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The Merge Condition

A syntactic approach to selection*

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This paper proposes that morphological selection and subcategorization are derived from conditions on Merge, specifically the claim that Merge is only possible when it leads to feature valuation, which I argue takes place under Reverse Agree. The Merge Condition, together with a Reverse Agree mechanism, allows us to unify different types of selection and provides a strictly local and derivational mechanism for structure building which does not require recourse to special selector features or separate notions of (lexical) selection. I provide an explicit feature system encoding the selectional properties of verbs and a detailed account of clausal complementation structures in English and German. The system offers a new way of deriving verb second configurations, doubly filled Comp effects, the distribution of T–to–C movement, as well as the syntactically restricted behavior of embedded root clauses.

1. Introduction

The main issue addressed in this paper is the question of what the conditions on Merge are. I follow the view that Merge is not free but subject to a (Last Resort) constraint allowing Merge only when some feature is satisfied (see, among others, Watanabe 1996, Collins 1997, Chomsky 2000, Collins 2002, Abels 2003, Pesetsky and Torrego 2006 for different technical instantiations of this general idea). The specific condition I propose is given in (1).

(1) *Merge Condition*
Merge α and β if α can value a feature of β.

In Chomsky (2000) and Collins (2002), among others, it is proposed that Merge is triggered by a *selector* feature, which, analogously to the probe in an Agree relation, must be satisfied under Agree (see Chomsky's 2000 claim that both Merge and Agree must be feature-driven). The EPP feature on T, for instance, can be seen as such a selector feature. Merge of an XP in Spec,TP is licensed by the feature in T which 'selects' (i.e.,

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probes) the specifier. Given that standard Agree requires the probe to c-command the goal, Merge of a specifier cannot be licensed by the head T, but must be assumed to involve probing by the sister of the specifier, T′ here fore convenience. Since features of the head are also part of the projections of the head, this is typically not problematic. Important, however, is that Merge of T with its complement (e.g, *v*P, AuxP) cannot satisfy the (EPP) selector feature of T but must involve an additional feature, unless this type of selectional relation is instantiated in a different (not feature related) way. There is usually little said about how selectional relations between the projections of the clausal spine are encoded, and this article aims at spelling out an explicit feature system which regulates Merge of the functional clausal projections.

A similar, yet also crucially different view on Merge is taken by Pesetsky and Torrego (2006). Their main claim, the *Vehicle Requirement on Merge* (VRM), is given in (2) and illustrated in (3). As shown, verbs are assumed to start out with unvalued ϕ-features and nouns with an unvalued T-feature (which ultimately, when properly valued, is realized as Case). The VRM essentially states that only successful probe–goal relations license Merge, which has the effect that verbs can only combine with XPs with ϕ-features (DPs, CPs), and nouns can only combine with XPs with T-features (PPs, certain CPs).

(2) *Vehicle Requirement on Merge (VRM)* Pesetsky and Torrego (2006)
If α and β merge, some feature F of α must probe F on β.

(3) a.

V *u*T: val *u*φ: __	XP φ: val

b.

N *i*φ: val *u*T: __	XP T: val

While the VRM is defined as a probe-goal relation, an important assumption made in that account is that the Agree relation necessary for Merge can only be a *hypothetical* Agree relation. Crucially, valuation must not take place. The main reason for this assumption is that in contexts such as (3b), the complement of a noun must not value the T-feature of the noun. The T-feature on an NP corresponds to the Case of that NP, which must be valued by a functional head outside the NP (e.g, T, *v*), and cannot be valued by a complement of N. Thus, essentially Pesetsky and Torrego's approach requires Merge to be satisfied by feature matching and not by feature valuation.

In this paper, I adopt the basic idea that Merge is licensed under Agree, but I follow Chomsky (2000) and Collins (2002) in that Merge does require actual feature satisfaction, which I assume is feature valuation as stated in (1). In contrast to the above mentioned works, however, I propose that feature valuation takes place under Reverse Agree, which is defined as downward valuation (see Section 2.1). I show that the Merge Condition in (1), together with a Reverse Agree mechanism and an explicit account of the distribution of features, allows us to unify different types of selection and provides a strictly local syntactic mechanism for structure building which does

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not involve a search within the objects undergoing Merge and no recourse to special selector features or separate notions of subcategorization or (lexical) selection.

In the first part of the paper, I lay out the Reverse Agree system I adopt and provide some evidence for this view. I show that morphological selection is determined syntactically via Agree rather than lexically. The evidence is provided by constructions involving movement where it is the configuration after movement (and not the selectional relation) that feeds into the determination of the morphological form. In the second part of the paper I propose an explicit feature system which encodes and derives the selectional properties of verbs. While part of this task will be an exercise in feature assignments, I will show that the resulting system covers a large empirical domain and provides a new way of handling some long-standing puzzles of clausal complementation structures in English and German such as the mechanism and driving force of verb second movement, the distribution of doubly filled Comp effects, the *wh*-criterion and T–to–C movement, as well as the syntactically restricted behavior of embedded root clauses.

2. Agree as a condition on Merge

2.1 Reverse Agree

In recent years, there has been a growing number of approaches that propose, in one way or another, that Agree involves some form of upward probing or downward valuation (see Neeleman and van de Koot 2002, Adger 2003, von Stechow 2003, 2004, 2005, 2009, Baker 2008, Hicks 2009, Haegeman and Lohndal 2010, Zeijlstra 2012, Bjorkman 2011, Grønn and von Stechow 2011, Merchant 2011). In Wurmbrand (2012a, b, c), I argue that Agree is valuation driven and that interpretability is to be separated from the notion of valuation (see Pesetsky and Torrego 2007, Bošković 2009). That is, both interpretable and uninterpretable features can come as valued (*i*/*u*F: val) or unvalued (*i*/uF: __). The definition of Agree adopted is given in (4).

(4) A feature F: __ on α is valued by a feature F: val on β, iff
   i. β c-commands α AND
   ii. α is *accessible* to β. [*accessible*: not spelled-out]
   iii. α does not value {a feature of β}/{a feature F of β}.[1]

This approach dispenses with the activation condition (see Bošković 2007, Pesetsky and Torrego 2007), eliminates the need for feature sharing, and allows direct Agree relations without (often stipulated) intermediaries (as needed under Standard Agree for deriving binding and Case licensing, for example). The basic workings of Reverse Agree can be illustrated by considering Case licensing. Following Pesetsky and Torrego (2007), I assume that Case corresponds to an uninterpretable V-feature on a DP, which has to get valued by T (nominative) or *v* (accusative), as illustrated in (5) (I use a

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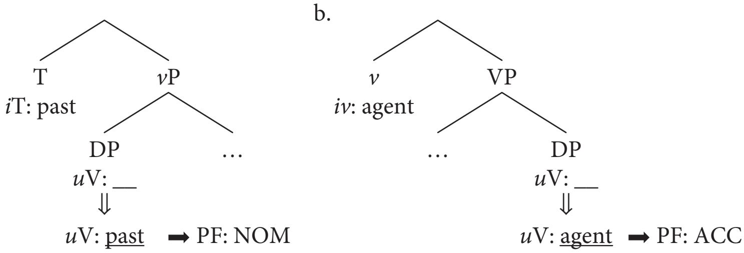
generic V-feature on DPs for Case, rather than a T-feature, to unify Agree by T and *v*). Crucially, Reverse Agree allows a direct dependency between the Case licensing head and the DP, which has the advantage of extending to long-distance Case relations (see for instance Şener 2008). Furthermore, in contrast to the Agree approach in Chomsky (2000, 2001), no reflex checking (or mixed Agree direction) is necessary: Agree uniformly involves downward valuation. In contrast to the Agree approach in Bošković (2007), in which Case licensing requires movement of the DP to the specifier of the Case licensing head, no such movement is necessary under Reverse Agree. A Reverse Agree approach to Case therefore extends to non-EPP languages such as German, in which Case licensing does not require movement (see Wurmbrand 2006).

(5) a. b.



Note that the standard version of upward valuing Agree is mainly motivated by Last Resort, which is encoded as the *activation condition* in Chomsky (2000): the higher element (the probe) has to be *active* (=contain an uninterpretable or unvalued feature) to motivate the initiation of a search for available features.[2] Thus, under standard Agree, Last Resort is defined with respect to the probing element (in some approaches also the goal element). This conception, which obviously cannot be applied to Reverse Agree, I suggest, is not the right conception for evaluating Last Resort for Agree. While under the Reverse Agree account proposed here the higher element in an Agree relation is not seen as the deficient element, Last Resort is nevertheless met via the Merge Condition. Thus, Last Resort is a condition on Merge (not on the probing or attracting element). A consequence of this view is that multiple dependencies can be straightforwardly established between one valuator and several 'needy' elements. Zeijlstra (2012) shows this, among others, for multiple nominative constructions, negative concord, and NPI licensing. In Section 2.4 below I summarize an account of parasitic participle constructions — constructions in which more than one participle is dependent on a single auxiliary. Furthermore, a significant advantage of a Reverse Agree approach is that it allows a single syntactic licensing relation to apply to a large amount of diverse syntactic dependencies (e.g., Case, binding, control, negative concord, among many others).[3] Lastly, Reverse Agree also allows us to implement morphological selection in a straightforward way. I turn to this in the next subsection where I also lay out the specific featural architecture proposed in this paper.

