Bill sincerely foolish.

Such cases may not strongly support the SC analysis since we could assume that the adverb is modifying the following predicative expression. However, consider the scope of the sentence adverb *probably*, as pointed out by Aarts (1992):

- (30) a. I have found that probably Minimalism is the most convincing approach to language.  
b. I have found that Minimalism is probably the most convincing approach to language.

The adverb *probably* outscopes the sentence it modifies. Now consider (31). Here, the sentential adverb *probably* scopes over the SC, not the matrix clause.

- (31) I consider [Minimalism probably the most convincing approach to language].

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<sup>2</sup> An adverb can intervene between a lexical verb and its CP complement, as in ... *has found consistently that men are more likely than women to spend large amounts of time watching ...*

Finally, the SC analysis is further supported by the fact that SCs can occur in the subject position as noted by Culicover (1997: 48) and Culicover and Jackendoff (2005) in (13), repeated here in (32), and as attested in (33).<sup>3</sup>

- (32) a. [<sub>SC</sub> [Susan] [angry]] is a terrible sight.  
       b. [<sub>SC</sub> [Susan [in the Vatican]]] made history.  
       c. [<sub>SC</sub> [So many people drunk] would really ruin my party.
- (33) a. Marlise is struck by the disquieting fact that [[[his hair] [undyed]]  
       would look like her Persianlamb cape]. (COCA 1998 FIC)  
       b. [[Even the best device] [available]] would still limit the range of  
       motion of each leg. (COCA 1999 SPOK)

Let us take stock. There are multiple sources of empirical evidence that only *imagine*-type verbs select a single complement. Conversely, there is good evidence that such constituents units need not be complements, and may occur in subject position as well. Below, we examine evidence that has been used to argue against the SC analysis.

#### 4. Arguments against the Small Clause

Many authors have raised criticism against the Small Clause analysis, such as Stowell (1981), Safir (1983), Williams (1983), Napoli (1993), Pollard and Sag (1994), Baltin (1998), Culicover and Jackendoff (2005). For example, Safir (1983) argues that the agreement patterns in (34) are not compatible with the existence of SCs.

- (34) a. [Workers angry about the pay] is just the sort of situation that the ad  
       campaign was designed to avoid.  
       b. [Workers angry about the pay] does indeed seem to be just the sort  
       of situation that the adcampaign was designed to avoid.

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3 One might take *undyed* and *available* as reduced relative clauses, but note that English disfavors a single expression as a reduced relative clause.

The matrix verb here is singular, which may not be accounted for with the assumption that *workers* is the subject with the following AP as a modifier. However, as pointed out by Baltin (1998), there are cases where the plural subject accompanies with the singular verb:

- (35) a. Several angry workers is just the sort of situation that the ad campaign was designed to avoid.  
 b. Workers who are angry about the party is just the sort of situation that the ad campaign was designed to avoid.

What the data suggest is, as Baltin (1998) hints, that subject-verb agreement in English is semantic-based, rather than morpho-syntax sensitive.<sup>4</sup> There are others sources of evidence for this, such as the well-known fact that singular collective nouns like *committee* can trigger plural subject-verb agreement, as in *The committee are here*. See Copestake (1995) for more discussion. Hence, the agreement evidence neither supports or refutes the SC analysis.

In addition, Pollard and Sag (1994: 113) point out that the facts concerning Complex NP shift also support the non-SC analysis. Complex NP shift does not operate on NPs that are subjects at the point of application (Postal 1974):

- (36) a. \*Are happy – all of the men who recovered from mononucleosis?  
 b. \*I regret the fact that were destroyed – so many of our priceless relics.

In contrast, the SC cases seem to allow Complex NP shift as seen below.

- (37) a. We would consider acceptable – any candidate who supports the proposed amendment.  
 b. We would regard as acceptable – any candidate who supports the proposed amendment.

The acceptability of the latter indicates that the non-subject property of the displaced NP. However, once again note that examples like (37) can be analyzed

4 For an account of subject-verb agreement in terms of semantics, see Pollard and Sag (1994) and Kim (2004).

in a different way. That is, these examples can be taken to be extraposition rather than Complex NP shift.

As such, there are factors that appeal to the postulation of the SC in the English grammar, but most of the arguments can be answered with different perspectives.

## 5. Proposal: Nonfinite clausal constructions in English

In what follows we argue that there are a variety of different non-finite sentence constructions in English, which have some properties in common with Small Clauses.<sup>5</sup> We then move on to propose a general account where the similarities between these families of non-finite constructions are accounted for in a uniform way.

### 5.1 Infinitival CP

Accusative NPs can combine with infinitival VPs to form sentences, as shown below. We therefore assume that *for* is a complementizer rather than a preposition in such constructions, as proposed by Gazdar et al. (1985) and others.

- (38) a. [For [students to do this on their own]] would be impossible  
       b. What we intended was [for [Sam to review that book]].  
       c. It is intolerable [for [John to get away with this]].  
       d. They arranged [for [the woman to get the best medical treatment]].  
       e. Fred intends [for [Sam to review that book]].

Moreover, Levine (2001) offers convincing arguments that the classic diagnostics for treating *for Mary* in *John is easy for Mary to please* as a PP are flawed. Evidence from both extraposition and parasitic extraction suggests that *for* is a complementizer and that *Mary to please* is a clause. For example, the

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5 Part of the discussion given in this section is developed from Kim (2013).

extraposition datum below has the interpretation one would expect from a clausal analysis, in which *us* is the agent of *please*

- (39) How easy do you think Robin will be [for us to please]?  
 (= How easy [for us to please] do you think Robin will be?)

This implies that an accusative NP subject and its infinitival VP can form a sentence, to which the complementizer *for* can attach. The distribution of the *for* complementizer parallels the distribution of the *that* complementizer. More specifically, it is obligatory in subject position, but optional in complement position as seen below.<sup>6</sup>

- (40) a. \*(For) [students to do it on their own] requires more training.  
       b. \*(That) [students did it on their own] meant a lot to me.  
 (41) a. Fred intends (for) [Sam to review that book].  
       b. Fred said (that) [Sam reviewed that book].  
       c. They believe (that) [the woman got the best medical treatment].

Coordination evidence is also consistent with the hypothesis that the infinitival S is a constituent:

- (42) a. I prefer for [Tom to do the washing] and [Bill to do the drying].  
       b. Mary meant for, but nobody else meant for, [Sandy to do the washing].

Further evidence comes from the fact that such infinitival sentences allow expletive subjects and idiomatic subjects as shown in (43). The expletives *it* and *there* here function as the subject of the infinitival VP. The subject *the cat* forms a unit with the following VP, inducing an idiomatic meaning.

- (43) a. It would be unusual for it to snow here.

<sup>6</sup> Some speakers require the presence of *for* in examples like (38b), but corpus data yields examples without the complementizer *for* as in *They arrange them to face each direction, providing a variety of temperatures* (COCA 1990 MAG).

- b. It would be unwise for there to be no fire exist.
- c. It would be difficult for the cat to be out of the bag.

Given this evidence, we propose that infinitival Ss and CPs are modeled along the lines shown below. Accusative NPs are allowed to combine with infinitival VPs as their subjects, and the *for* complementizer selects an infinitival S.<sup>7</sup>

$$(44) [S_{inf} NP_{acc} VP_{inf}]$$

## 5.2 Gerundive clauses

In what follows we argue that verbal gerunds are yet another type of non-finite sentence which takes a nonnominative subject NP. As is well-known, English gerunds display a mix of nominal and verbal properties. With regard to nominal properties, they can occur in syntactic positions that generally only admit NPs. For example, they can appear as the complement of a preposition as in (45a), as a clause-internal subject as in (45b) and (45c), and as the focus of a cleft as in (45d) (see Malouf (2000) and references therein):

- (45) a. They didn't approve of [him/my [leaving without a word]].
- b. Tom believes that [him [taking a leave of absence]] bothers Mary.
- c. Why does [John's [taking a leave of absence]] bother Mary?
- d. It's [John's [taking a leave of absence]] that bothers Mary.

