The grammatical basis of verb second – the case of German*

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1 Introduction

Grammatical systems of natural languages provide devices to build syntactic and semantic objects which correspond on the one hand to a propositional core and, on the other hand, to a component which gets an intentional interpretation. While the former part has a rather established elaboration in formal semantics, the relation between the syntactic realization and the semantic object derived from it has not been understood correctly so far. Since Rizzi (1997), it is often assumed that a ForceP dominates the clausal structure. Its content is characterized by means of illocution type operators or other invisible material which tries to capture the intentional part of the sentence meaning. But such elements only represent the linguist's knowledge about these meaning components (illocutionary force). They prevent an adequate understanding concerning the interaction of the grammatical means which lead to semantic objects restricting the interpretation of illocutionary force.[1]

The theory I will propose in this contribution is guided by the belief that the grammatical (and/or lexical) system of a natural language provides devices to build syntactic and semantic structures which are the *precursors* of illocutionary interpretation. Syntactic structures themselves do not contain any elements or operators which encode illocutionary force. In particular, I assume ForceP not to exist.

Illocutionary force itself is a notion which belongs to the intentional system of human beings, but has only a very limited set of grammatical or lexical counterparts—at least in German and the other Germanic languages as well. A consequence of this matter of fact evokes the following questions. What are the grammatical means which contribute to the intentional part of the sentence meaning? How do they interact to derive semantically interpretable objects which correspond to the respective sentence moods? In particular, I will argue that fronting finiteness via verb second serves the purpose of anchoring a propositional object in the discourse situation. This process of anchoring is brought about in that variables from the inflectional categories of finiteness become bound to components of the discourse situation.

The organization of this paper is as follows. In the next section, I present the pertinent data concerning the verb second phenomenon in German. In section 3, I refer to some non-canonical cases, in particular embedded verb second complement clauses, which are possible in connection with specific classes of matrix predicates. It turns out that verb

*I am grateful to Rebecca Woods and Sam Wolfe for issueing this volume on verb second as well as to the organizers and the audiences of the workshops "Rethinking Verb Second" (Cambridge 2016) and 'International Workshop on Verb Second' (Wuppertal 2015, 2016) for discussion and fruitful comments. Especially, I want to thank Marga Reis for her comments on this paper. In addition, I wish to thank Janina Beutler for correcting and improving my English.

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[1]This kind of reasoning about form and function of clause types was—to my knowledge—first pursued by Brandt et al. (1992) in a consequent way.

second in embedded clauses has similar properties as it has in root clauses. The differences can be traced back to differences between the respective higher order structures (matrix vs. discourse). In a situation of speech, the two cases coincide, since they both deal with the discourse participants' knowledge about the propositional contents and their respective allocations as pointed out by Truckenbrodt (2006) and Tsiknakis (2016).

Furthermore, in section 4, I will consider the structure of a bare FinP. Although it perfectly satisfies all grammatical needs, FinP does not constitute a clause. Something seems to be missing. This section touches upon the idea that an operation is required in order for the propositional object to be anchored in a structure of higher order.

Various kinds of propositional objects have to be distinguished. They will be scrutinized in section 5. As the German philosopher Gottlob Frege (1919/1966) states, an assertion consists of three separate acts: thinking—judging—announcing. This 'trinity' will be applied and extended to non-assertive clause types: The resulting theoretical objects are 2-fold partitions for y/n- and n-fold partitions for wh-questions, a reduced binary partition for declarative and properties for imperative clauses.[2] After a short digression to inquisitive semantics, the relation between syntactic movement, in particular $\overline{\text{A}}$- and head movement to the left periphery, is related to the semantic objects which constitute the sentence moods. Going one step further in this section the relation between the propositional objects and the higher ordered structures in terms of anchoring relations will be discussed.

Since the subcomponents of finiteness, tense, mood and agreement [Person, Number] trigger the fronting of the finite verb, the properties of these inflectional categories deserve some attention in section 6. It is argued that the system of the weak verbs in German, which represent the systematically inflecting forms, is compositionally organized in that the two 'morphemes' -ə and -t determine the proposition's place of evaluation. While -t induces a distance relation between the world of the situation of speech and the world of evaluation, -ə shifts the situation of speech to another situation of speech in the case of conjunctive 1 (reported speech) and to a counterfactual world in the case of conjunctive 2. All these categories are deictic, because their interpretation depends on the parameters of the situation of speech.

The core idea of this paper will be presented in section 7. It suggests a detailed analysis of the syntactic process of fronting finiteness and its semantic interpretation. According to this analysis, the fronting of finiteness via verb second is triggered by the unvalued deictic variables in the functional category Fin^0 thereby serving the purpose of anchoring a propositional object in a higher ordered structure. This idea differs crucially from the usual assumptions about the interpretation of indexicals by way of a Kaplanian character function (cf. Kaplan 1989), since grammatical properties and processes are necessary to get the deictic interpretation accomplished. This interpretation is achieved through binding these variables to discourse (or matrix) components in the C-interface.

Moving on to the relation between the pertinent grammatical objects and illocutionary forces, section 8 proposes a sketch of a general theory about verb second, sentence moods and illocutionary force. The derivation of the syntactic and semantic objects is assigned to the various levels of representation in a well defined manner together with precisely characterized objects. The constitution of sentential (illocutionary) force turns out to be a pragmatic property, not part of the grammar.

[2]These concepts are already proposed in Lohnstein (2000, 2007), cf. also Portner (2005).

2 Canonical cases

2.1 Root clauses

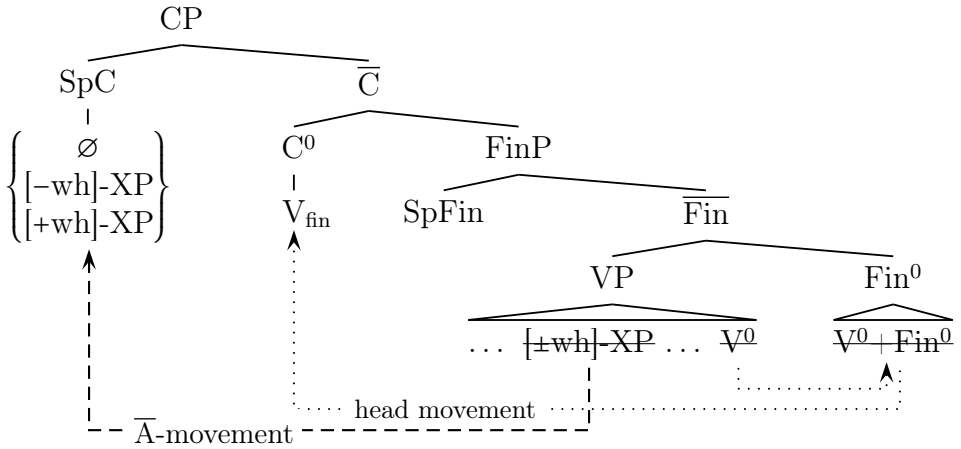
In German, two left peripheral positions can be distinguished, one for the complementizer or the finite verb and one for a [±wh]-phrase, which can be located in front of the (fronted) verb.[3] Assuming a CP-analysis, the canonical sentence types of root clauses in German show the distributional patterns in (1):

(1)

	SpC	**C⁰**	**FinP**	**Fin⁰**
a.	∅	**Hat**	Hans gestern die Katze gestreichelt	~~hat~~
		Has	Jack yesterday the cat stroked	
b.	∅	**Streichel**	die Katze	~~streichel~~
		Stroke	the cat	
c.	$[_{-wh}$ Gestern$]_j$	**hat**	Hans t_j die Katze gestreichelt	~~hat~~
	Yesterday	has	Jack the cat stroked	
d.	$[_{+wh}$ Wann$]_j$	**hat**	Hans t_j die Katze gestreichelt	~~hat~~
	When	has	Jack the cat stroked	

Structurally, this distribution can be captured by a CP-structure with head movement from V^0 to Fin^0 to C^0 and/or $\overline{A}$-movement of a single [±wh]-phrase to the position SpC:

(2)



The two left peripheral positions are filled by two internal MERGE operations—$\overline{A}$- and head movement. The SpC-position can be left empty or can be filled by a [+wh]- or a [−wh]-XP. All three alternatives are compatible with the fronted finite verb in C^0. There are no differences between auxiliaries or main verbs in German according to their ability to occupy the position C^0.

On the semantic side, these syntactic *sentence types* correspond to y/n-interrogative (1a), imperative (1b), declarative (1c) and wh-interrogative (1d) *sentence moods*.[4] The Germanic languages—except English, which is sort of residual[5]—show the same syntactic patterns in root clauses together with the corresponding semantic sentence moods.[6] Before turning to the relation between syntactic sentence types and their relation to sentence moods in more detail, let us consider the embedded variants in the next and some hybrid

[3]Cf. Bierwisch (1963), Thiersch (1978), den Besten (1977/1989), Lenerz (1981), Grewendorf (1988) and others.

[4]The term was coined by Altmann (1987). He gives an explication of this notion as a correspondence between a *form type* and a *function type*.

[5]Cf. Rizzi (1996).

[6]Cf. Platzack (1986), Taraldsen (1986), Holmberg & Platzack (1995), Vikner (1995), Thráinsson (2007), Roberts (2011), Holmberg (2015).

types in the next but one subsection.

