The representation of selection in syntax

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1 Introduction

In this paper, I revisit some puzzles about selection, and argue that they suggest principled restrictions on the content of syntactic features. The primary puzzle is: early work on selection revealed that there can be multiple different kinds of selectional relationships between a head and a phrase, where each type of relationship has its own locality signature. Chomsky (1965) identified *subcategorization* and *selection* as two kinds of such relationships, where subcategorization was necessarily a relationship between a head and (the head of) its complement, and selection was a relationship between a head and either its complement or specifier.

Later work by Grimshaw and Pesetsky redefined the typology of selection to distinguish c(ategory)-selection, s(emantic)-selection, and l(exical)-selection. However, the puzzles about which kinds of selectional relationships are satisfiable by complements vs. specifiers remain unsolved.

In this paper, I propose that these puzzles reflect a need to be explicit about the syntactic features implicated in different kinds of selectional relationships. In an effort to be explicit in this way, I take up two guiding principles, which jointly comprise what I will call a *Sparse Feature* approach to selection and Merge. The first principle is that Merge-inducing features should be *abstract*, referring to properties that distinguish sets of lexical items from other sets of lexical items, without referring to individual lexical items themselves. The second principle is that Merge-inducing features should refer to *syntactic* properties. Given the modularity of grammar and the autonomy of syntax, one expects the syntax to only be sensitive to the syntactic properties of lexical items, allowing other modules and the interfaces to consider other properties (semantic, phonological) of lexical items. These desiderata are summarized in (1).

(1) The Sparse Feature theory:
Syntactic Merge-inducing features refer to abstract, syntactic properties.

I will argue that many features that are commonly implicated in selection do not meet these criteria, as stated. Moreover, I propose that choosing other features that *do* meet these criteria offer ways to understand the locality profiles of different selectional requirements.

More concretely, I propose to represent all semantic and lexical selectional requirements with an *underspecified* syntactic feature [·X·], a feature proposed by Newman (2024b) to introduce non-DP phrases. I show that this proposal, paired with existing proposals about feature-driven Merge, makes the following prediction: any selectional relationship that is characterized by a *specific syntactic feature* can be satisfied by either a complement or a specifier. Selectional relationships not characterized by a specific syntactic feature must be represented by [·X·], which, for principled reasons that we will see, is only checked by complements. I propose that this prediction manifests itself in several ways, such as a requirement for lexically selected prepositional phrases to merge as complements, as well as so-called *smuggling* derivations (cf. Collins 2005, 2024). Furthermore, we will see that this approach also helps resolve puzzles about c-selection first discussed by Grimshaw and Pesetsky, in which verbs apparently *anti-select* for DP.

An outline of the paper is as follows: §2 outlines the feature-checking system that I will adopt, and introduces the idea of Newman's underspecified feature [·X·]. This section demonstrates the abstract ramifications of having an underspecified feature in the system. §3 revisits puzzles about the locality of selection and demonstrates how representing certain selectional relationships with [·X·] predicts the relative configurations of complements and specifiers in two contexts: 1) l-selection of prepositions and complementizers, and 2) smuggling derivations. §4 revisits an old puzzle about c-selection and s-selection from a feature-driven perspective, in which some verbs appear to select for anything but DP. I argue that representing s-selection with [·X·] resolves it, provided we reanalyze verbs like *wonder* as unaccusative.

2 A sparse theory of features and feature-checking

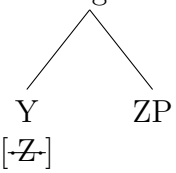
The starting point of this paper is a feature-driven approach to Merge, in which lexical requirements are encoded as syntactic Merge-inducing features, which can be "checked" by merging the right kind of phrase (Chomsky, 1995; Adger, 2003; Pesetsky and Torrego, 2006; Heck and Müller, 2007; Müller, 2010; Longenbaugh, 2019; Newman, 2024b, a.o.).

While Chomsky (1995) largely invoked such features to represent requirements for a certain kind of specifier, others have extended this approach to complement-Merge as well (Adger, 2003; Pesetsky and Torrego, 2006; Heck and Müller, 2007; Müller, 2010; Newman, 2024b). I will take up Heck and Müller; Müller's (2007; 2010) notation for feature-driven Merge, which is based on the principle that *all*

Merge proceeds in this fashion: every element that wants to Merge[1] must check a corresponding feature on its sister, or else it will violate the Last Resort Principle (2) and lead to a crash. Heck and Müller use the generalized notation in (4) to describe the featural requirements of a head. Their system has other features as well for inducing movement/agreement but we will leave those aside.

(2) **Last Resort** (Chomsky, 2000, 2001)
α can only target K if a feature of either α or K is checked by the operation

(3) ZP merges in order to check [·Z·] on Y



(4) $[\cdot\alpha\cdot]$ = an instruction to Merge with an element bearing $[\alpha]$ (Heck and Müller, 2007; Müller, 2010)

The basic insight from Heck and Müller is to use such features as the means of encoding c-selection. However, Newman (2024b) argues that not every instance of Merge is in response to a specific category feature. Some phrases, she argues, are introduced by an *underspecified* feature [·X·], which can be checked by an element of any category.[2]

(5) [·X·]: a merge-inducing feature that can be checked by a phrase of any category

Newman focuses on certain consequences of having [·X·] in the inventory of features, including: the order of argument-merge and limits on the possible lexical verbs. Two such consequences are based on the idea, following Chomsky (1995); Pesetsky and Torrego (2001); Rezac (2013); van Urk and Richards (2015); Longenbaugh (2019), that a single instance of Merge can check multiple features. This proposal is based on Chomsky's Free Rider condition, generalized to the economy condition in (6). The Free Rider condition requires syntactic operations to maximize their feature-checking potential: if a phrase merges that can check multiple requirements of a head, all such requirements must be considered satisfied by that phrase. Importantly, the Free Rider condition is not a global economy condition: it does not tell the derivation which elements to Merge. Rather, if something merges, it regulates how many requirements of a head are satisfied as a result.

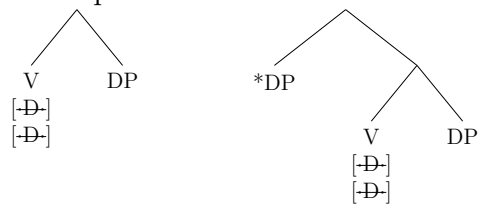
(6) Free Rider/Feature Maximality condition: Given a head H with features $[F_1]...[F_n]$, if XP discharges $[F_i]$, XP must also discharge each $[F_j]$ that it is capable of (Chomsky, 1995; Pesetsky and Torrego, 2001; Rezac, 2013; van Urk and Richards, 2015; Longenbaugh, 2019).

[1]By Merge, Heck and Müller largely mean *Set-Merge*, and leave aside whether adjunction is also feature-driven.

[2]This proposal takes inspiration from the unspecified edge features of Chomsky (2005).

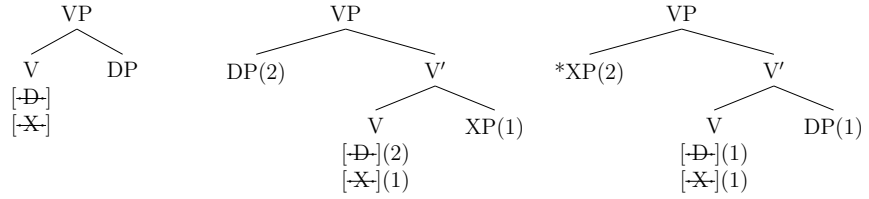
This condition imposes two kinds of constraints on the construction of a verb phrase. First, it predicts that no head can c-select two arguments of the same category. Supposing we had a head that c-selected two DPs, the feature-driven approach to Merge would need to endow that head with two instances of [·D·]. Merging a DP with such a head would also be subject to the Free Rider condition: that DP has to check every feature of the head that it can, which includes both instances of [·D·]. After the first DP merges, there are no remaining argument-introducing features left to license a second DP specifier, thus blocking (7).

(7) Consequence: no c-selection for multiple phrases of the same category



A second prediction of this account has to do with cases where a verb c-selects for a DP and also has [·X·] for introducing another phrase. The fact that DP is itself a kind of XP (and can therefore check [·X·] as well as [·D·]) induces restrictions on the relative order in which the DP and the other (non-DP) phrase may merge. If the DP is merged first, no other phrases are licensed in that projection due to the fact that the DP checks both [·D·] and [·X·]. However, if the other phrase is merged first, it checks only [·X·], allowing the DP to be merged later. Newman calls this ordering restriction *the non-DP first theorem*.

(8) *The non-DP first theorem*: if V merges with a non-DP (licensed by [·X·]), the non-DP must merge first. (Newman, 2024b)



Newman's proposal focuses on the content of Merge-inducing features and how it affects phrase structure, but does not fully address the relationship between the presence of Merge-inducing features and the kinds of selectional relationships that verbs might have. In this paper, I examine this relationship further and propose the following: while c-selection may correspond to the presence of specific syntactic features on heads, other selectional relationships (s-selection, l-selection), being non-syntactic, must be represented by [·X·]. As discussed in the introduction, this proposal is motivated by two desiderata about the content of syntactic Merge-inducing features.

(9) Desiderata on the content of Merge-inducing features:

a. Merge-inducing features refer to *abstract* properties.
b. Merge-inducing features refer to *syntactic* properties.