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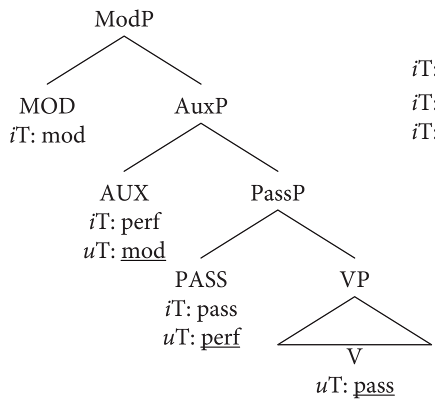
2.2 Selection via Reverse Agree

Regarding the distribution of verbal features, I assume that functional clausal heads (T, Mod, Asp etc.) have an interpretable T(ense)-feature which is typically (but not necessarily) valued; the value corresponds to the semantic value of the head (e.g., *i*T: PAST, MODAL, PERFECT). Note that the labels I use are only given for expository convenience — they have no theoretical bearing but should be seen as abbreviations of the feature bundles of these elements. Furthermore, all verbal heads have an uninterpretable T-feature, which is typically (but not necessarily) unvalued. As unvalued features cannot be used at the interfaces, F: __ must undergo Agree with the closest valued feature. Lastly, the value of the *u*T feature is what is realized at PF (see von Stechow 2003, 2004, 2005, 2009, Grønn and von Stechow 2011 for similar proposals). For instance, the *u*T: __ of a verb which is valued by a modal is realized as an infinitive in English; a verb which is valued by a perfect or passive auxiliary is realized as a participle. A sample derivation for an English sentence such as *He must have been left alone* is given in (6) (I ignore *u*T-features of the highest head, since this depends on the properties of the domain above ModP; see Section 2.5). Features that have been valued under Agree are underlined.

(6)



He must have been left alone.

*i*T: mod ➡ *must*
*i*T: perf *u*T: mod ➡ *have* + INF: *have*
*i*T: pass *u*T: perf ➡ *be* + PART: *been*
*u*T: pass ➡ V + PART: *left*

As illustrated in (6), features are valued in a downward fashion, which guarantees that a verb correctly realizes the morphology "selected" by the higher head. Reverse Agree is thus essentially a syntactic mechanism to implement morphological selection. In the usual case, Agree is equivalent to selection, however there are two scenarios where Reverse Agree and selection yield different results, which will motivate a syntactic approach. First, if, for some reason, a head (X) which *semantically* selects a verb (Y) is not specified for an *i*T feature, an element higher than X can value Y, and Y will occur with the morphology corresponding to the higher verb rather than the selecting verb. Second, movement, which changes the syntactic Agree configuration (but not the semantic selectional properties) can affect valuation and a verb will surface in a morphological form different from the form predicted by selection. We will see that parasitic participles provide evidence for both of these cases. Before turning to those,

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I summarize another argument based on VP ellipsis in English. We will see that Reverse Agree shows a clear advantage over Standard upward valuation Agree.

2.3 Ellipsis

A well-know observation regarding VP-ellipsis is the fact that identity between the antecedent and elided VPs is sometimes required but not always (Quirk et al. 1972, Sag 1976, Warner 1986, Lasnik 1995, among others).

(7) a. *John slept, and Mary will ~~sleep~~ too.* [Lasnik 1995: (39)]
b. *John was sleeping, and now Mary will ~~sleep~~.* [Lasnik 1995: (68)]

Lasnik (1995) points out that, assuming isomorphism between the two VPs is necessary, it is hard to see how a lexicalist approach to verbal morphology can handle these facts. Under a lexicalist approach, the structure for (7a), for instance, would involve a VP with a fully inflected verb $\textit{slept}_{\text{3SG.PAST}}$. However that VP could not function as an antecedent for the elided VP, since *Mary will slept* is impossible. Lasnik (1995) proposes a hybrid lexicalist approach which allows some but not all mismatches. Turning to Agree approaches, the same issue arises for standard Agree accounts in which probing is defined as a downward looking but upward valuation operation. Under such an approach, for T to Agree with *v*/V, T must be deficient (Pesetsky and Torrego 2007). I illustrate the problem using Pesetsky and Torrego's (2007) feature system as this account is the most explicit about the features of the verbal domain. As shown in (8a), for the modal *will* to probe the verb, the modal (or a T-head associated with the modal) must be unvalued. However, if main verbs come with valued features, the antecedent of the elided VP would be specified as *u*T: PROGRESSIVE (*sleeping*), which would not be an appropriate goal for *will* in the second conjunct ((8a) would be ruled out for the same reason **he will sleeping* is ruled out).[4]

Under a Reverse Agree approach as given in (8b) on the other hand, the feature specifications would be different: The unvalued element is the main verb, and the functional T-head is inserted with the appropriate interpretable value corresponding to that head. In a non-ellipsis configuration, T Agrees with *v*/V and values its feature with the value of T's interpretable feature. What is special about ellipsis is that Spell-out applies before feature valuation. Thus, in (8b), ellipsis applies at the stage given, crucially a stage where the antecedent and elided VPs match. Ellipsis is thus correctly predicted to be possible despite a mismatch that would be created in the non-ellipsis structure.

(8) *John was sleeping, and now Mary will ~~sleep~~.*

a.	Antecedent:	*was*	»	**V [*sleeping*]**	Standard *Agree*
		*i*T: __	»	***u*T: prog**	
	Elided	*will*	»	**V [*sleep*]**	Antecedent ≠ Elided VP
		*i*T: __	»	***u*T: fut**	

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b.	Antecedent:	*was*	»	V [*sleep*]	*Reverse Agree*
		*i*T: prog	»	*u*T: __	
	Elided	*will*	»	V [*sleep*]	Antecedent = Elided VP
		*i*T: fut	»	*u*T: __	

An important part of the argument is that mismatches are not generally possible — some mismatches do lead to ungrammaticality. The fact that some mismatches are impossible is evidence that isomorphism is required between the antecedent and elided VPs. One example is given in (9) (see Lasnik 1995, Potsdam 1997, Merchant 2007, 2008, 2009/11 for further illegitimate mismatch contexts).

(9) a. ? *Bill will use the system tomorrow, and Mary has been ~~using the system~~ all day.*
    b. * *The system can be used by anyone, and Mary has been ~~using the system~~ all day.*

In work in progress, I develop a detailed account of possible and impossible mismatches which would lead us too far away to lay out here. The crucial point there is that examples such as (9) which disallow ellipsis of a VP which featurally differs from the antecedent VP are excluded because of the lack of isomorphism between the two VPs. Licit cases of ellipsis which appear to involve featurally different antecedent and elided VPs involve a step in the derivation in which the two VPs match — the stage where the T-features of the verbs are not valued yet. Illicit cases of ellipsis involve larger projections, in which there are heads that are necessarily valued (e.g., ellipsis in (9) applies to *v*P; since in (9a) the antecedent and elided *v*Ps are both active, no mismatch arises; but in (9b), the antecedent and elided *v*Ps have different voice values, which precludes ellipsis). Such an account is only possible if a feature distribution as in (8b) is allowed. If, as it has to be the case under a standard Agree account, main verbs are fully valued and the corresponding probes unvalued, isomporphism could never be created and mismatches should generally be impossible (or perhaps generally possible if the uninterpretable features on V are deleted and ellipsis applies after feature-deletion).[5]

2.4 Selection as part of syntactic structure building

As mentioned above, Reverse Agree is a means to syntactically encode morphological selection. The account differs, however, in some crucial ways from lexical selection (however that is instantiated). Making morphological selection dependent on syntactic Agree adds a configurational component to selection, which is not present in other approaches to selection. This can be illustrated by a phenomenon found in many Germanic languages, namely parasitic participle constructions (Wiklund 2001, Wurmbrand 2012b). As shown in (10), in restructuring configurations in Norwegian and Frisian, the verb (semantically) selected by a modal verb, which in turn is selected by perfect *have*, can occur either as an infinitive or as a participle. Importantly, both

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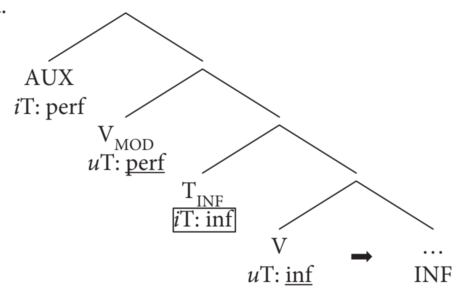
cases are interpreted as infinitives (i.e., *want to read* and not *want to have read*), that is, there is no hidden perfect in the embedded clause.

(10) a. *Jeg* *<u>hadde</u>* *villet* ***lest*** */ lese* *boka* Norwegian
I had want.PART **read.PART** / read.INF book.DEF
'I would have liked to read the book.' [Wiklund 2001 :201]

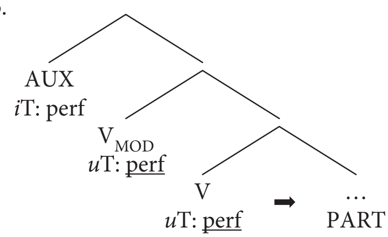
b. *hy soe it* ***dien*** */ dwaan wollen* *<u>ha</u>* Frisian
he would it **do.PART** / do.INF want.PART have.INF
'He would have liked to do it.'
[den Dikken and Hoekstra 1997: 1058]

The analysis is schematized in (11). Note again that I use the labels AUX, MOD etc. solely as shortcuts for specific feature bundles to facilitate navigating through these examples and structures. In the usual case, (11a), the embedded clause involves an infinitival head which values the embedded verb as an infinitive. In restructuring configurations, on the other hand, the functional domain of the embedded clause is impoverished and the embedded verb becomes dependent on the functional domain of the matrix clause. In (11b), the auxiliary merged in the matrix clause values both the matrix verb and the embedded verb as a participle.[6]

(11) a.



b.



A second type of parasitic participle is found in Frisian and other head-final languages (e.g., Stellingwerf dialect; Bloemhoff 1979, Zwart 1995). As shown in (12), the surprising pattern involves participles that are apparently selected 'upwards'; that is, the modal *want* which is selected by another modal (*would*) and itself selects the auxiliary *have* can occur as a participle (see the underlying structure in (12b)).

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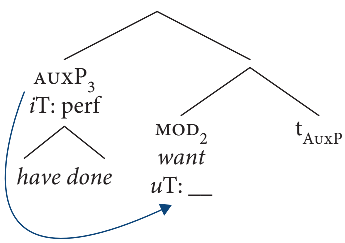
(12) a. *hy soe* *it dien* *<u>ha</u>* *wolle* /***wollen*** Frisian
he *would* it do.PART have.INF want.INF /**want.PART**
'he would like to have it done' [den Dikken and Hoekstra 1997]
b. [$_1$ *would*.FIN [$_2$ *want*.INF/PART [$_3$ *have*.INF [$_4$ *do*.PART]]]]

This apparent upward parasitic construction is only found in head-final languages, that is, languages which can be assumed to involve movement of verbal projections to the left (yielding the head-final word order). This factor, I argue, plays a crucial role in deriving the morphology displayed. The analysis proposed in Wurmbrand (2012b, c) is sketched in (13). The projection headed by the auxiliary (AuxP) re-merges above the modal *want* (before the modal *would* is merged). This re-merge is only possible in head-final (verb cluster) languages. As a result, AuxP (which includes the features of its head) comes to c-command its selecting verb, the modal *want*. Agree can be established, and the modal want *can* be valued as a participle.