However, the internal syntax of gerundives exhibit clause properties, too: they can take accusative NP complements (like the verbs they are derived from), can

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7 Following Sag et al. (2003) and Kim and Sells (2008), we assume that the VFORM value of the verb or VP is first classified as *fin* and *nonfinite*. The value *nonfinite* has further subtypes, *en*, *ing base* and *inf*. Of these, *en* and *ing* in turn have three subtypes each:

- (i) a. *en ppr* (past perfect), *pass* (passive), *psp* (past participle)
- b. *ing prog* (progressive), *ger* (gerundive), *ppp* (present participle)

See section 6 for further discussion and refinement.



be modified by adverbial modifiers, and can be negated with the negator *not* (see Malouf (2000)):

- (46) a. Tom's calling (\*of) the roll started each day.  
b. Tom disapproved of my quietly/\*quiet leaving before anyone noticed.  
c. Tom's not having bathed for a week disturbed the other diners.

Gerunds can take accusative, nominative, or genitive subjects (although the latter can alternatively be seen as a possessive determiner combining with a nominal as argued by Sag (2012), rather than subjects combining with a verb). See section 5.5 for attestations with nominative subjects. Interestingly, these types of gerunds can be coordinated, even though the resulting verb agreement may be slightly different:

- (47) a. [Pat's coming] and [Chris's leaving] ??bothers/bother John.  
b. [Pat coming] and [Chris leaving] bothers/??bother John.

This is arguably because the two uses of the gerund are not exactly synonymous. Lees (1960: 65) argues that verbal gerunds denote facts, as suggested by the paraphrase in (48a), and that nominal gerunds denote actions, as in (48b). See Malouf (2000) for further discussion.

- (48) a. Kim's drawing Sue surprised me. (the fact that he drew Sue surprised me)  
b. Kim's drawing of Sue fascinated me. (the way he drew Sue fascinated me)

The coordination data strongly support the postulation of the gerundive nonfinite S as a constituent. Note that the gerundive clause with the accusative subject can function as the subject:

- (49) a. Robin falling on the ice would be a disaster.  
b. Robin's falling on the ice would be a disaster.  
(50) a. I imagined Robin falling on the ice.

- b. We got all the way home without Robin falling on the ice.
- c. I believed/judged Robin falling on the ice. (Culicover and Jackendoff 2005: 133)

Given this evidence, we model verbal gerunds along the lines shown below. Non-nominative NPs can be subjects of gerundial VPs. The type *non-nom* stands for any non-nominative case value.<sup>8</sup>

- (51) [<sub>S[ger]</sub> NP<sub>acc</sub> VP<sub>ger</sub>]

### 5.3 *With* absolute construction

The *with* absolute construction consists of an accusative subject and a predicate that form a non-finite clause, introduced by *with* or *without* as seen from the attested corpus data (see Stump (1985) for more discussion):

- (52) a. [With the children so sick], we weren't able to get much work done.  
 b. [With Tom out of town], Beth hastily exited New Albany and fled to Ohio.  
 c. [With Bush a born-again Christian], the public already had a sense of where he would stand on those issues.  
 d. They were standing against the wall [with their hands above their heads].

The predicate needs to be a stage-level predicate, or else introduced by a copula:

---

8 As extensively discussed by Malouf (2000), GEN-subject gerundive constructions behave like a nominal expression. For example, conjoined ACC-gerundive clauses allow singular agreement on the main verb while conjoined GEN-gerundive clauses trigger plural agreement behaving like full DPs.

- (i) a. That John comes so often and that Mary leaves so often bothers/\*bother Mother.  
 b. John coming so often and Mary leaving so often bothers/\*bother Mother.  
 c. John's coming and Mary's leaving \*bothers/bother Mother.

This implies that the GEN subject here functions as a specifier of a NP which is constructionally controlled to be GEN-marked.

- (53) a. With [him (being) injured], the team was eliminated from the State Cup.  
b. With [the dog (being) exhausted], we finally got to eat dinner in peace.  
c. With [him (being) sick with the flu], Ann was out of school for two weeks.  
d. [With Sue \*(being) vegetarian], we never got to eat anything we liked.  
e. [With my friends \*(being) European], we could travel without any Visas.

The absolute *with* can also be accompanied by *what* and can license a coordination, supporting the constituent analysis (Kim and Davies 2020):

- (54) a. What with [the prices (being) so high] and [my wife (being) out of work], I can't afford to buy a new refrigerator.  
b. What with [his daughter working for the bank] and [his son working for the airlines], no one would be take care of the little sisters by the day.

We cannot take the expressions after *with* or *what with* to form an NP since we can observe clausal properties:

- (55) a. What with [it raining all day long], I didn't get a chance to hang the washing out.  
b. With [the cat out of the bag], there is not much point in trying to hid the truth.

The subject in (55a) is the expletive *it* while the one in (55b) is an idiomatic subject. Further sentential properties of the absolute construction are observed in various syntactic phenomena from attested data from COCA (Kim and Davies 2020):

- (56) a. At least Doc was probably safe back there now, what with [Mad Dog Tannen arrested and all]. (passivization)  
b. What with [there being no possibility of advancement], Linda is

- determined to find a new job. (there insertion)
- c. What with [his daughter working for the bank and his son [e] for the airlines], no one would be take care of the little sisters by the day.  
(gapping)
  - d. What with [Emil obviously afraid of snakes and all], we sent him home. (S-adverbs)
  - e. What with [everything all dug up], you can't trust a slant (quantifier floating)

Phenomena like passivization, there-insertion, and gapping are all sensitive to sentence level expressions, supporting the idea that the bracketed expression here forms a clausal unit like a SC. In some cases, the nonfinite sentence (or SC) can appear without *with*, as shown in (57).

- (57) a. The weather being cold, the children stayed at home.
- b. The sun having set, they made a fire.
- c. He left the room, the dog following him.

Even though there is no expression introducing the nonfinite clause, each clause functions as a subordinate clause whose meaning with respect to the matrix clause depends on context. As in the absolute construction, the subordinate clause can have an AP, an NP, or a PP as its predicate:

- (58) a. [His face pale with anger], he stormed out of the room.
- b. The contestants, [some of them primary school children], were kept waiting for two hours.
- c. There he sat, [his back against the hot stones of the tower].
- d. [His dad tired from work], John drove by himself.

In these examples, it is obvious that each bracketed part is a constituent, modifying the main clause. Coordination further supports the existence of a clause:

- (59) a. [<sub>SC</sub> [His house flooded] and [his wife missing]], John cried on Brown's

shoulder.

- b. [<sub>SC</sub> [No food in the fridge] and [no money left in the account]], John didn't know what to do.

Having no overt expression determining the structure of the bracketed expression, it appears to be reasonable to assume that the SCs are coordinated in such sentences. We propose to model these clauses as having a predicative (PRED) XP:

- (60) [<sub>S</sub> NP<sub>acc</sub> XP[PRED +]]

The absolute construction thus allows an accusative NP to combine with a predicative phrase XP, as its subject (see Riehemann and Bender (1999) and Kim and Davies (2020) for a construction-based HPSG account along these lines).

#### 5.4 The incredulity construction

Small clauses also arise in certain idiosyncratic constructions, such as the so called 'Mad magazine' sentences with an exclamatory function (Akmajian 1984; Lambrecht 1990; Kay and Michaelis 2012):

- (61) a. What, [me] [worry]?  
 b. [[My boss] [give me a raise]]!  
 c. What! [John] [get a job]! (Fat chance)

Such a construction, employed to express surprise, disbelief, or skepticism, includes several grammatical constraints. For example, the subject must be ACC, tense and modals cannot appear on the head verb, and sentential adverbs are disallowed as observed from the following data (Akmajian 1984):

- (62) a. What! \*She call me up?! Never.  
 b. Him gets a job?  
 c. Her might call me up?!

d. What! \*Her unfortunately lose her job!

Cases involving predicative phrases are shown below.

- (63) a. What! Mary [(be) in the army]?  
 b. What! Larry [(be) a doctor]?  
 c. What! Bronsky [(be) clever]?! Ha!