The inability to find syntactic correlates of other selectional requirements (defined by e.g. semantic quantities or concrete entities like lexical items) is what forces the syntax to invoke [·X·], which has the aforementioned effects on the distribution of phrases so selected. The engine behind the proposal is thus the sparseness of features available to the syntax for describing selection. For convenience, I will refer to this proposal as the *Sparse Feature theory* throughout.

With a requirement for sparseness, I propose that the second consequence of Newman's inventory of features is what accounts for the unique locality profile of subcategorization-type relationships. Elements that must check [·X·] have to be merged as complements, by (8). Thus, any selectional relationship that can only be encoded (syntactically) through [·X·] is obligatorily satisfied by complementation. I will argue that this accounts for the locality profile of *l-selection*, as well as interactions between complements and specifiers in the functional sequence. These cases of l-selection/subcategorization are not reducible to category selection or other kinds of syntactic selection. As a result, the only feature that can introduce these phrases is [·X·], which forces them to be complements.

3 The locality of selection

In this section, I revisit different kinds of proposed selectional rules from the literature, and clarify which puzzles I hope to address and the terminology that I use to describe them. Starting with Chomsky (1965), Chomsky proposed that two sorts of rules regulated the relationship between a head and its structural context. *Subcategorization* rules captured the (arbitrary) structural requirements that a head imposes on the head of its complement(s). Subcategorization rules were therefore used to describe things like the functional sequence, as well as verbs' requirements for clausal or prepositional complements headed by certain complementizers/prepositions.

(10) Subcategorization frames from (Chomsky, 1965, p.94, ex.40)
a. V → CS/_ α, where α is a string such that Vα is a VP (general rule)
b. V → CS/_ *that* S′ (example for a verb like *say*)

In addition to subcategorization rules, Chomsky also proposed *selectional* rules to cover the relationship between a verb and its arguments. Selectional rules could be used to introduce either complements or specifiers, and could impose featural restrictions on those phrases, such as whether they were animate, concrete, etc.

(11) Selectional rules for subjects and objects (Chomsky, 1965, p.95, ex.42)
a. [+V] → CS/ [+Abstract] Aux ___

b. [+V] → CS/ [-Abstract] Aux ___
c. [+V] → CS/ ___ Det [+Animate]
d. [+V] → CS/ ___ Det [-Animate]

(12) Corresponding English verbs with the above selectional requirements
a. Sincerity frightens the boy. (11a,c)
b. The boy fears sincerity. (11b,d)

Thus, the two kinds of relationships characterized by *subcategorization* and *selection* respectively were distinguishable according to two parameters: 1) their locality profile, and 2) their inputs. Subcategorization regulated head-head relations and only introduced complements; selection regulated head-feature relations and introduced both complements and specifiers.

Later work led to a re-drawing of the typology of selectional relationships. One reason for this was the VP-internal subject hypothesis and subsequent idea that subjects move to Spec TP. In a world with EPP requirements, we confront a reality in which not all specifiers are arguments of the head that attracted them. This requirement for movement has the character of subcategorization, in that it is an arbitrary structural requirement, unrelated to argument-introduction. At the same time it has the locality profile of selection because movement necessarily creates specifiers.

For this and other reasons, authors like Grimshaw and Pesetsky suggested that we distinguish selectional rules from each other according to other parameters. Grimshaw (1979) suggested distinguishing rules according to whether they deal in semantic types or syntactic categories, termed s(emantic)-selection and c(ategory)-selection, respectively. In addition, Pesetsky (1982) introduced a notion of l(exical)-selection for other cases where there was no obvious semantic type or syntactic category to appeal to.

This redrawing of the typology of selectional rules has been successful in many ways – I will assume throughout this paper that it is essentially right. However, it obscures the locality puzzle that had been more obvious in Chomsky's proposal. Some selectional rules still have the locality of Chomsky's subcategorization rules: they can only be satisfied by complements. In this paper, I revisit the issue of locality in selection and propose that the Sparse feature theory helps us understand at least two cases where a selectional rule has this locality profile: l-selection of prepositions/complementizers and the organization of functional heads in the verbal domain.

3.1 L-selection of P and C

An example of a selectional rule with this locality profile is a special subcase of Pesetsky's *l-selection*, in which heads require the heads of their complements to be a specific preposition or complementizer. Pesetsky originally used the term *l-selection* to refer to a broader set of situations, including selection for *subcategories* (e.g. [±finite]), but more recent work on l-selection by Merchant (2019) and Hewett (2024) mainly uses

the term to refer to cases like (14,15). I will follow this convention to use the term *l-selection* to describe cases where heads require a specific lexical item as the head of their complement.

(13) L-selection (based on Merchant 2019)
A head H_1 *l-selects* for a head H_2 if H_2 must be realized as a specific lexical item.

(14) Verbs l-select for certain prepositions
   a. Wallace **depended** *on/*to*... Gromit's intelligence.
   b. Gromit **bristled** *at/*on*... Wallace's hubris.

(15) Verbs l-select for certain complementizers
   a. Wallace **arranged** *for/*that*... Gromit to win.
   b. Gromit **said** *that/*for*... Wallace would win.

As observed by Neeleman (1997), l-selection of prepositions only occurs with complement PPs, not specifier PPs. While there are many verbs that are picky about the choice of preposition that heads their complement, situations with a PP specifier never seem to have this profile. Neeleman argues that while PP subjects exist, they do not have the same profile as l-selected PP complements: their interpretation is predictable from the choice of preposition rather than from the choice of verb.

(16) PP subjects are interpreted according to the meaning of P, not V
   a. **Under the bed** is a good hiding place.
   interpretation of 'under the bed' = location
   b. **Into the room** walked the students.
   interpretation of 'into the room' = goal

In other words, the interpretation of PP subjects is transparent, related to the meaning of the preposition that heads it. Choosing a different preposition is possible, and leads to a different interpretation. By contrast, the meanings of l-selected complement PPs are not transparent or predictable from the choice of preposition, rather they are predictable from the meaning of the verb. Moreover, the choice of a different P head leads to a crash. The phrase headed by *on* in (14a), for example, is not interpreted as a location argument, despite *on* being a locative preposition. Instead, we interpret the PP in (14a) as a theme argument of *depend*, where knowing English includes knowing the idiosyncratic fact that the theme argument of *depend* must be headed by the preposition *on*.

The aspects of (14-15) that are most puzzling are the specificity of the relationship as well as its locality profile. Rather than being satisfied by a feature or semantic type, head 1 demands that a *particular lexical item* be head 2. Furthermore, head 2 heads the *complement* of head 1.

To my knowledge, there is no principled explanation for why l-selection of PPs should have this locality profile. In addition, it seems that l-selection of CPs patterns

the same way. While verbs can be particular about the heads of their CPs complements (e.g. whether they are headed by *that, whether, to...*), they do not impose such requirements on the heads of their clausal subjects (17).

(17) C heads of clausal subjects not conditioned by verb choice.
  a. [That Wallace could win the race] would interest me.
  b. [For Wallace to win the race] would interest me.
  c. [Whether Wallace wins the race] would interest me.

This may be a fact about English – many other languages restrict the forms of their clausal subjects in some way, by requiring a special complementizer, tense/mood, case marker or demonstrative, for example (see Hartman 2012 for an overview). In languages with such restrictions, however, it doesn't appear to be the *verb* that conditions these choices, but rather language-wide requirements on the forms of subjects. According to Davies and Dubinsky (1998); Hartman (2012), following Chomsky (1965); Rosenbaum (1967); Emonds (1970); Koster (1978); Stowell (1981); Grimshaw (1982), languages that impose these kinds of restrictions usually require their clausal subjects to be nominal, for example. As a result, such restrictions on the form of CP subjects are not due to the l-selectional requirements of verbs, but instead relate to the morphosyntax of nominals and what kinds of clausal complements they can take.

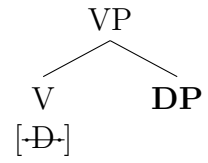
Importantly, the pattern that we do not find is one where a verb selects for a CP subject (that is not nominal), where the choice of complementizer is conditioned by the verb. This contrasts with what we find in clausal complementation, where CP complements both exist and may have their complementizers determined by the choice of verb. In sum, l-selection for complementizers and prepositions seems to have a strict locality requirement: this sort of l-selection is only satisfiable by complementation.

I propose that the explanation of this locality profile lies in the representation of this kind of selection in a feature-driven framework. Supposing that every instance of Merge is driven by the need to check a syntactic feature, we now must examine what kinds of features may be used to represent these different relationships. For c-selection, the choice is clear: a requirement to merge with an element of a particular category is represented as a Merge feature specified for that category.

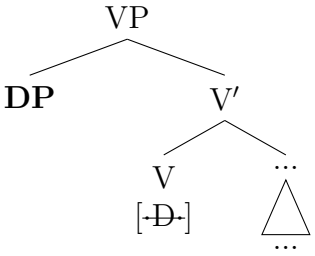
(18) C-selection: a selectional relationship characterized by syntactic category, represented by the presence of $[\cdot\alpha\cdot]$ on a head, where α is a syntactic category

Since Merge features can be checked by any instance of Merge, the expectation is that c-selection should be able to introduce both complements and specifiers. For example, if c-selection for a DP is represented as a feature $[\cdot\text{D}\cdot]$ on a head, verbs that c-select for DPs should be able to satisfy their requirement either through complementation or specifier formation. This appears to be right: some verbs that select for a DP host that DP as a complement (21a), while others host it as a specifier (21b).