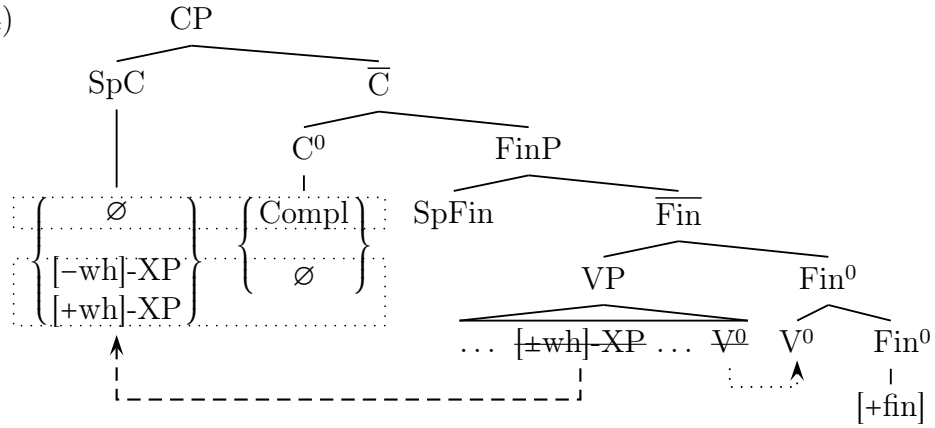
2.2 Embedded clauses

Embedded clauses in German show similar distributions in the position SpC as root clauses do, but they differ clearly when it comes to filling the C^0-position. In the standard dialect of German, this position has to host a lexical complementizer in argument and adverbial clauses (3a) and it has to be empty in the case of relative clauses (3b) and indirect wh-interrogatives (3c):

(3)	**Matrix**	**SpC**	**C^0**	**FinP**	**Fin^0**
a.	(Maria fragt,)	∅	**ob**	Hans gestern die Katze gestreichelt	**hat**
	(Mary asks)		whether	Jack yesterday the cat stroked	has
b.	(Der Tag),	[$_{-wh}$ an dem]	∅	Hans die Katze gestreichelt	**hat**
	(The day)	at which		Jack the cat stroked	has
c.	(Es ist egal,)	[$_{+wh}$ wann]	∅	Hans die Katze gestreichelt	**hat**
	(It is equal)	when		Jack the cat stroked	has

Represented as a CP-structure the patterns of the embedded clause types look like in (4)—ignoring the matrix for the moment:

(4)



The position SpC may be empty as well as the position C^0, but it is not an option for embedded finite clauses in German to leave both positions empty at the same time. If the SpC-position is unoccupied, the position C^0 has to be filled and the other way around as indicated through the two dotted squares, which signify the possible combinations. Structurally, the crucial difference between root and embedded clauses in German consists in the fact that the finite verb remains in the final position in embedded clauses, while it moves to the left periphery in root clauses. Apart from some important details,[7] filling the SpC position appears to be identical in the root as well as the embedded clauses.

[7]These details have to do with relative clause formation and specific restrictions on [−wh]-movement without verb second in embedded clauses. While [+wh]-movement without verb second is possible, [−wh]-movement without it is not:

(5) a. Maria glaubt, gestern **hat** Karl die Katze gefüttert.
Mary believes, yesterday has Carl the cat fed.

b. * Maria glaubt, gestern Karl die Katze gefüttert **hat**.
Mary believes, yesterday Carl the cat fed has.

(6) a. * Maria ist egal, wann **hat** Karl die Katze gefüttert.
Mary is equal, when has Carl the cat fed.

b. Maria ist egal, wann Karl die Katze gefüttert **hat**.
Mary is equal, when Carl the cat fed has.

Semantically, however, there is a difference with respect to the anchoring of the respective propositional objects.

Fronting the finite verb causes—as Lohnstein (2000, 2007) proposed—the propositional object to be anchored in the discourse context, while leaving the finite verb in final position requires some matrix structure in which this anchoring can take place. Fronting of finiteness, thus, marks the essential difference between root vs. embedded clauses. While the former are relevant for the discourse situation, the latter are encapsulated in the grammatical environment. Before turning to these issues in a more detailed way, let us take a look at some non-canonical constructions.

3 Non-canonical cases

Beside the canonical cases, German, however, allows for some variation. There are verb second complement clauses, which are embedded under specific classes of matrix predicates, and verb final root clauses, which are introduced by a complementizer.

Moreover, there exist a range of adverbial clauses allowing verb second order.[8] Reis (2016) uses Gaertner's (2002: 39f) 'assertional proto-force' hypothesis about these cases in the following way: "If in modifying function, dependent V2-clauses are root clauses paratactically linked to their ACs, *and* vice versa."[9] Reis (2016: 310). Assuming this analysis, adverbial V2 clauses can be treated as root clauses along the theory proposed here. For reasons of space, I cannot go into these issues any further—but see Reis (2016: 312f) for the various realizations of adverbial verb second clauses in German.

Subsection 3.1 adresses verb second complement clauses, and subsection 3.2 presents shortly the class of complementizer introduced verb final root clauses.

3.1 Embedded verb second clauses

Verb second complement clauses are possible constructions in German, if they are embedded under matrix predicates belonging to one of the following classes:[10]

(7) Verb second is licensed with:

verba dicendi:	sagen, behaupten, erzählen, berichten, bestätigen, ...
	say, claim, tell, report, confirm, ...
verba putandi:	glauben, hoffen, meinen, finden, ...
	believe, hope, think, find, ...
preference predicates:	besser sein, lieber sein, vorziehen, ...
	be better, prefer, prefer, ...
evidential verbs:	erfahren, erkennen, ...
	experience, recognize, ...

(8) Verb second is not licensed with predicates which are:

factive or negative:	bedauern, herausfinden, entsetzt sein, vergessen, verhindern, ...
	regret, find out, be appalled, forget, prevent, ...
volitional:	befehlen, auffordern, bitten, wollen, verlangen, ...
	order, request, beg, want, demand, ...

For a recent analysis of these restrictions see Tsiknakis (2016).

[8] Thanks to Marga Reis (p.c.) for drawing my attention to these cases.

[9] AC = antecedent clause

[10] Cf. Reis (1997), Romberg (1999), Meinunger (2004, 2007).

The classes of verbs in (7) allow verb second complement clauses, as (9) shows, while the ones in (8) do not, as illustrated in (10):

(9) Peter glaubt / sagt / erfährt, **dass** Maria ohne Fahrschein **fährt**.
Peter believes / says / experiences that Mary without ticket drives
Peter glaubt / sagt / erfährt, Maria **fährt** ohne Fahrschein.
Peter believes / says / experiences Mary drives without ticket

(10) Peter bedauert / verlangt / verhindert, **dass** Maria ohne Fahrschein **fährt**.
Peter regrets / demands / prevents that Mary without ticket drives
* Peter bedauert / verlangt / verhindert, Maria **fährt** ohne Fahrschein.
Peter regrets / demands / prevents Mary drives without ticket

The possibility to combine with V2 complement clauses interacts with several other factors like modality, verbal mood, negation, interrogation, and maybe others. I cannot go into these details any further.

3.2 Complementizer introduced verb final root clauses

Beside embedded verb second, verb final clauses introduced through complementizers can be used without a matrix clause. Treating these constructions as matrix clause ellipses turns out not to be the correct analysis, as is argued in the literature:[11]

(11) a. **Dass/Ob** du schon wieder ins Kino gehen **willst**!/?
that you already again into cinema go want
b. **Ob** er immer noch kubanische Zigarren **raucht**?[12]
Whether he always still Cuban cigars smokes
c. **Wem** Karl (wohl) das Buch gegeben **hat**?
Whom Carl (possibly) the book given has

The manner of use of stand-alone verb final constructions essentially differs from the prototypical uses of canonical V1 or V2 clauses, as Truckenbrodt (2013: 245) pointed out. They seem to stand in a kind of anaphoric relation to a fact already introduced in the common ground, but it is not well understood, how the various illocutionary functions can be captured adequately. For the time being, it suffices to note that they exist. How exactly their semantic properties and their anchoring conditions have to be formulated remains an open question. In section 8, however, some steps towards an adequate treatment are mentioned.

4 Root vs. embedded clauses

Since Emonds (1970: 8), the root vs. embedded distinction is related to structural properties of clauses. Accordingly, a syntactic node representing a root clause is not dominated by any other node: "[. . .], a root will mean either the highest S in a tree, an S immediately dominated by the highest S, or the reported S in direct discourse."[13] While this kind of characterization is without doubt adequate, it makes use of syntactic terms only. A further general property of root clauses, however, consists in their activated illocutionary force, as already pointed out by Wechsler (1991). For example, (12.a) *asserts* 'that Peter has fed the cat', while (12.b) does not. Cases like (12.c) will be discussed later on. In the same

[11] Cf. Weuster (1983), Reis (1985), Altmann (1987), Oppenrieder (1989), Truckenbrodt (2004, 2006, and especially 2013: 234f.).
[12] Example from Truckenbrodt (2004: 333).
[13] Cf. also Reich & Reis (2013: 537f.) on an analogous characterization of embedded clauses in terms of *integration* and *subordination*.

way, (13.a) *asks* a question, while there is no possibility of answering (13.b) at all, and (13.c) showing verb second [+wh]-constructions are strictly ungrammatical in German:

(12) a. Peter **hat** gestern die Katze gefüttert.
Peter has yesterday the cat fed

b. (Maria glaubt,) dass Peter gestern die Katze gefüttert **hat**.
(Mary believes) that Peter yesterday the cat fed has

c. (Maria glaubt,) Peter **hat** gestern die Katze gefüttert.
(Mary believes) Peter has yesterday the cat fed

(13) a. Wer **hat** gestern die Katze gefüttert?
Who has yesterday the cat fed

b. Maria ist egal, wer gestern die Katze gefüttert **hat**.
Mary is equal who yesterday the cat fed has

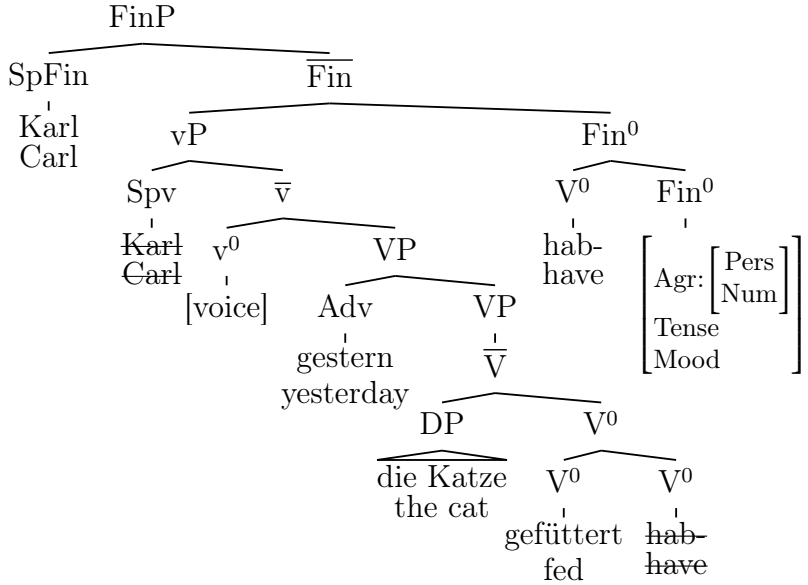
c. * Maria ist egal, wer **hat** gestern die Katze gefüttert.
Mary is equal who has yesterday the cat fed

To outline this difference in a theoretical way, Lohnstein (2000, 2007) proposed the hypothesis that the root variants in the a.-examples are anchored in the discourse situation, while the b.-examples are anchored in a matrix structure (cf. Rizzi (1997) and section 5.3). In the discourse situation—an interactional setting containing a speaker and a hearer—root clauses can unfold their illocutionary potential. Embedded verb final clauses usually do not allow for an illocutionary interpretation.[14]

Moreover, let us consider a derivational object like the bare FinP in (14.b), which is established after several operations of external and internal MERGE:

(14) a. * Karl gestern die Katze gefüttert hat
Carl yesterday the cat fed has

b.