Though the presence of the copula induces some interpretational differences, we can assume that the Mad Magazine construction has at least the following constructional constraint:<sup>9</sup>

- (64) [<sub>S</sub> (NP<sub>acc</sub>[*ref*]) XP[PRED +] | [*base*]]

This means the XP can be either a predicative phrase or a base VP covering the data we have discussed.<sup>10</sup> Note that the construction allows the omission of the subject, as seen from the following dialogue:

- (65) A: Why don't you get a respectable job?  
 B: (Me) get a respectable job! What do you think I am?

In addition, the ACC subject of the construction needs to be referential (*ref*), disallowing the expletive subject:

- (66) a. What! \*There be no more beer?!  
 b. What! \*It (be) false that the world is flat?!

The construction thus also supports the existence of nonfinite clauses (SC) as a syntactic constituent.

9 For example, the presence of the copula describes unrealized states while the copula-less versions refer to both unrealized and realized states. See Akmajian (1984) for further discussion.

10 The bar notation in (64) means disjunction.

### 5.5 Nominative subjects of non-finite clauses

So far we have seen the examples where the subject of nonfinite clauses is accusative-marked. This follows the traditional generative approach in which nominative case assignment rule is done as shown in (67).

(67) Nominative Case Assignment (English)

Finite T assigns nominative (NOM) case to its specifier. (Pesetsky and Torrego 2011)

This rule assumes a strict correlation between finiteness and types of subjects: finite constructions display lexical subjects, while non-finite ones only allow PRO or NP-traces. Such an approach is taken to block the nonfinite clause from having a NOM subject:

- (68) a. \*He claims she to understand Hegel.  
b. \*Robin considered she a good friend.

However, Pietsch (2005) notes that in standard English, absolute constructions as well as the so-called subordinating-*and* clause license nonfinite clauses with a NOM subject:

- (69) a. [[John/him/he]] being late, I decided not to wait longer.  
b. Why should we keep waiting, [and [John/him/he] being late again]!

Pietsch (2005: 174) further observes that modern Irish English allows NOM subjects in a variety of environments, as illustrated in (70). The NOM case is assigned to the subject of an infinitival clause in (69a), to the subject of a nonfinite subordinate clause in (69b) and (69c), to the subject of a gerundive clause in (69d), and to that of the nonfinite VP in (69e).

- (70) a. It's a point o'law for she to put him out.  
b. indeed I walked it myself when I young

- c. My Sister Bridget stopped with her old Misses after I leaving.
- d. What is the cause of we not getting the possession of this farom.
- e. When I heard she being in this place I went to see her directly.

Our corpus investigation also shows that even American English seems to allow NOM subjects in nonfinite clauses, such as absolute constructions like (71), subordinating-*and* clauses as in (72), and the gerundive clauses like those in (73).

- (71) a. the Soviets had a weasel in the Los Alamos hen house, **he** being the spy Klaus Fuchs. (COCA 2004 FIC)
- b. they went in opposite directions in the middle of the avenue, **he** looking back at her a few times (COCA 1996 MAG)
- c. They will be in the water, **she** leaning against the wall (COCA 2006 FIC)
- d. For more than ten blocks we hurry to her friend, **she** aloof and I pursuing. (COCA 2001 FIC)
- (72) a. The incumbent is Democratic Stephanie Sandlin, and **she** trailing in the latest poll to Republican Kristi Noem. (COCA 2010 SPOK)
- b. (...) so close their lips were touching, and **he** smiling all the time (COCA 1997 FIC)
- c. Her arm's through his, and **they** strolling like Sunday promenade time. (COCA 1994 FIC)
- (73) a. You heard President Carter's comments about **he** believing racism is at the heart of much of the animosity toward President Bush. (COCA 2009 SPOK)
- b. It might seem peculiar to **he** bringing in such imprecise sentiments in talking about a subject (COCA 1997 ACAD)
- c. And they said what's the point of **we** taking part in a unity government while, in fact, we have won (COCA 2007 SPOK)

What these attested examples as well as Irish English data suggest is that English allows the subject of nonfinite clauses to be NOM or ACC, though the former case marking pattern is more restricted.



## 5.6 Subject Auxiliary Inversion

Gazdar et al. (1985), Pollard and Sag (1994), Culicover and Jackendoff (2005), Fillmore (1999), and many others have traditionally assumed that Subject-Auxiliary Inversion (SAI) structures like (74) have ternary structures of the form [s AUX NP XP], rather than more complex, binary-branching structures like those adopted in movement-based accounts.

- (74) a. [Has [he] [opened the door]]?  
       b. [Is [he] [happy]]?  
       c. [May [she] [live long and prosper]].  
       d. I don't know you, nor [do [I] [want to be your friend]].

This ternary structure is motivated by the fact that the subject of the finite auxiliary is NOM, and by the fact that the VP complement of the auxiliary can be elided (e.g. *Has he?*). When the subject is not inverted, case is still NOM and the VP complement of the auxiliary can still be elided (e.g. *He has?*). Hence, it is natural to assume that in inverted and non-inverted structures the subject of the auxiliary is always NOM and the VP is always a complement of the auxiliary.

However, there is conflicting evidence against the flat analysis in (74), and which suggests that SAI is yet another type of construction where a NOM subject combines with a nonfinite phrase. Consider the structures in (75), in which the auxiliary seems to combine with a complex non-finite clause.

- (75) a. Can [[Robin sing] and [Mary dance]]?  
       b. When the going got tough, why did [[the men quit] and [the women stay behind]]?  
       c. Do [[more women practice Yoga] [than men play golf]]?  
       d. Who did [[Tom hug <sub>i</sub>] and [Mary kiss <sub>j</sub>]]?  
       e. Which man and which woman did [[Tom hug <sub>i</sub>] and [Mary kiss <sub>j</sub>]] respectively?

For example, in (75d) it is rather unclear what is being coordinated other than the non-finite clauses *Tom hug* <sub>t</sub> and *Mary kiss* <sub>t</sub>. One possibility is that the sentence involves some kind of ellipsis, like *Who did Tom hug and did Mary kiss*, but the oddness of the non-elided counterpart *\*Who did Tom hug and did Mary kiss* undermines this hypothesis. Similarly, (75e) is not amendable to an elliptical analysis.<sup>11</sup> Based on such empirical facts, following Kim and Michaelis (2020), we allow an inverted auxiliary to combine with a SC the predicate of which is overt or elliptical, as illustrated in (76).

$$(76) [{}_S V[AUX +] [{}_{SC} NP_{nom} (XP)]]$$

This analysis of SAI, reminiscent of the traditional movement-based analysis (Radford 1988), allows the inverted auxiliary to combine with a SC, forming a binary structure, which we will discuss at detail in the following section. We therefore depart from Pollard and Sag (1994) by abandoning the flat analysis for SAI in HPSG.<sup>12</sup>

## 6. A Generalized constructional account

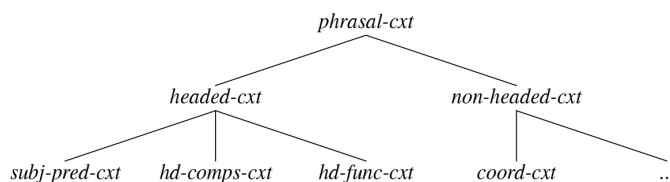
### 6.1 Basic framework

The discussion we have made so far indicates that English allows various types of finite as well as non-finite sentential constructions including predicative ones. In the constructional view licensed phrasal constructions, like lexical items, are pairings of form and function, lexical as well as phrasal constructions are related in a network in which nodes are related by inheritance links (see Flickinger et al. (1985), Flickinger (1987), Sag (1997), Goldberg (2006), and Sag (2012)). Incorporating this constructional view of grammar in HPSG, phrasal constructions are modeled via the following hierarchy:

<sup>11</sup> See Gawron and Kehler (2004), Chaves (2012), and Kubota and Levine (2016) for more on *respectively* constructions.