(19) Checking a feature via complementation



(20) Checking a feature via specifier formation



(21) Different verbs that select for DP

a. Wallace built <u>a rocket</u>. DP = complement

b. Wallace put <u>a rocket</u> on the moon. DP = specifier

The question is: what feature is used to describe l-selection? By definition, l-selection is not a relationship conditioned by syntactic category. Thus, invoking a categorial Merge feature to encode l-selection would be ad hoc, and an inaccurate representation of the selectional relationship involved. It is also not obviously conditioned by other abstract syntactic features, such as [wh], [φ], etc. In fact, any specific syntactic feature will be a poor representation of l-selection: it is not the *syntactic properties* of *on* or *for* that make them the selected heads of PP or CP in (14,15), it is the lexical items *themselves* that make them so.

We could add features like [·*on*·] and [·*for*·] to the inventory of Merge-inducing features for the purposes of describing l-selection, but this option faces some disadvantages. First, what is the principle that makes these features part of the inventory of Merge-inducing features? Is it that every lexical item is associated with a corresponding Merge-inducing feature, such that the inventory of features includes both abstract features ([·D·], [·V·]...) and concrete features ([·*cat*·], [·*run*·], [·*on*·]...)? This doesn't seem to be right. If every lexical item had a corresponding Merge-inducing feature, the space of imaginable selectional requirements would be enormous, and include many options that we don't find: verbs that l-select for DPs headed by *some*, determiners that select for NPs headed by *cat*, *v* heads that select for VPs headed by *run*, verbs that l-select for multiple phrases, and so forth.

Alternatively we could stipulate that only some lexical items have this privileged status of having a corresponding Merge-inducing feature, such that concrete features include [·*on*·] and [·*for*·] but not [·*cat*·] or [·*run*·]. However, this still does not address the locality problem. A verb that has [·*for*·] and a verb that has [·*on*·] would still have nothing in common on this view, making it hard to imagine what accounts for

the similarity of the locality restrictions on those selectional requirements.

The Sparse Feature theory avoids this overgeneration problem by restricting syntactic features so that they only encode abstract syntactic quantities. This reduces the size of the inventory of features to something much smaller than the lexicon. As we will see, it also allows us to identify patterns in the profiles of l-selection. I therefore reject the possibility of features like [·*on*·] and [·*for*·].

The framework of feature-driven Merge demands that *some* feature be implicated in the Merge of l-selected PPs and CPs. Newman's underspecified [·X·] gives us the ideal candidate: it encodes no particular syntactic properties at all. It just says: something must be merged, leaving it to the interfaces to determine whether the output is convergent. Thus, the choice of [·X·] as the feature that introduces l-selected PPs and CPs is motivated by the (lack of) syntactic character of the selectional relationship, and it also predicts the right locality profile.

The essential property of [·X·] is that it may be checked by any element – it does not restrict the syntactic properties of its checker in any way. Thus, unless the l-selected element is the first phrase to merge with the head bearing [·X·], the l-selected element will not be able to merge at all. Whatever merges first checks [·X·] and prevents any other instances of [·X·]-driven Merge within that projection.

Thus, l-selected elements must be complements: they are introduced by [·X·], and [·X·] is checked by the first thing that merges. Newman mainly explored this consequence in the context of verbs that select for multiple arguments, such as a DP and PP, where her *non-DP first theorem* forced the PP to merge first. Here, I suggest a more general extension: selected elements that don't check a category feature (e.g. l-selected elements) must be complements.[3]

(22) *Selection of complements theorem*:
Phrases introduced by [·X·] are complements.

(23) L-selection (updated)
A head H_1 *l-selects* for a head H_2 if H_2 must be realized as a specific lexical item.
Syntactic representation: [·X·]

[3]A potential counterexample to the claim that the heads of specifiers are never l-selected could come from quirky subjects. Verbs whose subjects must have a special case (e.g. dative, genitive) could be an instance of l-selection for a particular case feature/head on their specifier. I leave investigation of quirky subjects aside here because they raise several other issues that are not obviously connected with l-selection. First, their status as base-generated specifiers needs to be further examined – as dative subjects in some languages are realized as rightward experiencer PPs in other languages, one could imagine the possibility that they are actually base generated as complements, which later raise to subject position. Second, the status of quirky case as being l-selected vs. featural/assigned is not well established. Thus, further work is needed to understand whether quirky subjects are actually counterexamples to the generalization that l-selected elements are always complements.

To reiterate, on this proposal, the syntactic representation of l-selection does not actually specify the choice of lexical item: the syntax only knows that something needs to merge, but cannot specify that it needs to be a phrase headed by *on*, for example. In that case, what actually enforces l-selection? Which component of the grammar or the representation of *depend* requires the head of its sister to be *on*?

I propose that this aspect of l-selection is enforced by the non-compositionality of how l-selected elements are interpreted. This is especially clear in the case of selection for prepositions. This view is motivated by two observations: 1) cases of optional l-selection, and 2) cases of l-selection for multiple prepositions. Consider verbs like *react*, *trust* and *look*. All of these verbs exemplify cases of optional l-selection for certain prepositions in different ways.

(24) a. Wallace reacted (when the doctor tapped his knee).
b. Wallace reacted **to**/*on/*in... the doctor's tap.

(25) a. Gromit trusted Wallace.
b. Gromit trusted **in**/*on/*to... Wallace.
c. Gromit trusted that Wallace would arrive on time.

(26) a. Wallace looked **at** Gromit.
b. Gromit looked **after** Wallace.

React optionally l-selects a phrase headed by *to*, but does not require an object. *Trust* optionally l-selects a phrase headed by *in*, but can alternatively take a DP or CP complement. *Look* optionally l-selects phrases headed by various prepositions, where the choice of preposition affects the interpretation of *look* in idiosyncratic ways (meaning *gaze upon* when P=*at* but *take care of* when P=*after*).

Based on these observations, I propose that the l-selected preposition in each case is not enforced by the syntax but rather by the semantics. On this view, the verb does not require a phrase headed by a particular preposition as its complement. Thus, failure to merge one (or the right one) does not lead to a crash. However, the verb may only acquire certain *interpretations* in the presence of phrases headed by those prepositions. These interpretations are not lexically assigned to either the verb or the preposition, but arise non-compositionally.

Thus, it is plausible that the syntactic selectional requirement of each verb is just [·X·], which can be satisfied by several kinds of elements (DPs, PPs, or CPs in the case of *trust*; various PPs in the case of *look*). However, *trust* only acquires the unique interpretation *have faith in* in the context of *in*, and *look* only acquires the unique interpretation of *take care of* in the context of *after*.

This analysis seems plausible when considering verbs that only optionally select for certain prepositions, but what about verbs like *depend*, which crash in the absence of *on*? What enforces l-selection in these cases?

What is striking about relationships like *depend* and *on* is that *on* shares the same non-compositionality that was observed for the other verb-preposition pairs.

The interpretations of the prepositional phrases in (27) are not the same. In (27a), the bus is interpreted as a location, while in (27b), the bus is interpreted as a sort of theme of *depend*.

(27) a. Sue sat **on the bus**. *bus = location*
b. Sue depended **on the bus**. *bus = dependee*

In order to arrive at a theme-like interpretation for *the bus* in (27b), the locative preposition *on* must not be interpreted compositionally, or else the result would be a location interpretation. The question now arises: what conditions permit *on* to be interpreted non-compositionally? The answer appears to be that only in the context of verbs like *depend* can *on* have this special interpretation. In order to speak English, a learner must therefore internalize the following facts about *on*'s meaning.

(28) Meanings associated with *on*:
a. designates its argument as a *location*
b. designates its argument as a *theme* in the context of verbs like *depend/rely*

A similar idea can capture *depend*'s requirement to combine with an *on*-phrase. Only unlike *on*, suppose that *depend* cannot be interpreted outside of the context of *on*. On this view, *depend* is like a *cran-* morpheme: uninterpretable on its own, but meaningful in a limited set of contexts (e.g. *cranberry*, *cranapple*). These two idiosyncratic properties of the possible interpretations of *depend* and *on* conspire to make sure that *depend* (in its verbal form) only occurs in the context of *on*, and *on* gets a special interpretation in the context of *depend*.

In sum, heads may be picky about the heads of their complements but not their specifiers, which is explainable if the feature responsible for introducing such phrases is only checked by complements. The present proposal suggests that these phrases are introduced by an underspecified feature, which is always checked by the first thing that merges (i.e. the complement), thus producing the desired locality restriction. The underspecified nature of this feature allows heads like *trust* to satisfy it with a range of elements, where the interfaces may constrain the interpretations that result from some of these choices. In cases where heads are *cran-* morphemes, the options for satisfying [·X·] become more limited, as with *depend*.

3.2 The functional hierarchy and smuggling

An essential component of the present proposal is that the mapping between selectional requirements of a verb and its corresponding Merge-inducing features is not perfect. There are selectional requirements that match one-to-one with syntactic requirements: a verb that c-selects a DP is endowed with [·D·]. There are also selectional requirements that do not match one-to-one with syntactic requirements: a verb that l-selects for *on* is endowed with [·X·], which does not in general need to get

checked by *on*. This result should be considered against a backdrop in which many syntactic requirements do not correspond to selectional requirements: EPP properties are syntactic requirements for a certain kind of specifier, where the specifier is not an argument of, or 'selected' in any sense by the head bearing the EPP requirement.