(13) 

=(12a); *want*.PART

While several technical details have to be left unaddressed here, the key point of these constructions is that movement/re-merge changes syntactic Agree configurations, but *not* the underlying semantic hierarchy between the verbal elements (the meaning of both versions in (12) is *want* » *have*, and *want* is still 'selected' by *would*). This shows that the morphological form is determined after movement, that is, morphology realizes the features supplied after Agree, rather than features determined by lexical selection.

2.5 Feature valuation as a (Last Resort) condition on Merge

Under a Reverse Agree approach, morphological (more generally *value*) selection reduces to Agree. Selection of verbal morphology has been illustrated in (6). Another type of value selection, cases where a predicate selects a complement with a specific value (e.g, *demand* requires a subjunctive complement, *decide* requires an irrealis infinitive, *claim* requires a propositional 'Now' infinitive), is discussed in Wurmbrand (2013, To appear). I argue there that such predicates involve an uninterpretable feature which is lexically valued as whatever the selected value is (e.g., *demand* involves a uT: subjunctive). The complement of these predicates starts out underspecified, that is, the topmost tense/mood head is inserted with an interpretable but unvalued feature. This feature needs to be valued (otherwise it would not be interpretable), hence a

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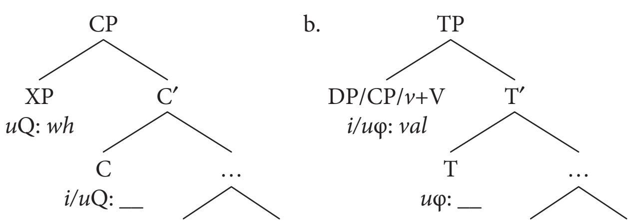
dependency with the selecting predicate must be established. This form of value selection, I propose, has consequences for phasehood, which is reflected in certain transparency effects displayed by subjunctive and infinitival complements.

A further consequence of the Merge Condition is that it derives certain types of movement (or more accurately internal merge, which I will refer to as re-merge) without the assumption of an EPP feature. The diagrams in (14) illustrate *wh*-movement and subject movement. In (14a), C is specified for an interrogative feature, which, per assumption, is unvalued. For the Q feature on C to be valued an XP with a valued Q-feature must merge with C′. I adopt Pesetsky and Torrego's (2007) claim that *wh*-phrases involve an uninterpretable valued *wh*-feature. Thus, the driving force of *wh*-movement does not lie in the *wh*-element (which is supported by the fact that *wh*-elements can be used as indefinites in many languages in non-interrogative contexts), but rather in the complementizer. This essentially derives *wh*-movement under a Reverse Agree account. If C is inserted with an interpretable Q-feature, the resulting sentence is an interrogative (e.g., *Who left?* or *I wonder who left.*). If C is inserted with an uninterpretable Q-feature, successive cyclic *wh*-movement is derived (*Who did he say left?*).

The structure in (14b) illustrates subject movement to Spec,TP or V-movement to T. I assume that T is inserted with uninterpretable unvalued ϕ-features. In languages where the EPP holds (which is formalized via the stricter restriction in (4iii)), these features must be valued by an element merging with T (see fn. 1; in non-EPP languages, *v*P can value the ϕ-features of T). This can be achieved in two ways. Either an XP with valued ϕ-features must merge with T′ (yielding subject movement), or T must re-merge with *v*/V in languages where the EPP can be satisfied by the verb (see Alexiadou and Anagnostopoulou 2001). I assume that *v* is inserted with uninterpretable unvalued ϕ-features, which get valued via Agree with the subject in Spec,*v*P. Movement of *v*+V to T then creates a configuration in which the unvalued ϕ-features of T can be valued by the uninterpretable and now valued ϕ-features of *v*+V under Agree (recall that the Agree version in (4) allows valuation between two uninterpretable features, as long as the valued feature c-commands the unvalued feature).

(14) a. b.



The proposal that the version of Agree proposed here acts as a condition on Merge also derives the locality of selection. To ensure that selector features are satisfied immediately, Chomsky (2000) proposed a lexical access condition, which is similar to the Locus Principle assumed in Collins (2002). In the current system, Merge is subject

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to Last Resort, which in turn requires feature valuation. Thus, only elements that can establish a feature valuation relation can be merged with an existing structure, and satisfaction of selectional properties cannot be postponed.[7]

3. Agree and other cases of complementation

3.1 Complement selection

So far, I have provided a Last Resort Merge account for the verbal and inflectional projections of a clause and for certain movement operations. One aspect of selection, namely the selection of arguments, has not been discussed yet. The main proposal is that verbs encode their argument structure properties as uninterpretable unvalued features, which need to get valued under Merge. Thus, Merge of arguments is also constrained by Agree. I propose the features in (15), which, when valued, translate semantically as follows: ϕ-features are translated as 'argument of' relations for both V and *v* — that is, the XP valuing the ϕ-features of V is interpreted as an argument (the object) of V, whereas the XP valuing the ϕ-features of *v* is interpreted as an argument of *v*, i.e., the external argument of the predicate (see also Hornstein and Nunes 2008);[8] a Q feature is translated as an interrogative; and *v*-features encode the values of the *v*P/VP-shell projections introducing further arguments (e.g, agent, holder, experiencer etc.; cf. Hale and Keyser 1993, Kratzer 1994, Baker 1997).

(15)	a.	*v*/V:	[*u*ϕ: __]	XP ϕ: val is an argument of *v*/V
	b.	V:	[*u*Q: __]	XP *i*Q: val is interrogative
	c.	V:	[*u*v: __]	Event identification

To be more specific, I assume that active *v* is inserted with unvalued ϕ-features, which requires *v*′ to merge with an XP. As for passive constructions, I follow Landau (2010) and Legate (2010, 2012) who propose that the implicit subject argument is structurally present as a ϕ-feature bundle. With Legate (2010, 2012), I assume that these ϕ-features are on *v*, thus passive *v* is inserted with *valued* ϕ-features, which eliminates the need for an external argument to merge with *v*, but nevertheless supplies the semantics that there is an implicit subject (see Legate for morphological evidence for this claim). As in most current approaches, the external argument is thus solely an argument of *v* (it is not selected nor introduced by the main verb). However, given the features assumed, the main verb does nevertheless encode information about the entire extended VP-structure. This is desirable since it allows us to (lexically) specify argument structure properties and exclude various impossible combinations. For instance, whether a verb allows the causative-inchoative alternation is encoded in the *v*-feature specification of V. As shown in (16a) vs. (16b), *clean* and *break* differ regarding the optionality of the *v*-feature on V: a *v*P can be omitted for *break* but not for *clean*. The distribution of *v*-features then has the effect that a *v* head must merge with the VP in (16a)

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(and subsequently an XP with *v*) but not in (16b). Similar considerations apply to the ϕ-features of V. If V is specified for ϕ-features, an object must merge with V as in (16c), if the ϕ-features are optional, an object is optional, (16d), and if V is not specified for ϕ-features, an object is impossible, (16e).[9]

(16)	a.	*clean*:	[*u*T: __, *uv*: __, (*u*ϕ: __)]	*John cleaned* (*the car*); **The car cleaned.*
	b.	*break*:	[*u*T: __, (*uv*: __), *u*ϕ: __]	*John broke the car; The car broke.*
	c.	*wear*:	[*u*T: __, *uv*: __, *u*ϕ: __]	*John wore* *(*a coat*).
	d.	*call*:	[*u*T: __, *uv*: __, (*u*ϕ: __)]	*John called* (*Mary*).
	e.	*laugh*:	[*u*T: __, *uv*: __]	*John laughed* (**Mary*).

In (17), I give the full derivation for the sentence *John called Mary*. (17a) shows the lexical items with the features at the point of Merge. (17b) through (17f) give the feature combinations after each step of Merge (indicated by < >) and after Agree has applied (features acquired via valuation are again underlined). Note again that the labels I use in the structures are merely for ease of referring to specific syntactic objects. The way the tree is to be understood is that the labels stand for syntactic objects with specific feature combinations. I follow the standard assumption that the features of the head are carried on to the newly created object. Furthermore, I assume that features of a head are not just carried up to the projection of that head, but are also passed up to the extended projection of that head (specifically, features of V percolate up to the extended projection of the verb, namely the *v*P). This assumption achieves the same result as V-to-*v* head movement would under a view where head-movement targets the root of the structure and leads to re-projection or, more accurately, joint projection of both heads (see for instance Pesetsky and Torrego 2001, 2004, 2007, Donati 2000, Gallego 2005, 2010, and below). Joint projection of *v*+V has the effect that the unvalued tense feature of the V(P) is carried along with the features of *v*. This has two consequences: first, the unvalued tense feature on v+V(P) motivates Merge of T; second, it allows T to value the unvalued tense feature of V before the VP is spelled-out. As shown in (17e–g), I propose that Spell-out of the VP takes place after T has merged with *v*P, but before the structure is further extended. In Hornstein and Nunes (2008) terms, the steps are (i) concatenate, (ii) Agree as in (17e), (iii) Transfer and Spell-out (see below), (17f), and (iv) label (extension of the structure) as in (17g).