<sup>12</sup> See the next section for the discussion of how to deal with the facts about VP Ellipsis as in examples like *Did you?* and *Can you?*

## (77) Type hierarchy of English phrasal constructions



As seen above, phrasal constructions come in two major subtypes: headed and non-headed constructions. The latter includes coordination constructions (and possibly others). The headed-construction (*headed-cxt*) reflects the generalization underlying the  $X'$ -schema, and encompasses several subtypes of constructions: the subject-predicate construction (*subj-pred-cxt*) combines a subject with its predicate (licensing both finite and nonfinite Ss), the head-complement construction (*hd-comps-cxt*) licenses the combination of a head with its complement(s) (generating all headed phrases like NP, VP, AP, and PP), and the head-functor construction (*hd-func-cxt*) licenses structures where the head combines with a non-head selects the head (as in modification structures, see Van Eynde (2003), Kim and Sells (2011), and Sag (2012) for more discussion).

Following Pollard and Sag (1994), all constructions of the type *headed-cx* are required to satisfy the HFP (Head Feature Principle), which ensures the endocentricity of such constructions. Hence, verbal heads project verbal structures, nominal heads project nominal structures, prepositional heads project prepositional structures, and so on. We use **H** as a convention to identify the head daughter.

## (78) HFP (Head Feature Principle)

$$\left[ \begin{array}{c} \textit{headed-cxt} \\ \text{SYN}[\text{HEAD}\boxed{1}] \end{array} \right] \rightarrow \dots \mathbf{H}[\text{SYN}[\text{HEAD}\boxed{1}]] \dots$$

In this work, we adopt the feature geometry shown in (79), which is closely based on Sag et al. (2003: ch. 13). The feature PHON records phonological representations (informally depicted throughout, for simplification), the feature CAT contains categorial information (such as agreement), and the valence features SUBJ and COMP record subjects and complements, respectively. More

generally, we refer to the argument in SUBJ as the external argument of the predication. Hence, all predicative phrases – verbal, adjectival, nominal, or prepositional – are similar in that they subcategorize for an external argument via SUBJ. Finally, the feature SEM contains semantic indices and semantic relations. Following standard HPSG practice, we assume that predicative signs are identified with a [PRED+] specification.<sup>13</sup>

$$(79) \left[ \begin{array}{l} \text{word} \\ \text{PHON } \langle \text{sings} \rangle \\ \text{SYN} \left[ \begin{array}{l} \text{HEAD} \left[ \begin{array}{l} \text{verb} \\ \text{PRED } - \\ \text{AGR } 3rd - sing \\ \text{FORM } fin \\ \text{XARG } [1] \end{array} \right] \\ \text{SUBJ } \langle [1]NP_x \rangle \\ \text{COMPS } \langle [2]NP_y \rangle \end{array} \right] \\ \text{SEM} \left[ \begin{array}{l} \text{INDEX } e \\ \text{RELS } \langle sing(e, x, y) \rangle \end{array} \right] \\ \text{ARG-ST } \langle [1], [2] \rangle \end{array} \right]$$

The feature XARG (external argument) singles out information about the subject. This allows information about the subject of a clause to be accessed at the clausal level. There is independent evidence for such a feature (Sag and Pollard 1991; Meurers 1999; Bender and Flickinger 1999; Levine 2001; Sag 2012; Kim and Michaelis 2020). For example, in tag-questions the embedded subject of the final clausal conjunct must be linked to the subject of the preceding clause as in (80a,b). In HPSG terms, the tag question accesses the antecedent's clause subject via XARG. Similarly, dangling modifiers adjoin to clauses but predicate over the subject of that clause, as in (80c,d,e). Again, the dangling modifier can access the clauses' subject via the feature XARG.

- (80) a. Sarah<sub>x</sub> read the book<sub>y</sub>, didn't she<sub>x</sub> / \*it<sub>y</sub>?  
 b. The book<sub>x</sub> was read by Sarah<sub>y</sub>, wasn't it<sub>x</sub> / \*she<sub>y</sub>?

13 Nothing hinges on this assumption, though. See Van Eynde (2015) for an alternative account of predicative constructions.

- c. [Furious as hell]<sub>v</sub> Kim<sub>x</sub> threw the TV out the window.  
 d.\*[Furious as hell]<sub>v</sub> the TV was thrown out the window by Kim<sub>x</sub>.  
 e. Kim<sub>x</sub> threw the TV out the window, [furious as hell]<sub>x</sub>.

Another example is copy-raising constructions, which require that the matrix subject (including expletive pronouns) are co-indexed with the subject of the embedded clause (see Kim 2014 for detailed discussion) as in (81). The feature XARG allows the matrix verb can access the subordinate clause's subject.

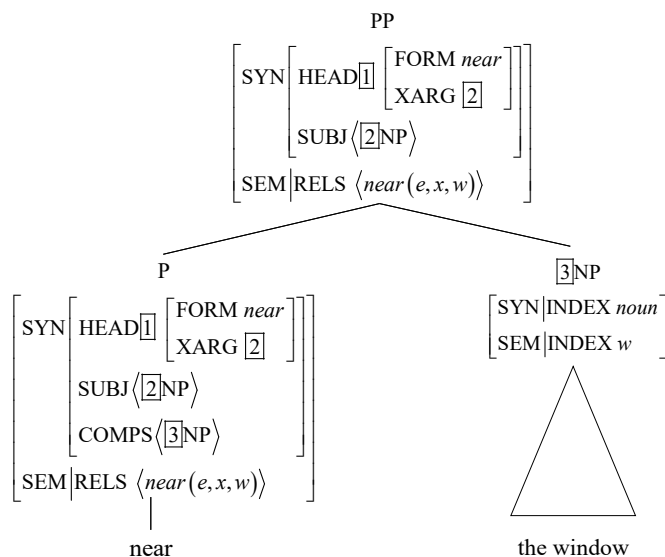
- (81) a. She seems like she/\*he is laughing hysterically.  
 b. There looks like there's/\*it's going to be a storm.  
 c. It looks like it's/\*there's going to rain.

We make the standard assumption that there are two major classes of preposition: one is non-predicative prepositions with no external argument and the other is predicative prepositions selecting an external argument. For example, a predicative preposition (e.g., *near* in *Kim is near the window*), on the other hand, is semantically potent and requires a complement as well as an external argument, as shown in (82):

$$(82) \left[ \begin{array}{l} \text{word} \\ \text{PHON } \langle \text{near} \rangle \\ \text{SYN} \left[ \begin{array}{l} \text{HEAD} \left[ \begin{array}{l} \text{prep} \\ \text{PRED} + \\ \text{FORM } \text{near} \\ \text{XARG } \boxed{1} \end{array} \right] \\ \text{SUBJ } \langle \boxed{1} \text{NP}_x \rangle \\ \text{COMPS } \langle \boxed{2} \text{NP}_y \rangle \end{array} \right] \\ \text{SEM} \left[ \begin{array}{l} \text{INDEX } e \\ \text{RELS } \langle \text{near}(e, x, y) \rangle \end{array} \right] \\ \text{ARG-ST } \langle \boxed{1}, \boxed{2} \rangle \end{array} \right]$$

This would then license the projection of a structure like the following:

(83)



As illustrated here in the structure, since the HPF ensures that the information in the HEAD of a phrase is always required to be identical to the HEAD information of the head daughter, the preposition's FORM is visible at the PP level in both cases, which enables verbs that select PP complements to control the casemarking P FORM. The PP projected from the predicative preposition *near* in (83b) still requires a SUBJ, eventually licensing sentences like *Kim is near the window*.<sup>14</sup>

Similarly, the predicative use of adjectives like *happy* also has two arguments, as seen in (84). The parenthesis indicates that the complement is optional. As in the case of prepositions, we assume that the FORM value of adjectives is the morph form of the adjective. In Sag (2012) the feature LID is used for this purpose instead, and is key in modeling selectional restrictions imposed by idioms.

