V2: The German Liberation Movement

Version 2

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In this paper I present an analysis of the verb second phenomenon in German. I suggest, along the lines of Desouvrey (2020), that tensed verbs must cliticize to the highest host in order to break free from an inseparable ill morpheme. They thus become live vectors and take their widest scope in the structure. I argue that the ill affix that plagues the German conjugation system is *ge*, which surfaces only in past participle verbs by a default morphological rule associating the floating melody with the skeleton. In complement clauses, many complexities arise because the relative complementizer is a vector. If both verbs move, the resulting structure amounts to a parallelogram of forces by virtue of which the two most distant vectors become the resultant of all the intermediate ones, which are therefore bypassed, i.e. they are not spelled out. In most cases, the bypassed element is the complementizer, hence its complementarity with V2. I present evidence from relative clauses, *wh*-extraction, and multiple questions, showing that the bypass effect can eliminate significant material as well, including negation, *wh*-interrogatives, and relative pronouns. It turns out that a mathematical tool which is useful in the physical world takes center stage in German syntax.

Keywords: V2, features, skeleton, *wh*-operators, vector interaction, potential difference parallelogram of forces, bypass effect, pendulum effect, superiority effect, multiple questions, relative clauses, expletive matrix clauses, topicalization, morphology, syntax.

1. Introduction

The Wackernagel's Law, which describes a second position dependency, unifies pronominal and auxiliaries clitics in Serbo-Croatian, a Slavic language, and verb-second phenomena in Germanic languages. If pronominal clitics are taken out of the picture, this law is reduced to a matter of verb placement. In Serbo-Croatian, auxiliaries, but not lexical verbs, have to be in the second position, while in Germanic all tensed verbs, under certain conditions, must acquire the second position of their clause. I will show, along the lines of Desouvrey (2020), that the verb second effect (V2) in German results from a morphological deficiency of tensed verbs. Specifically, they are inert vectors due to an inseparable ill morpheme they carry in the syntax. To become an active vector, any tensed verb must break free from this affix by adjoining to the highest phrase in the structure.

I will proceed as follows. In the next section, I take a fresh look on verb morphology in German, hypothesizing that the ill morpheme in the conjugation is the past participle affix *ge.* In section 3, I tackle the simplest form of V2, as it takes place in root clauses, while outlining the basic principles of

the theory I build on. In section 4, I discuss a newfound vector interaction that occurs in complement clauses when the verb moves to realize V2 in both negated and expletive matrix clauses. Section 5 is devoted to *wh*-extraction from complement clauses, relative clauses, and multiple questions, all of which being evidence for the analysis presented in the previous sections. Finally, in the last section, after a brief summary of the results, I make some general remarks on the second position in non-V2 languages; then I consider possible developments in the history of English that led to the disappearance of V2, and the probable reason that modals are not compatible with preposition *to* in modern English.

2. The morphology of German Tense

Verb morphology in German is mostly similar to that of Romance languages. Indeed the verb stem can be modified by either the infinitive or any tense affix, which carries person and number features. The remarkable fact that sets German apart from Romance and English is the formation of the past participle. It is made up of the prefix *ge* and the third person singular (weak verbs), or the 1st/2nd plural, which are homophones with the infinitives (strong verbs), at least according to certain descriptive accounts for foreigners.[1] This is illustrated in (1).

(1)	kauften	'to buy'	gekauft	'bought'	(weak)
	lesen	'to read'	gelessen	'read'	(strong)

Clearly the past participle consists of a verb stem to which an affix is added: *ge-stem-3sg* or *ge-stem-1/2pl*. Suppose that all German verbs but infinitives underlyingly include the morpheme *ge*. Consistently with an analysis of the Wackernagel effect in Serbo-Croatian (Desouvrey 2020), it must be the case that it is a deficient morpheme in the sense of the theory of the skeleton, and it must be filtered out as stray in the syntactic derivation (see below).[2] On this view, the first and the third person singular of *kaufen* ('to buy') can be given the underlying representation in (2a,b), where the deficiency of *ge* is due to its floating melody, i.e. not linked to the x-skeleton (the '~' is used here as a morpheme boundary). If a participle is needed, a morphological rule links the x-slots and the melody with an association line, as in (2c). Thus, the participle is set up in the morphology and enters the syntax with the morpheme *ge* added, unlike other conjugated forms.

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1 See, for instance, https://courses.dcs.wisc.edu/wp/readinggerman/category/07-perfect-participles/ and https://en.wikipedia.org/wiki/German_verbs

2 For the skeletal theory in phonology and morphology, see Goldsmith (1979), Kaye and Lowenstamm (1984), Leben (1973), Levin (1985), McCarthy (1979, 1981), etc.

(2) a. g e ~ k a u f e
x x ~ x x x x x

b. g e ~ k a u f t
x x ~ x x x x x

c. g e ~ k a u f t
x x ~ x x x x x

Since *ge* cannot be separated from the stem, it must be taken as an inseparable morphological affixes, as opposed to lexical affixes. Given that German verb stems can carry various affixes, and *ge* is in general adjacent to the stem, one can assume that this adjacency is a condition for the association rule given in (2c) to take place. Suppose that those affixes belong to two types: lexical affixes that merge with the verb from the lexicon and morphological affixes that the verb fetches in the morphology. The morphological affixes may be either separable or inseparable, and in addition they are arguably subject to some hierarchy, so that certain affixes take priority and merge with the stem before others. Thus if *ge* yields priority to another affix, so that it is not adjacent to the lexical stem, I assume that the rule in (2c) does not apply, and hence *ge* may not surface in past participle. On this view, the inseparable morphological affix *ver* is adjacent to the stem (3a), hence the rule that allows *ge* to emerge is dismissed in the past participle. With verbs with a separable prefix, *ge* inserts between the stem and the separable prefix, as in (3b). In (3c), *schlussfolgern* enters the morphology as a lexical compound and it merges with *ge;* thus, (2c) applies normally, as it is seen as a complex stem in the morphology (see below).[3]

(3) a. ver~kaufen 'to sell'
ver~kauft 'sold'
ver~stehen 'to understand'
ver~standen 'understood'

b. ein~kaufen 'to shop'
ein~ge~kauft 'shopped'
auf~gehen 'to rise'
auf~ge~gangen 'risen'

c. schluss~folgern 'to conclude'
ge~schluss~folgern 'concluded'

This view of German tense verbs, as I will show, is supported by the account of V2 to be

3 There are other complications with *ge.* According to certain documents (cf. fn. 1) verbs with the *ieren*/*eien* ending, essentially foreign words, do not take *ge* in the participle, suggesting that it must attach to a native stem. Also it is mentioned that *ge* does not show up in verbs with an initial unstressed inseparable prefix, as in (3a). This weakness might be the reason why such affixes take priority over *ge.*

discussed below. It is precisely this deficiency of the past participle morpheme that triggers this type of verb movement. The rationale is that the verb must get rid of this ill morpheme to become a liberated or live vector, i.e. an element that has a scope and a direction (cf. Desouvrey 2003, 2006, etc.).

3. The primary facts

It is a well-known fact that in root clauses German verbs must occupy the second position, after any phrase that can legitimately be in the first position. In clauses with an overt complementizer, however, the verb appears in final position. This is illustrated in (4) (the data discussed in this section are taken from Bayer 2008, ex. 1).

(4) a. Johann kaufte Socken
Johann bought socks
b. … daß Johann Socken kaufte.
… that Johann socks bought

With respect to this fact, the question is whether the basic word order in German is SVO or SOV. Standard analyses in current generative theory assume an SOV order, as in subordinate clauses. In such clauses, the verb mostly stays in situ since it cannot move to the position already filled by the overt complementizer (see among others Bayer 2008, Müller 2002, Thiersch 1978). This order, which I will assume in the input structure, is the most plausible, though it may not be rigid, given the V2 requirement (see below).

V2 phenomena are strictly limited to tensed verbs, infinitives and participles being spared. Under Bayer's (2008) assumptions, V2 is triggered by tensed morphology which must move to some abstract functional position. The question is still why tense needs to move in German and other like-languages so as to force the verb to move along. I argue that this is due to the special morphology of German tensed verbs, which are specified for the feature [ω], just like the ill affix *ge* that plagues the conjugation, as seen above. Given this morphological specificity, German verbs seek to realize V2 in order to become live vectors. This can only be done by adjunction to the highest phrase in the structure, as I will show. Given the adjunction mechanism, they can break free from the ill affix *ge*.

Vectors are any grammatical element which is specified for the feature [ω]. Elements with such a feature have scope and direction, and show certain special behaviors when interacting with one another. The key property that allows to detect them is their rigid ordering throughout the derivation. This is known as the Superiority Condition. In the generative framework this constraint, which applies only to operators, is formulated in terms of phrase-structure rules. In the feature- and constraint-based theory I

build on, it is simply formulated as in (5) (cf. Desouvrey 2020 and earlier work).

(5) **Superiority Condition**

Vectors in the same domain are not commutable by movement rule:

$[V^1 \ldots V^2] \rightarrow * V^2 [V^1 \ldots t]$

It should be noted that negation and *wh*-operators are universally vectors by their very nature. Other grammatical categories may be members of this set as well on a language particular basis. In German tensed verbs are live vectors when they are in V2 and inert in situ, as I will show. The inertness of in-situ verbs is due to their concatenation with the ω-specified affix *ge.* Inertness is also triggered by adjunction to another vector in the syntax, since temporal adjunction, amounts to syntactic concatenation (see below). This special property is stated in (6) (cf. Desouvrey 2020, etc.).

