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How much verb moves to second position?

Abstract: In this chapter, it is shown that finite verbs which are attracted by Verb-Second (V2) movement are reconstructed into their base position for interpretation. In fact, the lexical part of the finite verb is never interpreted in its fronted position. We present two groups of empirical findings which strongly support this conclusion. The first group provides grammar-internal evidence for reconstruction, the second group shows that the verb's reconstruction can also be traced in the process of human sentence comprehension. The German verb *brauchen*, which happens to be a negative polarity item and thus needs to be interpreted in the scope of negation, provides evidence for the reconstruction process in on-line comprehension. Our discussion is embedded in a review of sentence processing in German. It is shown how processing can be efficient despite the fact that the verb's semantic contribution may be delayed. Our account of V2 in grammar and parsing supports a rather tight link between the competence grammar and the dynamics of sentence processing.

1 Introduction

With the exception of modern English, the Germanic languages share the remarkable property that the finite verb appears in a higher position in the root clause than in the embedded clause. In German, a language that has retained the head-final structure of the older Indogermanic languages, this is most visible due to the fact that the finite verb appears in sentence-final position in the embedded clause whereas it appears in first or second position in the root clause.

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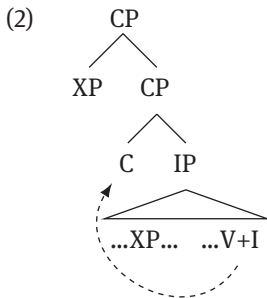
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- (1) a. ... dass Johann Socken kaufte
 that Johann socks bought
 ‘... that Johann bought socks’
- b. Kaufte Johann Socken?
 bought Johann socks
 ‘Did Johann buy socks?’
- c. Johann kaufte Socken
 Johann bought socks
 ‘Johann bought socks.’

Following a long tradition of research that dates back into the late 19th century, the Principles and Parameters approach to generative syntax suggested for German a phrase structure roughly like in (2), in which C is a functional head position that, in the embedded clause hosts a complementizer and in the main clause, the finite verb which has picked up its finiteness features from a clause-final functional head called I (for inflection).



Any theoretical detail aside, the important point here is that the finite verb (here V+I) is “actually” in clause-final position and comes to stay in V2 (or V1) position only as a result of movement by which the verb is taken out of its lexical projection and is inserted into a higher functional head position, conventionally called the “C-position” because it shares a number of properties with the position in which one usually finds the complementizer.

Two important properties of V2 are that (i) it is exclusively the *finite* verb which undergoes this shift, and that (ii) it is only the minimal finite verb that moves. According to Kremers (2009), it is a prosodic word ω . In particle verbs like *anrufen*, the particle *an* is a separate prosodic word. The particle verb as a whole is a phonological phrase ϕ . The finite particle verb *anruft* is then as in (3a). (3b) shows that the C-position is filled only with the ω -element that carries the finiteness features.

- (3) a. (φ (ω an) (ω ruft))
 b. [_{CP} er [_{C'} (ω ruft) [_{IP} mich morgen ... (ω an)]]]

One is under the strong impression that V2 has to do with semantics only in so far as the finiteness feature or feature bundle consisting of tense, number, person and mood should be in the higher position. The fact that the particle makes an essential contribution to the meaning of the verb in a particle verb construction, as illustrated in Section 2.1.1, appears to be totally irrelevant to the V2 order. To express it more radically, V2 is only accidentally related to the verb, namely by the (Indoeuropean) property that the finiteness feature is spelled out on the verb.¹ Morphological integrity (“You must not linearly separate the (verb) stem from the inflectional morpheme!”) will then condition the verb to travel along with the finiteness information encoded in the inflectional morpheme.² This process has become known as *Generalized Pied Piping*, the smallest consensus that can satisfy both the PF and the LF interface (see Chomsky 1995: 264). If this line of thought is on the right track, we land at the conjecture in (4), which we will in fact defend in the rest of this article.

(4) **Conjecture about V2**

The finite verb that appears in 2nd position in a V2 language is in this position only for the reason of generalized pied piping. Even when it is perceived in V2-position, its lexical part is evaluated in its base position, i.e. in German in clause-final position.

¹ See e. g. König & Gast (2012: 194) who advocate *finite-second*, rather than *verb-second* as the accurate description.

² In Warlpiri as described by (Hale 1983), finiteness is obviously morphologically disconnected from the verb. Warlpiri is an X2 language albeit not a V2 language. Why? Because the 2nd position is taken by finiteness morphology whereas the verb can be elsewhere. Legate (2008) argues that the aspect and agreement markers in Warlpiri are (second position) clitics, that attach either to auxiliaries or complementizers.

Ngajulu-rlu ka-ma-ngku nyuntu nya-nyi
 I-ERG PRES-1SUBJ-2OBJ you see-NON.PAST
 ‘I see you’

(Hale 1983: 18)

Tohono O’odham (Papago) is another V2 language in which the finiteness marking is always realized as an auxiliary in second position and never through inflectional affixes on the lexical verb. Consequently in O’odham, the lexical verb never occupies the second position (Zepeda 1983, Miyashita 2006).