14 The PP near the window, of course, needs to combine with the raising type of the copula be. Since the raising verb identifies the subject of its complement to be identified with its own subject, the subject of near the window and that of the copula verb are identical. See Pollard and Sag (1994); Sag et al. (2003); Kim and Michaelis (2020) for the detailed discussion of raising verbs.

$$(84) \left[ \begin{array}{l} \text{word} \\ \text{PHON} \langle \text{happy} \rangle \\ \text{SYN} \left[ \begin{array}{l} \text{HEAD} \left[ \begin{array}{l} \text{adj} \\ \text{PRED} + \\ \text{FORM} \text{happy} \\ \text{XARG} \boxed{1} \end{array} \right] \\ \text{SUBJ} \langle \boxed{1} \text{NP}_x \rangle \\ \text{COMPS} \langle \langle \boxed{2} \text{PP}_y [\text{FORM} \text{about}] \rangle \rangle \\ \text{SEM} \left[ \begin{array}{l} \text{INDEX } e \\ \text{RELS} \langle \text{happy}(e, x, y) \rangle \end{array} \right] \\ \text{ARG-ST} \langle \boxed{1}, \boxed{2} \rangle \end{array} \right] \end{array} \right]$$

Basically the same analysis extends to nouns. Following Partee (1987) in general terms, we assume that predicative nouns are semantically similar to predicative adjectives and predicative prepositions. Thus, whereas a non-predicative noun like *doctor* is represented as *doctor*( $x$ ), has an individual index  $x$ , and does not have an external argument, its predicative use is represented as *doctor*( $e, x$ ) has an eventuality index  $e$  and has an external argument. Hence, predicative NPs can be modified by degree adverbs like *very much* and *so*<sup>15</sup> Note that common nouns are lexically underspecified for case, and therefore bear a head feature [CASE *case*], where the type *case* has as subtypes *nom* and *acc*. Following standard practice, we omit underspecified descriptions from our representations, for exposition purposes.

15 Following Pollard and Sag (1994), Ginzburg and Sag (2000), and Müller (2009), we assume that a unary-branching rule converts non-predicative N' phrases  $P(x)$  into predicative N' phrases  $P(e, x)$ . This way, adjectives can combine and modify the nominal index of the N' before the INDEX is changed from  $x$  to  $e$ . However, nothing hinges on this kind of account, since our proposal is equally compatible with the account put forth by Van Eynde (2015).

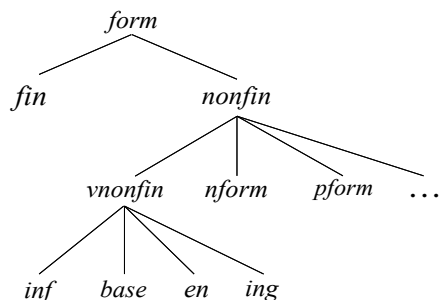
- (85) a. 
$$\left[ \begin{array}{l} \text{word} \\ \text{PHON } \langle \text{doctor} \rangle \\ \text{SYN } \left[ \begin{array}{l} \text{HEAD } \left[ \begin{array}{l} \text{noun} \\ \text{PRED } - \\ \text{FORM } \text{doctor} \\ \text{XARG } \text{none} \end{array} \right] \\ \text{SUBJ } \langle \rangle \\ \text{COMPS } \langle ([1] \text{PP}_y [\text{FORM } \text{of}]) \rangle \end{array} \right] \\ \text{SEM } \left[ \begin{array}{l} \text{INDEX } x \\ \text{RELS } \langle \text{doctor}(x, y) \rangle \end{array} \right] \\ \text{ARG-ST } \langle [1] \rangle \end{array} \right]$$
- b. 
$$\left[ \begin{array}{l} \text{word} \\ \text{PHON } \langle \text{doctor} \rangle \\ \text{SYN } \left[ \begin{array}{l} \text{HEAD } \left[ \begin{array}{l} \text{noun} \\ \text{PRED } + \\ \text{FORM } \text{doctor} \\ \text{XARG } [1] \end{array} \right] \\ \text{SUBJ } \langle [1] \text{NP}_x \rangle \\ \text{COMPS } \langle ([2] \text{PP}_y [\text{FORM } \text{of}]) \rangle \end{array} \right] \\ \text{SEM } \left[ \begin{array}{l} \text{INDEX } e \\ \text{RELS } \langle \text{doctor}(e, x, y) \rangle \end{array} \right] \\ \text{ARG-ST } \langle [1], [2] \rangle \end{array} \right]$$

Finally, we assume that the FORM values are organized as illustrated by the hierarchy in (86). As in Kim and Michaelis (2020), we distinguish two major classes: finite (*fin*(*finite*)) forms (appropriate for verbal signs with finite inflection), and non-finite (*nonfin*(*non-finite*)) forms (appropriate for all other signs, verbal or otherwise). The latter type can split into several subtypes, some appropriate only for verbs and others appropriate for other parts of speech, including nouns, adjectives and prepositions (see footnote 7).<sup>16</sup>

<sup>16</sup> The types *inf* and *bse* are specified to be [PRED], ruling out examples like \**with him to sleep* or \**with him sleep*.



(86) Type hierarchy of the type '*form*'



## 6.2 Non-finite sentential constructions in English

We can now characterize subject-predicate constructions (finite or not). We depart from previous work and propose that these constructions are modeled by the constructional rule in (87).<sup>17</sup> The construction states that a head phrase that selects a subject can combine with it to form a clause, as long as the two phrases bear compatible agreement specifications.

(87) Subject Predicate Construction

$$\left[ \begin{array}{c} \text{subj-pred-cxt} \\ \text{SYN} \left[ \begin{array}{c} \text{SUBJ} \langle \rangle \\ \text{COMPS} \langle \rangle \end{array} \right] \end{array} \right] \rightarrow \left[ \begin{array}{c} \boxed{1} \left[ \text{SYN} \left[ \text{HEAD} \left[ \text{AGR} \boxed{2} \right] \right] \right], \text{H} \left[ \begin{array}{c} \text{HEAD} \left[ \text{AGR} \boxed{2} \right] \\ \text{SUBJ} \langle \boxed{1} \rangle \\ \text{COMPS} \langle \rangle \end{array} \right] \end{array} \right]$$

Departing from standard HPSG, we assume that subject-verb agreement is not enforced lexically, but rather, syntactically. As discussed by Kim (2004) and Chaves (2012), there are various types of subject-verb agreement mismatches. For example, there is a mismatch between plural subject-verb agreement and semantic predication in (88), where although the verbs *sing* and *dance* agree in number with the subject *Tom and Sue*, they do not predicate the plurality *Tom and Sue*. Rather, *sing* and *dance* predicate (different) singular entities. See Kim

<sup>17</sup> In representing the constructional constraints, we follow a standard feature-based phrase-structure grammar rule schemata. The latter can be easily converted into typed constraints systems such as those adopted in Sag (2012).

(2004) and Chaves (2012) for more discussion.

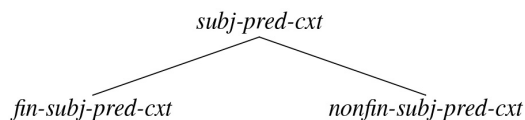
- (88) [Tom and Sue] sing and dance respectively. (= Tom sings and Sue dances)

The construction rule in (87) thus allows an NP to combine with a VP of any kind as well as with a predicative phrase (a PP, NP, or an AP). We further divide the subject-predicate construction into two major classes, depending on the type of predicate being finite or not. The typical declarative sentence will be an instance of the finite subject-predicate construction in (89a). Here, there is subject-verb agreement and the subject is nominative. On the other hand, the nonfinite (infinitival and base), nonpredicative subjectpredicate constructions involve accusative subjects or no agreement, as in (89bc). Finally, the nonfinite and predicative *subj-pred-cxt* corresponds to cases where a non-nominative subject combines with a predicative phrase, as in (89d)-(89f).

- (89) a. [[He] [accepted the existence of small clauses]].  
 b. We want [[him] [to sing a song]].  
 c. Did [[she] [sing a song]]?  
 d. John imagined [[her] [in the army]].  
 e. John imagined [[her/his] [dancing on stage]].  
 f. I can't imagine [[him] drunk].

We capture this classification straightforwardly, with the type hierarchy below, inspired by Sag (2012) and Chaves (2012). This hierarchy divides *subj-pred-cxt* (subject-predicate construction) into two types, shown in (87). This type of inheritance network enables us to capture cross-cutting generalizations among construction types (see Sag (1997), Goldberg (2006), and Sag (2012)).