(6) **Vector Inertness Law**

Two vectors become inert (insensitive to the Superiority Condition) under morphological concatenation or syntactic adjunction.

In this theory, an unsatisfactory input can be dismissed for another more convenient one, unless it can be amended, usually by movement of the offending element. Two types of movement are to be distinguished. According to the first one, named 'inbound movement', the moved element adjoins to a host in the structure, a process which puts it on a different timing tier, given the adjunction mechanism (see below). In the second type of movement, referred to as 'outbound movement', an element moves outbound, linearly juxtaposing itself to the left edge of the structure. Which movement is available to an element is normally a matter of feature specification and economy. Elements bearing the feature [π], like *wh*-operators, are incompatible with inbound or short movement, which necessarily implies adjunction to some host. Both types of movement must satisfy the constraint in (7).

(7) **Well-Formedness Condition on Movement**

No string-vacuous movement is allowed. That is, a moved element must skip at least another element.

Having these considerations in mind, let us turn to the derivation of basic V2 sentences. Assuming that German is normally of the type SOV, one can posit for (4a) above the input shown in (8a). This input consists of fully inflected lexical elements that are assembled in constituents. The verb, which is shown with the ill affix *ge~*, is merged with its complement to make a constituent which is then merged with the subject. In the resulting structure, the verb and the affix being vectors, they are

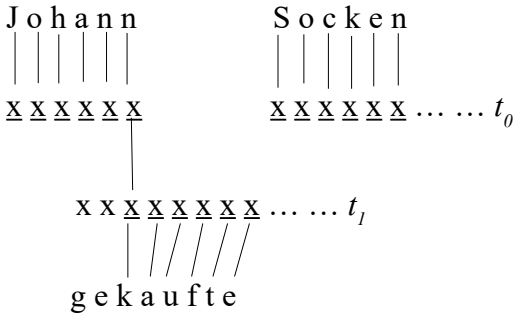
inert (cf. (6)). To become a live vector, the verb must get rid of the ill affix by moving across its complement to adjoin to the subject, yielding (8b). The ill affix disappears under adjunction, conveniently indicated with the equal sign, as usual.

(8) a. [Johann [Socken *ge*~kaufte]]

b. [Johann=kaufte Socken]

The disappearance of the ill affix follows from the representation given below. In one hand, we know that audible segments in phonology are made of a melody and a x-skeleton linked together with association lines. If a melody is not attached to the skeleton, it may not be spelled out. On the other, the syntactic adjunction is realized by anchoring one element to another with an association line originated from a regular or valid segment (i.e. linked to a skeletal slot), so that the leftmost x-slot of the adjunct is aligned with the rightmost x-slot of the host, as seen in (9).[4] As a result the adjoined element comes to define a distinct timing tier, t_1, from the original one, t_0.

(9)



The Linearization Convention, stated in (10), acting like a cursor, successively scans each segment starting from the first one in the original timing tier, [j], and reaches the adjunct via the association line. It then flows forward until the segment [e], and jumps back to the original tier where it successively processes the segments of *Socken.* As a result, the inseparable ill morpheme *ge,* which is not in the path of the cursor, indicated by the underlined x-slots, is severed from the verb stem.

4 Notice that the structure given in (9) should be based on phonetic segments, which do not necessarily correspond to the orthography. It is likely that *Johann* and *Socken* contain each five segments, the sequences 'nn' and 'ck' being a matter of orthographic convention. Anyway, in subsequent examples, only the melody will be shown for convenience and the ill affix will be omitted as well.

(10) **Linearization Convention**

(a) From the leftmost segment of the original tier, process successively each temporal slot; (b) two temporal slots linked by an association line (adjunction) must be processed successively so as to align the adjunct and the host on the same tier.

Similarly an OVS variant of the above sentence (11a) can be derived from the same input. First the object is fronted and then the verb adjoins to it, as seen in (11b).

(11) a. Socken Kaufte Johann.
Socks bought John

b. [Johann [Socken *ge*~kaufte]] → Socken [Johann *ge*~kaufte] → Socken=kaufte Johann.

If an adverb occupies the first position in the structure as in (12a), the verb must take it as a host. The derivation of this sentence is given in (12b).

(12) a. Glücklicherweise kaufte Johann Socken / *Glücklicherweise Johann kaufte Socken
Fortunately bought John socks

b. [Glücklicherweise [Johann [Socken *ge*~kaufte]]] →
Glücklicherweise= kaufte Johann Socken

It appears that V2 is obligatory, unless some insuperable problem results in (see below). Thus, the verb must adjoin to the highest possible element. The reason is that vectors seek to have the highest possible scope, unless they are stopped by another vector, given the Superiority Condition. In German, verbs are inert vectors when they move, and they are reactivated under adjunction to a non-vector host, so that there movement does not result in a superiority effect. In most cases, the V2 verb remains inert if the host is a vector, and a bypass effect eliminates the vector it moves across, as I will show.

In subordinate clauses, tensed verbs can stay in situ, as illustrated above in (4b). This state of affairs sharply contrasts with Serbo-Croatian auxiliaries, which must adjoin to a host in order to avoid being disappeared with the derivation. In German, unlike Serbo-Croatian, the inseparable morpheme *ge* is a morphological affix, which remains autonomous of the verb during the derivation. Thus whether or not it is processed by the cursor may not affect the verb, as shown in (13). Each element of the sentence is processed in turn segment by segment, as indicated by the underlining. The cursor just skips the ill particle *ge* since its segments are not valid, i.e. not linked to the skeleton. It remains to explain why the complementizer apparently blocks the verb from realizing V2 or rather why V2 is incompatible with the complementizer. This will be tackled in the next section.

(13) daß [Johann [Socken ge~kaufte]] → daß [Johann [Socken *ge*~kaufte]]

In a nutshell, verb second amounts to cliticization of the verb to the highest possible host in the structure. The verb becomes a live vector, as this process liberates it from the unwanted vector *ge*. One may note that Serbo-Croatian differs from German in that only auxiliaries undergo this process. This analysis captures the original view of Wackernagel according to which (auxiliary) clitics and verb second are the same phenomenon (cf. Anderson 1993). In the next section, various complexities generated by V2 will be tackled.

4. Vector interaction

In this section I turn to a newfound and surprising vector interaction that results from the verb moving to second position. Specifically, in certain contexts, the movement of the verb triggers the bypass of lexical material, which in certain case may ruin the derivation.

4.1 The bypass of the complementizer

In complement clauses, V2 is not always realized in German. In the absence of the complementizer, the tensed verb occupies the second position, as in (14a); otherwise it appears in the final position (14b) (cf. Fanselow 2004, ex. 34). Descriptively V2 and the complementizer cannot coexist in the sentence.

(14) a. Ich denke er **hat** sie eingeladen
I think he has her invited

b. Ich denke **dass** er sie eingeladen **hat**
I think that he her invited has
'I think (that) he has invited her'

Fanselow also mentions that certain German dialects allow V2 with an overt complementizer, weakening the traditional generative analysis, which claims that the verb can only move to an empty Comp node.

I will show that the complementizer is the source of the complexities in German grammar. Under our assumptions, if an overt complementizer can block V2 in certain languages or dialects, but not in others, then it must be the case that such an element is variably specified for some feature. Suppose that in German this element is specified for [ω], which makes it a vector, just like negation, *wh*-operators, and V2 verbs, as discussed above. This hypothesis will be proved to be correct to the extent that it makes it possible to account for various complexities in a uniform and elegant manner.

Actually the term 'complementizer', which I use for convenience, represents another reality

ignored in its traditional definition and use. Indeed, I take it to be a referential element, precisely an accusative relative pronoun/anaphor (cf. Desouvrey 1997, 2003, 2010, etc.), and hence is the direct object of the matrix clause, which is in fact a restrictive clause to the event described by the embedded clause. The complementizer, which presumably does not have the capacity to refer to an event, take the subject of the complement clause as is default antecedent. Therefore, both the complementizer and the subject of the embedded clause must be adjacent by the end of the derivation, a requirement which is the hallmark of relative clauses.

With this in mind, let us turn to the derivation of the sentences in (14). They can be derived from the input structure given in (15a). This input consists of two independent (island) SOV structures, which are linked by coreference. The subject of the complement clause, which is logically the main clause in the present perspective, is the antecedent of the complementizer, as indicated for the time being by the indexes. Thus, from left to right each element is processed in turn, segment by segment. The matrix verb and then the subordinate verb realize V2 in their respective clause. As a result, each cliticized verb becomes a live vector, as seen in (15b) (vectors are italicized), and *dass* becomes adjacent to its antecedent, *er*. I claim that in this type of configuration, which includes three non-collinear vectors (recall that the host and the adjunct are on a distinct timing tier), the vector complementizer cannot be spelled out.