What kind of movement is V2? Difficult to say. V2 has one clear property of movement: it leaves a *copy*.³ We will give ample demonstration of this. On the other hand, it had been debated whether V2 is head movement. There is no evidence for intervention in the sense of Relativized Minimality (Rizzi 1990) as it would be expected under the Head Movement Constraint (Travis 1984). Müller (2004) goes as far as suggesting that V2 is actually movement of a vP from which everything but the finite verb has been evacuated.⁴ Whatever has been suggested along these lines, we will not go into any of these details. We will rather stick to the traditional assumption that V2 is a special kind of head movement, and that this movement leaves a copy in the base position.

The concept that a moved element is interpreted in a lower position, from which it has been moved at an earlier stage of the derivation, is known as *reconstruction*, see Sportiche (2006) for a comprehensive overview. Interestingly Sportiche (2006: 69–72) notes that preposed predicates must always, obligatorily reconstruct into their base position, an observation known as the *argument/predicate asymmetry* (Barss 1986: 186–194, Heycock 1995). Hence despite V2 movement, there is independent evidence that verbal elements have to be interpreted in their base position.

In the following sections, this will be demonstrated with selected data from German, some already known, others new. Hopefully, we can convince the readers that all of them speak in favor of (4). We will begin with empirical observations that support the two subclaims of (4), namely that the C-position is not the locus of lexical interpretation (Section 2.1), and that the lexical meaning of the verb must be evaluated in its base position (Section 2.2). In Section 3 we will first give an overview of previous sentence processing studies and show that they are in line with the conjecture in (4) before we present a self-paced reading study that successfully reveals the predicted processing correlates of the reconstruction process. In Section 4 we will discuss some consequences of reconstruction on the comprehension process in German before we end with a conclusion in Section 5.

³ According to (Chomsky 1995: 206; 251ff), a trace of movement is such an inaudible copy of the moved constituent.

⁴ Phrasal movement instead of head-movement would kill the connection that researchers, most prominently Jacob Wackernagel (1853–1938), traced between V2 and cliticization; see especially Anderson's (1993) important contribution.

2 Theoretical investigation of V2-movement

2.1 Closer inspection of the C-position: Challenging an early lexical contribution

2.1.1 Particle verbs

Given the split that V2 induces in the PF-representation of particle verbs, we face a completely unexpected constellation. Parts of the lexical representation of the verb are not only non-adjacent, the linear distance between them can, in principle, be infinitely large.

- (5) Johann *rief* den Mann, [der ..., nachdem jemand, [der ...]], ... *an*.
 Johann called the man who after somebody who at
 ‘Johann called the man [who ... after somebody [who ...]]’

V2 looks like a blatant violation of Behaghel’s first law which says that “mentally closely related elements appear side by side”.⁵ While many particle verbs are formed according to rules of semantic compositionality, there are various particle verbs which resist the Fregean principle. Particle verbs such as *an+hören* (*at+listen*, ‘listen to’), *zu+hören* (*to+listen* ‘pay attention by listening’, *auf+steigen* (*up+climb* ‘climb up’), *ab+steigen* (*down+climb* ‘climb down’) exhibit more or less transparent semantic compositionality; *anhören* is some kind of listening, and so is *zuhören*; *aufsteigen* is some kind of climbing, and so is *absteigen*. However, this is not the case in the following.⁶

- (6) a. *auf+hören*
 up listen
 ‘to stop’
- b. *an+fangen*
 at catch
 ‘to start’

They are entirely non-compositional. *Aufhören* is not some sort of listening, and *anfangen* is not some sort of catching. The meaning of these verbs is like

⁵ “das geistig eng Zusammengehörige auch eng zusammengestellt wird” (Behaghel 1932: 4, § 1426) [english translation in the text above J. B.]

⁶ There are clearly more. For all of them, their meaning has to be stored holistically.

the meaning of idioms. For idioms it is established that they can only be split into pieces if these pieces relocate into a contiguous D-structure.⁷ Idiosyncratic meaning does, of course, not prevent these verbs from adhering to V2-movement. Thus, especially for them, V2 looks like a completely dysfunctional representation. Bierwisch (1983: 146–147) points to semantic ambiguities which can arise when such verbs are being used. Consider his well-chosen example of a V1-construction in (7).

- (7) Hört der Pianist ... noch vor der Probe {zu üben
 listens the pianist yet before the rehearsal to practicing
 auf+hört/ die Bänder an+hört}?
 up the tapes at
 ‘Does the pianist ... {stop practicing/listen to the tapes} before the rehearsal?’

As Bierwisch points out, the space which is signalled by the dots can in principle be of arbitrary length. Nevertheless, the variant of example (7) in which the resolution terminates in the non-compositional meaning ‘to stop’ does not present an intuitively noticeable semantic parsing problem.