One phenomenon that exemplifies this (lack of) relationship between selection and Merge-inducing features is raising to object. Verbs like *believe* only select for a single internal argument, where that argument can be either of several categories. However, certain choices for the category of that phrase may allow VPs headed by *believe* to host a second phrase, raised from inside *believe*'s argument. This suggests that verbs like *believe* are endowed with two Merge-inducing features, despite only selecting for a single internal argument.

(29) a. Sue believed [the story].
b. Sue believed [that the world is round].
c. Sue believed [the world] (with all her heart) [to be round].

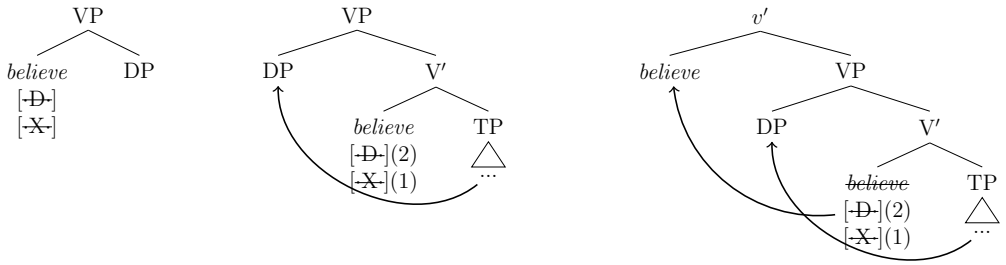
Based on the kinds of phrases that can be internal arguments of *believe* and raise to object respectively, I propose that *believe* has the following features: [·D·] and [·X·]. The presence of [·X·] on *believe* allows the internal argument to Merge, where that internal argument might be a DP or another phrase (CP or TP), an issue we will return to in Section 4. Since only DPs can raise to object, the second feature must be [·D·].

(30) *Sue believed [into the room] to have walked the soldiers.

These Merge-inducing features of *believe* predict the following pattern: DP phrases in a VP headed by *believe* are complements, unless something else merges as *believe*'s complement, in which case DP can merge as a specifier. A DP argument of *believe* will check both [·D·] and [·X·] simultaneously, blocking raising to object, but a clausal argument of *believe* will only check [·X·], licensing movement to check [·D·].[4]

(31) *Raising to object*: if V merges with a non-DP (licensed by [·X·]), a DP may raise to check [·D·] (V moves to v, deriving the right word order)

[4]In cases where the argument of *believe* is a finite CP complement, I assume that raising to object is blocked by the ban on improper movement. This raises the question of what happens to the unchecked [·D·] on *believe*, which fails to attract a DP. Since this feature is not associated with a selectional requirement, one option is that it simply fails to be checked, but this is unproblematic for the interfaces and thus does not lead to a crash (cf. Preminger 2014). Another option would be to assume that finite CPs have the option of being introduced by a null D head, allowing the CP complement to satisfy both features.



Importantly, the phrases must be organized this way: *believe* cannot have the specifier be its argument and the complement be unselected, nor can *believe* have a DP complement and a raised non-DP specifier (32b). If the Merge-inducing features were specified in any other way, other possibilities like this would be plausible, contrary to fact.

(32) a. Wallace believed Gromit's side of the story.
b. *Wallace believed [of the story] Gromit's side.

In what follows, I argue that this pattern of raising to object has a counterpart beyond the distribution of DPs. Cases of so-called *smuggling* in the verbal domain demonstrate the same phenomenon: a head that can take a range of complements, including VP, takes VP as a specifier when something else is its complement. This comes about as a prediction of the theory if the head in question has features [·V·] and [·X·]. Thus, heads that select for one argument but have two Merge-inducing features are expected to give rise to similar kinds of interactions between the more and less specific features. The specific feature can introduce complements or specifiers, while [·X·] can only introduce complements.

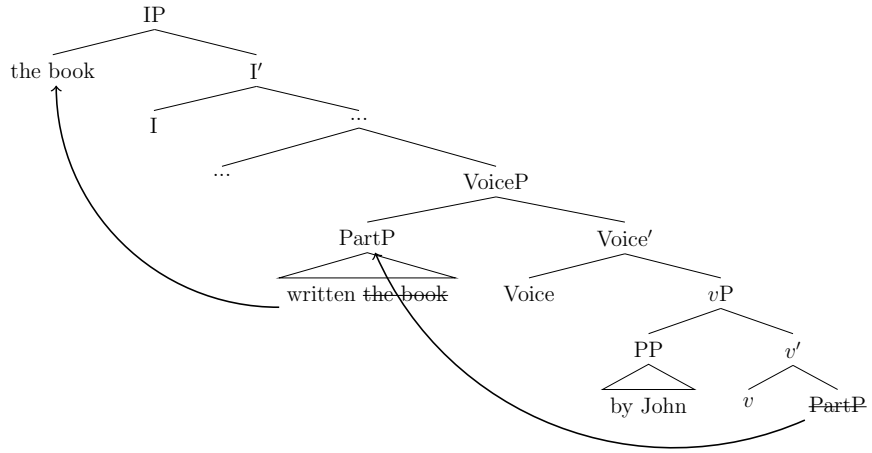
By *smuggling*, I refer to a phenomenon in which VP moves to a specifier position. While traditional approaches to the verbal domain represent VP as the complement of v, smuggling analyses suggest that sometimes other projections besides VP (e.g. ApplP, PartP, nP) can be the complement of v. In these cases, smuggling analyses also propose that VP (or material containing VP) moves to a specifier position for various reasons. Here, we look at some of these analyses and observe that while smuggling is constant across all of the proposals, the theoretical motivation for smuggling in each case is not. I propose that the unifying explanation for why VP-movement should occur in each of these cases comes from the identity of features on v and the kinds of phrases that may check them, making smuggling a natural analog to raising to object.

The three cases of smuggling we will consider include: Collins (2005, 2024) on the passive, Newman (2024a) and Collins (2024) on the position of VP in ditransitives, and a VP-fronting approach to Romance causatives dating back to Kayne (1975). All of these proposals have in common the idea that VP fronts in contexts where v has merged with a different complement. We will look at each case in turn, starting with Collins' smuggling approach to the passive.

According to Collins' *Argument Criterion*, external arguments of passive clauses must merge with the same head that normally introduces the external argument in active clauses. In this case, that means that the *by*-phrase must be introduced by the v head, because v is normally responsible for assigning external theta roles.

At the same time, in a passive clause, Collins proposes that v does not directly take VP as a complement, but rather takes a participial projection as its complement, which in turn merges with VP. Under these circumstances, he proposes that the direct object of V cannot raise to subject position without violating locality conditions on movement: it would have to raise past the intervening external argument that is in its usual Spec vP position. Thus, he proposes that some projection containing the direct object must raise above the external argument, smuggling the direct object to a position from which it can raise freely.

(33) Collins (2005, 2024): Smuggling derived by movement



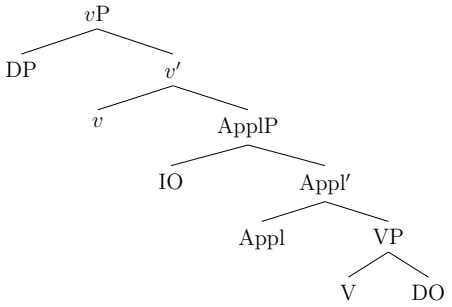
Collins supports his proposal with evidence from binding/scope reconstruction to demonstrate that the passive agent c-commands the base position of the direct object. This forms the empirical argument for movement – the theoretical proposal is that smuggling happens altruistically to enable the the direct object to raise past the intervening external argument.[5]

Collins (2024) and Newman (2024a) make similar proposals about the position of VP in certain ditransitive clauses. They consider the high applicative structure of Pylkkänen (2008) (34) as the default structure for double object constructions. In

[5]There is a potential issue with the locality argument: it is not always clear whether PPs/oblique arguments are true interveners for A-movement/subject agreement across languages, in which case the direct object should just be able to A-move without smuggling. In previous versions of Collins' proposal, however, the external argument wasn't embedded within a *by*-phrase, but was just a normal DP argument of v (*by* appears for other reasons). Thus, there is a version of the proposal in which a locality argument makes sense despite this objection – a DP direct object cannot move past an intervening DP external argument.

this structure, v takes ApplP as a complement instead of the usual VP, where VP is introduced as Appl's complement. Importantly, in this structure, the indirect object asymmetrically c-commands the direct object.

(34) High applicative structure of Pylkkänen (2008)



A puzzle about double object constructions is that they allow "symmetric passivization" in many languages: in a passive, either the direct or indirect object may raise to subject position (35). Holmberg et al. (2019) discuss a number of such symmetric languages including: Norwegian, North-West British English, Zulu, Lubukusu, Xhosa (Visser, 1986), Swati (Woolford, 1995), Haya (Duranti and Byarushengo, 1977), Fuliiru (Van Otterloo, 2011), Sotho (Morolong and Hyman, 1977), and Tswana (Creissels, 2002) (this is not meant to be a comprehensive list).

(35) *Norwegian symmetric passives of double object constructions* (Haddican and Holmberg, 2015, ex. 2, p. 146)

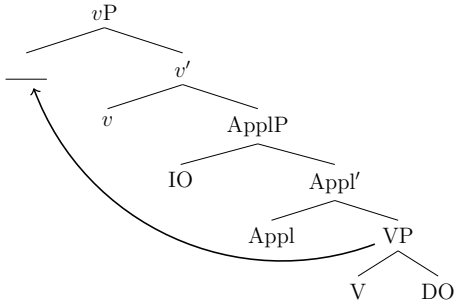
a. Jeg ble gitt _ Paralgin Forte.
   I was given Paralgin Forte
   'I was given Paralgin Forte.'

b. Lånet ble gitt meg _.
   the.loan was given me
   'The loan was given to me.'