(15) a. [Ich [*dass*$_i$ denke]] [er$_i$ [sie [eingeladen hat]]]

b. [Ich=*denke* ~~*dass*$_i$~~] [er$_i$=*hat* [sie eingeladen]]

The nonlinear representation of (15b), as in (16), should make clear both the referential dependency and the vector interaction that causes the disappearance of the complementizer. The referential link between these island clauses is shown above the timing tier t_0. The complementizer has an ω-specified root node, which is compatible with the presumably neutral root node of the personal pronoun. The latter also possesses a neutral thematic node (Ø) to which the feature Q is assigned by spreading. Q, which must come from an NP in the discourse, is the virtualization of a real-world entity in the grammar. Thus, the relative complementizer enters this derivation as a vector anaphor, and it must inherit the feature Q from the subject of the independent clause by fetching the node Ø, as indicated by the directed line.[5,6]

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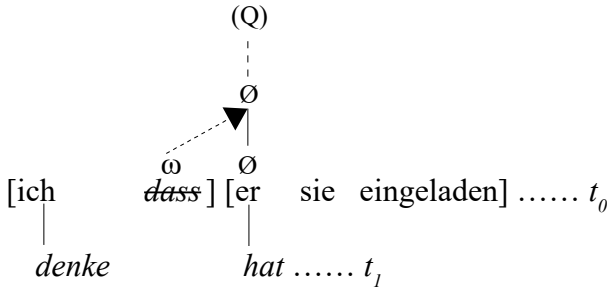
5 It is important to note that if the adjacency of an anaphor complementizer with its antecedent cannot be maintained, the derivation may not proceed. In such a situation, the complementizer must be deleted in any language.

6 The root node, the thematic node, and the terminal feature make it possible to capture the distribution of the three types of referring elements. A NP is referentially autonomous because it is endowed with a virtualization feature, a thematic node and a root node. A pronoun does not have the virtualization feature, and therefore it must receive it from an NP by

(16)



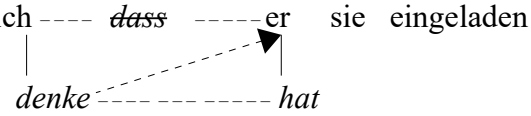
Ich=denke er=hat sie eingeladen. (=14a)

Let us turn to vector interaction. In the representation above, adjunction puts both verbs on the same secondary timing tier, t_1, as opposed to the primary timing tier t_0, which includes the complementizer. Now vectors are complex elements which have conflicting requirements according to their position. A lower vector may want to move leftward to seek a wider scope, while a higher vector seeks to maintain a greater distance with a lower vector. As suggested in Desouvrey (2020), the distance between two vector amounts to a potential difference (PD), which is a force or energy between them. When the PD is null, the vectors are inert (cf. (6)). Thus in a sequence of non-collinear vectors, all vectors pair off alternately with one another (cf. Desouvrey 2022). When the highest vector pair off with the lowest one, an effect is created so that any intermediate vector, here the complementizer, is bypassed by the cursor. This bypass effect results in the disappearance of *dass* at the output.

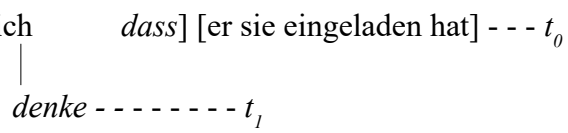
In actuality, this process is a consequence of the Parallelogram Law, which is used in mathematics to calculate the sum of two vectors. So, let us choose the first adjoined vector as the origin from which we draw a directed line to the first segment of *hat* via the adjunction line linking *(e)*r to *h(at)*. On can thus assume that such a directed line amounts to the resultant of the three vectors, as shown in (17a). This means that any vector that appears between these two points (i.e. [e] and [h]), including eventually the host of the adjunct, need not be processed by the cursor. If V2 is not realized in the subordinate clause, there remains two vectors in the structure. In this case, I assume that no parallelogram can be formed, and therefore both vectors are processed successively, so that that there is no bypass effect, as shown in (17b).[7]

spreading. An anaphor has only a root node, hence it must depends either on an NP or a pronoun to have a thematic node. The adjacency between an anaphor and its antecedent is constrained by the ban on line crossing in the representation (cf. Desouvrey 2003, 2006, etc.).

7 Vectors have further interesting properties. A vector has a positive pole and a negative pole, which are its first and its last segment respectively. The resultant must run from two opposite poles of two non-collinear vectors. This notion will no be discussed further in this version; see Desouvrey (2022) for details.

(17) a. 

Ich=denke er=hat sie eingeladen. (=14a)

b. 

Ich=denke dass er sie eingeladen hat. (=14b)

It is stated in the literature that V2 and the complementizer are in a complementarity in German. This analysis accounts for this fact in a highly principled way, as the bypass effect, which occurs according to the Parallelogram Law, is a product of the representation. It is expected to occur in other languages, all other things being equal (cf. Desouvrey 2022). As I will show, the parallelogram of forces has further consequences in German syntax, playing a central role in the interaction of V2 and extraction from subordinate clauses.

4.2 The fatal bypass of negation

In German, it appears that the vector complementizer, which is present in the derivation, goes missing in the output. The bypass of this element is inconsequential, as it does not compromise the interpretation of the sentence. This may not be the case for other vectors like negation and *wh*-elements, which are semantically crucial. Indeed, as is well-known, negated bridge-verbs do not allow V2 in their complement clause, (18). I show that this fact is due to a slick bypass which eliminates both the complementizer and negation.

(18) a. Ich denke nicht, dass er sie eingeladen hat.
b. *Ich denke nicht, (dass) er=hat sie eingeladen.

Since negation appears inside the VP in German, in the position preceding the lexical verb (e.g. Thiersch 1978), one normally expects the derivation of (18) to proceed from the following SOV input:

(19) [ich $dass_i$ nicht denke] [er_i sie eingeladen hat]

However, this structure runs into a few problems, given the following assumptions: (i) coreference must be set at the input and may not be compromised in the course of the derivation; (ii) a vector referring element cannot acquire its antecedent across another (live) vector (Desouvrey 2003, 2009, 2010). Under these assumptions, the coreference between the complementizer and the subject of the

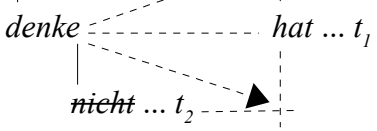
complement clause fails on both counts, since it is blocked by negation.

This problem can be overcome by assuming that negation is a separable particle to the lexical verb; hence both make up an inert vector. This may not be surprising for a Wackernagel language, since in Serbo-Croatian negation makes a compound with lexical verbs and auxiliaries, and with the latter the compound is even 'sandhied' (Desouvrey 2020). If this is correct, negation may not block the coreference between the complementizer and the subject of the matrix clause in the input. However, if the verb moves, the stranded negation becomes an active vector, and the complementizer can no longer be linked to its antecedent. It should be noted that the complementizer cannot move down to the right edge of the clause, given the Superiority Condition.

Therefore, assuming the strictest relation of coreference, meaning it may not be compromised, even temporary, at any stage of the derivation, it must be the case that the derivation proceeds instead from an SVO input, as in (20a). Such a structure is propitious for the V2 requirement, as the matrix verb can move non-vacuously to the highest element (*ich*) across the negative morpheme. Indeed, the verb adjoins to the subject and drags along *nicht*. If V2 is realized in the the embedded clause, two parallelograms can be formed, as shown in (20b). Interestingly, the result is the same in either parallelogram: both the complementizer and negation are bypassed, hence the ill-formedness of this sentence. Since negation, unlike the complementizer is crucial for the semantics of the sentence, some action must be taken to prevent its loss. In an alternative derivation, the embedded verb, which is the offending element, is forced to stay in situ. Thus, the integrity of the negative morpheme is insured; as there is no parallelogram. the vectors thus are processed successively, as shown in (20c).

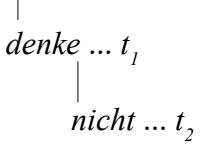
(20) a. [ich nicht denke dass$_i$] [er$_i$ sie eingeladen hat]

b. *[Ich ~~*dass*~~] [er sie eingeladen] ... t_0



*Ich *denke* er *hat* sie eingeladen.

c. [Ich *dass*] [er sie eingeladen hat] ... t_0



Ich *denke=nicht dass* er sie eingeladen hat. (=18a)

It turns out that negation and the complementizer have the same fate in German: both are incompatible with embedded V2. Since negation is universally a vector, this fact proves that the complementizer is a vector as well. In the present view, they are specified for the feature [ω], just like tense verbs.

4.3 Restrictions on V2

Certain verbs are incompatible with V2 and hence must stay in situ. These are non-bridge verbs which block V2 in the subordinate clause, and certain verbs with particles. In the latter type, the particles are inseparable from the verb stem. This is consistent with our assumption that V2 movement is intended to liberate the verb from the ill particle *ge*. It is self-evident that if *ge* is preceded by other inseparable material, V2 may not be possible. In effect under adjunction, *ge*, and anything that precedes it, is set to go missing in the output. For instance, consider the complex verb *uraufführen* 'to perform first'. It has the morpheme *ge* between the stem and the particles in the participle, *ur~auf~ge~führt.* Thus in the conjugation, it must be the case that *ge* is still in this position underlyingly. Under adjunction, the stem would link to the host, putting the particles *ur*, *auf*, and *ge* out of the path of the cursor. Thus, since the particles *ur* and *auf* are not separable, this verb must stay in situ, as shown in the following paradigm (adapted from Müller 2002, ex. 62):

(21) a. dass sie die Oper hier ur~auf~führen
that they the opera here perform first
b. *Sie führen die Oper hier ur-auf
c. *Sie auf~führen die Oper hier ur
d. *Sie ur~auf~führen die Oper hier

Quite contrary, the verb *radfahren* 'bicycle ride', whose participle is *rad~ge~fahren*, normally undergoes V2 since, as Müller points out, the particle *rad* is separable and hence can be left behind. More generally, one expects complex verbs to undergo V2 if *ge* precedes the inseparable particles. For instance, the participle of the verb *schlussfolgern* 'to conclude' is *ge~schluss~folgert*, and therefore this verb normally undergoes V2. It should be noted that *schluss* may not be a morphological affix under our assumptions, otherwise it would not take *ge* in the participle. It is rather a genuine lexical compound, as suggested above.