The solution to the problem of particle verbs must be sought in the syntax of V2. If it is indeed the case, that the minimal finite verb leaves a copy in the clause-final position and appears in the C-position for the only reason of activating the finiteness features (for whatever illocutionary purposes), the verb as a lexical element is interpreted in the position of the copy. Regular semantic composition is then possible in agreement with Behaghel’s first law, and the idiomatic or idiosyncratic meaning of opaque verbs like those in (6) is established in an unspectacular way. Last not least, the semantic resolution of local ambiguities as seen in (7) will be delayed until the base position of the finite verb (i. e. its copy) can be activated.⁸

⁷ *The shit seems to hit the fan* is ok because the D-structure is *seems [to [the shit hit the fan]]* (see Hornstein et al. 2005: 81–84).

⁸ From a processing perspective, one could expect a garden path effect. However, garden paths do not arise for reasons of semantic ambiguity but for reasons of revisions of syntactic structure. The example in (7) does not involve any such syntactic revision, see also Section 4, in particular footnote 31. This does not seem to be common currency, as is demonstrated by the inclusion of lexical ambiguity in the definition of *garden path* in Glück & Rödel (2016: 220).

2.1.2 Periphrastic *tun*

Certain registers or dialects of German have the possibility of inserting *tun* ('to do') as the carrier of finiteness morphology.⁹

- (8) a. Ich glaube, dass der Johann grade den Müll hinunter
I believe that the Johann now the garbage down
tragen tut.
carry does
'I believe that Johann is right now carrying the garbage down.'
- b. Der Johann tut grade den Müll hinunter tragen
the Johann does now the garbage down carry
'Johann is right now carrying the garbage down.'

Unlike *do* in English examples of *do*-support, German *tun* appears to retain agentive semantics. It requires a *vP* that is headed by an activity verb such as *tragen* in (8). Closer inspection reveals, however, that it is quite compatible also with stative verbs as long as these can be interpreted as stage-level predicates.¹⁰ This is the case in (9):

- (9) Die Clarissa tut den ganzen Tag auf dem Sofa liegen.
the Clarissa does the whole day on the sofa lie
'Clarissa is lying the whole day on the sofa.'

⁹ For details of this construction see Abraham (2013), Abraham & Fischer (1998), Schwarz (2004), and Bader & Schmid (2006) among various others. There is a tendency for *tun* to occur in the C-position, but its occurrence in clause-final position, as in (8a), is by no means ungrammatical. A reviewer disagrees with our judgments but surprisingly accepts (10a) and (10b) below. For this reviewer, periphrastic *tun* is not possible in clause-final position. It is, however, easy to find such examples in great number on the internet and respective corpora, such as (i), one of more than 200 hits in the DeWaC corpus (Baroni et al. 2009).

(i) *So ist es dafür nicht ausgelegt, dass man sich das spritzen tut.*
'So it is not made for injecting it.' (DeWaC: #152774805)

¹⁰ Maienborn (2003: 62–63) uses the incompatibility with the *tun*-periphrasis as a heuristic to identify Kimian statives. She also notes that this contrast vanishes in VP-topicalization (see also Rothmayr 2009: 30–31).

Tun is incompatible with an individual-level predicate such as *to own*, *to resemble*, *to lie on a lake* etc., illustrated in (10).¹¹

- (10) a. *Der Johann tut einen guten Charakter besitzen.
 the Johann does a good character own
 ‘Johann has a good character.’
- b. *Der Johann tut seinem Vater ziemlich ähneln.
 the Johann does his father much resemble
 ‘Johann resembles his father quite a lot.’
- c. *Konstanz tut am Bodensee liegen.
 Konstanz does at-the Bodensee lie
 ‘Constance lies at Lake Constance.’

While there may also be further semantic restrictions, this diagnostic seems to be sufficient for the following argumentation. Notice first that the verb *tun* in V2-position will under our previous assumptions invariably appear in clause-final position for the purposes of core syntactic computation. As such it displays its semantic effects which may be compatible with the predicate as in (8) and (9) or not as in (10). Interestingly, the semantics of *tun* can be suspended. This is the case when the predicate has been moved to Spec-CP such that no finite verb would be left to satisfy the V2-requirement. In this case, *tun* steps in as a last-resort option, and it does so without displaying any lexical semantic effect.¹² Consider the following well-formed versions of (10). They have been slightly adjusted for stylistic reasons.

11 Yvonne Viesel (p.c.) confronted us with the following song text:

- (i) *Schön ist ein Zylinderhut, / juppheidi, juppheida, / wenn man ihn besitzen tut, / juppheidi, heida.*
 ‘Nice is a top hat juppheidi juppheida if you do it own juppheidi juppheida.’ https://www.lieder-archiv.de/schoen_ist_ein_zylinderhut-notenblatt_100096.html

We assume that in this genre, rhyme can easily win over aktionsart. We found another counter example with *ähneln* ‘to resemble’ which seems to be the most acceptable of the three verbs in (10). Nevertheless the contrast to examples like (8) and especially (11) remains robust.