- (90) Subconstructions of the Subject-Predicate Construction (*subj-pred-cxt*)



Any constructional constraints that the supertype *sub-pred-ctx* imposes are inherited by each of its subtypes. Regardless of the type predicate, all subject-predicate structures require the subject to precede the predicate, and to agree with it, as specified by (87). However, (91a) allows finite predicates to have nominative subjects, and (91b) allows non-finite predicates to have – by default – accusative subjects, as indicated by the [CASE / *acc*] constraint (see Kim 2016 for the construction-based account of case assignments within the HPSG framework).

(91) a. Finite Subject-Predicate Construction

$$[fin-subj-pred-ctx] \rightarrow \left[ \text{SYN} \left[ \text{HEAD} \left[ \text{CASE } nom \right] \right] \right], \left[ \text{SYN} \left[ \text{HEAD} \left[ \text{FORM } fin \right] \right] \right]$$

b. Non-finite Subject-Predicate Construction

$$[nonfin-subj-pred-ctx] \rightarrow \left[ \text{SYN} \left[ \text{HEAD} \left[ \text{CASE / } acc \right] \right] \right], \left[ \text{SYN} \left[ \text{HEAD} \left[ \text{FORM } nonfin \right] \right] \right]$$

Here we adopt the notion of ‘non-persistent default’ proposed by Lascarides and Copestake (1999). In a nutshell, what the default constraint [CASE / *acc*] in (91b) achieves is that the case of the subject will be resolved as accusative if no other constraint in the grammar forces it to be otherwise.<sup>18</sup>

Following Pollard and Sag (1994), with the exception of personal pronouns *I, me, he, him, she, her* and so on, all nominals are underspecified for the feature CASE, and therefore are compatible with either [CASE *acc*] or [CASE *nom*]. There are two ways for the value of CASE to be resolved: via a lexical specification or via a constructional specification. An example of the former is the lexical constraint that all transitive verbs require their direct objects to be accusative, and that verbs lexically impose idiosyncratic subcategorization constraints on the case-marking P heading their PP complements, as in Pollard and Sag (1994). An example of the former are the structural case assignments in (91a) and (91b). Whereas (91a) requires that all finite predicate subjects are nominative, (91b) states that all non-finite predicates (i.e., a predicative NP, AP, PP, or an infinitival or uninflected VP) can combine with a subject phrase of any case. However, if no other constraint states otherwise, that case will by default be

<sup>18</sup> All SCs are nonfinite because of the definition for form values as given in the hierarchy in (86).

resolved as being accusative. For further discussion about structural case assignment in HPSG see Müller (2001) and Kim (2016).

Let us consider some examples of how the above approach works. Given that subjunctive verbs are finite (Huddleston and Pullum 2002: 89), it follows that their subjects must be [CASE *nom*], in accordance with (91a). Thus, our account predicts NOM subjects for subjunctive clauses as in (92).

- (92) a. John suggested that [[**he**] [(should) go to Seoul in March]].  
 b. I recommend that [[**she**] [(should) not smoke]].

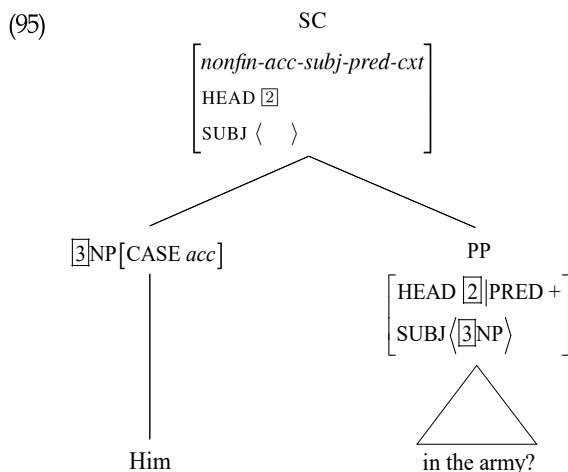
Conversely, base form verbs are non-finite, and therefore (91b) requires such verbs to take accusative subjects, as (93) illustrates. Analogously to (92), we assume that verb does not lexically impose any case on its subject.

- (93) a. [[Him/\*He] [wear a tuxedo]]?!  
 b. [[Her/\*She] [give me a raise]]?

A similar situation arises in predicative heads like (82), (84), and (85b), which must have accusative subjects, in accordance with (91b). We illustrate this in (94).

- (94) a. What? [[Him/\*He] [a doctor]]?  
 b. What? [[Him/\*He] [in the army]]?  
 c. With [[me/\*I] in the car], Robin drove very carefully.  
 d. With [[him/\*his] [in control]], we will never get anything done.

The present analysis would then assign the following structure for (94b):

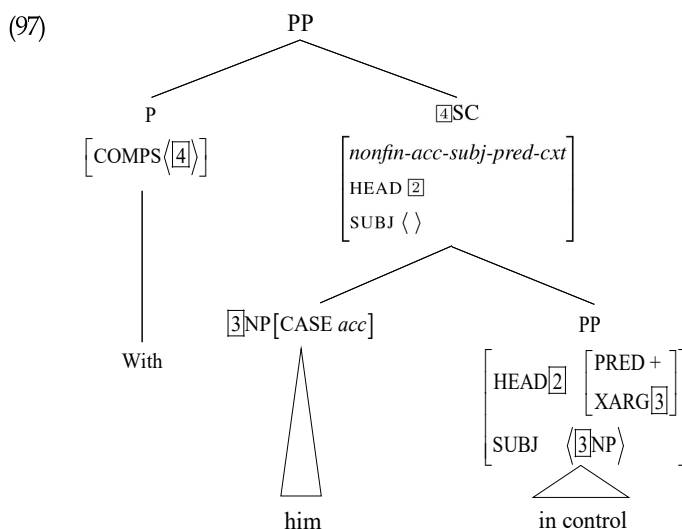


The predicative PP *in the army* combines with the ACC subject, forming a saturated nonfinite SC. The HFP ensures that the predicative property of the PP is further inherited to this SC. Note that within the present feature-based system there are in fact no categories like SC, NP, or PP. These are mere abbreviations for certain feature specifications. The symbol SC is an abbreviation for a nonfinite clausal expression with empty SUBJ and COMPS values:<sup>19</sup>

$$(96) \quad \text{SC} = \left[ \begin{array}{l} \text{SYN} \left[ \begin{array}{l} \text{FORM } \textit{nonfin} \\ \text{SUBJ } \langle \quad \rangle \\ \text{COMPS } \langle \quad \rangle \end{array} \right] \\ \text{SEM}[\text{RELS } P] \end{array} \right] \quad (\text{where } P \text{ is a proposition})$$

The SC can in turn be selected by the preposition introducing an absolute construction:

19 Similarly, NP abbreviates a nominal sign with empty SUBJ and COMPS values, PP abbreviates a prepositional sign with an empty COMPS value, VP abbreviates a verbal sign with a non-empty SUBJ value and an empty COMPS value, etc. In addition, note that the value of the feature RELS is a simplified version since its value is a list which may contain more than one proposition.



The absolute *with* lexically selects a nonfinite SC with the positive PRED feature value. In the structure (97), it combines with the nonfinite SC projected from a predicative PP whose external argument is assigned ACC in accordance with the default construction rule in (91b). Our construction-based account offers a uniform analysis of ACC case in absolute structures both with the preposition *with* and without it:

- (98) a. Her being a friend, I didn't want to commit to nothing. (COCA 2006 NEWS)  
b. With him being down, everybody on the other team piled on him. (COCA 2010 FIC)

The subject gets accusative case because it is the subject of a nonfinite clause and the predicate does not lexically impose any case assignment for its subject. Note that this account in which the predicative PP functions as the head of a nonfinite clause is not unlike the analysis of Bowers (1993), which assumes the following S structure:  $S(\text{PredP}) \rightarrow NP \text{ PredP}$ . Of course, Bowers and many others assume an empty Pred head. Adopting the feature PRED for the *sub-pred-ct* can be seen as an reinterpretation of Bowers' PredP in the feature-based HPSG framework.