On the other hand, non-bridge verbs, as is well-known, proscribe V2 in the complement clause, as exemplified in (22) (adapted from Müller 2002, ex. 54). Thus, the question is why V2 is blocked. A possible answer is that V2 can be used as a mood marker. Unlike bridge-verbs, these verbs express

some kind of state of mind, which is signaled by a specific modality in many languages. In French, for instance, such verbs require subjunctive mood in the subordinate clause, as illustrated in (23). Thus, it might be that keeping the verb in situ is the expression of a subjunctive, which might well be overlooked by traditional normative grammarians.

(22) Ich bedaure dass den Fritz die Maria geküsst hat.
I regret that the.ACC Fritz die.NOM Maria kissed has

(23) Je regrette que Marie soit [subj.] / *est [ind.] ici.
I regret that Marie be here.

It appears that verbs in which the ill affix *ge* is preceded by inseparable particles cannot undergo V2, consistently with our assumptions. In addition, certain matrix verbs force the subordinate verb to stay in final position, most likely for reasons of mood. The mood analysis seems to be limited to standard German. In other varieties, it is likely that a harmonization process (cf. Desouvrey 2000, etc.) bans V2 altogether in complement clauses, regardless of the verb type. This lack of V2 in complement clauses appears to be the fault line between the standard dialect and other varieties (see below).

4.4 The expletive matrix clause

German has a construction in which a non-argumental pronoun, *es*, shows up in front of a V2 clause, as illustrated in (24a) (cf. Müller 2002, ex. 41). This construction differs from the one in (24b), presumably a well-formed sentence (as obtained from Google Translate), in that the later includes a matrix copula while the subordinate verb is in situ.

(24) a. Es hat die Maria den Fritz geküsst.
it has the.NOM Maria den.ACC Fritz kissed.

b. Es ist, dass die Maria den Fritz geküsst hat.
'It's that Maria kissed Fritz.'

Müller points out that there are other types of *es*, for instance those that are arguments of weather verbs. I will assume the null hypothesis, which is not crucial here, as to there is just one expletive pronoun, which is used in various constructions.

It is a matter to explain how this expletive can appear in clause-initial position, apparently as a host for the verb. It is unlikely that it originates from a position inside the clause, as in Müller's analysis, since it is neither an argument nor an adverb. Müller's own tests show this cannot be the case.[8] I would like to suggest that *es* in (24a) is the remnant of a small matrix clause, namely *es ist dass* 'it is that', as in (24b), which is similar to French *c'est que*.[9] Thus, it must be the case that both sentences in (24) originate from the same input. If one assumes that the expletive is a vector, the derivation of these sentences may proceed from input (25a). The matrix copula must realize V2, while the embedded verb may or may not stay in situ. If *hat* stays in situ, (24b) is derived, as shown in (25b); otherwise, it adjoins to the complementizer, which yields a parallelogram of four vectors, as shown in (25c). In such a structure where the parallelogram is rigidly defined by two adjunction lines, the longest diagonal runs from *es* to *hat*, bypassing both the complementizer and the copula.[10]

(25) a. [Es dass$_i$ ist] [die Maria$_i$ den Fritz geküsst hat] →

b. *Es* *dass* die Maria den Fritz geküsst hat ---- t_0
|
ist -------- t_1

Es=ist dass die Maria den Fritz geküsst hat. (= 24b)

c. *Es* ~~*dass*~~ die Maria den Fritz geküsst hat ---- t_0
| ⟍
~~*ist*~~ *hat* -------- t_1

Es hat die Maria den Fritz geküsst. (= 24a)

Now the question is why the subordinate verb does not realize V2 within the limits of its clause, i.e. by adjoining to the subject, as seen above. This may be due to the following facts: (a) the matrix clause is meaningless by itself, and (b) the verb may not end up in the middle of the sentence, which would be the case if it were to adjoin to *Maria*, (26). Thus, given (a), (26) is avoided while the grammar is enriched with a further construction.

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8 In fact, Müller suggests that, in German, Comp has an expletive feature that attracts the expletive pronoun, which then moves from a base-generated position inside the clause. This ensures that the expletive can never show up elsewhere.

9 This matrix clause, *c'est que*, is used in French as a causal marker. It is also used as a dummy matrix clause to extract *wh*-interrogatives without subject inversion, which is mostly obsolete in colloquial speaches (cf. Desouvrey 2008). There is also another small clause, *ce que* 'it that', which is analogous to Serbo-Croation *dali la*, as discussed in Desouvrey (2020). It is not clear if German has such a small clause like *es dass*, as assumed in the previous version of this paper.

10 Notice that both sentences in (24) have the same translation in French (according to Google Translate): *C'est que Maria a embrassé Fritz* 'It is that Maria kissed Fritz'. I do not know at this point if they really have the same meaning in German. Notice that the copula could be protected in (25c) if the resultant were to run from *(is)t* to *(da)ss*. It might be that the sacrifice of the meaningless copula is meant to induce some nuance.

(26) *Es die Maria=hat den Fritz geküsst.

To conclude this section, it appears that both the complementizer and negation cannot co-occur with V2. If V2 is realized, the verb becomes a live vector, and by its interaction with the matrix verb, it triggers the bypass of these elements. This fact, thus, confirms the hypothesis that the complementizer is a vector, just like negation. As for the expletive in front of a V2 clause, it is derived from a small matrix clause whose complementizer and copula are bypassed. In the next section, I will consider further facts regarding *wh*-extraction that support this analysis.

5. *Wh*-operators and V2

In this section, I will provide further evidence for the analysis presented above, showing that in embedded questions verb movement can cause the fatal disappearance of *wh*-operators by a bypass effect. Then I analyze in turn certain facts discussed in Salzmann (2005), namely long *wh*-extraction, long relativization, and long topicalization.

5.1 Embedded questions

In root clauses, German interrogatives are not significantly different from other languages, like English for example. *Wh*-objects must move outbound, i.e. to the left edge of the structure. In the present perspective, this is due to the fact that they are generally specified for a feature incompatible with adjunction to a host, namely [π].[11] For instance, sentence (27a) (adapted from Müller 2002, ex. 34a) can be derived as in (27b), where the fronted operator becomes a host for the verb.

(27) a. *Wen hat* die Maria geküsst?
whom has the Maria kissed?
b. [die Maria [[***wen*** geküsst] hat?]] → ***Wen***=*hat* [die Maria geküsst?]

In embedded interrogatives, however, V2 cannot be realized, as illustrated by the contrast in (28) (Müller 2008, ex. 40). I show that (28a) is impossible because the operator must be bypassed, as expected. The derivation of these sentences is detailed in (29). If from the input structure (29a), both verbs realize V2 in their respective clause, a configuration of four consecutive but not collinear vectors obtains, as shown in (29b). The highest vector, the matrix verb, targets the first segment of the

11 What triggers the *wh*-movement is the case features they share with the verb. Normally case-specified elements, whether pronominal clitics, adverbs, etc. must exit the VP under the Obligatory Contour Principle (OCP). The type of movement, outbound or inbound, depends on the feature [π] and [ω] (Desouvrey 2000 and subsequent work). I will not discuss the OCP effect, which seems to be generally irrelevant in SOV languages for other elements (non-*wh*), given the ban on string-vacuous movement.

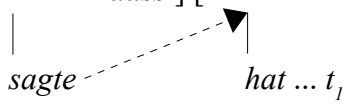
subordinate verb on the line *(we)r-h(at)*, and as a result the complementizer and the *wh*-operator are bypassed. Obviously, the loss of the operator, unlike the complementizer, is fatal to the derivation. If instead the subordinate verb stays in situ, the matrix verb aligns with the operator, directing the cursor to the first segment [*w*], which results only in the loss of the complementizer, (29c).

(28) a. *Er sagte, ***wer** hat den Fritz geküsst.
he said who.NOM has the Fritz.ACC kissed

b. Er sagte, ***wer*** den Fritz geküsst hat.

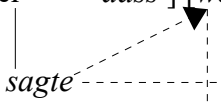
(29) a. [Er *dass* sagte] [*wer* den Fritz geküsst hat] →

b. *[er ~~*dass*~~] [~~wer~~ den Fritz geküsst] ... t_0



*Er=*sagte hat* den Fritz geküsst.

c. [er ~~*dass*~~] [*wer* den Fritz geküsst **hat**] ... t_0



Er=*sagte* ***wer*** den Fritz geküsst **hat.** (=28a)

To summarize, *wh*-operators cannot host V2 in embedded interrogatives, given the Parallelogram Law that causes them to be bypassed. I will return to this issue in the context of multiple questions in §6.

5.2 Long *wh*-extraction

Salzmann (2005) provides the example (30a) to the effect that *wh*-extraction from subordinate clauses is ungrammatical for speakers of standard German. He points out that those speakers use the sentence in (30b) instead, to circumvent this "functional gap", as he puts it. (Salzmann's example number are indicated in parentheses.)