- (ii) *Kennt wer ein Spiel was Aion stark ähneln tut?*
 knows anyone a game that Aion strongly resemble does
 ‘Does anyone know a game that strongly resembles Aion?’ <https://board.de.aion.gameforge.com/index.php/Thread/3060-Server-down/?pageNo=7>

12 See Bayer (2017) for an explanation of semantic suspension that goes beyond this isolated case.

- (11) a. [Einen guten Charakter besitzen] tut der Johann auf alle Fälle.
 a good character own does the Johann in any cases
 ‘Johann has a good character in any case.’
- b. [Seinem Vater ähneln] tut nur der Johann.
 his father resemble does only the Johann
 ‘Only Johann resembles his father.’
- c. [Am Bodensee liegen] tut Stuttgart zum Glück nicht.
 at-the Bodensee lie does Stuttgart luckily not
 ‘Luckily, Stuttgart does not lie at Lake Constance.’

A semantic conflict would invariably result if *tun* were semantically “reconstructed” into the clause-final position. The fact that such a conflict is absent proves that *tun* is inserted in V2-position as a default operation. The presence of *tun*, in this case, reduces to nothing else but the presence of the finiteness features in C. Here, the German *tun*-construction is comparable to English *do*-support, which demonstrably lacks the semantics of an action verb.¹³ The desemantization of *tun* is only possible with *tun* in second position, never with *tun* in clause-final position. This proves that the locus of semantic interpretation of the finite verb is the clause-final position.

Thus, we have another important piece of evidence that in all the regular cases in which the finite verb is in V2-position, it is reconstructed into the clause-final position, – hard to believe from the viewpoint of common sense but inevitably true in the abstract world of grammar.

13 Consider the striking difference between (i) and (ii) and the even more striking similarity between (i) and (iii).

- (i) *Does he know French?*
- (ii) **Tut er Französisch (sprechen) können?*
 does he French speak able to
- (iii) *Französisch (sprechen) können tut er auf alle Fälle*
 French speak able to does he on all case
 ‘In any case he is able to speak French.’

We notice a certain speaker variation that would deserve further investigation. What is really relevant here, however, is the difference between (ii) and (10) on the one hand and (iii) and (11) on the other. While the former are between dubious and downright ungrammatical, the latter are perfect throughout.

2.1.3 Verb doubling

What we learned in the previous section about periphrastic *tun* can be supplemented with a look at language variation. A number of German dialects as well as Yiddish show verbal doubling. The infinitival form of the verb (or a projection of it) is in the Vorfeld (Spec-CP) and the verb additionally appears in its finite form in V2-position (C). Fleischer (2008) calls this construction *Topikalisierte Infinitivverdoppelung* (topicalized infinitive doubling). It is rather easy to see that the doubling strategy is an alternative to periphrastic *tun*. Among the German dialects, this construction appears in the Berlin dialect as well as in archaic peripheral varieties of Prussian on the northern end and high Alemannic of Graubünden on the southern end, as well as in diasporic German minority dialects which have survived in the former Soviet Union. Examples from Fleischer's collection are given in (12) and (13). The exact sources can be found in Fleischer's article.

(12) PRUSSIAN

- a. Schaden schadet ihm das nichts.
 harm.INF harm.3SG him that nothing
 'This does not harm him.'
- b. Schnifke schnûwe schnöffft hei nich, man Branntwîn
 snuff snuff.INF snuff.3SG he not but brandy
 sûpe söppt hei sêr.
 guzzle.INF guzzle.3SG he very
 'He does not snuff tobacco but he guzzles a lot of brandy.'
- c. aber ihr redet bloß und geben gebt ihr nichts
 but you talk only and give.INF give.2PL you nothing
 'You only talk and talk but never give anything'

(Fleischer 2008: 245–247)

(13) a. ALEMANNIC (Splügen, Davos)

Syn bischt schoon albig der glych verdamt Schelm!
 be.INF are.2SG still always the same damned rogue
 'You are still the same old rogue!'

b. ALEMANNIC (Gressoney, Aosta Valley)

Weerchu weerchut=er weenig.
 work.INF work.3SG=he little
 'He works little.'

(Fleischer 2008: 248–249)

Under the assumption that the verb in V2-position is semantically relevant, these constructions look bizarre. Why would one want to repeat a verb or the verbal part of a predicate?¹⁴ Given our current findings, the doubled verb is nothing else but the host of the finiteness features that must be positioned in C in order to fulfill the V2-constraint. Since due to the Stranded-Affix-Filter¹⁵ the inflectional morpheme cannot be uttered as such, there must be a lexical carrier. While in Standard German this carrier is *tun*, the dialects under consideration use the lexical form that appears in Spec-CP. In this respect, the doubling strategy corresponds directly to the default *tun*-insertion. Nevertheless, a problem may emerge from the fact that the finite verb in C can be any verb. Thus, unlike *tun*, the verb is not – at least not in an immediately plausible sense – a default. One may be tempted to believe that the finite verb is moved from its clause-final base position. As such its copy would be interpreted. The immediate consequence would be that the examples are weird because the verb would indeed be interpreted twice. How can this consequence be avoided? Assume that the verb in clause-final position is an infinitive or a verbal projection of the infinitive. This form is moved to Spec-CP. We assume the copy theory of movement as suggested by Chomsky (1995); the trace is actually a phonetically silent copy of the displaced element and as such accessible to semantic interpretation.¹⁶ The purpose of fronting seems to be topicalization in the sense of highlighting or emphasizing the predicate. The lexical semantic interpretation is performed in the position of the copy. Now, the strategy of the doubling dialects must be that instead of inserting *tun* in C, these dialects insert a finite version of the non-finite verbal form in Spec-CP. This finite form must conform to the usual requirement of V2, namely that the lexical element is the minimal prosodic word. Consider the following pair.