Finally, the restricted and non-standard uses in which nominative subjects are allowed to combine with non-finite predicates, such as those discussed in section 5.5 are modeled by assuming that such uses of the predicate lexically specify that the subject is nominative. This lexical specification overrides the default accusative case assignment specified by (91b). This allows us to obtain examples like (99), repeated from section 5.5.

- (99) a. they went in opposite directions in the middle of the avenue, **he**  
looking back at her a few times (COCA 1996 MAG)  
b. (...) so close their lips were touching, and **he** smiling all the time  
(COCA 1997 FIC)  
c. It might seem peculiar to **he** bringing in such imprecise sentiments in  
talking about a subject (COCA 1997 ACAD)

For illustration, in (100) is the lexical entry that allows for the relevant use of *smiling* observed in (99b). Crucially, no constraint on the feature CASE is imposed by (100), which in turn allows the subject to bear any case. If it turns out that the subject bears nominative case, then the default accusative case required by (91b) is overridden, whereas if (100) combines with an accusative subject then is (91b) satisfied.

- (100) 
$$\left[ \begin{array}{l} \text{word} \\ \text{PHON } \langle \textit{smiling} \rangle \\ \text{SYN } \left[ \begin{array}{l} \text{HEAD } \left[ \begin{array}{l} \text{verb} \\ \text{PRED } + \\ \text{FORM } \textit{nonfin} \\ \text{XARG } \boxed{1} \end{array} \right] \\ \text{SUBJ } \langle \boxed{1} \text{NP}_x \rangle \\ \text{COMPS } \langle \rangle \end{array} \right] \\ \text{ARG-ST } \langle \boxed{1} \rangle \end{array} \right]$$

Coupled with HPSC's analysis of filler-gap dependencies (Pollard and Sag 1994; Sag et al. 2003), our proposal readily predicts that the head phrase cannot

be moved, given that it is not subcategorized by anything. This is illustrated below.<sup>20</sup>

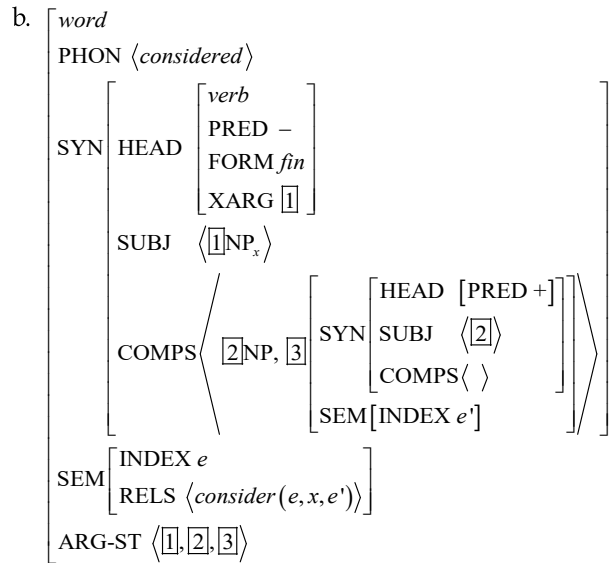
- (101) a. I can't imagine Bob in the army.  
 b. \*It is in the army that I can't imagine Bob.  
 c. \*Where I can't imagine Bob is in the army.  
 d. \*Where can't you imagine Bob?
- (102) a. I can't imagine Bob drunk.  
 b. \*It is drunk that I can't imagine Bob.  
 c. \*How I can't imagine Bob is drunk.  
 d. \*How can't you imagine Bob?

The lexical entries for *imagined* and *considered* are shown below:

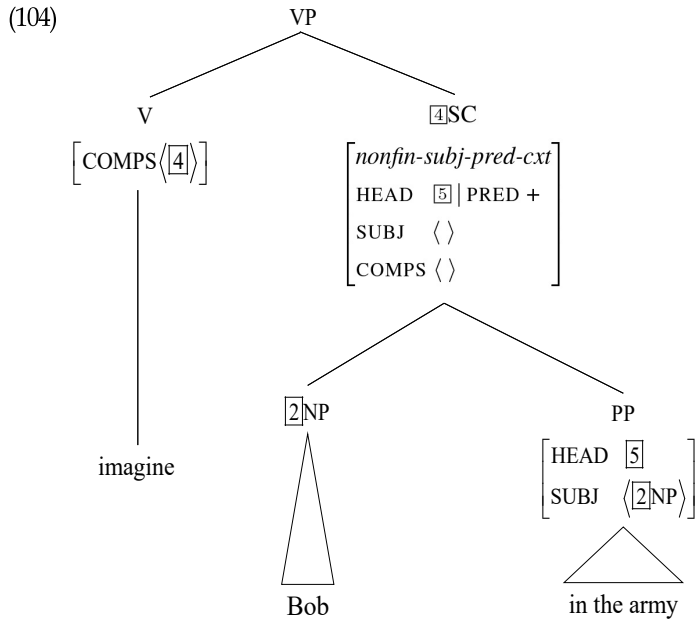
- (103) a. 
$$\left[ \begin{array}{l} \text{word} \\ \text{PHON } \langle \textit{imagined} \rangle \\ \left[ \begin{array}{l} \text{HEAD } \left[ \begin{array}{l} \textit{verb} \\ \text{PRED } - \\ \text{FORM } \textit{fin} \\ \text{XARG } [1] \end{array} \right] \\ \text{SUBJ } \langle [1] \text{NP}_x \rangle \\ \text{SYN } \left[ \begin{array}{l} \text{COMPS } \langle [2] \rangle \\ \text{SEM } [\text{INDEX } e'] \end{array} \right] \left[ \begin{array}{l} \text{SYN } \left[ \begin{array}{l} \text{HEAD } \left[ \begin{array}{l} \text{PRED } + \\ \text{SUBJ } \langle \rangle \\ \text{COMPS } \langle \rangle \end{array} \right] \end{array} \right] \\ \text{SEM } [\text{INDEX } e] \end{array} \right] \end{array} \right] \\ \text{SEM } \left[ \begin{array}{l} \text{INDEX } e \\ \text{RELS } \langle \textit{imagine}(e, x, e') \rangle \end{array} \right] \\ \text{ARG-ST } \langle [1], [2] \rangle \end{array} \right]$$

20 In all of these examples *where* should be interpreted as the predicate that takes *Bob* as an external argument, not as an adverbial modifier of the VP headed by *imagine*.

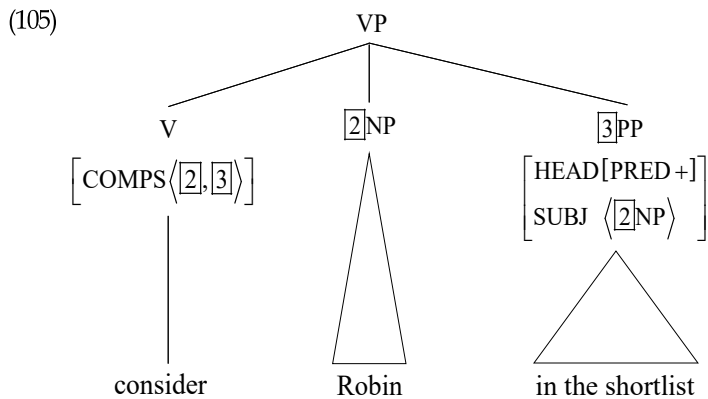




The former *imagined* selects a single complement, which can be topicalized, clefted and so on, whereas the latter *considered* selects two complements. We assume that *imagined* lexically imposes semantic selection constraints on the eventuality  $e'$  denoted by the complement such that adjectival and prepositional projections are allowed, but nominal projections are excluded. Hence, *I imagined Robin drunk* and *I imagined Robin in the army* and *I imagined Robin a poet* are grammatical, but not *\*I imagined Robin the poet* in which *the poet* cannot function as a predicative expression. Note that its complement carries further constraints, [PRED+], [SUBJ  $\langle \rangle$ ] and [COMPS  $\langle \rangle$ ], ensuring itself to be a structure composed of a subject and a predicative phrasal head. This is illustrated by the following structure generated from the present analysis:



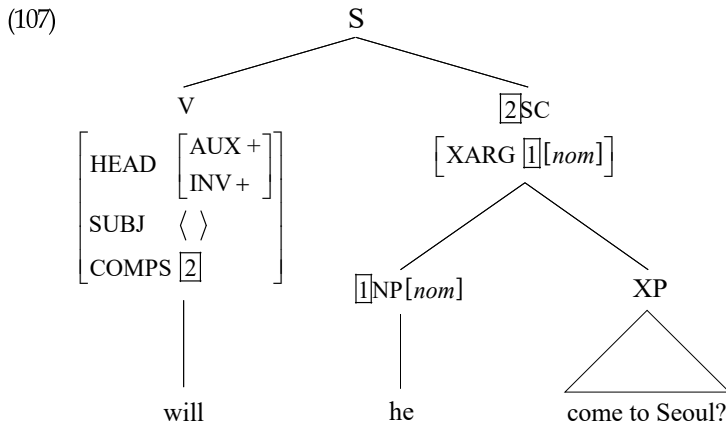
In the case of *considered* the verb requires the NP complement to be identified as the unsaturated subject of the second complement. This is done via the constraint [SUBJ <2>] on the 3PP, as illustrated from the following structure:



Because there are two complements rather than one, the predicative head is extractable, as illustrated below.

- (106) a. How much of a good friend do you consider Robin?  
 b. How much of an idiot do you consider Robin?  
 c. How smart do you consider Robin?

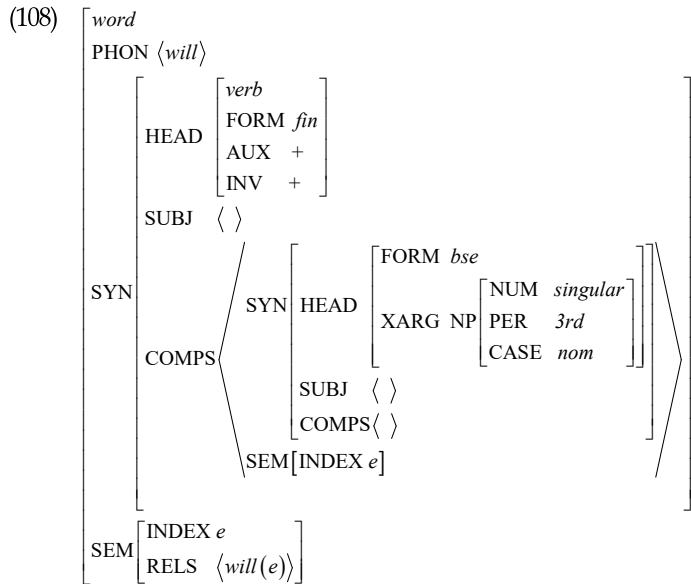
Since we now allow a NOM subject to combine with a nonfinite small clause in accordance with the nonfinite construction rules in (91), we predict that the non-finite clause in the SAI (Subject-Auxiliary Inversion) construction can be generated as seen below (Kim and Michaelis 2020):



As noted earlier, this analysis is a departure from the non-transformational account of SAI (Pollard and Sag 1994; Sag et al. 2003; Kim and Sells 2008), which instead assumed a flatter structure, and relied on a feature INV. The account we propose instead does not assume a flat structure.

In (108) we show an example of an ‘inverted’ auxiliary verb. There is a systematic relationship between a noninverted auxiliary verb and its inverted auxiliary verb. As usual in HPSG, most of the noninverted auxiliary verb can ‘pump’ into an inverted one by a lexically-controlled construction rule with the change of selected arguments.<sup>21</sup> For example, noninverted auxiliary verbs will select two arguments: one is realized as the subject and the other as the base VP complement:

<sup>21</sup> We leave out the exact formalization of this pumping rule, but see Sag (2012) and Kim and Michaelis (2020) for a direction.



As illustrated here, a non-inverted auxiliary selects a nominative subject and a VP, and its subject is structureshared with the subject selected by the VP complement. A SAI auxiliary, in contrast, selects no subject and instead selects an S complement, the subject of which is required to bear a nominative case specification. Note that the inverted auxiliary lexically selects a verbal complement whose FORM head feature value is identical with the noninverted counterpart. Thus if the non-inverted auxiliary selects a *bse* VP, then its SAI counterpart will select a *bse* S instead, thus blocking cases like *\*Will he coming to Seoul?*, *\*Will he came to Seoul?* and so on. Hence, the FORM value requirements of these environments are maintained in the SAI environments too:<sup>22</sup>

- (109) a. John can come to Seoul. vs. Can John come to Seoul?  
b. John has driven to Seoul. vs. Has John driven to Seoul?  
c. John is [visiting to Seoul]. vs. Is John [visiting to Seoul]?  
d. John is [visited by his friends]. vs. Is John [visited by his friends]?  
e. John is [to visit his friends]. vs. Is John [to visit his friends]?

<sup>22</sup> For the combinatorial possibilities of English auxiliary systems in accordance with the FORM value, see Pollard and Sag (1994); Sag et al. (2003); Kim and Sells (2008).

In addition, inverted auxiliary verbs like (108) impose number and agreement constraints on the subject of their complement clause via the independently motivated feature XARG (see (80) above). Thus, the lexical entry of the auxiliary verb forces the SC's subject to be nominative, overriding the accusative case imposed by (91b).

There are various kinds of lexical exceptions that this account of SAI can easily accommodate. For example, *better* does not invert (cf. *I better not cry?* with *\*Better I not cry?*), and therefore is listed as a sign of type *word* subcategorizing for a subject NP and a non-finite VP. Conversely, *aren't* must invert (*Aren't I invited?* with *\*I aren't invited?*), which we assume is the result of the negation rule requiring an inverted auxiliary as input (i.e. a verb bearing the specification AUX +, an empty SUBJ list, and a non-finite S in the COMPS list). In sum, the SC analysis is consistent with SAI phenomena.

One possible remaining issue for such analysis concerns SAI with VPE:

- (110) a. I didn't. Did you?  
b. John cannot finish the project on time. Can Robin?

In such examples, the inverted auxiliary combines only with the subject. The traditional assumption for such cases is that the VP Ellipsis is triggered by the auxiliary verb. There are several possible analyses we can pursue. One is to introduce a *pro* for the elided VP as suggested by Johnson (2001) and Kim (2003). Another possibility is to license the construction [AUX NP] directly, as a fragment, leaving out the interpretation of the VP to semantics, as direct interpretation (Ginzburg and Sag 2000; Culicover and Jackendoff 2005; Jacobson 2008).<sup>23</sup>

## 7. Conclusion

The existence of SC (small clauses) has been rather controversial in both theoretical and empirical grounds. Within the Principles and Parameters

<sup>23</sup> For example, see Park (2019) for a HPSG QUD-based account of verbal ellipsis of the Gapping variety, which we could take inspiration from. We leave this matter to future work.

approaches, the postulation of the SC appears to be a natural consequence. The Projection Principle requires one-to-one mapping relations between argument structure and syntactic structure and this position is also supported by several linguistic phenomena. However, within the non-derivational perspective in which non-isomorphic relationships between the two structures are also possible, the SC is not a necessary constituent.

In this paper, we have seen that even within the nonderivational perspective, there is evidence to posit the SC as a syntactic constituent though it exists in limited environments. We have observed that *gerundive* and (*with* or *verbless*) absolute constructions all employ nonfinite clauses whose subject is typically ACC but can be even NOM. In addition, the *imagine* class of verbs also employs the SC as its complement. This position also offers a binary structure for the SAI constructions, departing from the nonderivational, flat structure adopted by Pollard and Sag (1994) and subsequent work. We have seen that the licensing of the SC depends on lexical as well as constructional properties. For instance, the auxiliary in the SAI constructions lexically select a SC with the NOM subject while incredulity and absolute constructions in general combine with a SC with the ACC subject as constructional constraints.

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Received: 2020. 11. 01.

Revised: 2020. 12. 07.

Accepted: 2020. 12. 10.