(30) a. ***Wen** glaubst du, dass Petra ***t*** liebt? (ex. 1a)
who.ACC think you that Petra loves
'Who do you think that Petra loves?'

b. **Wen** glaubst du, liebt Petra? (ex. 3a)

Under our proposal, it is obvious that both sentences are derived from the same structure. Indeed, (30a)

differs from (30b) by the presence of the complementizer and the verb in final position, suggesting a common input. Now it is matter to characterize this fact so as to pinpoint exactly the line where both varieties part (30a being acceptable for speakers of other varieties). In the present perspective, this can be done straightforwardly. I suggest that these sentences are derived from an alternative input, which consists of an SVO matrix and a normal SOV subordinate clause. The natural input with a matrix SOV fails, as it requires some additional doubtful decision to be discussed shortly.

The derivation proceeds as follows. Starting from the left edge of the input structure (31a), the cursor passes through each element and allows their movement if necessary. No element in the matrix clause needs to move at this stage; in particular, the verb being adjacent to the first element cannot adjoin to it by virtue of the ban on string-vacuous movement. In the subordinate clause, the cursor gets to the operator and extracts it from the VP to the front of the structure, and then moves to the final verb. Suppose that the fronting of the operator to the left of the matrix clause forces the unification of both structures. On this view, the final verb can move further up (once the operator is extracted, the subject can no longer be a host) and adjoin to the complementizer, yielding the second derivational step, (31b). From this intermediate step, the matrix verb can realize V2 by moving to the operator across the subject, yielding (31c). In this structure, the matrix verb aligns with the subordinate verb, resulting in the bypass of the complementizer. This derivation can be said to be semantics-controlled, just like when the subordinate verb is forced to stay in situ in order to prevent negation from being bypassed. Otherwise the resultant would be normally the longest diagonal, running from *(we)*<u>*n*</u> to <u>*l*</u>*(iebt)*, and as result both the matrix verb and the complementizer would be bypassed, as in the case of the expletive matrix clause (cf. 25c).

(31) a. [du glaubst dass] [Petra **wen** liebt] →

b. **wen** [du glaubst dass=liebt Petra] →

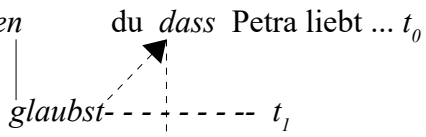
c. [*wen* du ~~*dass*~~ Petra

wen=glaubst du, liebt Petra. (=30b)

To derive sentence (30a), which is acceptable in other varieties, it suffices to assume that non-standard varieties ban V2 in complement clauses, as suggested above. Thus, the operator normally moves from the input (32a), while the verb stays in situ, as shown in the intermediate step (32b). Finally, the matrix verb realizes V2 by adjoining to the fronted operator, as in (32c). Obviously, there may be no bypass effect, as discussed above, and hence the complementizer is normally spelled out.

(32) a. [du glaubst *dass*] [Petra ***wen*** liebt] →

b. ***wen*** [du glaubst *dass*] [Petra liebt] →

c. 

wen=glaubst du dass Petra liebt. (=30a)

Now the question is why the fronted operator triggers the unification of the structures in the standard variety, so that the complementizer comes to host V2. I claim that the verb moves to the complementizer to avoid a superiority effect. Since the complementizer is a vector, extraction of the operator results in the violation of the Superiority Condition. The adjunction of the verb to the complementizer creates an inert vector cluster, which cancels the superiority effect right away, meaning it does not 'lay over' in an intermediate step. In the varieties that do not allow V2 in complement clauses, the superiority effect is transitory, as it is allowed at the intermediate stage of the derivation. Thus, in the second derivational step in (32b), there is a superiority effect, but it is eliminated in the last step when the operator becomes inert by hosting V2. Thus, it appears that in the standard dialect, the Superiority Condition is strictly enforced at any stage of the derivation, while the non-standard varieties are less strict, enforcing this condition only at the output.

To complete the analysis of (30), suppose that the matrix clause is SOV in the input, just like the complement clause, as shown in (33a). Since the derivation starts from the leftmost element, the matrix verb can realize V2 by adjoining to the subject, and then the operator is fronted. The subordinate verb may or may not realize V2, according to the variety. In any case, the matrix verb fails to have its widest scope, given the natural assumption that the host-adjunct cluster cannot be undone to allow a further movement. In addition the live operator comes to be in a superiority effect with respect to the complementizer in the non-V2 varieties. Alternatively, to save this input, one can think of a look-ahead situation, where the matrix verb delays V2 after the fronting of the operator, as in (33b). Then in the last step, the matrix verb moves to the operator, while the subordinate verb may or may not stay in situ, according to the variety.

(33) a. [du *dass* glaubst] [Petra *wen* liebt] →
**wen* [du=*glaubst dass=liebt* Petra] / **wen* [du=*glaubst dass* Petra liebt]

b. [du *dass* glaubst] [Petra *wen* liebt] → *wen* [du *dass* glaubst] [Petra liebt] →
wen=glaubst du ~~dass~~ =liebt Petra / wen=glaubst du dass Petra liebt

Although the derivation in (33b) yields the desired results, it seems unlikely that such a procedure is allowed in German. Normally an operation cannot stop from occurring automatically in the normal input in order to apply in a better environment. If this were possible, a vector could delay its movement if the potential host is a vector. It would allow a lower vector to move first so as to create an inert cluster; thus, it can take the highest position, as illustrated in (34), where A, B, and C are non-adjacent vectors. Therefore, I assume that a movement is obligatory if the structural description requires it; and if the derivation fails, an alternative input with an amended structural description or a proscription on the offending operation is generated, as seen above.[12] Of course, a failed derivation does not have to be repeated time and again if one assumes that the grammar 'logs' all ill inputs, those from which a well-formed sentence cannot be derived.

(34) [...A … B … C …] → [A=C … B …] → B [A=C …] (A=C is inert)

It turns out that the difference between both varieties comes down to their degree of tolerance vis-à-vis the superiority effect. The strict standard variety rejects any transitory superiority effect in the derivation, hence it forces the unification of the islands by moving the verb to the complementizer, which is thus disabled and bypassed. The other variety, which does not have V2 in complement clauses, is more liberal, as it allows the derivation to proceed with a transitory superiority effect.

5.3 Long relativization

Since the complementizer is a vector, one can assume that the other relative pronouns are vectors as well, as least in standard German. If this is right, extraction of a relative pronoun from an embedded clause is expected to run into problems, given the superiority condition. This is borne out. According to Salzmann (2005), there are no speakers of standard German that accept a relative clause like the following:

(35) *Ein Maler, **den** er glaubt, dass Petra ***t*** mag (ex. 1b)
a painter who.ACC he thinks that Petra likes
'A painter who he thinks Petra likes'

One can exactly show why this is the case. Whether the input includes two SVO or SOV clauses,

12 This point is surely a source of variations among languages, just like the strict vs. transitory superiority effect. Serbo-Croatian has what is referred to as a 'safe-conduct' which allows special operations to take place, as it is crucial to save the derivation from crashing. For instance, movement of auxiliaries clitics are an absolute necessity and hence any other operation must be delayed to make it happen. Similarly, a pronominal clitic with a deficient part on its right side must postpone its placement till last to prevent another element from disappearing (cf. Desouvrey 2020).

or one SOV and one SVO clause, a correct sentence cannot obtain. For instance, suppose that the derivation of this sentence proceeds from input (36a), where the matrix clause is SVO, while the complement clause is SOV. This type of input has proved to be successful in the derivation of long *wh*-extraction (cf. 31). Thus, as discussed above, the relative pronoun is fronted across the complementizer, giving rise to a superiority effect. Then in the same derivational step, the verb must move to the complementizer, yielding (36b), where the complementizer is normally bypassed. In this intermediate step, no further operation can take place, given the following assumptions: (a) the relative clause must ultimately adjoin to its head in another clause, and (b) a derivation may not have more than three steps including the input, a well-formedness condition referred to as the Derivation Equivalence Number (DEN ≤ 3) (cf. Desouvrey 2008, 2010, 2018, etc.). Under these conditions, if the matrix verb were to realize V2 by adjoining to the relative pronoun, the derivation would be overloaded (i.e. DEN > 3). In this variety, which is highly sensitive to the superiority condition, there would be no way to save this derivation.

(36) a. [er glaubt *dass*] [Petra *den* mag] →

b. *den* [er glaubt ~~*dass*~~ Petra] ... t_0

mag ... t_1

* Ein Maler, den er glaubt mag Petra.