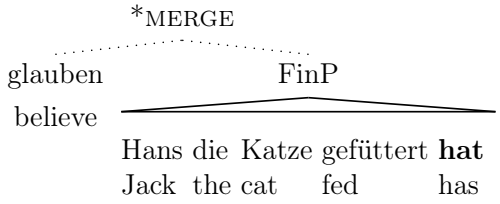


This FinP is a complete expression containing all grammatical requirements perfectly satisfied: All θ-roles are assigned, every argument is θ-marked, agreement relations are complied, case requirements are met, ... Still, (14.a) is not a clause. It appears as if something is

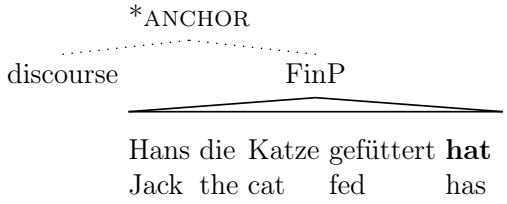
[14]Nevertheless, appositive relative clauses allow for an illocutionary interpretation, which appears to be exceptional. The properties and conditions which enable these interpretations are not entirely clear. However, it is a typical property of appositive (in contrast to restrictive) relative clauses that the referent of the relative clauses head is discourse given (cf. Blühdorn 2007). Thus, appositive relative clauses are related to the discourse situation too, although in an indirect way.

missing which accomplishes the kind of anchoring of the expressed proposition to some structure of higher order (Rizzi 1997). In particular, for the bare FinP in (14.b) it is neither possible to merge with an embedded clause (15.a) nor to be anchored in a discourse situation (15.b):

(15) a. embedded clause:

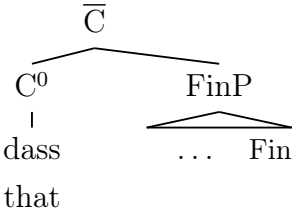


b. root clause:

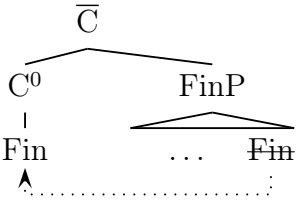


In order to be prepared for these processes of structural integration exactly four merge operations are available in German leading to the configuations in (16) and (17). C^0 insertion via external MERGE leads to the C^0-introduced verb final clause (16.a), while fronting of finiteness via internal MERGE leads to the verb second root structure (16.b) in German:

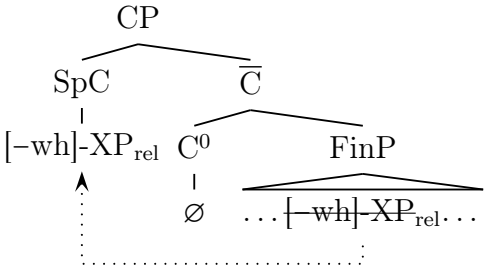
(16) a. external MERGE of lexical C:



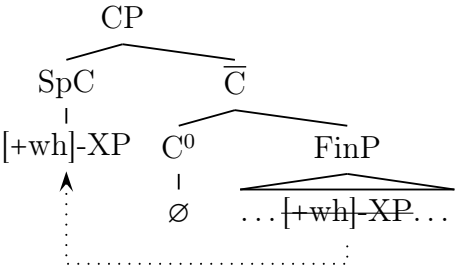
b. Fronting of finiteness (internal MERGE):



(17) a. Fronting of [−wh]-XP (internal MERGE):



b. Fronting of [+wh]-XP (internal MERGE):



(17.a) and (17.b) are the structural options for indirect embedded question and relative clause formation respectively. In these cases, the finite verb obligatorily has to remain in final position too—consequently leading to clause types with an empty C^0-position.[15] For the time being, let us concentrate on the operations shown in (16.a) and (16.b) to which we restrict our attention for the purposes of this paper.

Before turning to the reasons for fronting finiteness, let us take a short look at the semantic properties of the various root clauses possible in German.

[15]Note, however, that in Bavarian, a dialect spoken in the south of Germany, a left periphery filled by a [+wh]-XP together with the lexical complementizer *dass* 'that' is a possible syntactic configuration (cf. Bayer 1984). In standard German this is not a grammatical option.

Whether verb second relative clauses exist in German is an intricate matter. As Gärtner (2001) argues these contructions show a very different behaviour in comparison to verb final relative clauses. From a semantic point of view both kinds of constructions are capable of being restrictive with respect to the head noun.

5 The semantics of clause types: Propositions, Partitions, Properties

In German (and the other Germanic verb second languages too), four semantic categories (sentence moods) need to be distinguished for interpretative reasons: (i) declarative, (ii) y/n-interrogative, (iii) wh-interrogative, and (iv) imperative. Two further moods, often said to complete the system, are exclamative and optative clauses. However, it appears that these clauses do not constitute separate classes, since their properties can be derived from the basic sentence moods together with some specific (prosodic) marking (exclamative accent turns every sentence mood into a exclamative variant, while conjunctive 2 together with specific modal particles are necessary ingredients in order to constitute optative mood).[16]

5.1 Frege on assertion—from the thought to the judgment

The German philosopher and logician Gottlob Frege was the first person who characterized the semantic content of a declarative as an assertive act in a rather precise way. Frege, in his paper *Der Gedanke* 'The thought' (1919), distinguished three steps for an assertion to be accomplished properly:

(18) "We expect to hear 'yes' or 'no'. The answer 'yes' means the same as an indicative sentence, for in it the thought that was already completely contained in the interrogative sentence is laid down as true. [...]
Consequently, we may distinguish:

the grasping of a thought	—	thinking
the recognition of the truth of the thought	—	judging
the announcement of the judgment	—	claiming

By forming a y/n-question the first act is already performed."(Frege 1919/1966: 35)

In modern terms, a thought corresponds to a proposition. Each proposition in turn indicates a bipartition of the set of possible states of affairs, in that it separates the affairs the proposition characterizes to be true from the affairs it characterizes to be false. As Frege notes, a proposition corresponds to a y/n-question, which denotes a bipartition of the possible states of affairs too. After the proposition is formed, it must be decided whether it is true. This judgment is performed by reducing the bipartition to the class of states of affairs the proposition characterizes as true—the truth of the proposition is acknowledged. The judgment, then, is announced, which means that it is presented to some (group of) addressee(s).

Consequently, Frege's distinctions can be formulated using more formal terms as in (19):

(19) a. A *proposition* (thought) induces a *bipartitioned set* of possible states of affairs.
b. A *judgment* leads to a *reduction* of this bipartitioned set.
c. The *announcement* of a *judgment* is equal to *anchoring* it in a discourse situation.

Let us take a closer look at these semantic objects and the operations that derive them. *Thinking* leads to the formation of propositions which in turn correspond to y/n-questions:

(20) Grasping a thought—thinking
a. Did Carl pick apples?

[16] Cf. d'Avis (2013) for exclamative and Grosz (2013) for optative clauses.

b. Bipartition:[17]

Carl picked apples	Carl didn't pick apples

c. y/n-interrogative as an intensional function: (a = current world)
$\lambda a \lambda i[\text{pick}(i, \text{Carl}, \text{apples}) = (a, \text{Carl}, \text{apples})]$[18]=
$= \begin{cases} \lambda i[\text{pick}(i, \text{Carl}, \text{apples})], & \text{Carl picks apples in a} \\ \lambda i[\neg\text{pick}(i, \text{Carl}, \text{apples})], & \text{Carl doesn't pick apples in a} \end{cases}$

This structural object conforms to Groenendijk & Stokhof's (1982) representation of a y/n-question. According to their theory of interrogatives, a question denotes an index-dependent proposition as in (20.c). In the case of a y/n-interrogative it denotes the proposition "that Carl picks apples", in case Carl currently picks apples, and it denotes the proposition "that Carl doesn't pick apples", in case Carl currently doesn't pick apples. What the denotation of a question is, thus, depends on how the current world is designed—it is index-dependent.

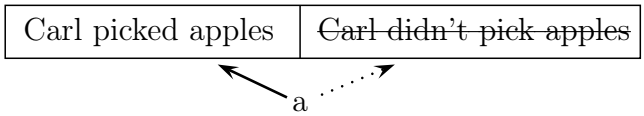
Next, let us consider the case of judgments.

(21) The recognition of truth—judging

a. Carl picked apples.

b. p = that Carl picked apples.

c. Judging:



d. Judgment: Application of an intensional function to the current world:
Judgment(p): $\lambda i[p = \text{pick}(i, \text{Carl}, \text{apples}) \;\&\; p(a) = \text{true}]$

Through the act of judging, the bipartion induced through the thought becomes reduced to one class. Judging therefore means that a twofold distinction is reduced to only one option. This typically happens in the case of declarative clauses.

The last step in Frege's distinction consists in the announcement of the judgment—the assertion. The judgment needs to be communicated to an addressee in an interactional setting—a discourse situation. Note, that this operation does not take place when it comes to embedded clauses, since they are anchored in a matrix structure. Accordingly, they are unable to be assertive at all. This step, in fact, completes the act of assertion in Frege's sense.

The difference between (22.a) and (22.c) depicts the relevant point. While (22.a) is assertive, (22.c)—although it is declarative—is not. (22.a) is anchored in the *discourse situation*, (22.c) in the *grammatical context*. While (22.a) is announced to an addressee, the embedded proposition in (22.c) is embedded in the doxastic system of the matrix subject's referent (in the following abbreviated as MSR). Due to those facts, it has no illocutionary force:

(22) a. Karl hat Äpfel gepflückt.
Carl has apples picked
'Carl picked apples.'

b. ⇝ The judgment is ASSERTED—it is anchored in the discourse situation.

[17] Cf. the partition semantics for interrogatives from Groenendijk & Stokhof (1982) and Higginbotham (1991) together with the newer version of inquisitive semantics in Ciardelli, Groenendijk & Roelofsen (2015).