- (14) a. Sein Zimmer aufräumen räumt er nie (auf).
 his room tidy.INF tidy.3SG he never PART
 ‘He never tidies up his room.’
- b. * Sein Zimmer aufräumen aufräumt er nie
 his room tidy.INF tidy.3SG he never

¹⁴ Of course, there are languages in which the verb undergoes doubling, sometimes reduplication, for reasons of expressing progressive aspect, intensity of action etc. Such reasons can be safely excluded in these cases. Moreover, verbs like *snuff* or *work* in (12) and (13) do not take infinitival complements, i. e. self-embedding is excluded.

¹⁵ Stranded-Affix-Filter: “A morphologically realized affix must be a syntactic dependent at surface structure.” (Lasnik 1981: 162)

¹⁶ For details of the copy theory of movement see Nuñez (2011).

(14b) is clearly deviant. Doubling concerns exactly the minimally licit carrier of finiteness, nothing more. Verb doubling deserves a detailed theoretical investigation of its viability in a strictly derivational system. Such an investigation is beyond the focus of the present chapter. Let us for the time being suggest that the non-finite verb X (or some projection of it) is moved to Spec-CP, leaving a copy, and that a minimal finite form of X , X_{fin} , is inserted in C. This step does not conform to cyclic movement. It applies after the CP-cycle has been completed. Although other technical solutions come to mind, we think, this is a plausible and defensible way of putting it. The acyclic insertion of the finite verb form is a last resort step of repair that serves nothing but the satisfaction of the V2-constraint. While V2 is usually hard-wired in the bottom-up derivation, acyclic insertion is a local repair that applies only in case the standard mechanics of verb movement is unavailable. According to Jürg Fleischer (p. c.), his data collection does not contain a single example of doubling of the verb in its clause-final position. In fact all such examples seem to be thoroughly ungrammatical.

- (15) a. *Ich glaube, dass ihm das nichts schaden schadet
 I believe that him this nothing harm.INF harms.3SG
- b. *Ich glaube, dass ihr nichts geben gebt
 I believe that you nothing give.INF give.2PL
- c. *Ich bin froh, dass Stuttgart nicht am Bodensee liegen liegt
 I am glad that Stuttgart not at-the Bodensee lie.INF lies.3SG

The data in (15) show that the doubling strategy must not be equated with unmotivated PF-style doubling. The existence of V-doubling in dialects is rather another strong piece of evidence in favor of the conjecture in (4). The finite verb in V2 is not semantically interpreted where we see it but rather in its underlying position. With respect to doubling, this means – in full analogy to the corresponding cases with *tun* – that the lexical stem of the finite verb is not interpreted at all. The conclusion appears to be radical, but it is nothing but a logical consequence.

2.1.4 Frisian *wer*-insertion

In another West Germanic variety, we find additional evidence which indicates that the lexical content of the verb does not need to appear in the C-domain but

only the finiteness features. Karrharde North Frisian¹⁷ exhibits a periphrastic verbal construction with a finite auxiliary *wer-* in V2-position and a finite thematic verb in clause-final position (Hoekstra 2016). Like the *tun*-periphrasis, this construction appears in declaratives, *wh*-interrogatives polar interrogatives, and imperatives, as shown in (16). Moreover, Hoekstra (2016) argues that *wer-* is a reanalyzed complementizer that functions as a semantically empty auxiliary. This assumption predicts all its properties: restriction to V2-position (C-position), complementary distribution with other auxiliaries in V2-position, no semantic/pragmatic restriction, and the double marking of finiteness on the auxiliary and the thematic verb. Due to its origin as a finite complementizer, *wer-* selects a finite VP, even in last resort cases, such as VP-topicalization in (17), whereas German *tun* selects a non-finite VP.

(16) KARRHARDE NORTH FRISIAN

- a. Tèth-üttinen wer-t er kan-d.
Teeth-pulling wer-PRS.3SG he know-PRS.3SG
'He knows how to pull teeth.' (Hoekstra 2016: 322)
- b. Wat wer-e jem der apfask-e?
what WER-PRS.2PL you there up.fish-PRS.2PL
'What are you fishing up there?' (Hoekstra 2016: 323)
- c. Denn wer-e man eg aw't Håd fâl-e.
then WER-IMP.PL only not on=the head fall-IMP.PL
'Then don't fall on your head.' (Hoekstra 2016: 325)

(17) KARRHARDE NORTH FRISIAN

- He es fallight ferkimen, an lait je sagt wer
he is maybe, come down and lays really perhaps somewhere
krönk, an [_{VP} sturwe-d]₁ wer-t ham niman t₁.
ill and nurses-PRS.3SG WER-PRS.3SG him no one
'Maybe he has come down in the world and is perhaps ill in bed somewhere
with nobody nursing him.' (Hoekstra 2016: 341)

¹⁷ Frisian is closely related to low German and Dutch. It is a V-final V2 language that is spoken in the coastal area of the German Bight.