Symmetric passives are surprising in light of the c-command relation between the two internal arguments of a ditransitive: surely, the direct object should violate minimality by raising across the indirect object in (35). One way to circumvent this issue is smuggling.[6] Newman's smuggling proposal is illustrated in (36): if VP can raise past the indirect object, smuggling the direct object to a high position, the direct object could raise without without violating any locality principles.

[6]Smuggling is not the only proposed analysis of symmetric passives. Holmberg et al. (2019) discuss an alternative approach from the literature, called *leapfrogging* (McGinnis, 2001), in which the object raises to the edge of ApplP in order to move to subject position.

(36) VP smuggling in a ditransitive



Thus, two proposals motivate smuggling from locality conditions: Collins motivates a smuggling account of the passive, in which the direct object must be smuggled past the external argument to raise to subject position. Newman motivates a similar smuggling account of passives of double object constructions, in which the direct object must be smuggled past the indirect object to raise to subject position.

These analyses of smuggling raise a question: what are the circumstances that lead to smuggling? The locality argument might lead one to expect that smuggling arises only when the direct object wants to raise past an intervening DP. Without smuggling, the object would fail to raise, but with smuggling, it succeeds. If smuggling only happened altruistically (unlike raising to object, which simply happens), then we might expect no fronting to occur in constructions where the object stays in situ.

As it turns out, this is not the case. Smuggling has been proposed in many contexts in which the object never raises, suggesting that VP-fronting happens for independent reasons, much like raising to object happens independently. Collins (2024) also proposes a VP-fronting step in ditransitives like (36) but for different reasons, namely to derive the prepositional dative construction from the double object construction. He makes this proposal to derive well-known binding and scope differences between the two constructions (Barss and Lasnik, 1986; Larson, 1988; Kitagawa, 1994; Takano, 1998; Harley and Miyagawa, 2017). One of these differences has to do with the availability of backwards variable binding, shown in (38). In the double object construction, the indirect object can bind a variable inside the direct object, but not vice versa (38a,d). In the prepositional dative construction, by contrast, either object can bind a variable inside the other (38b,c). Collins also demonstrates this asymmetry between the constructions with reciprocals, quantifier scope (see Bruening 2001; Aoun and Li 1989; Kitagawa 1994; Harley and Jung 2015 for extensive discussion), and the distribution of *each* (Burzio, 1986, 198-199).

(37) The two ditransitives:

a. The boss gave the employee a paycheck. *Double object*

b. The boss gave a paycheck to the employee. *Prepositional dative*

(38) Asymmetric tolerance for backwards variable binding (Collins, 2024, 137)

a. John gave every man his paycheck. *Double object*

b. ?John gave his paycheck to every man. *Prepositional dative*

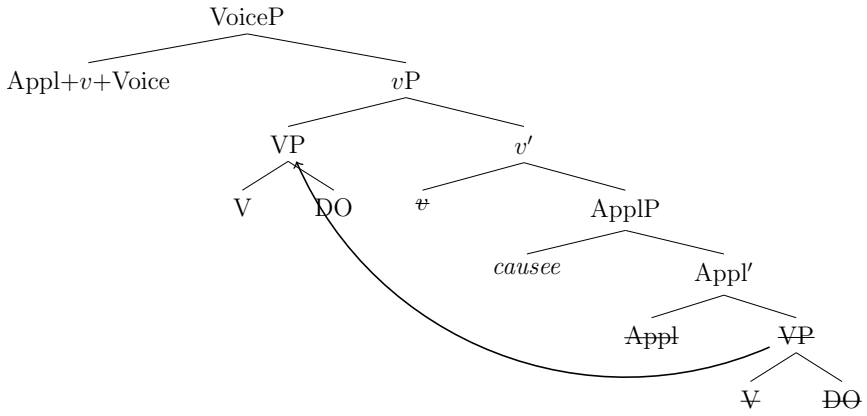
c. John gave every dog to its owner. *Prepositional dative*

d. *John gave its owner every dog. *Double object*

On his approach, the prepositional dative construction allows backwards binding and inverse scope readings between internal arguments because it is derived from the double object construction, by fronting VP across the indirect object to a higher position (as in (36)). VP can reconstruct below the applied argument, accounting for the flexible scope behavior. Here, neither internal argument raises to subject position, so VP-fronting has no impact on the movement prospects of an DPs. It is just an observation about ditransitives that scope reconstruction is possible in the prepositional dative construction, which Collins explains through smuggling. A similar result is supported by the last example of smuggling considered here, namely smuggling in Romance causatives.

Smuggling/VP-fronting is also commonly proposed in the context of Romance causatives. As discussed most recently by Pineda and Sheehan (2023) for Catalan, there is a long tradition of invoking smuggling to understand *faire*-infinitives across different Romance languages (Kayne, 1975; Zubizarreta, 1985; Burzio, 1986; Pitteroff and Campanini, 2013; Belletti, 2017, 2020). In some versions of this analysis, the *faire*-infinitive is represented as an ApplP, whose subject is interpreted as the *causee*. The VP inside it is proposed to undergo movement to a higher specifier position.

(39) A smuggling approach to Romance *faire* causatives (Pitteroff and Campanini, 2013, 227, with adjusted notation)(Pitteroff & Campanini 2013: 227)



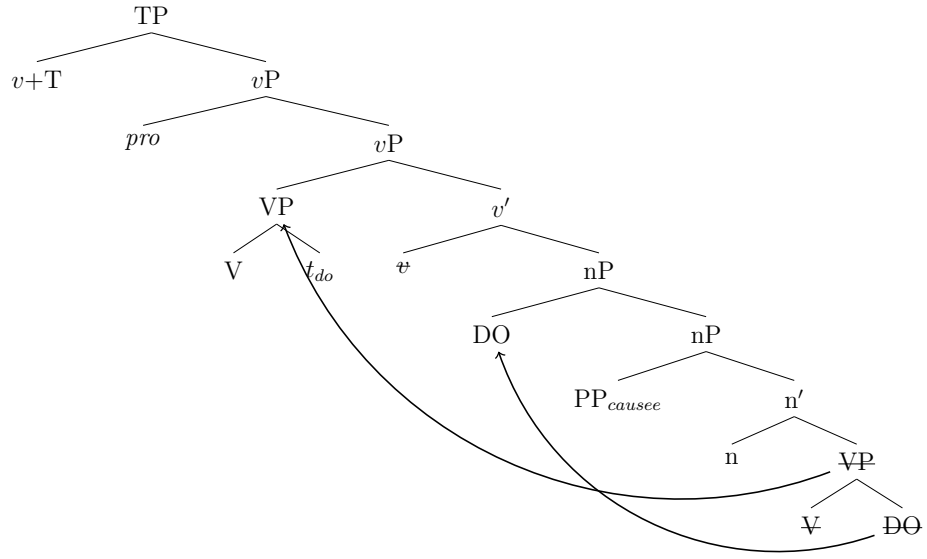
Pineda and Sheehan (2023) argue that this approach is especially attractive for languages like Catalan, whose word order in the *faire*-infinitive seems to clearly reflect the fact that VP has fronted across the causee.

(40) He fet [$_{VP}$comprar {un llibre}] [$_{causee}$a la Núria {#un llibre}].
have.1SG made buy.INF a book to the Núria a book
'I made Núria buy a book.' (Pineda and Sheehan 2023: ex. 17, p. 192)

Sheehan and Cyrino (2016) also extend a smuggling account to Romance *faire-par* causatives, adapting proposals from Guasti (1993, 1996); Folli and Harley (2007).

Unlike the smuggling account for *faire*-infinitives, in the *faire-par* construction, the complement of v is a nominalized passive clause, whose passive agent is interpreted as a causee. Nonetheless, VP-fronting is invoked again to account for word order. Again, the direct object does not raise to subject position in these examples, and so VP-fronting has no impact on the movement prospect of any arguments – it simply happens. Sheehan and Cyrino (2016) speculate that this movement occurs because head movement of the verb has been blocked by the intervening n head.

(41) Smuggling out of a nominalized VP in French/Italian/RP Spanish Faire-par infinitives (Sheehan et. al 2016: ex. 22)



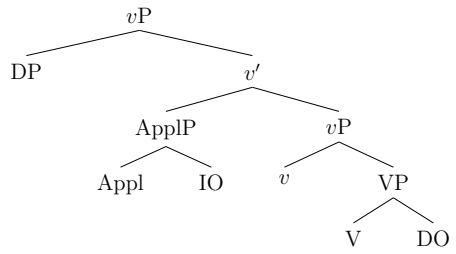
(42) Se hicieron [construir una casa (por un grupo de arquitectors)].
SE made.3PL build a house by a group of architects
'They had a house built by a group of architects.' *Spanish* (Sheehan and Cyrino, 2016, ex. 1e)

The generalization seems to be that v can in principle merge with a range of complement types: VP, PartP, ApplP, nP. The default is for v to merge with just one (non-DP) phrase, namely a VP complement. However, v can alternatively merge with something else, in which case VP-fronting occurs. A theory of feature-driven Merge that wants to capture this profile has two options, depending on how many features are permitted in the inventory. One option would be to say that v has four features: [·V·], [·Part·], [·Appl·], [·n·]. This option has a few disadvantages, however. First, it permits more features than the Sparse Feature theory would otherwise posit: features like [*appl*] and [*part*] are not particularly abstract because they refer only to individual lexical items (the applicative and participle morphemes, respectively). The

possibility that Merge features could pick out individual lexical items was rejected for selection of prepositions, in which case it should be rejected here. More pressingly, it doesn't explain the facts.