[18] In the case of an embedded clause like 'Peter knows, that Carl picked apples', the formula in (20.c) denotes that Peter knows, that Carl picked apples if Carl actually picked apples in a, and Peter knows that Carl didn't pick apples if Carl actually didn't pick apples in a. Therefore, the denotation of this index-dependent proposition depends on the state of affairs which hold at the current index.

Assert(p) = Judge(p) + discourse anchoring

c. (Paul glaubt) dass Karl Äpfel gepflückt hat.
(Paul believes) that Carl apples picked has
'that Carl picked apples'

d. ⇝ The judgment in the embedded clause is NOT ASSERTED – it is anchored in the doxastic system of the MSR *Paul*.

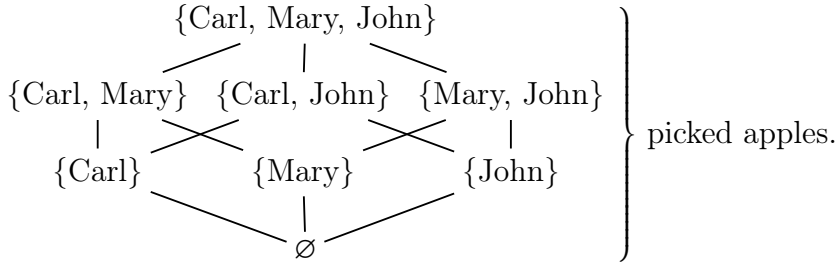
The faculty enabling an illocutionary interpretation, thus, is directly connected with the position of the finite verb in fronted or final position. This means that (22.a) is—as precisely outlined below—anchored in the discourse situation, while (22.c) is anchored in the doxastic system of some MSR.

A wh-question corresponds to a differentiated partition. It is derived through moving a [+wh]-phrase to the specifier of CP.

(23) a. Who picked apples?

b. ⟦who⟧ = {Carl, Mary, John}
⟦who picked apples⟧ = ⟦who⟧ x {λx[pick(x, apples], λx[¬pick(x, apples]}

c. Space of possible answers:



The denotation of the wh-question can be computed from the denotation of the wh-phrase together with the denotation of the propositionally induced bipartition. This is achieved by the formation of the Cartesian product of the denotation of 'who' with the two cells in the bipartition. The contradictory combinations have to be removed.[19] These operations generate the space of possible answers—a boolean lattice of equivalence classes, as illustrated in (23.c).

These concepts are clearly elaborated in the framework of inquisitive semantics.[20] Objects representing n-fold partitions (n > 1) are called *inquisitive*. They are equivalent to questions. If n = 2, the object is a y/n-question.[21] If n > 2, the question conforms to a wh-question.[22] An inquisitive object leads to a partition of the possible states of affairs into classes which are disjoint in pairs, and which yield the whole set under set union as defined in (24):

(24) Definition:
A collection of subsets of a set T is a *partition*, iff

a. $\forall t_i, t_j \subseteq T: t_i \cap t_j = \varnothing$ for $i \neq j$,
b. $\bigcup_{\forall i} t_i = T$.

Illustration:
Let $T = \{e_1, e_2, e_3, e_4, e_5\}$, then

t_1:	$\{e_1, e_2\}$
t_2:	$\{e_4, e_5\}$
t_3:	$\{e_3\}$

is a partition on T.

[19] For further details cf. Lohnstein (2007).

[20] Cf. Hamblin (1974), Groenendijk & Stokhof (1982), Groenendijk (2009), Ciardelli & Roelofsen (2011), Ciardelli, Groenendijk & Roelofsen (2015).

[21] Or it corresponds to an alternative question with two answer possibilities provided. For instance *Do you want tea or coffee?*

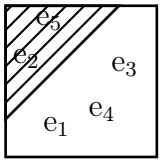
[22] Or it is an alternative question with n possibilities offered: *Do want to go to London, Paris, Berlin, Rome or Moscow?*

(25) Let $\#(\varphi)$ be the number of classes of a partition induced by a sentence φ, then
   a. φ is *inquisitive*, iff $\#(\varphi) = n$, $n > 1$,
   b. φ is *assertive*, iff $\#(\varphi) = 1$.

A typical property of inquisitive objects is that they are *not informative*. They just split up the available possibilities into classes of equivalent elements, but they do not add any information with the effect that the number of available alternatives becomes reduced. Assume T to be an information state of an individual or a group of individuals. Then, a clause φ is *informative*, if φ reduces the alternatives in T as in (26). If φ induces only one class, φ is *assertive* (27):

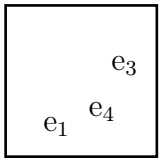
(26) Definition:
φ ist *informative* with respect to an information state T, iff $T \cap \varphi \neq T$.

Illustration:



(27) Definition:
φ is *assertive*, iff $\#(\varphi) = 1$.

Illustration:

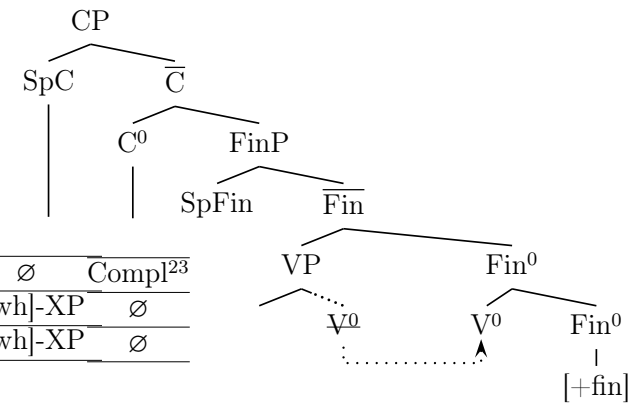


Equipped with these notions of inquisitive semantics and the concept of partition, let us analyse the relation between syntactic structures and their corresponding semantic objects more closely in subsection 5.2.

5.2 The relation between the syntax and semantics of clause types

As outlined in (14) a stand-alone FinP is not licensed grammatically in German. The canonical embedded clauses represented in (3) lead to the respective partitions as indicated in (28). (28-1) captures the case that a lexical complementizer is inserted. Depending on whether it is *dass* 'that' or *ob* 'whether' a reduced bipartition or an unmodified bipartition results. Fronting a [+wh]-XP leads to a n-fold partition (28-2), which corresponds to the space of possible answers in the sense of inquisitive semantics. Finally, fronting of a [−wh]-XP (28-3) results in a 1-fold partition—the typical case for relative clauses. The finite verb remains in its final position, so that the C^0-position is left empty in the cases (28-2) and (28-3):

(28)

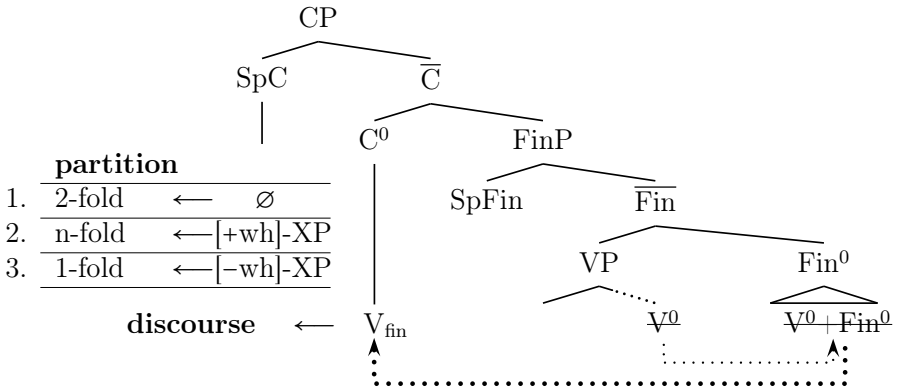


	partition		
1.		∅	Compl[23]
2.	n-fold	⟵[+wh]-XP	∅
3.	1-fold	⟵[−wh]-XP	∅

[23]'Dass (that)'-introduced dependent clauses denote judgments on a par with declaratives, but are not anchored in the discourse. 'Ob (whether)'-introduced dependent clauses denote bipartitions on a par with y/n-interrogatives. They also are not anchored in the discourse. If both kinds of clauses appear

Looking at $\overline{\text{A}}$-movement, a similar situation is met in root clauses. [+wh]-XP-movement leads to an n-fold partition—the case of wh-interrogatives (29-2). $\overline{\text{A}}$-movement of a [−wh]-phrase evokes Frege's judgment—a 1-fold partition. If the SpC-position is left empty an unmodified binary partition emerges—a y/n-question (the *thought* in Frege's terms):

(29)



Note, however, that these options are available using the verbal moods *indicative* or *conjunctive 2*. *Conjunctive 1* and *imperative* introduce other conditions to some of which we return in sections 6 and 7.

The difference between the structures in (28) and (29) consists in the position of the finite verb which is fronted in the root clauses in (29), but not in their embedded variants in (28). Employing Frege's acts again, the third step is given by the 'announcement of the judgment'. Accomplishing this step is equivalent to asserting the judgment towards one or more addressees. Additionally, a similar condition holds for interrogatives only if the finite verb is fronted—the question is *posed*. Otherwise an *interrogative* object denoting a *partition* indeed is built, but a *question* does not arise, because the partition is assigned to the epistemic system of the MSR.[24] As a general remark, there neither is a need to answer embedded interrogatives like (3-a) or (3-c) nor to believe an embedded judgment. Embedded judgments need not even be true if the verb is not factive.

Fronting of finiteness appears to trigger the property that V2 clauses receive an illocutionary reading, while clauses with finiteness in final position do not. The task at hand, therefore, is to reconstruct this outcome of verb second. Section 5.3 takes the first step towards this derivation. It clarifies the connection between the propositional content of the clause in connection with the two kinds of superordinated structures—matrix and discourse.

5.3 The pragmatics of clause types: discourse anchoring and verb second

Rizzi pointed out that the C-System works as an interface between the propositional core of a clause and a structure of a higher order to which it is linked:

(30) We can think of the complementizer system as the interface between a propositional content (expressed by the IP) and the superordinate structure (a higher clause or, possibly, the articulation of discourse, if we consider a root clause). As such, we expect the C system to express at least two kinds of information, one facing the outside and the other facing the inside. (Rizzi 1997: 283)

Assuming the C-System to be an interface does not only relate information structural units

without a matrix as free clauses (which is an option in German, cf. Truckenbrodt 2006) they get a deliberative reading, which means that they are anchored to the epistemic system of the speaker.