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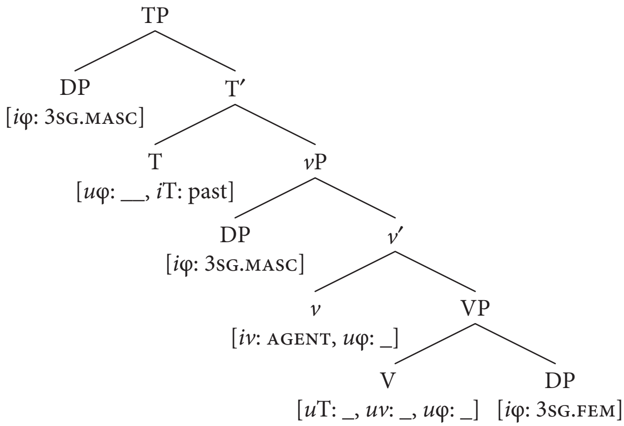
(17) a.



b. < V + DP > [*u*T: __, *uv*: __, *u*ϕ: 3sg.fem] (VP)
c. < *v* + VP > [*iv*: agent, *u*ϕ: __; *u*T: __, *uv*: agent, *u*ϕ: 3sg.fem] (*v*′)
d. < DP + *v*′ > [*iv*: agent, *u*ϕ: 3sg.masc; *u*T: __, *uv*: agent, *u*ϕ: 3sg.fem] (*v*P)
e. < T + *v*P > [*iv*: agent, *u*ϕ: 3sg.masc; *u*T: past, *uv*: agent, *u*ϕ: 3sg.fem]
f. Transfer; Spell-out of VP [*u*T: past, *uv*: agent, *u*ϕ: 3sg.fem]
g. [*u*ϕ: __, *i*T: past] (T′)
h. < DP + T′ > [*u*ϕ: 3sg.masc, *i*T: past]
i. Transfer; Spell-out of remaining structure

In the next sections, I will show that this system has some interesting consequences for clausal complementation in English and German. To do so, I first provide an overview of the different clausal complementation options in these languages.

3.2 Clausal complementation in English and German

The distribution of clausal complements in English and German is very similar. In both languages, matrix interrogative clauses require T–to–C movement (cf. (18a, a′)).[10] On the other hand, in both languages, embedded interrogatives prohibit T–to–C movement (cf. (18b, b′)). One difference between the two languages arises in root clauses: In English, root declaratives are TPs, whereas they are verb second CPs in German (cf. (18c, c′)). Lastly, both languages are alike again in the distribution of embedded declaratives. Embedded declaratives could either occur as *that*-CPs (cf. (18d, d′)) or as clauses corresponding to root clauses in each language — an embedded *that*-less clause in English (which I will assume is a TP), and an embedded verb second CP in German (cf. (18e, e′)).

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(18) a. *Who {has} John {*has} met?*
a′. *Wen {hat} er getroffen {*hat}?*
who.ACC {has} he.NOM met {*has}
'Who did he meet?'
b. *He wonders who {*has} she {has} met.*
b′. *Er fragt sich wen {*hat} sie getroffen {hat}*
he asks himself who.ACC {*has} she.NOM met {has}
'He wonders who she met.' [T–to–C: OK as direct question]
c. *John has seen Peter.*
c′. *Den Peter hat der Hans gesehen*
the.ACC Peter has the.NOM John seen
'John has seen Peter.' 'It was Peter that John has seen.'
d. *John said that Mary left.*
d′. *Er hat gesagt dass Maria weggegangen ist*
he has said that Mary left has
e. *John said Mary left.*
e′. *Sie glaubt den Peter mag niemand* t_{Obj} t_V
she thinks the.ACC Peter likes nobody.NOM
'She thinks nobody likes Peter'

The following table summarizes the distribution above and gives the features I assume for the topmost projection of the different types of clauses and, for embedded clauses, the features of the selecting verb. In the remainder of this section, I will discuss the first four constructions and motivate the features as given in the table by showing how the system proposed in this article derives the distribution of T–to–C movement as well as other properties. The feature and Merge approach developed here will then lead to a new approach to embedded root clauses, which will be laid out in the next section.

Type of clause	**English**	**German**	**Top features**	**Higher V**
Matrix declarative	TP	CP (V2)	*i*T, *i*C, *u*ϕ	–
Matrix interrogative	CP (T–to–C)		*i*T, *i*Q, *i*C, *u*ϕ	–
Embedded interrogative	CP (*T–to–C)		*i*Q, *i*C, *u*ϕ	*u*T: __, *uv*: __, *u*Q: __, *u*ϕ: __
Embedded declarative (*that*)	CP (*that*)		*i*C, *u*ϕ	*u*T: __, *uv*: __, *u*ϕ: __
Embedded *that*-less declarative	TP	CP (V2)	*i*T, *i*C, *u*ϕ	*u*T: __, *uv*: __, *u*ϕ: __

The generalization I will argue for is what I refer to as the *Root generalization* in (19).[11]

(19) *Root generalization*:
A TP or CP is a root clause iff it has interpretable tense on the top projection.

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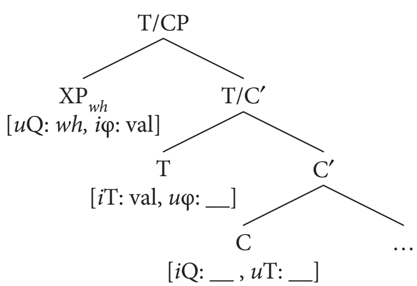
I propose that there are two ways in which a clause can have interpretable tense on the top projection. First, the top projection of the clause is a TP, which by definition is specified for interpretable tense. This, I argue, is the case for English matrix declaratives. The second way to meet the Root generalization is by movement of T–to–C. As mentioned above, in several works, head-movement has been treated as movement to the root of the structure (in accordance with the Extension Condition) and re-projection of the moved head together with the 'moved-to' head. For T–to–C movement, this has the effect, that the T/C(P) clause then includes the features of both T and C. Thus a CP in which T–to–C has applied, ends up with an interpretable tense feature on the topmost projection (see also Pesetsky and Torrego 2001, 2004, 2007 for a similar claim but a different feature and Agree system).

Returning to the table above, there are three cases in which T–to–C movement creates the correct environment for a root clause: German matrix clauses, English and German matrix interrogatives, and lastly, embedded *that*-less declaratives in German, which have been treated as embedded root clauses in most works (see the next section for an analysis). The simplified structure of matrix interrogatives is given in (20) (I omit certain features here for clarity; see below for the full set of features of the CP-domain). German verb second clauses are similar, except that C does not involve an interrogative feature (see (26)). As shown in (20), T re-merges with C′, which is licensed due to the unvalued tense features on C, and an XP with valued Q-features merges with T/C′.

(20)



Since I assume a re-merge approach to movement, where elements are (re-)taken from the numeration, T, when re-merged with C′, would again be merged with unvalued ϕ-features. The question then is how these features are valued. There are several conceivable options. First, it could be assumed, following Nunes (2011), that valuation takes place via copy identification. For instance, unvalued features corresponding to valued features in a copy of the same syntactic object could be marked as valued (or they could be deleted unvalued). A complication with this approach is that it is difficult to define how two syntactic objects are identified as copies of each other if they differ in their featural content. Another option would be to assume that re-merge involves literally only one item which is merged in several positions and which hence has the same properties in all 'copies' (see Bobaljik 1995). I will, however, pursue a different

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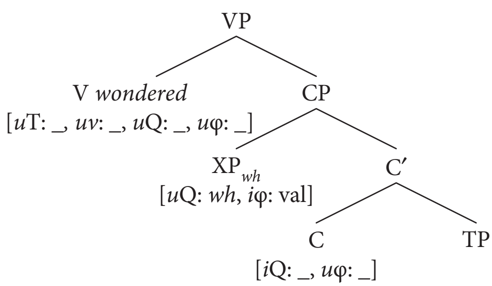
approach here. I propose that the unvalued ϕ-features of re-merged T are valued by the XP in Spec,CP. Re-merge of T with unvalued ϕ-features thus opens a new way of looking at the XP-movement part of verb second constructions. While XPs in the initial position of a verb second clause can be interpreted as topics or focused XPs, it is well-known that this is not obligatory. This makes it unlikely that XP-movement is triggered by a topic or focus feature, rather movement seems to be triggered by a generic EPP-like feature (see Fanselow 2004, Frey 2005, Fanselow and Lenertová 2011). If the unvalued ϕ-features of re-merged T are not valued or deleted via the copy of T, re-merge of T then forces another XP to merge with T/C′, deriving the verb second property. Thus, XP-movement becomes a consequence of V/T–to–C movement.[12]

What about the trigger for T–to–C? Here the Root Generalization is crucial. I assume that C can be inserted with or without an uninterpretable tense feature (see below for the full feature specification of C). If C is inserted with an uninterpretable tense feature, T–to–C will be required and the resulting clause will have interpretable tense on the top projection (due to T and C projecting together). (19) then states that the clause is a root clause, which, as noted in fn. 11, has consequences for the semantic and illocutionary properties of the sentence. If C is inserted without an uninterpretable tense feature, T–to–C cannot apply, and (19) states that the clause is not a root clause. The latter is illustrated for embedded interrogatives in (21) (again, not all features are given).

(21)



As in the previous case, an XP with valued Q-features must merge with C′ to value the Q-feature of C. Since there is no uninterpretable tense feature on C, re-merge of T cannot apply, and the CP ends up without interpretable tense. According to (19), the CP in (21) cannot be interpreted as a root clause, but must continue to merge with an appropriate element. In embedded questions, the CP merges with a verb, which, as shown in (21), is possible due to the unvalued Q and ϕ-features on V. Note that I assume that C, like T and *v*, can be inserted with unvalued ϕ-features, which I motivate below. The ϕ-features on C, like its Q-feature, are valued by the XP in Spec,CP and the CP therefore contains valued ϕ-features when it merges with V. As in the case of Merge of T with *v*P in (17), I assume that Transfer and Spell-out occur after Merge (concatenation) and Agree.[13] CP merges with the higher head, the selecting verb, which is followed by Agree and valuation of the Q and ϕ-features of V. Spell-out of TP (including

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deletion of copies and uninterpretable features) occurs after this step of valuation. The matrix clause then continues as in (17).