It appears that the above derivation has too many problems that cannot be solved within the limits of DEN. If V2 does not occur in the complement clause, it might be improved for certain speakers. However, the superiority effect resulting from the obligatory extraction of the relative pronoun across the complementizer is insuperable, given the derivation has to make room for the adjunction of the relative clause to its head. If certain speakers accept it, it might that in their variety the complementizer and other relatives are neutral elements, not vectors.[13]

According to Salzmann, speakers of standard German use the construction shown in (37), as an alternative to (35). As he puts it, "In this construction, the preposition *von* 'of' precedes the (putatively) extracted phrase and a co-referential pronoun occurs in the dependent clause in the position of the (alleged) extraction site." (p. 354)

(37) ein Maler, **von dem** er glaubt, dass Petra **ihn** mag. (ex. 4b)

13 For non *wh*-vectors, for instance pronominal clitics, superiority effect is forbidden in some limited domain. Thus a vector can move across a higher vector in the same domain if it ends up non-vacuously in another domain (cf. Desouvrey 2018 and earlier work). If this is applied to *wh*-elements as well in a liberal variety, (35) may be acceptable.

a painter of who.DAT he thinks that Petra him likes

'a painter who he thinks that Petra likes'

Given the assumption that every element in the syntactic derivation must be present in the input, one cannot say that the relative phrase, *von dem*, has been extracted in the course of the derivation and replaced by a pronoun not present in the input. The only logical option is that it is generated in its surface position, juxtaposed to the matrix clause, and is linked by coreference with a pronoun filling its argumental position in the complement clause.[14]

As for the accusative preposition *von* heading a dative complement, this is a surprising co-occurrence under this theory, since features may not clash in the merging process. If the relative carries a case feature, normally it may not and need not be case-marked by any preposition. Now, given the assumption that there are only three cases that correspond to the grammatical relations of subject (nominative), direct object (accusative) and indirect object (oblique), dative is a thematic node to which an oblique case is attached, whereas nominative and accusative are each attached to a null thematic node, which is by default interpreted as agent and theme respectively (cf. Desouvrey 2010, 2013, 2018, etc.). Thus, I am led to hypothesize that this instance of *von* is such an element which has no oblique case (O) attached to its dative thematic node (δ), and in addition it is ω-specified, hence a vector. On this view, *dem* and *von* have the feature structure shown in (38a). If *von* is not a case assigner, what is it doing in this construction? I claim that *von* is used as a vector anti-vector, that is, its function is to disable the vector relative pronoun, so that the coreference relation with the resumptive pronoun can be established across the complementizer.[15] Let us assume that this instance of *von* enters the derivation as an inseparable particle to the relative pronoun. Alternatively, one can assume that feature fusion in the syntax, as in (38b), has the same effect as concatenation in morphology or host adjunction in the syntactic derivation, namely the inertness of the vectors. In any event, this analysis presents a further benefit: it gives us the rationale for the use of *dem* instead of the normal accusative relative in this construction. It may be due to the lack of a compatible anti-vector for the accusative relative pronoun. In effect, under the analysis that a complement must be either specified for the feature required by the head, or unspecified for it (cf. Desouvrey 2000 and earlier work), the head *dem* can merge with *von* (38b), unlike the head *den,* which has a null thematic node (38c).

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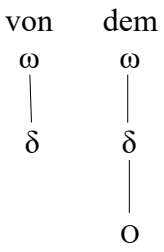
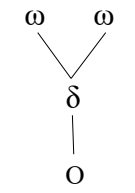
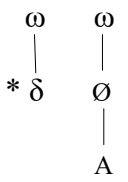
14 Salzmann discusses a construction in which an NP modified by *von dem* can be used in situ, although he admits that it is odd for most speakers. The reader is referred to Salzmann's paper for more details.

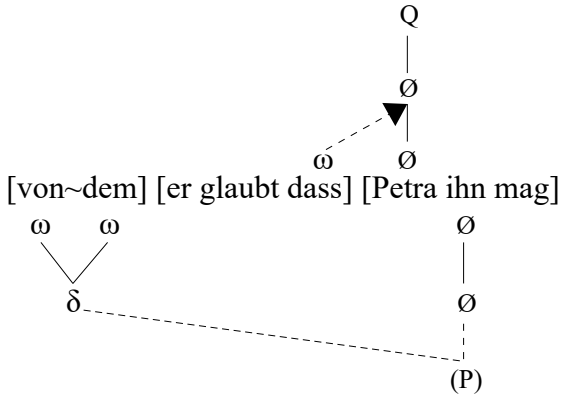
15 An anti-vector was first observed in Korean relative clauses (cf. Desouvrey 2010).

(38) a. 

b. 

c. 

Being an inert vector, the relative pronoun can be in a coreference relation with the resumptive pronoun across the vector complementizer. The referential representation of this sentence is as follows, setting aside other features including those from irrelevant elements:

(39) 

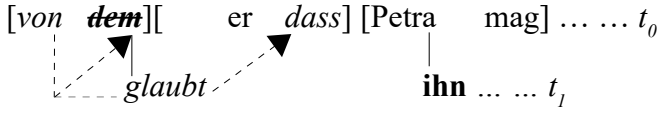
Under these assumptions, the derivation of (37) can proceed from input (40a), assuming an SVO order in both clauses for reasons to be discussed shortly. The accusative resumptive pronoun exits the VP under OCP and adjoins to the subject, yielding (40b) (=39). In the last possible step, the relative clause is adjoined to the head noun, as seen in (40c).

(40) a. *von* ***dem*** [er glaubt *dass*][Petra mag ***ihn***]

b. *von* ***dem*** [er glaubt *dass*][Petra=***ihn*** mag]

c. ein Maler=*von* ***dem*** [er glaubt *dass*][Petra=***ihn*** mag]

It is clear that V2 is not possible in the SVO complement clause. Indeed, there is no extraction, and hence no island unification that would allow the verb to reach the complementizer. In the matrix clause, V2 must not target the relative compound, *von~dem*. In effect, if it hosts V2, it must normally interact with the verb, since adjunction amounts to affixation. Thus, *von*, *dem* and *glaubt* would make up a parallelogram, and as a result the relative pronoun would be bypassed, as can be seen in (41).

(41) 

*von ~~dem~~ glaubt er dass Petra=ihn mag.

Let us now see why an SOV input is not suitable to derive (37). Input (42a) is propitious for V2, and therefore both verbs move to the first element of their respective clause. In the resulting structure, shown in (42b), movement puts the matrix verb in the fourth position, whereas the complementizer is normally bypassed. As suggested above, this structure is ruled out because the grammar, to ease its acquisition, does not allow a third choice for verb placement: either the verb stays in situ or it moves to the highest host. Notice that the matrix verb still may not target the relative pronoun, *dem*, for the adjunction would wake up the inert compound *von~dem*, triggering the bypass of *dem*.

(42) a. [*von~**dem***][er *dass* glaubt][Petra **ihn** mag] →

b. [*von~**dem***][er ~~*dass*~~] [Petra **ihn**] … t_0

glaubt ... *mag* ... t_1

von **dem* er=*glaubt* Petra=*mag* **ihn**

To conclude, this analysis accounts for the *von-dem* relative clause, explaining the mysterious appearance of the preposition *von.* We now know that its only function is to make the dative relative pronoun an inert vector, just like an in-situ verb, so that the coreference relation can be set up with the resumptive pronoun. It appears that V2 cannot take place in the matrix clause for two reasons: the verb may not move to the highest host, the relative pronoun, which is thus protected from being bypassed, and the derivation must make room for the adjunction of the whole relative clause to the head noun.

5.4 Long topicalization

Salzmann (2005) presents the topicalized sentence in (43a) as a further type of construction which is not acceptable for speakers of the standard variety. Those speakers use instead (43b). I will show that this variation arises from the fact that the standard variety does not tolerate any transitory superiority effect in the derivation, as discussed above. It seems that the existence of a construction like (43c) is due to a generalization of the strategy used in long relativization, since all speakers use it, as Salzmann points out.

(43) a. ***Den Maler** glaubt er, dass Petra ***t*** mag. (ex. 1c)
the.ACC painter thinks he that Petra likes
'The painter he thinks that Petra likes.'

b. **Den Maler**, glaube ich, mag Petra ***t***. (ex. 3b)
the.ACC painter think I likes Petra
'The painter I think Petra likes.'

c. **Von dem Maler** glaubt er, dass Petra **ihn** mag. (ex. 4c)
of the.DAT painter thinks he that Petra him likes
'The painter he thinks that Petra likes.'

The derivation of both (43a) and (43b) proceeds from the input shown in (44a) (the person alternation *er/ich* being irrelevant). The vector NP is extracted, while V2 is not yet possible in the matrix clause. For certain speakers, the unification of the islands automatically takes place, and the subordinate verb adjoins to the complementizer, yielding (44b) with no superiority effect. Then the derivation enters a third step where the matrix verb moves to the fronted NP. As shown in the resulting structure, (44c), the complementizer is bypassed. For other speakers, those who do not have V2 in complement clauses, the complementizer is not bypassed; but the vector NP and the adjoined verb yield an inert cluster, canceling the superiority effect in the output, as seen in (45).

(44) a. [er glaubt *dass*] [Petra *den Maler* mag] →

b. *den Maler* [er glaubt *dass=mag* Petra] →

c. *den Maler* er ~~*dass*~~ Petra … t_0
glaubt *mag* ... t_1

den Maler=glaubt er mag Petra. (strict variety)

(45) *den Maler* er *dass* [Petra mag]… t_0
glaubt ... t_1

den Maler=glaube er dass Petra mag (less strict varieties)

Let us turn now to (43c). One can observe that the subordinate verb is in final position, while the matrix verb is inverted with respect to the subject, suggesting a V2 effect. In addition, this structure is different from the relative clause in (37) in that the *von~dem* compound is presumably a determiner to the topicalized NP. As suggested above, it appears that there is no anti-vector available for the accusative determiner; the dative determiner is used instead with the anti-vector *von*.

One can posit for this sentence two SVO islands preceded by the topicalized phrase, as shown in (46a). The matrix verb realizes V2 by adjoining to the topicalized phrase, and then the cursor moves forward until it reaches the accusative resumptive pronoun, which then exits the VP. The structural

description for V2 is not met, hence the subordinate verb stays in situ, appearing in final position, as shown in (46b). I assume that the integrity of the determiner compound is maintained, so that it is inert like an in-situ verb, hence there is no bypass effect in this structure, contrary to (41) where the verb adjoins directly to the dative pronoun, breaking up the compound.