[24] 'Question' is a pragmatic notion, interrogative a semantic one (cf. Reis 2015 who uses this distinction in order to distinguish between echo-wh-questions and interrogatives).

like topic and focus to the discourse regarding Rizzi's primary interest, but treats other aspects as well. One of them concerns the anchoring of the propositional object in the discourse.

The propositional core of embedded complement clauses (of attitude verbs) has to become part of some epistemic system of the MSR. Uttering a clause like (31), the speaker claims that the individual called Mary believes p, and p is the proposition *that Carl picked apples yesterday.*[25] p is assigned to the doxastic system of Mary by inserting the complementizer *dass* 'that':

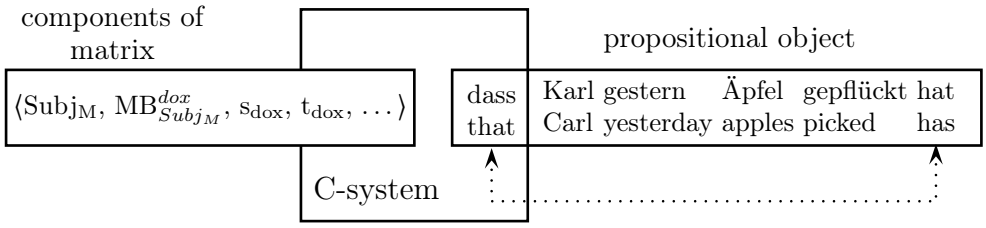
(31) Maria glaubt, **dass** Karl gestern Äpfel gepflückt **hat**
Mary believes that Carl yesterday apples picked has

One can think of the matrix clause as the specification of the *grammatical context* in which the embedded proposition is anchored—the doxastic system of the MSR (Subj_M) *Mary.* The matrix, however, specifies further components of this context, particularly the time t_{dox} and the situation s_{dox} of belief. A grammatical context, therefore, forms an n-tuple of these components as in (32.b):

(32) a. Situation of belief: $s_{dox} = \text{Subj}_\text{M}$ believes p at time t_{dox} in situation s_{dox}
b. Grammatical context: $\langle \text{Subj}_\text{M}, \text{Dox}_{\text{Subj}_\text{M}}, s_{dox}, t_{dox}, \dots \rangle$

The C-interface relates this context to proposition p via external MERGE of the complementizer *dass* 'that':

(33)



If the omplementizer is *dass* 'that' or *ob* 'whether', it selects for a finite FinP. The resulting object is θ-marked by the matrix predicate *believe.* Being located in the C-interface, the complementizer has access to the time and the situation of belief.

Similar characteristics figure in the association of root clauses with discourse contexts. A root clause like (34) is a judgment (a reduced bipartition via [–wh]-XP-movement to SpC). Fronting finiteness anchores this judgment in the discourse situation, thereby establishing the assertion:

(34) Gestern **hat** Karl Äpfel gepflückt.
Yesterday has Carl apples picked

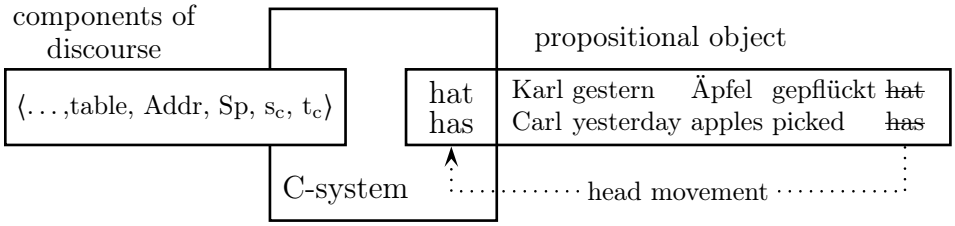
Take a discourse context to be a tuple consisting of the components Sp(eaker), Addr(essee), the time of the context t_c, the speech situation of the context s_c and the table (which becomes characterized in a moment) as in (35.a):[26]

(35) a. Discourse context: $\langle \text{Sp}, \text{Addr}, \text{table}, t_c, s_c, \dots \rangle$
b. s_c = Sp says p to the Addr at time t_c in situation s_c putting p onto the table.

Entering the C-System, finiteness gets access to the components of the discourse, in particular t_c, s_c and addr:

[25] Cf. Hintikka (1969).
[26] Cf. Quer (1998), Giannakidou (2011), and others.

(36)



Given this situation, one may wonder which properties of finiteness can be responsible for binding the propositional object to the discourse situation. To scrutinize this state of affairs, inflectional morphology deserves closer attention.

Section 6 considers morphosyntactic markings of finiteness which generates the precondition of the theory of verb second which will be presented in section 7.

6 Verbal inflectional morphology in German

In German, verbal inflection can appear strong or weak. Strong inflection uses the 'Ablaut' or 'Umlaut' of the vowel in the verbal stem. However, this kind of inflection refers back to earlier stages and is not productive in the synchronic system of German. If new verbs enter into German, they show weak inflection, making use of the suffix -t, for instance *googeln*, *googelte*, *gegoogelt* or *mailen*, *mailte*, *gemailt*. The central inflectional units are the coronal sounds *n*, *t*, and *s* together with the unmarked vowel ə. Only present and preterite possess *inflected* forms in German. The other tenses are formed by periphrastic verbal constructions. Conjunctive 1 vs. conjunctive 2 are distinguished inflectionally due to their correspondence to the present tense forms (without *-t*) vs. the past tense forms (with *-t*). The whole paradigm is contained in the tables in (37) with Indicative 1 and Conjunctive 1 present tense forms, and Indicative 2 and Conjunctive 2 past tense forms:

(37) strong und weak inflectional forms of finite verbs in German:[27]

	Ind 1 (weak)	Ind 1 (strong)	Conj 1 (weak)	Conj 1 (strong)
1 Sg	lach–e	geb–e	lach–ə	geb–ə
2 Sg	lach–s–t	gib–s–t	lach–ə–s–t	geb–ə–s–t
3 Sg	lach–t	gib–t	lach–ə	geb–ə
1 Pl	lach–e–n	geb–e–n	lach–ə–n	geb–ə–n
2 Pl	lach–t	geb–t	lach–ə–t	geb–ə–t
3 Pl	lach–e–n	geb–e–n	lach–ə–n	geb–ə–n

	Ind 2 (weak)	Ind 2 (strong)	Conj 2 (weak)	Conj 2 (strong)
1 Sg	lach–t–e	gab	lach–t–ə	gäb–ə
2 Sg	lach–t–e–s–t	gab–s–t	lach–t–ə–s–t	gäb–ə–s–t
3 Sg	lach–t–e	gab	lach–t–ə	gäb–ə
1 Pl	lach–t–e–n	gab–e–n	lach–t–ə–n	gäb–ə–n
2 Pl	lach–t–e–t	gab–t	lach–t–ə–t	gäb–ə–t
3 Pl	lach–t–e–n	gab–e–n	lach–t–ə–n	gäb–ə–n

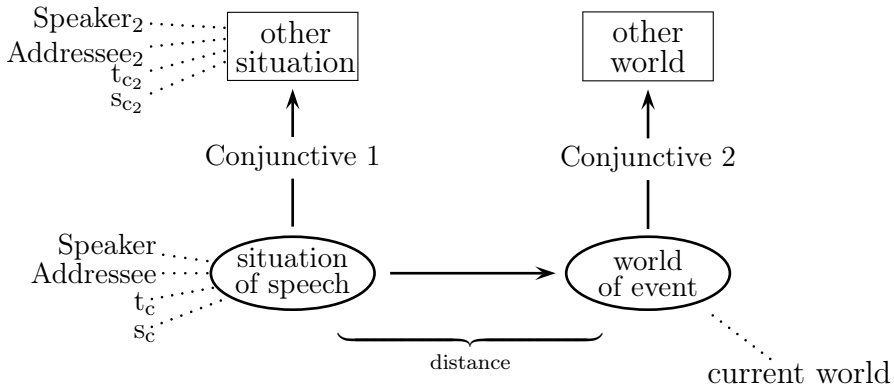
Preterite is marked with *-t* (light gray bars). The forms of the conjunctive are marked by *-ə* throughout the paradigm (i. e. strong and weak verbs) (dark gray bars). Details aside, Bredel & Lohnstein (2001) argue that the gray-coded units in (37) mark the proposition (i. e. tense and mood in the Fin^0 head), while their appearance at specific other positions in the paradigm mark the predication (i. e. agr = person and number in the Fin^0 head).

The following graphical representation suggests an isomorphism between the compo-

[27] Cf. Bredel & Lohnstein (2001).

sition of the formal properties of -ə and -*t* and their functional behaviour. The present indicative relates the clausal object to the current discourse context including speaker, addressee, t_c, and s_c. Adding -ə to this form, shifts the evaluation of the clause to another situation with another speaker$_2$, addressee$_2$, t_{c_2}, and s_{c_2}:[28]

(38) Functional compositional analysis of the tense and mood system in German:



Thieroff (1994) introduced the category *distance* for an analysis of the German tense system. Bredel & Lohnstein (2001) extended this analysis to also include the mood system.

Without going into the detailed analysis of this system, let us assume that tense is—roughly—a two place relation $\leftrightsquigarrow_t$ between the contextually determined time of utterance t_c and the expressed time of event t_e: $t_c \leftrightsquigarrow_t t_e$ with $\leftrightsquigarrow_t \in \{<, =, >\}$ in the sense of Reichenbach's (1947) parameters S and E.

In a similar manner, verbal mood can be presumed to be a two place relation $\leftrightsquigarrow_m$ too. It connects the situation of speech s_c with the expressed situation of event s_e: $s_c \leftrightsquigarrow_m s_e$.

Semantic analysis usually interprets the deictic components of tense and mood by means of a Kaplanian *character* (cf. Kaplan 1989: 505f.). This is a function from contexts to intensions assigning all indexicals their referential meaning in the respective context of use. I do not want to treat all deictic variables in this general way. Instead, I will claim that the components *time of speech* t_s, *situation of speech* s_s, and *addressee addr* of the discourse situation become bound through the operation of *fronting of finiteness into the C-interface*.

The following section 7 presents a more detailed analysis of the particular operations necessary to derive the pertinent findings.