If v had multiple specific features, including [·V·] and [·Appl·], nothing would prevent the unattested structure in (43), for example. An ordering restriction would have to be stipulated in which ApplP is always the complement of v.

(43) An imaginable but not adopted structure with ApplP

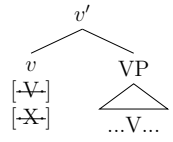


There is an alternative option available, namely the use of [·X·] to introduce v's complement. The choice of [·X·] is ideal for the following reason: it seems that the same v is implicated in monotransitive as ditransitive clauses. In both cases, v has the same morphological exponent, and introduces the same kind of argument (the external argument). The difference is also somewhat predictable: VP merges as a complement, unless another phrase like ApplP merges first, in which case VP merges as a specifier.

If the v head is really the same lexical item in both cases, then we need it to have the same bundle of syntactic features in both constructions, despite the two constructions being different. This is easily achieved with [·V·] and [·X·]. Suppose v has [·V·] to define the default structural context it selects for and [·X·] for licensing optional other phrases it might select for (and [·D·] for the external argument, where applicable). The Free Rider condition ensures that all of these features will be checked in every structure that v and VP appear in.

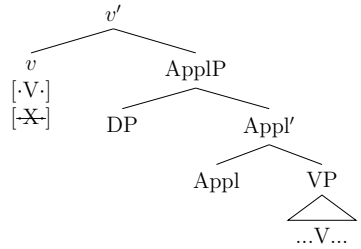
If there is no ApplP, and VP merges as v's complement, VP can check both [·V·] and [·X·] simultaneously, producing the default case.

(44) Default: VP checks [·V·] and [·X·]



If there is an ApplP, it must merge as v's complement to check [·X·], or else it will not get to merge – there is no [·Appl·] to otherwise license it. The unchecked [·V·] feature can then license movement (re-merge) of VP as a specifier (smuggling).

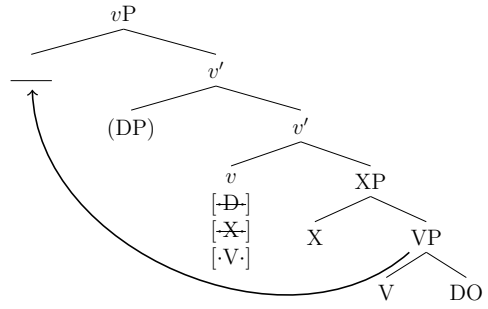
(45) Ditransitives: Appl checks [·X·] but not [·V·]



If we endowed v with any other feature besides [·X·] to license Merge of ApplP, we would have a harder time predicting the default case: that feature would go unchecked in the absence of ApplP, potentially causing a crash at the interfaces. The fact that [·X·] is checked no matter which complement v merges is what prevents this issue.

Another advantage of this approach is that it extends to all of the cases of smuggling that we have seen. If v is simply universally endowed with [·V·] and [·X·], then any non-VP complement of v should have the same effect. Any non-VP element can be licensed by [·X·], and will leave [·V·] unchecked, which can be later used to attract VP as a specifier.

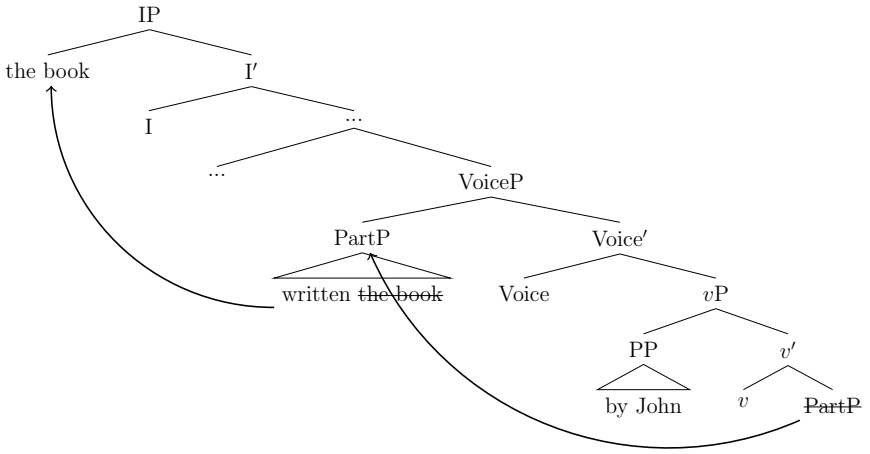
(46) VP-smuggling in the presence of any non-VP complement of v



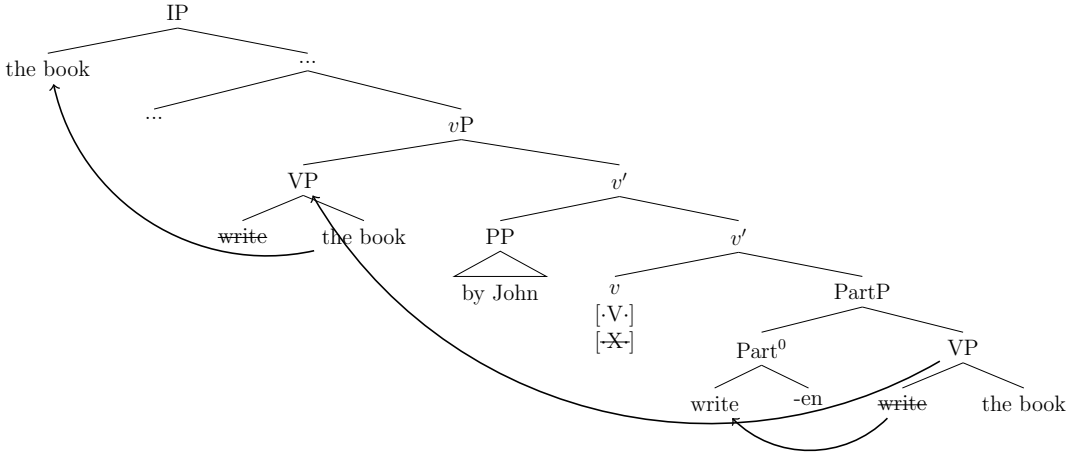
This proposal extends to many of the above cases of smuggling without amendment, with the exception of Collins' proposal for the passive. Recall that Collins proposed a slightly different articulation of the verbal domain, with both Voice and v, in which the PartP complement of v smuggles the direct object to Spec VoiceP. By contrast, I have proposed that smuggling has to do with VP (not PartP) movement to Spec vP. I believe that these differences in the proposals are superficial, however. What is crucial to Collins' analysis is that the direct object be smuggled past the external argument, which is in Spec vP. Both analyses achieve this in the same way, just with different amounts of structure.[7]

[7]One worry about (47) compared to Collins' original analysis has to do with the linear position of the *by*-phrase. The *by*-phrase is pronounced after the verb in English, but looks like it c-commands the verb in (47). To derive the right word order, we could either imagine that the verb head moves to a slightly higher position (e.g. Voice in Collins' system), or that the PP branches to the right (as in Janke and Neeleman 2005).

(33) Collins (2005, 2024): Smuggling derived by movement



(47) The current proposal's version of Collins' analysis of the passive



In sum, we have seen that when v selects for a non-VP complement, VP raises to Spec vP, just as when V selects for a non-DP argument, DP raises to Spec VP. This pattern is derived from interactions between specific and non-specific features on a head, in cases where the head only selects for one phrase. The selected phrase merges as a complement, checking [·X·], and another phrase raises to check [·D·]/[·V·] respectively. If the selected phrase *is* a DP or a VP, raising/smuggling doesn't happen – the Free Rider condition prevents [·D·]/[·V·] from licensing both a complement and a specifier.

4 A note on c- and s-selection

This paper is based on the premise that there are categorial Merge-inducing features, which are used to encode c-selection, where one of these features may be unspecified

for category. While it has become common to make use of formal category features in various settings, there are remaining puzzles from the literature on c-selection that they do not address. Here, I will focus on one puzzle from the work of Grimshaw and Pesetsky, in which it looks like DP is *anti-selected*. I show that Pesetsky's original case theoretic approach, when combined with an explicit theory of category features, captures these facts in a way that is consistent with more modern approaches to case assignment.

Grimshaw's (1979) original argument for c-selection was the observation that s-selection alone is not sufficient to predict the form of a verb's complement. She discussed cases of s-selection for *question (Q), proposition (P), exclamation(E)* and showed that verbs with each of these selectional requirements can show different preferences regarding the categories of their complements. While some can be satisfied by any element interpreted as Q/P/E, others exhibit categorial restrictions prohibiting DP complements, while permitting other categories. The following examples, which illustrate Grimshaw's argument, come from Pesetsky (1991).

(48) *Ask* selects for Q(uestion), satisfied by CP, DP, PP
  a. John asked me [$_{CP}$what the time was].
  b. John asked me [$_{DP}$the time].
  c. John asked me [$_{PP}$about the time].