Frisian *wer*-insertion therefore shows that the V2-position does not have to be filled with a genuinely verbal element. A suitable host for the inflectional affix appears to be sufficient. This fact agrees perfectly with the results of periphrastic *tun* and verb-doubling.

2.1.5 Complementizer agreement

A similar configuration, the so-called *complementizer agreement*, can be observed in embedded clauses of German and Dutch dialects.¹⁸ As with Frisian *wer*-insertion, the inflectional affix appears at the clause-final verb and on C-elements, i. e. complementizers and *wh*-pronouns as illustrated in (18). The paradigm is often defective and is realized only for selected number/person combinations, such as 2nd sg/pl in Bavarian but see West Flemish as described by Haegeman (1992). Crucially in the respective dialects, complementizer agreement is obligatory and incompatible with verb movement. These two properties indicate that verb movement and complementizer inflection are driven by the same feature. Only one operation can satisfy this feature. Hence the exclusivity is readily explained.

(18) BAVARIAN

- a. I frog' me, ob-st ned du des mocha kan-st.
 I ask myself, whether-2SG not you this make could-2SG
 'I ask myself, whether you could not do this.' (Weiss 2005: 148)
- b. Du sollst song an wäichan Schua dass-st du wui-st
 you should say a which one shoe that-2SG you want-2SG
 'You should say which one of the shoes you want.' (Bayer 1984: 235)
- c. Du sollst song wann-st du kumm-st
 you should say when-2SG you come-2SG
 'You should say when you are going to come.'

18 The reasons for the emergence of this phenomenon in the languages at hand are rather clear. V2 seems to be a necessary albeit not a sufficient condition. Cliticization to C was reanalyzed as inflection (see Bayer 2014: 41–44). Of all known V2 languages only German and Dutch seem to show complementizer agreement. It must be noted, however, that some North Italian dialects, such as Cimbrian, show subject clitics at complementizers that introduce non-V2 clauses whereas enclisis is blocked in subordinate clauses with V2-order (Bidese et al. 2012, 2013). Superficially similar phenomena in non-V2 languages differ considerably. Complementizer agreement in Nadji Arabic, as discussed in Lewis Jr. (2013), occurs only on specific lexical items, is optional, and uses non-verbal agreement morphemes.

Like Frisian *wer*-insertion, complementizer agreement indicates that inflectional affixes don't need to attach to a verb in the left periphery. They may well attach to other hosts in the C-domain, such as complementizers. In this way, the feature in C can be satisfied without moving the verb.

2.2 The base position: Arguments for reconstruction

2.2.1 Association with focus and markedness

Association with a focus particle such as *nur* 'only' is in German such that in the standard cases the focusing particle precedes and *c*-commands the associated focus. Consider first the case in which *nur* occupies a pre-*vP* scope position and associates with a focus constituent in the *vP* (signalled here with capitals).

- (19) a. ... dass er nur [mit CLARISSA getanzt hat]
 that he only with Clarissa danced has
 '... that he danced only with Clarissa'
- b. ... dass er nur [mit Clarissa GETANZT hat]
 that he only with Clarissa danced has
 '... that he only danced with Clarissa'

While (19b) may not be perfect for everybody, it improves when the non-focused PP is scrambled out of the *vP* as in (20).

- (20) dass er [mit Clarissa] nur [mit Clarissa GETANZT hat]
 that he with Clarissa only danced has
 'that he only danced with Clarissa'

The focus particle can also be merged with the focus constituent directly as one can see in those cases in which a constituent occupies Spec-CP, the German *Vorfeld*.

- (21) a. [Nur mit CLARISSA] hat er getanzt.
 'He danced only with Clarissa'
- b. [Nur GETANZT] hat er mit Clarissa.
 'He only danced with Clarissa'

Given that German is V2 and not V3, V4 etc., the strings in square brackets must be a single constituent.¹⁹ The important point is that in all of the standard cases the particle precedes the focus. Notice now that German has the marked option (indicated by ^M) of moving the focus constituent to the left of the particle, as seen in (22).

- (22) a. ^M[Mit CLARISSA] hat er nur [mit CLARISSA] getanzt.
 ‘He danced only with Clarissa’
 b. ^MGETANZT hat er [mit Clarissa] nur [mit Clarissa GETANZT hat].
 ‘He only danced with Clarissa’

In these examples, *nur* can only associate with the focused constituent if this constituent is reconstructed into its base position. Constituents in Spec-CP with inverted order appear to be equally marked and may for certain speaker even be ungrammatical.

- (23) a. ^M[Mit CLARISSA nur mit CLARISSA] hat er getanzt.
 ‘He danced only with Clarissa’
 b. ^M[GETANZT nur GETANZT] hat er mit Clarissa.
 ‘He only danced with Clarissa’

Consider now a case in which the associated focus is identical with the finite verb. As long as the verb stays in its clause-final position the particle precedes it.