7 Deriving verb second

As a general remark, verb second occurs in finite clauses only. Bayer (2010) convincingly argued that it is not the *verb* that needs to be fronted, but *finiteness* exclusively—ascribing verb second to an instance of pied piping. In fact, the verb needs to be reconstructed in order to get interpreted properly at the level of LF. This can be seen easily in case of the verb *brauchen* 'need'. In German, *brauchen* is a negative polarity item (NPI):

(39) Du brauchst *(nicht) zu kommen
You need *(not) to come
'There's no need for you to come.'

[28] Cf. Thieroff (1994), Schlenker (2000), Bredel & Lohnstein (2001), von Stechow (2004), Fabricius-Hansen & Sæbø (2004), Truckenbrodt & Sode (2015), Sode (2016). The transition from direct to indirect speech and the pronominal shift which is associated with it reveals that reference to another situation has taken place.

As NPI, *brauchen* has to be reconstructed in its base position in order to be in the scope of negation at LF, as Bayer (2010) argues. This case not only shows that the verb *can* be reconstructed, it moreover shows that it *has to* be.[29]

7.1 Declaratives and interrogatives

I will start this section by formulating the partial hypothesis H-1 about fronting of finiteness:

H-1: The tense and mood variables t_s and s_s have to be transferred into the C-system in order to get (semantic) values—meaning that they bind the components t_c and s_c of the discourse situation.

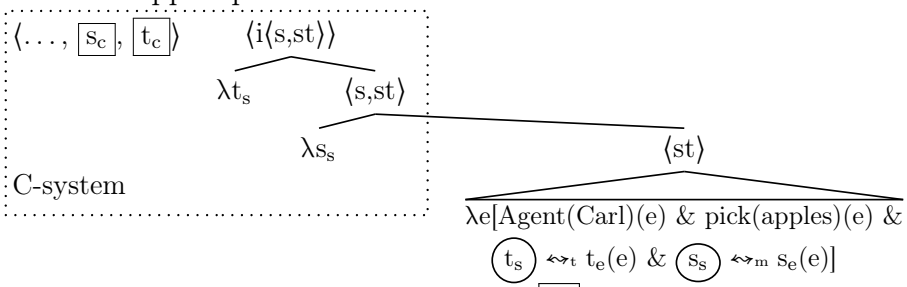
Consider again example (14) repeated here as (40) (omitting the adverb for reasons of clarity). (40) is not a clause, although all grammatical relations are satisfied. As (40.b) expresses, (40.a) characterizes a set of events, which are *pick-apples*-events with agent *Carl* and the time and situation of this event already specified. If that were all that has to be done, a Kaplanian character should assign values to the circled t_s and s_s and a complete clause should result. But this is not the case. Forming a root clause requires the fronting of finiteness:

(40) a. *Karl Äpfel gepflückt hat
Carl apples picked has

b. $\lambda e[\text{pick(apples)}(e) \,\&\, \text{Agent}(e)(\text{Carl}) \,\&\, \textcircled{t_s} \leftrightsquigarrow_t t_e(e) \,\&\, \textcircled{s_s} \leftrightsquigarrow_m s_e(e)]$

Assume λ-abstraction to take place, if movement occurs, as for instance Percus (2000) proposed. Then, the two variables without value, namely $\textcircled{t_s}$ and $\textcircled{s_s}$ become λ-abstracted and enter the C-interface via head movement in the sense of (36).[30] In this position, they have access to the discourse components $\boxed{t_c}$ and $\boxed{s_c}$ as indicated in (41.b):

(41) a. **hat** Karl Äpfel gepflückt
has Carl apples picked

b. 

c. $\lambda e[\text{pick(apples)}(e) \,\&\, \text{Agent}(e)(\text{Carl}) \,\&\, \boxed{t_c} \leftrightsquigarrow_t t_e(e) \,\&\, \boxed{s_c} \leftrightsquigarrow_m s_e(e)]$

Functional application and λ-conversion yield (41.c) representing a semantic object (property of events) anchored in the discourse situation.

$\overline{\text{A}}$-movement of a [−wh]-phrase as in (42.a) induces a choice function,[31] as Lohnstein (2015) proposed, which selects from the set of events a single element, turning (41.c) into (42.b):

(42) a. Karl **hat** Äpfel gepflückt
Carl has apples picked

[29]For further arguments of LF reconstruction of the verbal part see Bayer (2010).

[30]The variable t_s corresponds to Reichenbach's 1947 *time of speech*, the variable s_s stands for *situation of speech*.

[31]A choice function φ of logical type ⟨at, a⟩ maps a set of logical type ⟨at⟩ to an element of logical type a of that very set (a is a variable which ranges over types):

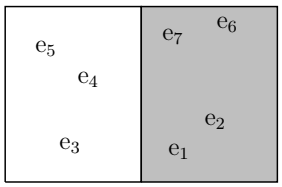
b. $\exists e[\text{pick(apples)(e)} \;\&\; \text{Agent(e)(Carl)} \;\&\; \boxed{t_c} \leftrightsquigarrow_t t_e(e) \;\&\; \boxed{s_c} \leftrightsquigarrow_m s_e(e)]$

The assertive character of (42.a) now follows from the semantic object anchored in the discourse which confirms the existence of the event. From this fact the assertion of truth concerning the expressed propositional object follows.[32] Therefore, the speaker in the discourse situation is committed to the truth of the clause.

A similar kind of treatment derives y/n- and wh-interrogatives. Fronting of finiteness leads to the anchoring of the propositional object in the discourse situation in the same way as in (41.b). If nothing else occurs and the SpC position is left empty, a discourse anchored bipartition results, which leads to the representation in (41.c) and (43.a). This expression, however, can serve as a representation of a bipartition in the sense of Frege's concept of thought. The set of events characterized as *Carl-picks-apples*-events by (43.a) builds one class of this very partition. Its set theoretic complement, namely all other events, constitutes the other class as illustrated in (43.b):

(43) a. $\lambda e[\text{pick(apples)(e)} \;\&\; \text{Agent(e)(Carl)} \;\&\; \boxed{t_c} \leftrightsquigarrow_t t_e(e) \;\&\; \boxed{s_c} \leftrightsquigarrow_m s_e(e)]$

b.



Carl picks apples: $\{e_3, e_4, e_5\}$

Carl doesn't pick apples: $\{e_1, e_2, e_6, e_7\}$

This, basically, is the concept of a thought that corresponds to a y/n-question, as Frege put it. Note, however, that (43.a) is by no means informative. It just assigns each event one of the two classes in (43.b). No reduction of the whole set of events takes place.

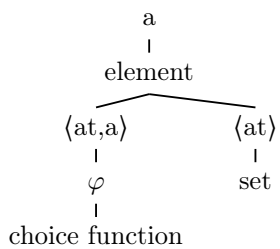
Moving on to the occupation of the SpC-Position via $\overline{\text{A}}$-movement of a [+wh]-phrase, we again see that fronting of finiteness leads to discourse anchoring. The [+wh]-phrase induces an n-fold partition of events—the denotation of a posed wh-question:

(44) a. Wer **hat** Äpfel gepflückt?
Who has apples picked
'Who picked apples?'

b.

Carl picked apples
John picked apples
Mary picked apples
Carl and John picked apples
Carl and Mary picked apples
...

c. $\lambda e[\text{pick(apples)(e)} \;\&\; \text{Agens(e)(x)} \;\&\; x \in \{\text{Carl, John, Mary}\} \;\&\; \boxed{t_c} \leftrightsquigarrow_t t_e(e) \;\&\; \boxed{s_c} \leftrightsquigarrow_m s_e(e)]$



[32] Cf. also Brandt et al. (1992) who represent the assertive force of declaratives via *existential binding of the event* characterized by the propositional content of the sentence mood expressed: $\exists e[e \text{ INST } p]$. The INST predicate stems from Bierwisch (1986) and bears the meaning: e is an event that is an instance of proposition p.

Again, it holds that a wh-question (like a y/n-question) is not informative. Instead, it assigns the possible events (events with different agents in the case of (44.a)) to different classes of a partition that is compositionally built by the denotation of the [+wh]-phrase and the bipartition delivered by the y/n-question, as shown in (44.b). The result is the space of possible answers in (44.c) (cf. also 23.c). Because of the fronted finiteness it is anchored in the discourse and thus the question is posed.

Concluding this subsection, we can state that declarative, y/n-interrogative, and wh-interrogative clauses can be derived in a compositional fashion. The ingredients necessary for the respective derivations are supplied by the grammatical system only. It is of particular importance that no pragmatic notion needs to be used so far, although the propositional objects are already anchored in the discourse situation.

7.2 Imperatives

The verbal form *imperative* is an inflectional form possessing person and number features (cf. (45)), but no specifications for tense and mood. For this reason, Donhauser (1986) called it a 'semi-finite' form. This fact provokes the question what the motivation for finiteness fronting is in imperative clauses.

A main characteristic of imperative clauses consists in their orientation towards the addressee, a 'spoken-to'-relation as Platzack & Rosengren (1998) named it. At the same time, formal subjects cannot be licensed, although imperatives bear agreement markers. As a general remark, the licensing of formal subjects does not only require agr, but tense and/or mood specifications seem to be necessary too.

That imperatives are always inflectionally realized as second person, in singular or plural can be seen regarding reflexive verbs in German like, for instance, *(sich) schämen* 'feel ashamed':[33]

(45) a. Schäm *mich / dich / *sich
ashame.2sg *myself / yourself / *herself
b. Schäm-t *uns / euch / *sich
ashame.2pl *ourself / theirself / *themself

The reflexive pronoun, which is bound to the subject variable, has to be second person, singular or plural, otherwise the constructions are ill-formed. Evidently, the missing subject has to be second person, singular or plural too—the inflectional markers for the addressee(s).[34] As the subject is not realized overtly, the agreement relation between finiteness and subject cannot be established. As a consequence, the agr-features remain unvalued.

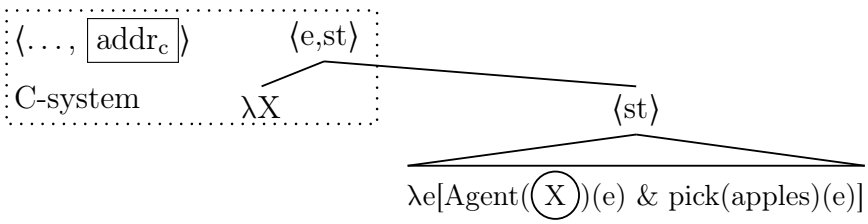
Semantically, an imperative denotes a property of the missing external argument of the involved verb (cf. Platzack & Rosengren (1998), Portner (2005, 2016)), which is due to the missing subject licensing. The resulting effect is that the thematic role for the external argument of the verb remains undischarged. The interplay of these factors lead to agr features without values. In order to get valued, the verb moves to the C-interface binding the subject variable to the addressee in the discourse situation as signified in (46.b):

(46) a. Pflück Äpfel!
pick apples

[33]Cf. Fries (1992).