(49) V s-selects Q, satisfied by CP but not DP
  a. John wondered [$_{CP}$what the time was].
  b. *John wondered [$_{DP}$the time].
  c. Mary cares [$_{CP}$where we are going].
  d. *Mary cares [$_{DP}$our destination].
  e. Bill inquired [$_{CP}$how old I was].
  f. *Bill inquired [$_{DP}$my age].

(50) S-selection for P(roposition), satisfied by CP vs. CP or DP
  a. I'll assume [$_{CP}$that he is intelligent].
  b. I'll assume [$_{DP}$his intelligence].
  c. I'll pretend [$_{CP}$that he is intelligent].
  d. *I'll pretend [$_{DP}$his intelligence].

(51) S-selection for E(xclamation), satisfied by CP vs. CP or DP
  a. Bill couldn't believe [$_{CP}$how incredibly hot it was].
  b. Bill couldn't believe [$_{DP}$the incredible heat].
  c. Bill complained [$_{CP}$how incredibly hot it was].
  d. *Bill complained [$_{DP}$the incredible heat].

Thus, the argument is that each of these verbs must specify both their s-selectional requirements as well as separate c-selectional requirements, or else we would not be able to properly distinguish them from each other. If a (concealed) question can be alternately realized as a DP or a CP, any verb that s-selects for Q but has no c-selectional requirements should take DP or CP arguments. The fact that some Q-selecting verbs might only take a CP suggests that category is also relevant.

Pesetsky's (1982) worry about this argument focuses on a conspicuous gap in the typology of verbs' selectional requirements, which Grimshaw had also noted. The observation is that, while there are many verbs that s-select for Q/P/E and c-select for CP but not DP, there are no verbs that s-select for Q/P/E and c-select for *DP* but not CP. If s-selection and c-selection were truly independent of each other, we would expect it to be possible for verbs to have any combination of s- and c-selectional requirements, including s-select for Q and c-select for D but not C. However, we do not find this.

(52) The pattern we do not find, illustrated with a nonexistent verb *blork*, which s-selects for Q
   a. *Bill blorked [what time it was].
   b. Bill blorked [the time]. (where the meaning is a concealed question)

Of course, we find many verbs that c-select for a DP and not a CP, but the point is that none of them s-select for Q/P/E. This is a surprise if s-selection is independent of c-selection. In some sense, a better way to describe the generalization is that while some of these Q-selecting verbs permit any kind of complement (CP, PP, DP), others permit *any complement except DP*. Thus, the distinction between these verbs isn't about selection for DP, but rather *anti-selection* for DP.

This kind of selectional profile remains something of a puzzle for the feature-driven approach to Merge. I have been assuming (following others, see §2) that the way to encode c-selection is through a categorial Merge-inducing feature on a lexical item. A verb that c-selects for a DP has [·D·]; a verb that does not c-select for a DP lacks such a feature. If these verbs only accepted one kind of complement, then we could just endow them with a feature specified for the complement that they accept (e.g. [·P·], [·C·]). However, these verbs are not like that: they accept multiple kinds of complements. Seeing as there is no feature that designates *anything but DP*, it isn't clear how to represent this syntactic profile with Merge-inducing features.

To describe the optionality, we have two possibilities: 1) posit rampant homophony in the lexicon, 2) invoke [·X·]. If we adopt option 1, then the lexicon would have to contain items like (53,54). Here, we have three versions of *ask*, each of which c-selects for a different phrase, but only two versions of *wonder*. This is a brute force way to capture the allowed structural context of each verb, but it is not very explanatory. It misses the observation that the relationship between *ask* and its complement is predictable from semantics rather than category, and it reduces *wonder*'s lack of DP licensing to an accidental lexical gap.

(53) *Ask* can be associated with 3 different feature bundles
   a. [·C·]
   b. [·P·]
   c. [·D·]

(54) *Wonder* can be associated with 2 different feature bundles
   a. [·C·]
   b. [·P·]

Option 2 is more promising because it requires less homophony in the lexicon, but does not capture the distinction between *ask* and *wonder*. To see why, consider the possibility that s-selection, like l-selection, has no corresponding syntactic feature associated with it. Thus, using the logic of the Sparse Feature theory, we should use Newman's [·X·] feature to encode s-selection: it is a requirement for an element that is not grounded in a specific syntactic feature. Nonetheless, Merge must be licensed by *some* feature, where if there is no specific syntactic feature that works, we must use a nonspecific one. On this approach, *ask* and *wonder* should each have [·X·] for licensing their s-selected complements.

(55) The same feature bundle for *ask* and *wonder*: [·X·]

Since [·X·] can be checked by any element, this proposal makes the right predictions for *ask*: any phrase with the right semantic properties can occur as the complement to *ask*. However, this makes the wrong predictions for *wonder*: how do we prevent a DP from merging as *wonder*'s complement, which can also check [·X·]?

Pesetsky proposes that Case Theory rather than c-selection is an ideal candidate for regulating the distribution of DPs in this case. He motivates this view with the following observations. The first observation is that CPs and DPs have different contextual requirements: CPs can occur as complements to passive verbs and adjectives while DPs cannot. This pattern follows if passive verbs and adjectives systematically lack the ability to license case on their complements.

(56) a. It was proved [that tomatoes are fruits].
   b. *It was proved [a theorem].
   c. John is curious (about) [where I went].
   d. John is curious *(about) [life].

Supposing that case licensing can be an idiosyncratic property of a lexical item, Pesetsky suggests that verbs like *ask* and *wonder* could differ in their case licensing abilities without differing in their selectional requirements. We can represent this idea in the following way: two verbs with [·X·] can nonetheless differ in their ability to assign case, accounting for why one of them cannot have a DP complement.

(57) Q can range over CPs or DPs, but DPs (unlike CPs) need case

a. ask: [+___ Q], [+objective case]
b. wonder: [+___ Q], [-objective case]

(58) A re-writing of the idea in a feature-driven framework:

a. ask:
c-selection: [·X·]
s-selection: Q
case assignment: +case

b. wonder:
c-selection: [·X·]
s-selection: Q
case assignment: -case

In support of this approach, Pesetsky shows that verbs like *ask* can be passivized, while verbs like *wonder* cannot. Assuming that only verbs that assign case can have this property suppressed by the passive, he concludes that verbs like *wonder* indeed never assign accusative case.

(59) a. It is not known whether John ever arrived.
b. It was asked when Mary would be there.
c. It has been guessed why you're here.
d. *It is not cared what time it is.
e. *It was inquired who killed Caesar.
f. *It has been wondered where John went.

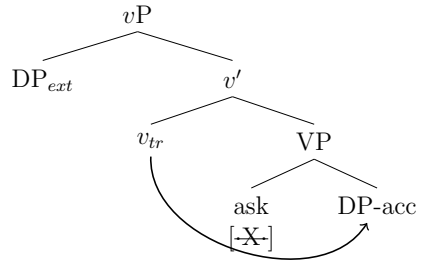
If Pesetsky is right, then the c-selectional profile of verbs like *ask* vs. *wonder* is the same: they can both merge with any complement in principle, licensed by [·X·]. DPs may merge, but may not be licensed, however. While this proposal is successful, it reflects a view of case assignment not shared by more recent theories of case, in which it is properties of v rather than V that determine whether accusative case is assigned. In §4.1, I propose a way to capture the basic insight of his proposal, taking into account the properties of v.

4.1 An alternative approach

On current approaches to case assignment, it is properties of v rather than V that determine whether accusative case is assigned. In a transitive clause, v introduces an external argument and either assigns accusative to the direct object through agreement or designates vP as a domain for dependent case assignment, in which the direct object gets assigned dependent accusative. In an unaccusative clause, v lacks these properties and so the internal argument does not receive case (and there is no external argument).

In this setup, in order for *ask* and *wonder* to have different case assigning abilities, they must combine with different v heads. *Ask* should combine with a transitive v head that introduces the external argument of *ask* and assigns accusative case to *ask*'s object, as in (60).

(60) *Ask* combines with transitive v



This raises the question of what properties the v head should have that combines with *wonder*. On the one hand, *wonder* appears to have an external argument, which suggests it should combine with transitive v. On the other hand, transitive v licenses accusative case, which *wonder* appears not to license. There are two analytical options for resolving this tension: 1) introduce a new v head into the typology, which does not obey Burzio's generalization, or 2) treat *wonder* as an unaccusative verb.

In the first option, we could imagine a v head, let's call it *unergative* v, which introduces an external argument but does not license accusative. If *wonder* combines with this v head, it can host an external argument like an unergative verb does. However, its internal argument will fail to get assigned accusative and thus cannot be a DP, accounting for the facts.

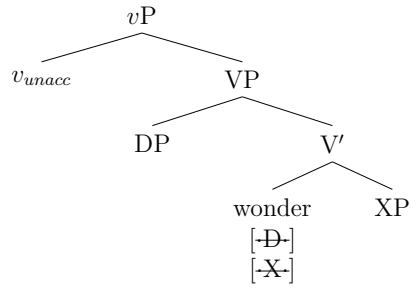
The problem with this approach is that it doesn't work for other unergative verbs in English. English unergative verbs notably *can* host DP internal arguments, such as cognate objects. It therefore seems that unergatives generally combine with a transitive v head, which allows their internal arguments to get case licensed (if they have one). This approach therefore has the disadvantage of adding a new v head to the typology just to describe *wonder*-type verbs.