- (24) dass er [mit Clarissa] nur [mit Clarissa TANZTE]
 ‘that he only DANCED with Clarissa (he didn’t KISS her)’

Interestingly, the focused verb can undergo V2 without giving rise to the markedness seen in (22) and (23). This is shown in (25).

- (25) a. Er TANZTE mit Clarissa nur TANZTE.
 ‘He only DANCED with Clarissa (he didn’t KISS her).’

How is this possible? It is possible if we assume that the focused finite verb is in V2-position solely for the reason of morphological integrity while it remains as a

¹⁹ This has been challenged, but we think for no good reasons; see the discussion in Bayer (2018) and in the literature cited there.

lexical item together with its focus in clause-final position. The part of the representation which is relevant for core syntax and semantic interpretation is thus as in (26).

- (26) Er -te mit Clarissa nur TANZte.
 he 3SG with Clarissa only dance

2.2.2 Negative polarity

The German verb *brauchen* ‘to need’, ‘to be obliged to’ is a negative polarity item (NPI), on a par with other NPI such as *jemals* ‘ever’, *überhaupt* ‘at all’, *auch nur ein bisschen* ‘even a little’ etc. *Brauchen* is a modal verb corresponding to *müssen* ‘must’, the difference being that the lexical option *brauchen* can arise only in the scope of a downward entailing operator. Consider first examples with adverbial NPIs:

- (27) a. Niemand/ *Johann hat den Kranken jemals besucht.
 nobody Johann has the patient ever.NPI visited
 ‘Nobody ever visited the patient.’/*Johann ever visited the patient.’
- b. Nur die wenigsten/ *die meisten haben überhaupt zugehört.
 only the fewest the most have at all.NPI listened
 ‘Only the fewest people listened at all.’/*Most of the people listened at all.’
- c. Keiner/ *jeder hat auch nur ein bisschen aufgepasst.
 no one everyone has also only a little.NPI attended
 ‘Nobody payed even a little attention.’/*Everybody payed even a little attention.’

In each of these cases, the NPI is in the scope of a downward entailing operator. Although adverbs can move to Spec-CP, NPIs generally cannot do so as the deviant examples in (28) show.²⁰

²⁰ See Meinunger (2004: 54) according to who “NPI licensing is known to be a very strong S-structure phenomenon”. This is also true for English *any*.

- (i) *I couldn't find anyone.*
 (ii) **Anyone couldn't be found anyone.*

The only possibility would be to have the NPI in a larger phrase which undergoes reconstruction into a position in the scope of negation as seen in (iii).

- (iii) [*A person [who knows anything about cholera]] could not be found [~~a person who knows anything about cholera~~].*

This constellation is, however, not relevant to what follows.

- (28) a. *Jemals hat niemand den Kranken jemals besucht.
 ever.NPI has nobody the patient visited.
- b. *Überhaupt haben nur die wenigsten überhaupt zugehört.²¹
 at all.NPI have only the fewest listened
- c. * [Auch nur ein bisschen] hat keiner auch nur ein bisschen
 also only a little.NPI has no one
 aufgepasst.
 attended

Returning to *brauchen*, notice now that this NPI's behavior would be a surprising exception to the otherwise valid requirement that the NPI must be in the scope of a downward entailing operator. Next to the expected case in (29a) we find that the V2-case in (29b) is likewise fully grammatical.

- (29) a. ... dass er sich nicht zu fürchten braucht
 that he REFL not to be afraid needs.NPI
 '... that he doesn't need to be afraid'
- b. Er braucht sich nicht zu fürchten braucht.
 he needs.NPI REFL not to be afraid
 'He doesn't need to be afraid.'

In (29b), *brauchen* precedes and c-commands the negator *nicht* and thus appears to be outside its scope, exactly the reverse of the constellation that is normally found in NPI-licensing. This paradoxical situation is resolved if we assume that the verb has been moved to second position (C) for the sole reason of making its finiteness feature available in this position. The lexical part of the verb stays put. If so, (30) is the core-syntactic version of (29b).

- (30) *Er -t sich nicht zu fürchten brauch-t
 he 3SG REFL not to be afraid need.NPI

The spell-out of *brauchen* in the C-position is in the service of the PF-interface. This result echoes exactly the message that we could derive in the previous two sections. We will return to the syntax of *brauchen* in Section 3.2 where we will follow its role in on-line sentence comprehension.

²¹ There is another reading in which *überhaupt* is a clause linker in the sense of 'by the way'. (28b) is grammatical with this interpretation which is, however, irrelevant for the NPI-interpretation.

2.2.3 Sentential negation

Negation allows us to construct an even more general argument: As we will show, only obligatory reconstruction of the finite verb explains how sentential negation in V2-clauses with a single verbal element can be derived. Negation may vary in its scope domain, as roughly indicated by the brackets in (31). Only the negation in (31a) can receive wide scope as sentential negation with the effect of reversing the truth value of the respective affirmative sentence. The negation in (31b) takes only narrow scope (constituent negation) and excludes the respective constituent from the otherwise positive statement.