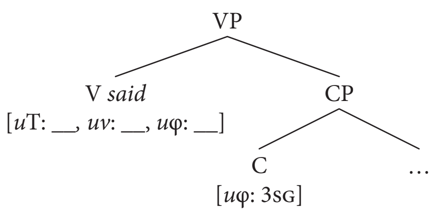
The assumption that an embedded interrogative CP values not only the Q-feature of V, but also its ϕ-features has as a consequence that the CP is interpreted as an argument (the object) of V. Recall that ϕ-feature valuation on V is interpreted as an 'argument of' relation. The Q-feature further specifies that this argument is an interrogative. Furthermore, some puzzling facts regarding the distribution of embedded questions are now derived without further assumptions. Embedded interrogatives, like embedded declaratives (but in contrast to embedded root clauses — see next section) can occur as subjects in both English (cf., (22)) and German (cf., (23); due to center embedding and the possibility of extraposition (23a,b) are marked, however, they are clearly grammatical).

(22) a. [*That Mary read a book yesterday*] *is not known*.
b. [*Which book Mary read yesterday*] *is not known.*

(23) a. *weil* [$_{CP}$ *dass den Peter niemand mag*] *allgemein bekannt ist*
since that the.ACC Peter nobody.NOM likes] commonly known is
'since that nobody likes Peter is commonly known'
b. *weil* [$_{CP}$ *welchen Buben niemand mag*] *allgemein bekannt ist*
since which boy.ACC nobody.NOM likes] commonly known is
'since which boy nobody likes is widely known'
c. *Er fragt sich wen dass der Hans getroffen hat*
he asks himself who.ACC that the.NOM John met has
'He wonders who John met.'

It has therefore been proposed that embedded questions involve the complementizer *that* which is deleted at PF (cf., Chomsky and Lasnik 1977, Pesetsky 1998). No such deletion is necessary in the present account. The difference between declarative C in (22a)/(23a) and interrogative C in (22b)/(23b), I propose, is that the former is inserted with lexically valued ϕ-features as in (24). The presence of valued ϕ-features at the top CP-level in both embedded declaratives and interrogatives then accounts for the fact that both types of CPs can occur as subjects. Recall from (17) that T is inserted with unvalued ϕ-features. Given the Merge Condition, only XPs with valued ϕ-features can merge with T′.

(24)



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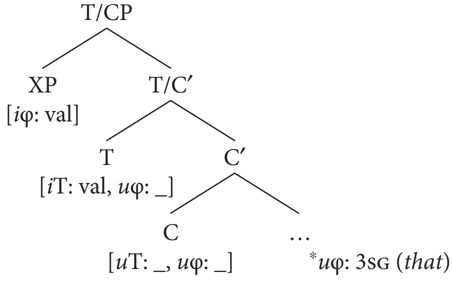
The situation is, however, more complex in German. First, as shown in (23c), in certain German varieties, embedded interrogative clauses can also involve the complementizer *that*. Second, C in declarative matrix clauses, which do involve a CP in German, cannot be inserted with valued ϕ-features — the complementizer *that* is impossible in (25). I refer to these facts as *doubly filled Comp* effects. Thus in German, the difference between valued and unvalued ϕ-features in C cannot be equated with declarative vs. interrogative.

(25) a. **Den Peter hat dass der Hans gesehen*
the.ACC Peter has that the.NOM John seen
'John has seen Peter.' 'It was Peter that John has seen.'

b. **Den Peter dass der Hans gesehen hat*
the.ACC Peter that the.NOM John seen has
'John has seen Peter.' 'It was Peter that John has seen.'

I propose that non-interrogative C in German can, in principle, be inserted either with valued or with unvalued C, but that certain combinations are excluded by other properties. Consider first German verb second clauses. The successful structure is given in (26), that is, a structure where C is inserted with unvalued ϕ-features. C is inserted with an unvalued T-feature, which triggers T–to–C movement, which in turn requires movement of an XP to Spec,CP. That XP then values the ϕ-features of both T and C. Suppose now that instead of unvalued ϕ-features, C would be inserted with valued ϕ-features. This would have the consequence that the CP would be marked with two distinct sets of ϕ-features. Recall that in head-movement configurations both heads project. In (26) it would mean that T would project ϕ-features that are valued by the XP, and C would project ϕ-features that are valued lexically. It seems natural to assume that such double specifications on one projection are impossible. The system proposed here thus provides a new account of the doubly filled Comp effects.

(26)



For embedded declaratives, the situation is exactly the opposite — C with valued ϕ-features is possible, but C with unvalued ϕ-features must be excluded, since embedded clauses that involve the XP-movement part of verb second but not the V-movement part are illicit (cf. (27)). Examples such as (27) would be derived if C is inserted with unvalued ϕ-features, followed by movement of an XP to Spec,CP and valuation of C's ϕ-features by that XP.

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(27) * *Sie glaubt* [$_{CP}$ *den Peter* __ *niemand mag*]
she thinks the.ACC Peter __ nobody.NOM likes]
'She thinks that nobody likes Peter'

To exclude that derivation, I assume that in embedded (non-root) declaratives the simpler derivation excludes the more complex derivation. The main function of a CP-domain in embedded declaratives is to turn a TP (i.e., a projection with interpretable tense) into a non-root clause. As we have seen, there are two potential derivations to achieve this: a derivation as in (24) where TP merges with C with valued ϕ-features; or a derivation as outlined for (27) where TP merges with C with unvalued ϕ-features, which must be followed by C′ merging with an XP. The latter derivation involves two steps of Merge, which, I suggest, is excluded by the availability of a derivation with a single step of Merge, the derivation in (24) (for embedded verb second clauses see the next section).

Lastly, interrogative C is inserted with unvalued ϕ-features in both German and English, but in certain German varieties it can also be inserted with valued ϕ-features, see again (23c). As in the case of verb second declaratives, matrix interrogatives (which are also verb second configurations) only allow C with unvalued ϕ-features (otherwise, CP would end up with two different ϕ-specifications, which is excluded). Embedded interrogatives, which cannot involve T–to–C movement (see below) allow a C with valued ϕ-features (but this is restricted to certain dialects), since both derivations, a derivation with valued ϕ-features and a derivation with unvalued ϕ-features in C, must involve two steps of Merge due to the Q-feature in C. Thus, the competition mechanism suggested above does not apply in embedded interrogatives, and both options are possible. A question I have to leave open at this point is why the choice between valued and unvalued C is only available in certain dialects. (28) summarizes the features of C in English and German. The distribution of the unvalued T-feature has been argued to follow from the Root Generalization. A large part of the distribution of the ϕ-features could also be derived from other properties. However, some differences between different languages/dialects remain and need to be specified as part of the lexical entries of C in those languages.

(28)	a.	$C_{interrogative}$:	[*i*Q: __, *i*C: val, *u*ϕ: __, (*u*T: __)]	English, Standard German
			[*i*Q: __, *i*C: val, *u*ϕ: val, (*u*T: __)]	German varieties
	b.	$C_{non\text{-}interrogative}$:	[*i*C: val, *u*ϕ: val]	English
			[*i*C: val, *u*ϕ: (val), (*u*T: __)]	German

The summary in (28) also includes one feature I have not discussed yet: *i*C. So far, I have shown how Merge of C′ and CP with their sisters meets the Merge Condition, but I have not yet addressed the question how Merge of C and TP is possible. While a detailed investigation of the properties and features of the CP-domain cannot be offered here, I propose preliminarily that the CP hosts mood features (indicative, subjunctive),

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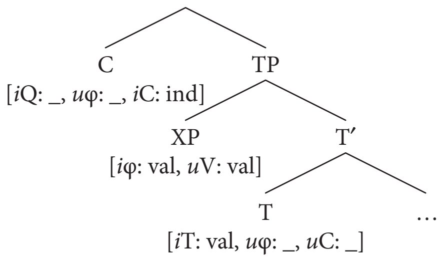
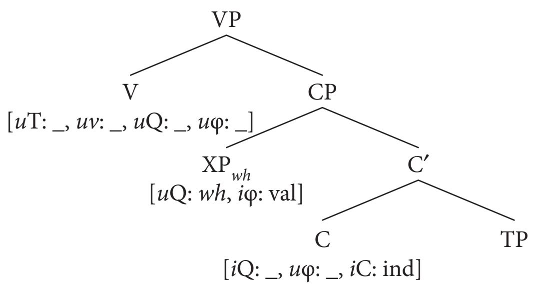
which presumably are interpretable. Mood distinctions are also reflected on tense (which is realized on the verb), which makes it plausible to assume that T is inserted with unvalued mood features. I notate these features as C-features here. Thus, the TP structure is as in (29). T merges with an XP with valued ϕ-features which values the ϕ-features of T. C, which involves valued mood (C) features, then merges with TP and values the unvalued C-feature of T.[14]

(29)



The Merge and feature system proposed in this paper now offers a new way to account for the impossibility of V/T–to–C movement in embedded interrogatives. Consider again the structure of an embedded interrogative in (21), repeated as (30a) (now with all features supplied, and the steps of Merge and valuation given in (30b–e)). (30d) shows that the matrix verb is left with unvalued T and *v*-features, which ensure that the matrix VP merges with *v* and T in the further course of the derivation (see (17)).

(30) a.



b. < C + TP > [*i*Q: __, *u*ϕ: __, *i*C: ind] (C′)
c. < XP + C′ > [*i*Q: *wh*, *u*ϕ: val, *i*C: ind] (CP)
d. < V + CP > [*u*T: __, *uv*: __, *u*Q: *wh*, *u*ϕ: val] (VP)
e. Transfer; Spell-out of TP

The structure in (31) gives a hypothetical (and as we will see eventually not successful) structure of an embedded interrogative in which T–to–C movement has applied. The T/CP in (31) is constructed like a matrix interrogative (cf. (20)). The crucial difference between (30) and (31) is that in the latter the embedded clause ends up with an additional tense feature due to T–to–C movement (recall that this is exactly what is needed in root clauses). This additional tense feature, however, now has an effect on the continuing structure in the matrix clause. Let's assume a Maximize Valuation condition (similar to Chomsky's 2000, 2001 Maximize Match), which requires that in a single

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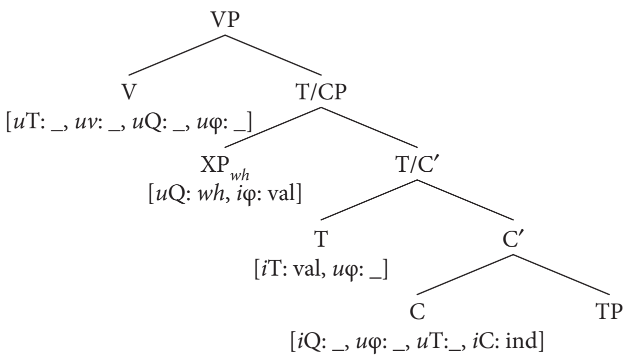
Agree operation, all matching features are valued. Thus, in (31), when the T/CP merges with V, not only are the Q and ϕ-features of V valued, but the unvalued tense feature of V would also be valued, as given in (31e). If that is the case, however, the matrix structure could then not involve another T-head anymore. Recall that in (17), Merge of T with *v*P was licensed, exactly since T can value the unvalued T-feature of V carried up to *v*P via extended projection or head movement. If no such unvalued feature is present, Merge of a matrix T would violate the Merge Condition. A structure without tense, however, is excluded as it would not be interpretable correctly (and it would also violate the Root Condition). Note that the Merge Condition in (1) is defined for features of the two merging elements. Thus, a Case feature on the subject in Spec,*v*P would not be sufficient to license Merge of T in the absence of an unvalued T-feature in *v*/V. This account thus derives why T–to–C is excluded in embedded interrogatives.