(46) a. *von dem* Maler [er glaubt *dass*] [Petra mag ihn]

b. [*Von dem* Maler er *dass*] [Petra mag] … t_0

glaubt ihn ... t_1

Von dem Maler=*glaubt* er *dass* Petra=ihn mag.

This strategy, which is available to all speakers, as Salzmann notes, can be used with *wh*-interrogatives as well. In parallel to the long *wh*-extraction in (30) above, (47a) is a possible alternative, which can be derived from an input similar to (46a), as shown in (47b).

(47) a. Von welchem Maler$_i$ glaubst du, dass Petra ihn$_i$ mag? (ex. 4a)
of which.DAT painter think you that Petra him likes
'Which painter do you think that Petra likes?'

b. [*von welchem* Maler$_i$] [du glaubst *dass*] [Petra mag ihn$_i$] →
[*von welchem* Maler=*glaubst* du *dass*] [Petra=ihn mag]

To conclude, V2, relativization, topicalization, and *wh*-extraction are sharply accounted for under our assumptions on vectors and their representation, particularly the parallelogram of forces that creates the bypass effect. Further evidence will be provided in the next section.

6. V2 and multiple questions

It is generally assumed that the Superiority Condition does not hold in German (e.g. Grohmann 1997, Müller 2002). The general assumption is that this condition is a parameter which may or may not be active in a given language. Under the present approach, this condition is due to a specific feature inherent in operators and negation, namely [ω], but which may be found incidentally in any grammatical category across languages. As seen above, this feature can be disabled, given (6). In the case of multiple questions, one expects that two operators may commute as long as one of them becomes inert in the course of the derivation (cf. Desouvrey 2020). This is borne out, as I show immediately.

Consider the sentences in (48), which illustrate the simplest case of multiple questions (cf. Heck

and Müller 2000, ex. 14, referring to Haider 1983). As can be seen, the order of the operators is not fixed, which prompts many to assume that the Superiority Condition has no effect in German. I contend that in both of these sentences, the higher operator is inert, and therefore there is no superiority effect in (48b).

(48) a. **Wer** hat **wen** getroffen?
who has whom met
b. **Wen** hat **wer** getroffen?

The derivation of these sentences proceeds from the input (49a). The cursor moves successively to each element until it reaches the auxiliary verb, which then realizes V2 by adjoining to the highest operator, as seen in (49b). If instead the second operator is fronted from the same input, it must serve as a host for the auxiliary, as in (49c). In any case, the cluster operator-verb is inert at the output. Both sentences are presumably perfect for all speakers, including those of the standard dialect, since the superiority effect arises and disappears in the same derivational step. We may note that, in this structure with three meaningful vectors, there may be no bypass effect, as the resultant links vacuously *(ha)t* with *w(en)/w(er)*.[16]

(49) a. [***wer*** [***wen*** [getroffen hat]]] →
b. ***wer***=*hat* ***wen*** getroffen
c. ***wen***=*hat* ***wer*** getroffen

It turns out that V2 disables the fronted operator, which results in the prevention of any superiority effect. In a complex structure with multiple operators, extraction of the lower operator may not be possible in any variety, given the Parallelogram Law. This fact can be illustrated with the contrast in (50) (cf. Heck and Müller 2000, ex. 12 and 13). Let us assume the natural input (51a), where the participle verb precedes its complement. From left to right, a series of movement takes places successively in one derivational step: firstly, the matrix verb realizes V2 by adjoining to *wer* 'who', then the second operator is fronted, and finally the subordinate verb adjoins to the complementizer, as shown in (51b). As can be seen, the five vectors forms two parallelograms in which the subject operator and the complementizer are bypassed. Therefore, the structure is rejected. In the varieties that do not have V2 in subordinate clauses, the embedded operator is fronted, but the embedded verb stays in situ,

16 It should be noted that in this structure, both operators pair off and make up a cluster of similar elements, which thus are complementary. The integrity of such a cluster must be preserved, so that there is no bypass anyway (cf. Desouvrey 2022).

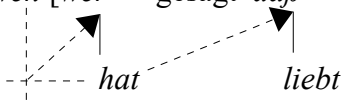
yielding (51c), where the complementizer surfaces while the subject operator is still bypassed.[17]

(50) a. **Wer** hat gesagt daß Maria **wen** liebt?
who has said that Maria whom loves

b. ***Wen** hat **wer** gesagt daß Maria liebt?

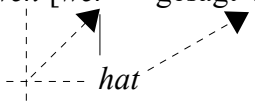
(51) a. [***wer*** gesagt *daß* hat] [Maria ***wen*** liebt] →

b. **wen* [~~*wer*~~ gesagt ~~*daß*~~ Maria]



*wen hat gesagt liebt Maria.

c. **wen* [~~*wer*~~ gesagt *daß* Maria liebt]

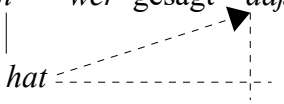


*wen hat gesagt daß Maria liebt.

If instead the matrix clause is SVO, as in (52a), so that V2 must be delayed after the fronting of the embedded operator, the subject operator is still bypassed in both varieties, as shown in (52b,c).

(52) a. [***wer*** hat gesagt *daß*] [Maria ***wen*** liebt] →

b. *[*wen* ~~*wer*~~ gesagt *daß*] [Maria liebt] (non standard)



**Wen hat* gesagt *daß* Maria liebt.

c. *[*wen* ~~*wer*~~ gesagt ~~*daß*~~ Maria] (standard)

**Wen hat* gesagt *liebt* Maria.

One can conclude that the well-formed sentence (50a) is obtained from input (51a) in which the operators are in situ, while V2 is realized in the matrix clause but not in the complement clause, as shown in (53a). One might now ask why V2 is not realized in the standard variety, since its structural

17 The parallelogram made up of *wen*, *wer*, and *hat* in (51) is similar to that of (49), except that the verb is adjoined to the second operator in (51). It so happens that the adjunction line, which runs through its last segment, makes its bypass inescapable. Quite contrary, in (49) the parallel passes through the first segment of the second operator, which allows an alternative to a diagonal running from *(we)n* to the (*ha)t-w(er)* intersection, which would cause the bypass of the verb.

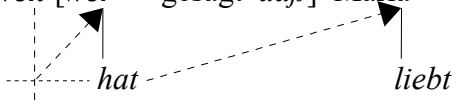
description is met in the embedded clause. The thing is that movement of the verb across the operator would trigger the bypass of the complementizer in the second step. Then, since the subject operator is inert in a V2 cluster, the lower operator would move freely to the front of the structure, i.e. without inducing a superiority effect. As a result, the subject operator would be in a parallelogram and hence would be bypassed, as seen in (53b). Notice that the operator cannot be forced to stay in situ, as in (53c), given the assumption that such elements must move up whenever possible for scope reason.

(53) a. [***wer*** gesagt *daß*] [Maria **wen** liebt]

hat

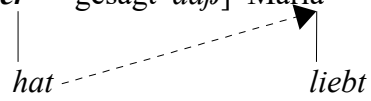
wer=hat gesagt daß Maria **wen** liebt. (=50a)

b. ***wen*** [~~***wer***~~ gesagt ~~*daß*~~] Maria



***wen** hat gesagt Maria=liebt

c. [***wer*** gesagt ~~*daß*~~] Maria ***wen***



****wer**=*hat* gesagt Maria=*liebt* ***wen.***

A different situation arises in multiple embedded questions. In (54), taken from Grohmann (1997, ex. 2), the subordinate verb stays in situ, but the operators can still commute, a fact which is not expected under the analysis presented above. I argue that this type of structure is made possible by a further vector effect, which prevents either operator from being bypassed.

(54) a. Ich frage mich **wer was** gekauft hat.
I wonder myself who what bought has
'I wonder who bought what'

b. Ich frage mich **was wer** gekauft hat.

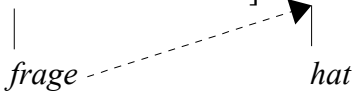
The derivation of these sentences proceeds from input (55a).[18] If both the matrix and the embedded verbs move to V2, a fatal bypass effect occurs, resulting in the elimination of the complementizer and the first operator, as seen in (55b). Similarly, if instead the second operator moves

18 In German the ω-specified complementizer is compatible with embedded interrogatives; thus it must be present in the input. In languages like French and English, where it is not a vector, it must be deleted (cf. Desouvrey 2008).

to the front of its clause and becomes a V2 host, it must be eliminated by a bypass effect, (55c).

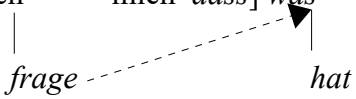
(55) a. [Ich mich *dass* frage] [*wer* [[*was* gekauft] hat]] →

b. *[ich mich ~~*dass*~~] ~~*wer*~~ [*was* gekauft]



*Ich *frage* mich *hat was* gekauft.

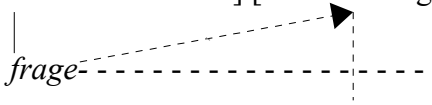
c. *[ich mich ~~*dass*~~] ~~*was*~~ [*wer* gekauft]



*ich *frage* mich *hat wer* gekauft.