[34]For the status of the subjects of imperatives cf. Platzack & Rosengren (1998), Wratil (2000), Portner (2005), Condoravdi & Lauer (2012), Portner (2016).

b.



c. λe[pick(apples)(e) & Agent(e)(addr$_c$)]

(46.c) denotes a property of events with the addressee as the agent of these events.

Thus, we can supplement hypothesis H-1 and include the case of unvalued agr features as a motivation for verb fronting on a par with unvalued tense and mood features:

H-2: The agr (person and number) variable is transferred into the C-system in order to get (semantic) values—meaning that it binds the component addr$_c$ of the discourse situation.

This leads to the exact result that the property denoted by the imperative clause is assigned to the addressee in the discourse situation as represented in (46.c). This analysis fits the considerations proposed by Portner (2005, 2016) quite well, and—at the same time—ascribes the phenomenon of addressee orientation in imperative clauses to the grammatical means in a more consequent fashion.

As a result, imperatives, too, reveal the general property of fronting of finiteness: to value features which otherwise remain unvalued. Thus, we can formulate the encompassing hypothesis H, which captures the syntactic and semantic properties in a general fashion:

H: *Syntax*: Fronting finiteness occurs for reasons of scope.
The three feature(bundle)s located in Fin^0: agr, tense, and mood are either checked inside FinP (embedded case) or they enter the interface between FinP and the discourse situation (root case) in order to (semantically) value their otherwise unvalued features.

Semantics: Binding of discourse components to semantic variables anchors the propositional object to the discourse situation—the central property of root clauses.

Hypothesis H covers declarative, y/n-interrogative, wh-interrogative and imperative root clauses—the main inventory of root clause structures throughout the Germanic verb second languages. Main clause formation in these languages[35] shows exactly the properties presented here. H not only provides a semantic motivation for syntactic head movement, but simultaneously explains the discourse relatedness of root as opposed to embedded clauses.

7.3 The discourse table

If the considerations developed so far are on the right track, fronting finiteness is required for the various propositional objects to enter the discourse. But what does it mean *to enter the discourse*?

To clarify this notion, let us look at an explicit discourse model, for instance the one proposed by Farkas & Bruce (2010). They distinguish the speaker A, a table that is the place on which the propositional objects are placed after their utterance, and a hearer B. The table can be considered the location where the discourse participants negotiate the knowledge they are (un-)willing to accept. Furthermore, there are two sets DC of discourse commitments—one for the speaker, one for the hearer. The common ground (cf. Stalnaker 1978) contains the propositions, which speaker and hearer assume to be

[35]English is to some degree exceptional, but see Koster (2003).

true. The 'projected set' contains the possible continuations of the discourse, for instance whether a question is completely or only partially answered or whether an assertion is believed or rejected by the addressee:

(47) (Simple) Model of a context structure (Farkas & Bruce 2010: 89):

A	**TABLE**	**B**
DC_A	S	DC_B
Common Ground cg	**Projected Set** ps	

Having an empty table, is the assumed (idealized) target situation of every discourse.

As mentioned in the two preceding sections, discourse relatedness means binding of discourse components through semantic variables of the functional elements located in Fin^0. This, in turn, leads to the placement of the respective propositional object on the table. In order to illustrate this idea, let us take a look at some examples.

If uttered, a verb second declarative root clause is put on the table. The speaker is obliged to the commitment that the expressed judgment p is true. The hearer has two options. He can believe that p, then p is added to the common ground, and the table is empty; or he can reject p (claiming ¬p), in which case the issue has to be discussed further. The projected set, therefore, contains the two possibilities: p or its negation ¬p.

(48) a. Karl **hat** Äpfel gepflückt.
Carl has apples picked
'Carl picked apples.'

b.

A	**TABLE**	**B**
p	p: Carl picked apples	DC_B
Common Ground cg	**Projected Set** ps $s \cup \{p\} \vee s \cup \{\neg p\}$	

If a y/n-interrogative is uttered, the speaker is not obliged to assume anything, so DC_A is empty. He does not know whether an event of *apple-picking by Carl* has taken place. The bipartitioned object enters the table. The projected set contains the two possiblities the question opens up:

(49) a. Hat Karl Äpfel gepflückt.
has carl apples picked
'Did Carl pick apples?'

b.

A	**TABLE**	**B**
	p: Carl picks apples ¬p: Carl doesn't pick apples	DC_B
Common Ground cg	**Projected Set** ps $s \cup \{p\} \vee s \cup \{\neg p\}$	

In the case of wh-questions, an n-fold partioned space of possible answers enters the table. The speaker is obliged to the commitment that somebody picked apples. The projected set contains possible continuations to every possible answer from the partition $\{p_1, p_2, \dots\}$:

(50) Wh-interrogative:

a. Wer hat Äpfel gepflückt.
Who has apples picked
'Who picked apples?'

b.

A	**TABLE**	**B**
$\exists x[p(x)]$	p_1: Carl picked apples p_2: Mary picked apples p_3: John picked apples p_4: Carl and Mary picked apples p_5: Carl and John picked apples ...	DC_B
Common Ground cg	**Projected Set** ps $s \cup \{p_1\} \vee s \cup \{p_2\} \vee s \cup \{p_3\}$ $\vee s \cup \{p_4\} \vee s \cup \{p_5\} \vee \ldots$	

Clearing the table means to provide a complete answer. Partial answers will not suffice, since the residual question would remain on it. If the question is completely answered, the questioner can accept the answer, which is then added to the common ground and the table is clear again.

7.4 Embedded verb second clauses

As outlined in section 3.1, some classes of verbs allow embedded verb second complement clauses. In this section, I will argue that the conditions outlined so far are sufficient to explain embedded verb second too. The difference between the embedded and the root variant consists in the fact that the embedded clause is θ-marked by a matrix predicate. Imagining a context structure which not only supplies a common ground, but also subcontexts which contain the knowledge of the discourse participants about the knowledge of the MSR, it appears that embedded verb second provokes a clarification of the MSR's belief system.[36] As Lohnstein & Staratschek (2016) propose, embedded verb second requires the embedded proposition to be *informative* with respect to the Common Ground, on the one hand, and to the belief system of the MSR, on the other hand. The hypothesis proposed by Lohnstein & Staratschek (2016: 7)—slightly modified—is similar to the generalization about embedded verb second complement clauses I propose here:

H-3 (embedded verb second):

Fronting finiteness in an embedded complement clause φ is licensed, iff the following condition holds:

φ is *informative*[37] with respect to the participants' knowledge about the say/ belief/ hope ... system of the MSR, which is specified by the matrix predicate.

The fundamental point is that in the case of verb second embedded clauses the embedded proposition is put on the table exactly as in the case of a root clause. This differs from an embedded complement clause in that the proposition p expressed by a root clause is in a sense θ-marked by the speaker's saying. This is formulated in the discourse condition (35.b) repeated here for convenience: "Sp says p to the Addr at time t_c in situation s_c putting p onto the table". This means that the speaker is responsible for the truth of p (cf. (35) and (36)). Verb final complement clauses on the other hand do not bind discourse components, but components specified by the situation of say/ believe/ hope of the MSR cf. (32) and (33). In contrast, embedded V2 complement clauses are θ-marked by the

[36] See Tsiknakis (2016) for a detailed analysis of two invariant principles guiding verb second in embedded and root contexts in German. Another hypothesis is proposed by Staratschek (2016), who claims that the speaker who utters an embedded verb second clause asserts the embedded proposition in the name of the MSR. Note, that both approaches coincide in the theory proposed here.

[37] In the sense of (26).

matrix predicate—the MSR says/ believes/ hopes/ ... p. This is on a par with embedded verb final clauses. But different to verb final clauses the fronted finiteness of embedded V2 clauses leads to binding the discourse components in the same way as in the case of root clauses. This makes p to be on the table—making it something like a *main point of the utterance* as Simons (2007) put it.

This interaction of θ-marking and binding of discourse or matrix components is specified by gramatical conditions only. As functional effect it has to be discussed between the discourse participants whether p *belongs to* the say/ belief/ hope ... system of the MSR signified by the matrix predicate. It is *not the truth* of this proposition that is under discussion, but rather whether the participants accept that it belongs to the respective system. Since the discourse participants clarify their knowledge (about MSR's knowledge), they do nothing else, as in the case they are clarifying any other proposition presented by a root declarative—except that the speaker is not responsible for the truth of p. Note that the particpants negotiate their knowledge in both cases in the same way, since their knowledge about the epistemic system of somebody is a proper subset of the knowledge represented in the Common Ground as Truckenbrodt (2006) and Tsiknakis (2016) pointed out.

To check H-3, consider embedded verb second interrogatives, which are generally not possible in German (cf. Reis 1985: 293):

(51) a. Fritz ist egal, wer Äpfel gepfückt **hat**
Fritz is equal who apples picked has
b. * Fritz ist egal, wer **hat** Äpfel gepfückt
Fritz is equal who apples picked has

As the embedded interrogatives partition the MSR's system of interests into equivalent classes (cf. the assumptions of inquisitive semantics in section (5.1)), they are not informative and thus excluded by H-3.

Verba dicendi et putandi allow for verb second complement clauses. Their functional effect consists in a reduction of possiblities with respect to the contents in (52) that are *told / claimed / believed*. The embedded clauses are, thus, clearly informative with respect to the system described by them, and for this reason allow verb second in accord with H-3:

(52) a. Hans erzählt / behauptet / glaubt, Karl **hat** Äpfel gepflückt
Jack tells / claims / believes Carl has apples picked

Preference predicates,[38] which usually introduce their finite complement clause with *wenn* 'if' rather then with *dass* 'that', are sorting predicates. They organize the states of affairs denoted by their complement clause along a preference scale and select the ones which are preferable. They, therefore, reduce epistemic alternatives and, thus, are informative and license verb second:

(53) Es ist besser, du **gehst** jetzt.
It is better you go now

Moving on to the next class, consider evidential verbs. They also lead to a reduction of the knowledge the disourse participants can share about MSR's belief systems:

(54) Paul erkennt / entdeckt, Fritz **hat** Äpfel gepflückt
Paul recognizes / discovers Fritz has apples picked

As hypothesis H-3 claims, verb second is licensed in these cases too.