(31) a.



b. < C + TP > [*i*Q: __, *u*ϕ: __, *u*T: __, *i*C: ind] (C′)
c. < T + C′ > [*i*T: val, *u*ϕ: __ ; *i*Q: __, *u*ϕ: __, *u*T: <u>val</u>, *i*C: ind] (T/C′)
d. < XP + C′ > [*i*T: val, *u*ϕ: <u>val</u>; *i*Q: <u>*wh*</u>, *u*ϕ: <u>val</u>, *u*T: <u>val</u>, *i*C: ind] (T/CP)
e. < V + CP > [***u*T: <u>val</u>**, *uv*: __, *u*Q: <u>*wh*</u>, *u*ϕ: <u>val</u>] (VP)

The current account of the impossibility of embedded CPs with interpretable tense on the top projection (i.e., CPs with T–to–C) derives one part of the generalization put forward in Pesetsky and Torrego (2006), namely that verbs can only (and in fact must) merge with XPs with ϕ-features, but not with XPs with tense features (unless Merge happens counter-cyclically, as I will propose for embedded root clauses in the next section). The second part of the generalization, the claim that nouns must merge with XPs with tense-features, however, is not compatible with the system proposed here. *That*-CPs do not have tense features in the current account, yet they can be complements of nouns. Furthermore, the claim that DPs cannot be complements of nouns seems to be an English specific property — in other languages (e.g., German), nouns do allow DP complements. The main factor regarding the distribution of DP complements to nouns seems to be the availability of a structural nominal Case (such as genitive), rather than a restriction on Merge. In German, D (or another functional Case head in the noun phrase) can assign Case to complements of N, but in English, this is

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impossible (unless 'of' is seen as a kind of Case marker, in which case English could also be seen as allowing DP complements of nouns). I thus propose that nouns, like verbs, have selectional features in the form of unvalued ϕ-features, hence unifying selection across categories.

The last question regarding Merge as feature valuation concerns the question of whether nouns can merge with XPs with tense features. I believe this is still an open empirical issue. Leaving aside PPs, for which it is controversial whether they involve tense or not, the main question concerns *that*-less clauses, which, as shown in the table above and argued for in more detail in the next section, involve interpretable tense on the top projection. A common claim is that nouns cannot combine with *that*-less clauses in English (see (32) from Pesetsky and Torrego 2004, 2006 and (33) from Bošković and Lasnik 2003)).

(32) a. *We proved Mary could not have committed the crime.*
b. *We demonstrated John was insane.*
c. *your proof* *(*that*) *Mary could not have committed the crime*
d. *the demonstration* *(*that*) *John was insane*

(33) a. *I heard about the fact that Mary did it.*
b. **I heard about the fact Mary did it.*

However, a general prohibition against nouns combining with *that*-less complements also seems to be too strong. First of all, German allows nouns (such as *Idee* 'idea', *Illusion* 'illusion', *Hoffnung* 'hope') to combine with embedded root clauses (see Reis 1997 for examples). Second, even in English, *that*-omission is well-attested (despite the above claims), at least with some nouns. Thus, Huddleston and Pullum (2002: 954) note that omission "is unlikely with a morphologically complex noun like *insinuation*", but contrast this with simple nouns like *fact: The fact it was illegal didn't seem to worry him*. Similar facts have been reported in Doherty (1997: 49):

(34) a. *The fact he left caused a storm.*
b. *The reason he stayed wasn't apparent.*

Furthermore, the following examples from Google searches show that *that*-less clauses can be found with *suggestion*, *belief*, *evidence*, and *claim*, and are, in fact, very common with *proof*. As for the Google searches of *proof*, I include both numbers, the raw number given by the search, as well as the number of entries listed on the last page of the search, which omits similar entries. The important point here is that there is no big difference between *that*-CP and *that*-less complements of N.

(35) a. *Ralph Brown, the institute's attorney, praises Salah and rejects the* ***suggestion*** *the center's money found its way "to any kind of improper activity, let alone terrorist activity."*

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b. *First up, the week began with […] more* ***evidence*** *the president is losing the power of the center that got him elected.*
c. *Additionally, there is a* ***belief*** *the committee keeps a running total of berths various conferences receive during the selection process, thus establishing quotas.*
d. *Cheney rejected the* ***claim*** *the Bush administration is to blame for the faltering economy…*

(36) a. *Then when you have seen enough* ***proof*** *he loves you, confess your love!*
b. *U.S. officials have received* ***proof*** *he is alive*

(37) Google search, 12/21/2012

	Search item	Total hits		Last page	
a.	"*proof she loves*"	About 1,460,000	(41.8%)	184	(40.1%)
b.	"*proof that she loves*"	About 2,030,000	(58.2%)	275	(59.9%)
c.	"*proof she is*	About 2,310,000	(38.9%)	436	(46.2%)
d.	"*proof that she is*"	About 3,630,000	(61.1%))	507	(53.8%)

Note that the cases found on Google are not just random corpus examples, but these constructions are all judged natural by native speakers. Nevertheless, speakers who find the above corpus examples acceptable typically also clearly agree that the examples in (32) and (33) are quite degraded and reject those examples. An answer to this apparent contradictory behavior of N-complementation may lie in semantic differences between *that* and *that*-less complements. Regarding *proof*, for example, there are subtle meaning differences between examples with and without *that*.[15] As shown in (38), *proof* without *that* roughly corresponds to 'confirmation', whereas the meaning corresponding to a step by step process of presenting logical arguments cannot involve a *that*-less complement. If (32c) is changed as in (38c), which facilitates the 'confirmation' interpretation, dropping *that* becomes possible again.

(38) a. *The lawyer had proof Mary was innocent.*
proof = confirmation
b. *The lawyer presented a proof* *(*that*) *Mary was innocent.*
proof = process
c. *They received proof* (*that*) *Mary could not have committed the crime*

Although an account that relates the different meanings to the (im)possibility of omitting *that* is still outstanding, it seems appropriate to assume that there should not be a general prohibition against merging a noun with a *that*-less complement. For the current account, this raises the question of how valuation of the Case feature of the selecting noun by the complement XP it merges with (and which in case of the *that*-less version involves interpretable tense on the top projection) can be prohibited (recall again that nouns do not receive Case from their complements but rather from a DP-external functional head, such as *v* or T). There are two options and I leave open here

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which option to pursue. First, *that*-less complements of nouns could merge counter-cyclically as will be argued for embedded root complements of verbs in the next section. The main idea is that the NP is built without the complement clause, then the NP combines with the higher clausal functional domain, and the clausal Case head values the V (=Case) feature of the NP. After that, the complement clause is merged counter-cyclically with N (which by now has no unvalued V-feature left). The second option is to assume that the locus of a DP's Case feature (the *u*V: __) is not N, but rather D. Thus, merging N with an XP with valued tense does not affect the Case of the NP/DP since the Case feature is not present on N.

3.3 Embedded root clauses — Merge at Transfer

In the previous section, I have argued that verb second clauses are root clauses, since T–to–C movement turns the T/CP into a clause with interpretable tense on the topmost projection. As I have shown in (31) for embedded interrogatives, a T/CP with interpretable tense cannot combine with the selecting verb since it would value the unvalued tense feature of that verb, and Merge of tense in the matrix clause would then be precluded. Exactly the same problem arises for embedded root clauses as in (39), repeated from (18e, e′). As mentioned, I assume that embedded *that*-less clauses in English are TPs (see, among others, Hegarty 1991, Webelhuth 1992, Doherty 1993, 1997, 2000, Bošković 1997, Svenonius 1994, Franks 2005 for the same claim) and embedded root clauses are verb second CPs in German. In both cases, the top projection involves interpretable tense and those clauses should hence not be able to merge with the selecting verb (cf. (39c)).

(39) a. *John said nobody likes Peter. that*-less TP
b. *Sie sagte den Peter mag niemand* t_{Obj} t_V V2 CP
she said the.ACC Peter likes nobody.NOM
'She said nobody likes Peter'
c. *V *said* [*u*T: __, *uv*: __, *u*ϕ: __] + TP/CP [*u*ϕ: val, *i*T: val, …] β
V *said* [*u*T: <u>val</u>, *uv*: __, *u*ϕ: <u>val</u>] β no further Merge of T possible

I propose that this is indeed correct — embedded root clauses (i.e., clauses with interpretable tense on the top projection) cannot merge with the selecting verb in syntax proper. Instead, I propose that embedded root clauses merge (counter-cyclically) at Transfer. After showing the derivation I propose for embedded root clauses, I provide some arguments for this approach.

As shown in (39), V and the TP/CP complement cannot merge at the time V is introduced. Instead, the matrix *v*P and the embedded clause are built in separate workspaces as in (40a,b). The Merge steps and resulting feature valuation outputs are given in i. to iv.