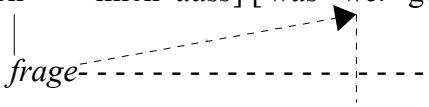
However, if the embedded verb stays in situ, the diagonal runs from the matrix verb to the lowest operator for a maximum PD, as shown in (56). As a result, any vector in between should be bypassed. However, I show that the operators can avoid being bypassed, unlike the complementizer. The thing is that the lowest operator can move to the front of its clause under the right condition. Suppose that when two operators are paired off, the lowest one is enabled to move up to any available position (here the left edge of its clause) without incurring a superiority effect, as in (56b). Once *was* is moved, *wer* becomes the lowest vector. Then, the same process is repeated again and again: the resultant keeps swinging from one operator to the other, which then moves accordingly in a potentially endless alternation. Let us refer to this as a 'pendulum effect'. In such a situation, I assume that neither of the operators can be bypassed; thus either (56a) or (56b) spells out randomly to exit the loop.

(56) a. [ich mich ~~*dass*~~] [*wer* *was* gekauft hat]



Ich *frage* mich wer *was* gekauft hat. (=54a)

b. [ich mich ~~*dass*~~] [*was* *wer* gekauft hat]



Ich *frage* mich *was wer* gekauft hat. (=54b)

Under the present analysis, operators normally may not commute, just like other vectors. However, a lower operator can move across a higher operator if it is intended to host V2, in which case it makes up an inert cluster with the verb. It appears that commutation of operators is also possible

when the highest operator can pair off alternately with two operators, giving rise to a pendulum effect.

7. Concluding remarks

I have suggested that the inseparable past participle morpheme *ge* plagues the conjugation system, making tensed verbs inert vectors. In order to become live vectors, German verbs must get rid of this morpheme by moving to the highest phrase of the sentence. As a result, a V2 effect obtains. In complex sentences, the movement is thwarted by a remarkable newfound vector interaction, namely the bypass effect, which eliminates intermediate vectors if the sequence is not aligned in the same timing tier.

This theory makes it possible to account for certain dialectal variations regarding long *wh*-extraction and long relativization. In standard German, where both phenomena are barred, no transitory superiority effect is allowed. V2 is obligatory and extraction triggers island unification, so that the verb can target the complementizer in order to disable it as a vector. In other varieties, V2 is not required in complement clauses, allowing a transitory superiority effect in the derivation, and as a result the complementizer surfaces.

The bypass effect may help shedding new light on bridge verbs in English, which has been historically a V2 language. Under the proposed analysis, it is possible that the complementizer in old English is a vector, which is bypassed under V2. The cause disappears, but its effect persists in modern English, as the complementizer can be omitted with such verbs. As for the prime cause of V2 in old English, it might be due to an analogous particle to German *ge.* One that comes to mind is, of course, the infinitive marker *to*. It is possible that it first appears as an ill affix to every verb, but only infinitive verbs trigger its setup in the morphology. Over time, V2 is phased out and this particle evolves to become a preposition.

If this view is correct, one can attempt an explanation as to why English modals are incompatible with *to*, which can neither precedes nor follows them. It might be that although the ill *to* (i.e. not attached to its skeleton) disappears elsewhere, as well as the attachment rule, it survives in this specific paradigm. On this view, it must be the case that these verbs underlyingly carry this floating affix; for instance, modal *can* must actually be *to~can*. If it is assumed that *to* has always been a vector, the derivation of a simple sentence like *he can go* may be as shown in (57). Whether or not the modal is a vector in modern English, the sound preposition *to,* as a vector, is attracted to the ill prefix, adjoining to its bare skeleton, (57b), and therefore disappears with it in the derivation. It is just like hanging on to a branch that is being cut.

(57) a. he *to*~can *to* go. (input)

b. h e *to* ~ c a n g o
   | | | | | | | |
   x x xx~ x x x x x
      |
      x x
      | |
      t o

   he ~~*to*~~ = ~~*to*~~ ~can go → he can go.

If the analysis presented above is correct, V2 must be different from other processes that shift the verb to an apparent second position. In standard French, for instance, the verb appears in second position in certain interrogatives. In Desouvrey (2000), it is shown that this is due to an instance of the OCP which is analogous to the gemination in phonology. The OCP forces the case-specified argument to exit the VP, but it still repels the intervention of any element between the verb and its case-specified argument. For instance, this effect can be seen in the derivation of the sentence in (58a). From the SVO input (58b), the operator is fronted under OCP. As a result the nominative subject, which comes to be sandwiched between the verb and the operator, moves rightward to the verb.

(58) a. Que voulez-vous?
   What.ACC want you.NOM
   'What do you want?'
   b. [vous [voulez que]] →
   que [vous voulez] →
   que voulez=vous

More generally, if a case-specified element, including certain adverbs, occupies the first position in the sentence, a case-specified subject (clitic) must be ejected from its normal position under OCP.

In Mainland Germanic languages, including Yiddish, V2 occurs normally in both root clauses and complement clauses, as Fanselow (2004) points out. Its rationale is yet to be found. The present analysis offers a drastic reduction of the number of avenues available. One has to find out what morpheme is underlyingly present in tense verbs, and whether V2 is of the German or Serbo-Croatian type.

In German, the non-realization of V2 is not fatal to the derivation because the ill morpheme arises by affixation in the morphology. In effect, there is a boundary between *ge* and the verb stem, so that the cursor can skip the ill affix and process the verb. In Serbo-Croatian, however, the ill segments are part of the lexical word, and thus there is no morphological boundary. Therefore, if one segment is not

valid, the whole word has to be discarded, resulting in the crash or the derivation.

8. References

Anderson, Stephen R. (1993). Wackernagel's revenge: Clitics, morphology, and the syntax of second position. Language 69(1), 68–98.

Bayer, Josef (2008). What is Verb Second? www.researchgate.net

Desouvrey, Louis-Harry (1997). Relativization in French without complementizer. In *CLA Annual Conference Proceedings*, p. 73-84. Memorial University, St-John.

Desouvrey, Louis-Harry (2000). Romance Clitics and Feature Asymmetry: An Autosegmental-Based Approach. Doctoral dissertation. http://ling.auf.net/lingBuzz.

Desouvrey, Louis-Harry (2003). The Proper Treatment of Coreference Relations. www.semanticsarchive.net.

Desouvrey, Louis-Harry (2006). Underspecification and Long-Distance Antecedent: The Case of Chinese Ziji. www.semanticsarchive.net

Desouvrey, Louis-Harry (2008). Vector Effects on Wh-Interrogatives. http://ling.auf.net/lingBuzz/000755/ and www.semanticsarchive.net.

Desouvrey, Louis-Harry (2009). Nominal Predication, Relative Clauses and Wh-Extraction: The Amazing Syntax of Haitian Creole *Se*. http://ling.auf.net/lingBuzz/000987

Desouvrey, Louis-Harry (2010). The Syntax of the So-Called Internally-Headed Relative Clauses: A Study of Korean Clause Structures. http://ling.auf.net/lingbuzz/001170.

Desouvrey, Louis-Harry (2013). Periodic Linking : The How, Where and Why of Ergativity and Analogous Phenomena. Http://ling.auf.net/lingbuzz/001655.

Desouvrey, Louis-Harry (2018). The Syntax of Italian Clitics. http://ling.auf.net/lingBuzz

Desouvrey, Louis-Harry (2019). The Syntax of Romanian Clitics. http://ling.auf.net/lingBuzz

Desouvrey, Louis-Harry (2020). The Origin of the Wackernagel Effect in Serbo-Croatian. http://ling.auf.net/lingBuzzt/005586

Desouvrey, Louis-Harry (2022). Japanese Relative Clauses and the Parallelogram Law.

Fanselow, Gisbert (2004). Münchhausen-style headmovement and the analysis of verb second. In Ralf Vogel (ed.), Three Papers on German Verb Movement. Linguistics in Potsdam 22.

Goldsmith, John (1979). Autosegmental phonology. New-York: Garland.

Grohmann, Kleanthes K. (1997). German Superiority. In Werner Abraham and Kleanthes K. Grohmann, eds. 1997. Groninger Arbeiten zur germanistischen Linguistik 40, 97-107.

Haider, Hubert (1983). Connectedness Effects in German. *Groninger Arbeiten zur Germanistischen Linguistik* 23, 82–119.

Heck, Fabian, and Gereon Müller (2000). Successive Cyclicity, Long-Distance, Superiority, and Local Optimization. In WCCFL 19 Proceedings, ed. Billerey and Lillehaugen, pp. 218-231. Somerville, MA: Cascadilla Press.

Kaye, Jonathan, and Jean Lowenstamm (1984). De la syllabicité. In F. Dell et al. (eds) *Forme sonore du langage: structure des représentations en phonologie*. Paris: Hermann.

Leben, William (1973). Suprasegmental Phonology. PhD dissertation, MIT.

Levin, Juliette (1985). A Metrical Theory of Syllabicity. Doctoral dissertation, MIT.

McCarthy John (1981). A prosodic theory of nonconcatenative morphology. Linguistic Inquiry 12: 373-418.

McCarthy, John (1979). Formal Problems in Semitic Morphology and Phonology. Doctoral dissertation, MIT.

Müller, Gereon (2002).Verb-Second as vP-First. In Syntax at Sunset 3. Head Movement and Syntactic Theory, Anoop Mahajan (ed.).UCLA/Potsdam Working Papers in Linguistics 10. 116-160. University of California, Los Angeles.

Salzmann, Martin (2005). On an Alternative to long A'-movement in German and Dutch. In Proceedings of ConSOLE XIII, 2005, 353-375. http://www.sole.leidenuniv.nl

Thiersch, Craig L. (1978). Topics in German Syntax. Doctoral dissertation, MIT.