Taking a further step, let us examine the predicate classes in (8), which do not license verb second. First of all, these are negated predicates. While they allow for complementizer introduced verb final clauses (55.a), they prohibit any verb second variants (55.b):

[38]Cf. Reis (1997), Romberg (1999), Meinunger (2007).

(55) a. Hans erzählt / behauptet / glaubt nicht, dass Karl Äpfel gepflückt **hat**
Jack tells / claims / believes not that Carl apples picked has
b. * Hans erzählt / behauptet / glaubt nicht, Karl **hat** Äpfel gepflückt
Jack tells / claims / believes not Carl has apples picked

Following the hypothesis in H-3, negated predicates express something beyond the belief system denoted by the matrix predicate. They, in general, never lead to a growth of information (by way of reducing alternatives) of the system signified by the matrix predicate. For this reason, embedded complement clauses of negated predicates are never informative with respect to this system. The result is that verb second is excluded.[39] Factive predicates presuppose the truth of their complement clauses. Whatever the embedded proposition denotes has to be true and, accordingly, belongs to the Common Ground. For this reason, propositions embedded under factive predicates can never be informative with respect to the discourse participants' knowledge and do not allow verb second complements either:

(56) a. Hans bedauert / versteht / weiß, dass Karl Äpfel gepflückt **hat**
Jack regrets / understands / knows that Carl apples picked has
b. * Hans bedauert / versteht / weiß, Karl **hat** Äpfel gepflückt
Jack regrets / understands / knows Carl has apples picked

Volitional predicates express the speaker's wishes or desires which can be associated with liabilities on the side of the addressee:

(57) a. Hans befiehlt / bittet / verlangt, dass Karl Äpfel **pflückt**
Jack orders / begs / demands that Carl apples picks
b. * Hans befiehlt / bittet / verlangt, Karl **pflückt** Äpfel
Jack orders / begs / demands Carl picks apples

Crucially, they are not informative, excluding verb second complement clauses. A slightly different picture emerges if conjunctive verbal mood or modals enter the clause, but for reasons of space I cannot go into these cases here.

Although a lot more has to be said about embedded verb second complement clauses, their relation to matrix predicates and the role of verbal mood, the hypothesis in H-3 captures the empirical situation rather well. Note, however, that beside informativity the relation between the knowledge of MSR and the knowledge of the discourse participants with respect to the assignment of the expressed proposition to MSR's beliefs is the core notion. Verb second complement clauses call for a negotiation between the discourse participants whether the embedded proposition is part of the MSR's respective belief system.

[39] Marga Reis (pc) reminded me of the following cases observed by Butulussi (1991):

a. Bilde dir nicht ein, du **könntest** die Welt verändern.
Imagine you not V-PART you can-CONJ2 the world change
'Don't imagine that you could change the world.'
b. Er bat ihn, er **möge** aufstehen.
He requested him he may-Conj1 stand up
'He wanted him to stand up.'
c. Er forderte, man **solle** sich gefälligst selbst helfen.
He demanded, one should himself kindly self help.
'He demanded one should-Conj1 kindly help oneself.'

Here, the imperative mood or the meaning component of demanding of the matrix predicate together with the modalization (conjunctive (1 or 2) and/or modal verb) of the dependent clause calls for an analysis which captures the interaction of these two conditions together with the fronting of finiteness. It is not completely clear to me how to get the pertinent conditions formulated. For an analysis of the verbal mood in German see Fabricius-Hansen & Sæbø (2004). The interaction with the meaning component of demanding in the matrix clause needs further scrutinizing.

The reason for verb second in all cases is the valuation of features specified by the categories of the inflectional system. In order for these features to receive values, fronting of finiteness takes place even in the case of embedded clauses. The resulting effect is, that the propositional objects (root and embedded) are put on the table—another term for anchoring the proposition in the discourse situation.

8 The overall picture

Since Wechsler (1991) it is assumed in one way or another that verb second activates illocutionary force. In the literature, several concepts are proposed which try to capture the nature of (embedded) verb second, like *question under discussion* (von Stutterheim 1989, Beaver et al. 2017), *activation of illocutionary force* (Wechsler 1991), *proto-assertional force* (Gärtner 2002), *double access reading with speaker assertion* (Meinunger 2004), *context indices with 'epist' and 'deont' components* (Truckenbrodt 2006), *main point of the utterance* (Simons 2007, Wiklund et al. 2009), *at-issueness* (Potts 2005, Antomo 2015), *assertive illocutionary force* (Julien 2010, 2015), *paratactically linked root clauses* (Reis 2016) to name just a few. They all share the intuition that verb second is a root phenomenon[40] evoking something like assertive illocutionary force. Given that *being bound to the discourse* means *being put on the table* and, additionally, fronting of a [–wh]-phrase leads to the judgment an analysis is given that is a bit more abstract than the proposed notions. It makes use of grammatical means only and leaves enough room for the mentioned interpretations at the same time. The judgment provides one part of the assertion, the discourse anchoring another one. The former represents the speaker's decision about the truth of the expressed proposition. The latter leads to the speaker's commitment to the truth of the proposition in the interactional setting provided by the discourse situation. Without an interactional setting containing an addressee the commitment to the truth of the expressed proposition is an empty notion.

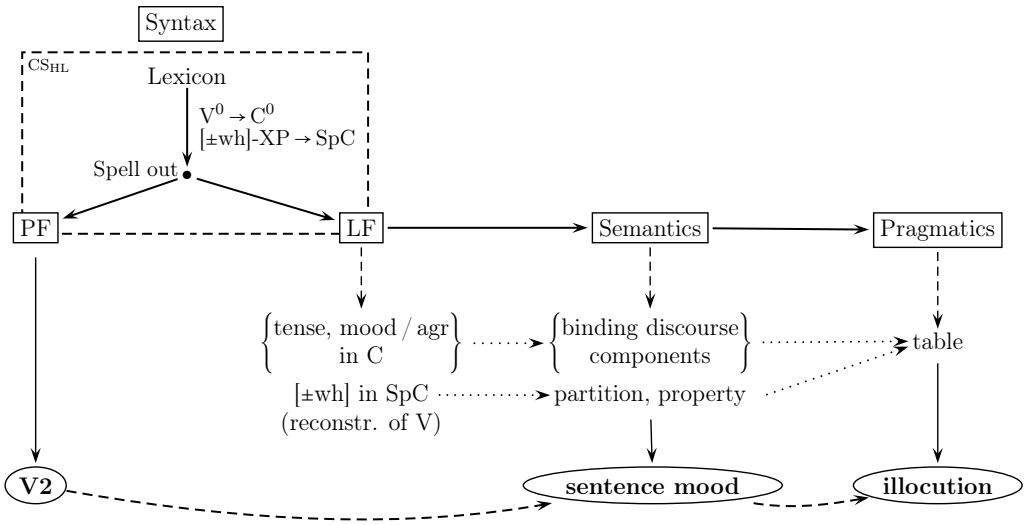
Determining illocutionary force referring to the PF-component of V2 requires a division of labor. Since there is no set of lexical items which encode sentence moods or illocution type operators in German, it is an ad hoc stipulation to assume elements like these to be part of a syntactic structure. In particular, it contributes little to the understanding of the interaction of the elements and operations which fill the left periphery, if holistic (illocution type) operators are assumed which do the job. They almost always contain a lot of knowledge ascribed to them by linguists, who thereby fail to notice the grammatical mechanisms determining the relevant properties.

As the Y-model of generative grammar together with the no-tampering and the inclusiveness condition of Chomsky (2001) claims, there is nothing at the level of LF which hasn't been in the lexicon before. What follows from these assumptions is that illocutions do not have any right to exist in the core component of grammar.

The syntactic operations required for verb second structures are fronting of finiteness and fronting of a [±wh]-phrase. These two operations are visible at the PF-interface. At LF, finiteness reaches a (scope) position to bind components of the discourse situation (cf. (41.b) and (46.b)). The following diagrammatic chart illustrates the various levels of representation together with the operations that are performed:

[40]Cf. Emonds (1970), Hooper & Thompson (1973), Heycock (2006).

(58)



The dashed box corresponds to the model of syntax in the sense of the Minimalist Program (since Chomsky 1995) according to which lexical items are (externally or internally) merged in order to derive a complex syntactic object. At some point in the derivation (Spell out) the PF-content is stripped off from the object derived so far and sent to the PF-interface. Overt movement (before spell out) of the finite verb together with a [±wh]-XP syntactically derives the PF form of the verb second phenomenon. Along this process, both kinds of objects enter the C-interface. This leads to a value assignment of the deictic components of the tense and mood features with the components *time of speech* and *situation of speech* determined by the discourse situation. This happens in the case of declaratives and interrogatives. For imperatives, the agr features person and number get values by the discourse component *addressee*. Possessing values, these features embody the derivational step which ensures that a 'root interpretation' can be realized—the relevant aspect of the expressed propositional object for the discourse situation.

Binding these components belongs to the semantic level. On the same level, the partition objects are formed via syntactic $\overline{\text{A}}$-movement into the C-system, in particular a reduced bipartition (declarative), an unmodified bipartition (y/n-interrogative), a differentiated bipartition (wh-interrogative). Imperatives do not need this type of movement, because their essential properties (no licensing of formal subjects in combination with the unvalued agr-features person and number) follow from inflectional morphology and the fronting of the semi-finite verb.

Having bound discourse components, the resulting semantic objects are put on the table—the place at which speaker and hearer negotiate their knowledge and their respective commitments, for instance answering questions, believing assertions, or performing actions. During the derivational process from the syntactic towards the semantic component the operations are rather fixed and determined in a straight way. Interpretational freedom comes into play at the level of pragmatics although with systematic restrictions. Thus, illocutionary force allows for a rather wide interpretation. This fact distinguishes the syntactic and semantic operations and representations rather sharply from the pragmatic ones.

In summary, the proposed theory not only explains the verb second phenomenon in root as well as in embedded clauses in German, but additionally derives the main classes of sentence moods in a compositional fashion from the *grammatical* units and processes only. The assumption of ForceP as the highest projection of clausal structure—which is filled by some kind of holistic illocution type operator or some other silent material—is completely dispensable.

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