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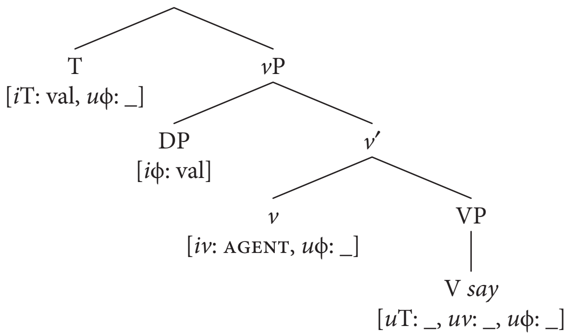
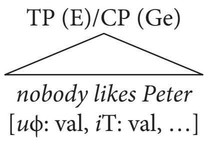
(40) a.



b.



i. < *v* + VP > [*iv*: AGENT, *u*ϕ: __; *u*T: __, *uv*: AGENT, *u*ϕ: __] (*v*′)
ii. < DP + *v*′ > [*iv*: AGENT, *u*ϕ: val; *u*T: __, *uv*: AGENT, *u*ϕ: __] (*v*P)
iii. < T + *v*P > [*iv*: AGENT, *u*ϕ: val; *u*T: past, *uv*: AGENT, ***u*ϕ:** __]
iv. Transfer

Note that if Spell-out of the matrix VP would happen immediately after Transfer, a problem would arise: the unvalued ϕ-features of V are not valued.[16] Technically, the subject DP could value both the ϕ-features of *v* and the ϕ-features of V. However, this would lead to a semantics where the subject DP is an argument of both *v* and V (recall that valuation of ϕ-features on verbal elements translates as an 'argument of' relation). Such constructions are possible, I propose, however, they lead to reflexive interpretations such as 'John washed himself' in sentences like *John washed*. Such a derivation may succeed featurally in (40a), however, it would lead to a wrong (possibly uninterpretable) semantics. Excluding such a reflexive derivation, the structure in (40a) would fail at the interface due to unvalued features on V, and it would also fail in semantics, since there is no argument that can be interpreted as the argument of *say*.

The solution I propose is that counter-cyclic Merge is possible after Transfer. Two objects can undergo a 'last minute' Merge after the two structures have been transferred (after syntactic structure building is completed), but before they are spelled-out. Last minute Transfer Merge should be seen as a way to combine two independent syntactic constructs into a single unit which feeds into PF and LF as a single Spell-out domain.

Thus, (40iv.) continues as follows (see steps iv. to vi. below): The VP (with the features resulting from Merge/Agree in (40i.-iii.)) is transferred, however, it is not spelled-out yet. At this point, the TP/CP which was built in a separate workspace in (40b) merges with V counter-cyclically. Since the only unvalued features that V has left at this point are the unvalued ϕ-features (the T-feature has been valued in step iii.), TP/CP values those ϕ-features, but no other features.

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(40) iv. Transfer of VP: [*u*T: <u>past</u>, *uv*: <u>AGENT</u>, ***u*φ: __**]
v. < V + TP/CP> [*u*T: <u>past</u>, *uv*: <u>AGENT</u>, ***u*φ: <u>val</u>**]
vi. Spell-out

The result is then sent to Spell-out, and the embedded clause is now an integrated part of the structure submitted to PF and LF. Most importantly, the embedded clause is correctly interpreted as an argument of the verb (due to step (40v.), and all the features of the verb are satisfied in the correct way.

The derivation for embedded root clause has one main consequence. While embedded root clauses, like embedded *that*-clauses, are integrated in the matrix VP when the VP reaches PF and LF, embedded root clauses are *not* part of the matrix VP in syntax. In other words, embedded root clauses end up being 'selected' by V, but in syntax, they behave like separate root clauses. The current account thus derives the often noted ambivalent status of embedded root clauses (cf. among others, Heycock 2006, Reis 1997; Reis refers to them as 'relatively non-integrated' clauses). Evidence for the syntactic non-integration of embedded root clauses is provided by their lack of being able to undergo syntactic movement: *that*-less declaratives cannot move to subject position, (41a), cannot topicalize, (41b), and cannot undergo syntactic extraposition (41c) (Doherty 1997, Bošković and Lasnik 2003, Pesetsky and Torrego 2004, 2006, Franks 2005, among others). Similarly, in German, embedded verb second clauses cannot move to subject position, (42a), cannot occur in initial position, (42b),[17] and cannot involve clear syntactic extraposition as diagnosed by a correlate expletive as in (42d). [The examples in (42b–d) are from Reis (1997: 139); the translations are mine. For a full set of non-integration properties of embedded verb second clauses in German see Reis (1997).]

(41) a. [*(*That*) *John liked linguistics*] *was widely believed.*
b. [*(*That*) *John likes Mary*] *Jane didn't believe.*
c. *It seemed at that time # *(that) he had left.*

(42) a. * *weil* [$_{CP}$ *den Peter mag niemand*] *allgemein bekannt is*
since the.ACC Peter likes nobody.NOM] commonly known is
Lit. 'since nobody likes Peter is commonly known' ('since it is commonly known that nobody likes Peter')
b. * [*Er*$_i$ *sei unheimlich beliebt*], *möchte jeder*$_i$ *gern glauben.*
he is.SUBJ immensely popular] would.like everyone like believe
'Everyone would like to believe he is immensely popular'
c. [*Dass er*$_i$ *unheimlich beliebt sei*], *möchte jeder*$_i$ *gern glauben.*
that he immensely popular is.SUBJ would.like everyone like believe
'That he is immensely popular, everyone would like to believe'
d. *Jeder wird* (**es*) *sagen sie ist zu jung dafür*
everyone will (*it) say she is too young there.for
'Everyone will say she is to young for that.

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These properties follow from the account proposed here. Embedded root clauses cannot merge with *v*/V in syntax. The only way the selectional properties of a predicate selecting an embedded root clause can be satisfied is if the embedded root clause merges with that predicate counter-cyclically after the T-feature in the *v*P has been valued (after T and *v*P have merged). I propose that counter-cyclic non-extending Merge is not possible in syntax (i.e., syntax is subject to the Extension Condition), but it is possible after Transfer to combine two separately built units into a single Spell-out domain. Similarly, Merge at Transfer cannot extend the structure (structure building is a property of syntax), hence no further movement or re-merge can apply at Transfer. This has the effect, that an embedded root clause which is merged counter-cyclically as in (40v.) is 'stuck' in its base position (the position where it values the ϕ-features of the selecting predicate). Since Merge at Transfer follows syntax, the two subtrees in (40) do not interact syntactically which accounts for why embedded root clauses cannot undergo movement.[18] Lastly, direct Merge of the embedded root clauses in the surface positions in (41) and (42), even if Merge occurs at Transfer, would also not lead to a successful derivation since in that case the ϕ-features of the selecting predicates would not be valued.

The only interactions spanning across the matrix *v*P and the embedded clause are phenomena applying at PF or LF. At PF, embedded root clauses are prosodically integrated into the main clause as is shown, for instance, by the fact that sentences with an embedded root clause involve a single focus background grouping (cf., (43a) from Reis 1997: 140). Furthermore, Truckenbrodt (2006a: 404) points out that embedded root clauses are preceded by non-terminal intonation and there is no prosodic break before the embedded clause (cf. (43b)). An intonation indicating two separate sentences as in (43c) is impossible — the first sentences involves a selectional violation as *suspect* does not combine with an object.

(43) a. *Ich hatte gelaubt, sie KÄME*
I had thought she WOULD.COME
'I had thought she would come.'
b. *Peter vermutet* [/], *er hat etwas vergessen* [\]
Peter suspects [/] he has something forgotten [\]
'Peter suspects he forgot something.'
c. * *Peter vermutet*. [\] *Er hat etwas vergessen* [\]
Peter suspects. [\] He has something forgotten [\]

Similarly, Bošković and Lasnik (2003) argued that an embedded root clause is part of the same prosodic domain as the matrix verb. In their account, PF-merger between a null C and the matrix V is required, which is only possible if C is within the same prosodic domain as V. Prosodic integration is thus a condition on a null C (i.e., a *that*-less embedded clause). In the account proposed here, prosodic integration is not a condition but rather the result of Merge before PF, while maintaining a view that embedded root clauses are not integrated syntactically.

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Lastly, embedded root clauses are integrated into the main clause for LF properties such as variable binding in (44).[19]

(44) a. *Every boy$_i$ said his$_i$ mother is the smartest.*

b. *Jeder$_i$ möchte gern glauben, er$_i$ sei unheimlich beliebt.*
everyone would.like like believe he is.SUBJ immensely popular
'Everyone would like to believe he is immensely popular.'
[Reis 1997: 139]

c. *Jeder Bub$_i$ sagte seine$_i$ Mutter sei die schlaueste*
every boy$_i$ said his$_i$ mother is.SUBJ the smartest
'Every boy said his mother is the smartest.'

4. Conclusions — Quo vadis?

Before concluding, I would like to point to some further directions which I have not covered in this paper and which will be considered in the next step of this project: the featural composition of PPs and NPs, more complex argument structure configurations (e.g., ditransitive predicates, double object constructions), distributional differences between DPs and CPs, CP-recursion and embedded verb second under *that* in certain Scandinavian languages, and others. Furthermore, modifiers raise some interesting questions for the Merge account proposed here. Since modifiers are not selected, the question is whether Merge of modifiers also involves feature valuation. The Transfer Merge account provided here for embedded root clauses is reminiscent of late insertion of modifiers (cf. Lebeaux 1991, 1995, 2009, Fox and Nissenbaum 1999, Fox 2000), and hence a possible approach would be to assume that modifiers only merge at Transfer. Merge at Transfer was seen as a last minute operation to combine two syntactically independent objects into a single Spell-out domain which then feeds into LF and PF as a single unit. Modifiers fit well into this picture: they do not involve feature valuation (there is no 'argument of' relation between a modifier and the modified constituent, nor any kind of selection). Instead modifiers are only subject to semantic compositionality (see also Hornstein and Nunes 2008). If Merge at Transfer does not need to involve feature valuation, modifiers could combine with a syntactic unit at Transfer, yielding the right LF configuration for interpreting modifiers via predicate modification. Furthermore, island effects of adjuncts would be expected under this system. If this approach can be supported (a more detailed investigation of different types of modifiers is necessary), it would provide further evidence for the general Merge system proposed in this article.