(61) Unergatives with objects
   a. He danced (the Walz).
   b. He cried (a great big cry).
   c. He barked (an angry bark).

Alternatively, we could conclude that *wonder*'s inability to assign accusative case stems from the status of its *subject*. Suppose that *wonder* combines with unaccusative v instead of transtive/unergative v. This v head cannot assign case. It also cannot host an external argument. For *wonder* to have both a subject and a complement, on this view, it must introduce both arguments within VP. The fact that v neither

introduces an external argument nor assigns case accounts for *wonder*'s resistance to the passive alternation.

(62) *Wonder* combines with unaccusative v



This proposal accounts for the anti-DP restriction on *wonder*'s complement with no additional stipulations. The DP specifier of *wonder* can raise to subject position for nominative case, but the complement of *wonder* receives no case – the v head that c-commands it is the unaccusative variant, which does not license accusative.

This analysis also provides another reason for the anti-DP restriction, one that is unrelated to case. Since *wonder* needs to introduce *two* arguments in the same projection, the feature-checking logic requires that they each check a separate feature. If the first argument to merge were a DP complement of *wonder*, it would check both [·D·] and [·X·], precluding the possibility of merging the DP subject as a specifier.

In sum, this theory of feature-checking, combined with an underspecified feature for introducing non-c-selected elements, is able to predict the category of a verb's complement from its accessibility to the passive alternation. If a verb is transitive, and V takes a single s-selected argument, that argument can be any category. If a verb is a ditransitive unaccusative and one of its arguments is s-selected (and the other is c-selected), the Free Rider condition forces it not to be a DP.

While there aren't good unaccusativity diagnostics that could support or refute this claim for English, there is circumstantial evidence from German and Dutch that this may be the right approach. In German, the verb *ask* is homophonous with the verb *wonder*, where the two are distinguished morphosyntactically by the presence of a reflexive element in the latter case (Nina Haslinger, p.c.). The situation is similar in Dutch, where the verb for 'ask' is *vragen* and the verb for 'wonder' is the obligatorily reflexive *zich af-vragen* (Hedde Zeijstra, p.c.).

(63) German *fragen* vs. *sich fragen* (Nina Haslinger, p.c.)

a. Er fragt [wie lange der Film dauert].
he asks how long the movie lasts
'He asks how long the movie is.'

b. Er fragt **sich** [wie lange der Film dauert].
he asks REFL how long the movie lasts
'He wonders how long the movie is.'

Reflexive morphology may signal unaccusativity in a number of languages, including Romance, Greek, and, more controversially, Germanic. In German and Dutch, Fagan (1991) argues that reflexives don't uniquely pick out unaccusatives, though many obligatorily reflexive verbs do turn out to be unaccusative when subjected to unaccusativity diagnostics such as impersonal passivization and *-er*-nominalization. German and Dutch have productive impersonal passives for unergative but not unaccusative verbs (Perlmutter, 1978; Grewendorf, 1989; Zaenen, 1993). As we can see, impersonal passives are available for *fragen*, but not *sich fragen*, and the same is true for Dutch (Hedde Zeijstra, p.c.).

(64) Impersonal passives with *fragen* vs. *sich fragen* (Nina Haslinger, p.c.)

a. Es wurde gefragt [wie lange der Film dauert].
it was ask.PTCP how long the movie lasts
'It was asked how long the movie is.'

b. *Es wurde **sich** gefragt [wie lange der Film dauert].
it was REFL ask.PTCP how long the movie lasts
intended: 'It was wondered how long the movie is.'

A second unaccusativity diagnostic is the *-er*-nominalizing affix, which picks out external but not internal arguments (Grewendorf, 1983).[8] In (65), we see that unergative verbs like *dance* permit *-er*, while unaccusative verbs like *come* reject it. Applying this test to *vragen* vs. *zich afvragen* in Dutch shows that the non-reflexive *vragen* patterns like an unergative while reflexive *zich afvragen* patterns like an unaccusative.[9]

(65) Unergatives vs. unaccusatives with *-er* (Fagan, 1991, ex. 29,31, p. 47)

a. der Tänzer, der Schwimmer, der Arbeiter *German*
de danser, de zwemmer, de werker *Dutch*
'the dancer, the swimmer, the worker'

b. *der Kommer, *der Sterber, *der Faller *German*
*de komer, *de sterver, *de valler *Dutch*
intended: 'the comer, the dier, the faller'

(66) *vragen* vs. *zich afvragen* (Hedde Zeijstra, p.c.)

a. Zij is a vrag-er.
she is a ask-ER
'She is an asker.'

[8]Fagan discusses some potential examples of unaccusative verbs that can also host *-er*. Whether or not those are true counterexamples, she doesn't find any cases of true unergatives or transitive verbs that reject *-er*, so *-er*-affixation appears to be a sufficient condition for unaccusativity even if not a necessary one.

[9]Hedde Zeijlstra, p.c., says that there is a non-reflexive use of *afvragen* that does permit *-er*-affixation, but it has an irrelevant meaning to refer to e.g. a contestant on a game show who has to ask questions to proceed with the game. This is not the *wonder* interpretation we are after, however.

b. *Zij is een zich af-vrag-er.
she is an REFL P-ask-ER
intended: 'She is a wonderer.'

Taken together, these tests suggest that the surface subject of *sich fragen* and *zich afvragen* in German and Dutch is not a true external argument, but rather an internal argument. Thus, it cannot be picked out by an *-er* nominalizer and cannot be demoted to form an impersonal passive. This stands in contrast with the surface subject of *fragen* and *vragen*, which behaves like a true external argument relative to both tests.

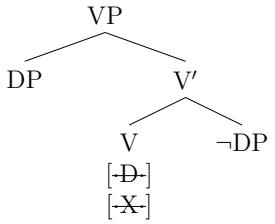
In sum, the German/Dutch verb *fragen/vragen* comes in two forms, where each form is distinguished by unaccusativity diagnostics and meaning: the transitive form lacks a reflexive element, permits an impersonal passive, and corresponds to an *ask*-type meaning. The unaccusative form has a reflexive element, rejects an impersonal passive, and corresponds to a *wonder*-type interpretation. My proposal about English is that these two frames associated with German/Dutch *fragen/vragen* are realized as different lexical items in English: *ask* is like transitive *fragen* while *wonder* is like unaccusative *sich fragen*.

To summarize the present proposal, the idea is that whenever a verb's selectional requirements are not syntactic (i.e. not conditioned by syntactic features like category), the only way for them to Merge is to check an underspecified feature [·X·], which can be checked by an element of any category. Transitive verbs that s-select for a question can thus be represented as having the feature bundle in (67). These verbs are agnostic about the category of their complement: their complements can be DPs, PPs, or CPs.

(67) Feature bundle for V that s-selects a Question: [·X·]

If a verb with this very same s-selectional requirement were instead a ditransitive unaccusative instead of transitive, then it would have to merge with both arguments in the same projection. The Free Rider condition makes it so that at most one of these phrases can be a DP, thus imposing an "anything but DP" restriction on the complement of these verbs.

(68) Feature bundle for V that s-selects a Question and another argument: [·D·], [·X·], where [·X·] cannot be checked by a DP due to (6).



5 Conclusion

In this paper, I proposed two desiderata for mapping selectional requirements to structure-building features, and argued that in some cases, these desiderata force us to invoke an underspecified feature [·X·] in the syntax (Newman, 2024b).

I showed that the distribution of [·X·], as motivated by the Sparse Feature theory, makes the right predictions about which kinds of phrases are restricted to complement positions. The idea is that whenever a phrase is selected, but not selected due to its having a particular *syntactic* feature, the feature that introduces it must be [·X·]. Importantly, introduction by [·X·] comes with a locality requirement: phrases introduced by [·X·] must merge as complements.

This proposal accounted for the locality profile of l-selected elements: l-selected elements are not selected according to a syntactic feature and thus must merge as complements, licensed by [·X·]. The proposal also addresses raising to object/smuggling interactions when a head selects for one argument but has two Merge-inducing features. Heads that have flexibility in the type of complement they can host must have an underspecified feature [·X·] to license the Merge of any of them. If those heads also have a formal category-feature that is unchecked by the complement, movement occurs to check that feature, leading to raising to object/smuggling.

[·X·] can in principle introduce a phrase of any category, where other factors may determine its form. I proposed that Pesetsky's case-theoretic analysis of *ask* vs. *wonder*, when expressed in a feature-driven framework with [·X·], was one such instance whether other factors predicted the form of a complement. Verbs that s-select for a phrase must introduce that phrase with [·X·], which can in principle be checked by PP, CP, or DP. When we see a restriction of the form *anything but DP*, it is because merging a DP in that position would either violate other principles like the Case Filter, or bleed introduction of the subject.

I proposed that this idea survives even on theories of case assignment in which v, not V, is responsible for the assignment of accusative case. Doing this required a reanalysis of *wonder*-type verbs as unaccusative, however, which was supported by circumstantial evidence from unaccusativity diagnostics in German and Dutch.

In sum, this paper has proposed an explicit relationship (or lack thereof) between the formal features assigned to lexical items and their selectional requirements. By invoking a non-specific syntactic feature for non-syntactic selectional requirements, we address several issues simultaneously, including: the paradox of feature-driven Merge when selection isn't conditioned by syntactic features, the different locality restrictions on different kinds of selection (c-selection vs. l-selection), the distribution of VP-fronting/smuggling, and interactions between s-selection and syntactic category.

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