To conclude, in this paper, I have spelled out a mechanism for syntactic structure building which is strictly local in that it does not involve a search operation within the objects undergoing Merge. Merge is not free but subject to the (Last Resort) Merge Condition, which requires that each step of Merge involves feature valuation of one

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of the merged objects by the other merged object. Feature valuation was proposed to apply under Reverse Agree, which allows us to treat morphological selection as a syntactic feature valuation process. Evidence for a syntactic approach to morphological selection comes from configurations in which movement feeds into determining the morphological properties. I have shown that like standard movement operations, such as NP-movement to Spec,TP, movement of verbal projections in verb clusters changes the Agree constellation and hence provides the opportunity for new feature valuation operations. While this is uncontroversial for phenomena such as subject-verb agreement, it is surprising for morphological selection properties such as the relation between an auxiliaries and a participle. Encoding morphological selectional properties as feature valuation dependencies that need to be satisfied under Reverse Agree accounts for these phenomena and also leads to the conclusion that morphology has to be determined after movement rather than lexically.

I have further provided an explicit feature structure for selectional properties of verbs. The features used to encode argument structure properties are Q-features (requiring interrogative complements), ϕ-features (requiring a DP or CP complement), and *v*-features (determining the type and number of verbal projections introducing further arguments of the verb à la Hale and Keyser 1993, Baker 1997). I have given a detailed account of clausal complementation structures in English and German, and shown that the system proposed has some welcome consequences: it provides a new way of deriving verb second configurations, doubly filled Comp effects, the distribution of T–to–C movement, as well as the syntactically restricted behavior of embedded root clauses. Following Truckenbrodt (2006a, b), I have proposed that interpretable tense on the top projection of the clausal complement plays a crucial role in typing that clause, which has consequences for the syntactic distribution and illocutionary potential. Tense marked complements cannot merge with the higher verb in syntax. Instead, counter-cyclic Merge occurs at Transfer, which is too late for the embedded clause to interact with the selecting predicate in syntax, but early enough to feed into PF and LF as a single Spell-out domain, hence deriving the partial integration status of these clauses. The account reflects, in a very transparent way, the fact that embedded root clauses are exactly what the term says: clauses that are embedded (i.e., selected), yet root clauses in terms of their syntactic properties.

Notes

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1. The third condition is necessary to prevent two sisters from valuing each other (e.g., when T merges with AuxP, T values the *u*T: __ of Aux(P), but AuxP cannot value a *u*T: __ of T). The first setting in iii. excludes any mutual valuation by two objects in a sisterhood configuration. The second setting allows two sisters to value each other, as long as the types of features are different. The latter, I propose is the case in languages which lack the EPP. As shown in (14b), T involves a *u*ϕ: __, which is typically valued by the subject in Spec,TP. In non-EPP-languages, the ϕ-features on T can by valued by *v*P (which is also specified for *u*ϕ: val); this involves mutual valuation, however for different feature types: T values a T-feature on *v*(P), *v*P values ϕ-features on T. EPP languages disallow any kind of mutual valuation between T and *v*P.

2. In Chomsky's system, in fact both the probe and the goal have to be active to allow Agree. In valuation driven approaches to Agree (such as Pesetsky and Torrego 2007, Bošković 2009), only the probe has to be 'active' in the sense that it must involve an unvalued feature.

3. In Wurmbrand (2012a), I argue that not all morphological agreement is the result of syntactic Agree. Specifically, I propose that Agree between two features where at least one feature is an interpretable feature must be syntactic, whereas Agree (or rather concord) between two uninterpretable features can also be determined post-syntactically (which, following Baker 2008, can apply in either direction; see also Bobaljik 2008). This system derives certain puzzling properties of the distribution of agreement mismatches involving collective nouns in British English (see Smith, To appear), and allows us to keep a uniform mechanism of Agree for a range of syntactic dependencies (Case licensing, binding, control, NPI-licensing among many others). To apply the current system to different agreement/concord phenomena it is thus necessary to first determine whether agreement is clearly established syntactically.

4. A similar issue arises in VP-topicalization cases of the form: *We had to stand firm, and stand firm we have*! (Bresnan 1991; thanks to Marcel den Dikken, Richard Kayne, Bob Frank, and Jairo Nunes for pointing these out to me). If auxiliaries need to get valued by a lower verb valued as a participle, as would be the case under the standard Agree approach, these constructions raise the questions of how the auxiliary could receive the perfect/participle value given that there is no participle in the lower clause.

5. Lasnik (1995) and Nunes and Zocca (2005, 2009) propose hybrid accounts — certain verbs are inserted fully inflected (valued), others are inserted bare (unvalued) and combine with their affixes via affix hopping. Translated into an Agree account, affix hopping is essentially Reverse Agree. While a hybrid system captures differences between main verbs and auxiliaries regarding (im)possible mismatches, it is hard to see how it could be extended to cases such as (9).

6. To satisfy the Merge Condition, the feature structure of infinitive taking verbs needs to be enriched (see Wurmbrand 2013, To appear for some discussion).

7. A question will arise for cases where one head has more than one unvalued feature that needs to be satisfied via valuation, hence Merge. Potential ordering issues will be taken care of by the locality of Agree (conditions (4ii) and (4iii)) or by semantic compositionality considerations.

8. Jonathan Bobaljik, p.c., informs me that possible support for the idea that selection involves ϕ-features comes from the observation that verbal roots (i.e. V) in many languages undergo suppletion for the ϕ-features of the internal argument (while suppletion for external arguments is vanishingly rare). That is, there is clear morphological evidence for a dependence of V on the

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ϕ-features of the argument it selects. Note that this dependence is one of selection and not of agreement — the NP selected by the verb controls suppletion on V, even if some other NP (or no NP at all) controls agreement features on the inflected verb. See Bobaljik and Harley (2012) for details.

9. I cannot give an account of more complex argument structures here, but the main idea would remain the same: every VP-layer is introduced by an unvalued feature on V to allow and ensure Merge of the VP with appropriate further argument introducing heads.

10. I assume that all matrix questions involve T–to–C movement in English and that the reason for the lack of *do*-support in subject questions is due to the adjacency between T and C which makes *do*-insertion unnecessary (see Bobaljik 1994, 2002).

11. In this paper, I do not attempt to derive the Root Generalization. Root clauses are often associated with assertive force and a separate illocutionary domain (see among many others, Hooper and Thompson 1973, Wechsler 1991, Wegener 1993, Reis 1997, 2006, Gärtner 2001, Krifka 2001, Meinunger 2004, Truckenbrodt 2006a, b, Zimmermann 2009). In Wurmbrand (2012d), I provide a more detailed account of the syntax and illocutionary domain of different types of clausal combinations in German, which is based on the analysis in Truckenbrodt (2006a, b) where it is argued that verb movement (T in C) plays a crucial role in deriving the semantic properties of different clause types.

12. This approach to verb second would entail that only XPs with ϕ-features can appear in initial position in a verb second configuration. Cases to consider are fronted PPs and adverbials. The featural composition of these constituents is quite controversial, and I need to leave this issue for future research.

13. In Wurmbrand (2013, To appear), I argue that phases are not defined categorically but dynamically (the topmost projection of a cyclic domain, whatever its label or size, counts as a phase; see also Bošković 2012). In order to know whether an XP is subject to Transfer, it is thus necessary for XP to merge with the next head. If the next head is part of the same cyclic domain as XP, the structure is further extended; if the next head is part of a different cyclic domain, Transfer of XP takes place.

14. While the unvalued C-feature on T accounts for the obligatory presence of a C-head in all clauses in German as well as in interrogative and embedded clauses in English, there is one context where this feature is problematic. I have proposed that matrix declarative clauses in English are TPs. To accommodate this case, I have to assume that the C-feature on T is inserted lexically valued in English but only when no other feature (i.e., no Q or ϕ-features) motivate Merge of C. The difference between a verb second language like German and a non-verb second language like English is thus whether a language allows mood features on T to be lexically valued (English) or whether mood feature valuation requires Merge of a C-head (German).

15. I thank Jonathan Bobaljik for pointing out these differences.

16. I assume here that Transfer has to be distinguished from Spell-out. Transfer affects the entire phase and involves operations such as *Chain reduction* (Nunes 1995, 1999, 2004) and splitting of the features to be transferred to PF and LF. Spell-out affects the complement of the phase head and renders the spelled-out domain inaccessible for further syntactic operations.

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17. The results of this diagnostic are sometimes blurred by the availability of parenthetical constructions resembling fronted verb second clauses at the surface (see Reis 1997). However, using a bound variable construction as in (42b) avoids this complication, and the contrast between embedded root clauses, (42b), and embedded *that*-clauses, (42c) is very sharp.

18. A question arising for the Merge at Transfer account is whether/how movement out of embedded root clauses is possible. For German, it is controversial whether embedded verb second clauses allow movement (see Reis 1995a, b for arguments that apparent movement configurations involve parenthetical structures). For English examples such as *What did John say Mary bought?* my preliminary account is that the operation Copy (see Nunes 1995, 2004), which identifies two elements as non-distinct elements (i.e. they relate to the same occurrences of lexical items of the numeration), takes place at Transfer. In other words, copies are merged in different positions in syntax, at Transfer copies of the same element are identified, and copy reduction takes place before PF and LF. This allows a derivation such as the one below in which the wh-phrase is merged separately in the two objects built in different workspaces. After Merge at Transfer, Copy identifies the wh-phrases as copies and deletes one copy for PF and LF Spell-out.

i.	[$_{vP}$ what John [say]] + [$_{TP}$ what [Mary [$_{vP}$ bought]]]	two parts built separately
ii.	[$_{vP}$ what John [$_{VP}$ say [$_{TP}$ what [Mary [$_{vP}$ bought]]]]]	Merge
iii.	[$_{vP}$ what John [$_{VP}$ say [$_{TP}$ ~~what~~ [Mary [$_{vP}$ bought]]]]]	Copy identification, deletion

19. As mentioned in fn. 11, embedded root clauses differ from embedded *that*-clauses in their illocutionary properties. A preliminary proposal for of how these properties can be incorporated in the account given here is given in Wurmbrand (2012d).

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