- (31) a. [Letztlich hat Johann seinen Bruder *nicht* besucht].
 finally has Johann his brother not visited
 ‘Finally Johann didn’t visit his brother. (But he will go for breakfast with his aunt today.)’
- b. Letztlich hat Johann [*nicht* seinen Bruder] besucht.
 finally has Johann not his brother visited
 ‘Finally Johann visited not his brother (but his girl friend).’

From a semantic perspective, it is somewhat surprising that sentence negation is not realized by an initial negation that takes surface scope over the entire clause structure, as noted by Zeijlstra (2007). In the German examples in (31) it even seems that the sentential negation occurs very low in the structure. How can this be explained? The expression of negation in natural languages shows considerable typological variation (Zanuttini 2001, Miestamo 2007) but one generalization seems to hold: sentential negation must c-command the highest verbal element of the clause.²² Haider (2012: 138–139) states that negation (and high adverbials) must c-command the element that situates the event variable in order to receive wide scope. This element is the finite verb in finite clauses and the highest non-finite verb in non-finite clauses. Accordingly, the negation in (31a) must have scope over the finite auxiliary *hat* or the whole verbal complex *besucht hat* respectively. This becomes even more evident in (32). Here the sentence contains only one verbal element. This verb must be finite and therefore moves to the V2-position. Hence it left the c-command domain of the negation. The structure in (32), however, is still interpreted as sentence negation. Under the assumption

²² In verb-initial languages, the negation therefore occurs in pre-VP positions, whereas in verb-final languages negation either occurs as a preverbal particle (German) or as postverbal particle or an affix (Korean, Turkish) (Zanuttini 2001, Miestamo 2007).

that the finite verb is reconstructed and interpreted in its base position, this fact is readily explained. In its base position, the verb *besuchte* in (32) is in the scope of the negation. Note that this mechanism was crucial to explain the licensing of the NPI-verb *brauchen* in the previous section.

- (32) Letztlich besuchte Johann seinen Bruder nicht ~~besuchte~~.
 finally visited Johann his brother not
 ‘Finally Johann didn’t visited his brother.’

Note further, that covertly raising sentential negation to a higher position in which it scopes over the V2-verb as in (32) is not a valid option. Such raising would predict that under sentential negation all NPIs that occur in a position lower than the V2-position should be licensed, contrary to the fact. (33a) shows that the NPI *jemals* ‘ever’ is ungrammatical in a position lower than the V2-position but higher than the sentential negation. In contrast, (33b) shows that *jemals* can be licensed in this very position by a licenser that scopes over the V2-position, here the negative phrase *auf keinen Fall* ‘in no way’ in Spec-CP.

- (33) a. Letztlich besuchte Johann (*jemals) seinen Bruder nicht ~~besuchte~~.
 finally visited Johann ever.NPI his brother not
 b. Auf keinen Fall besuchte Johann jemals seinen Bruder ~~besuchte~~.
 at no case visited Johann ever.NPI his brother
 ‘In no way did Johann ever visit his brother.’

Since the negation does not raise, the only explanation for sentential negation in sentences like (32) is that the lexical verb reconstructs into its base position where it is within the scope of the negator, as illustrated in (34).

- (34) Letztlich -te Johann seinen Bruder nicht besuch-~~te~~.
 finally 3SG Johann his brother not visit
 ‘Finally Johann didn’t visit his brother.’

2.3 Summary

This concludes our considerations of V2 from a grammar-internal point of view. Our claim is rather strong. In support of our conjecture about V2 in (4), it says that the verb in C-position reconstructs into its base position without any exception. Dummy insertion does not fall under the generalization because the dummy verb was

never in the base position. The question is to what extent this could have any significance outside the realm of the abstract system of grammar. Therefore, we will in the following explore whether the insights so far have any bearing on language use. In Section 3.1, we will first take a look at existing studies. In Section 3.2, a novel experimental investigation of processing V2-clauses will follow. In Section 4, we conclude with some general considerations of the parsing process as it can be conceived from the side of language comprehension.

3 Experimental investigation of V2-movement

The V2-phenomenon is so far only poorly studied in the area of sentence processing. Most studies that involve a contrast between V2 and V-in-base order employ this contrast only to investigate some other phenomena and do not focus on the influence that the early availability of verbal information has.

3.1 Previous research on German sentence processing

Research about German sentence processing has extensively investigated the effect of argument order. In embedded clauses, all nominal arguments precede the verb, while the situation is more complex in V2-clauses. German allows basically two mechanisms²³ to derive non-canonical argument ordering, XP-fronting (topicalization) and scrambling, both of which yield different effects. Additionally, arguments are unambiguously case marked, or ambiguously, depending mostly on gender and the argument's categorial status (full DP, pronoun, bare NP). Generally it has been attested that German shows a robust preference for canonical argument ordering, i. e. nominative (subject) > dative (indirect object) > accusative (direct object). Deviations from these linearizations result in correlates of increased processing load. In case of scrambling, these effects manifest themselves in immediate responses such as longer reading times, and in ERPs as a fronto-central negativity on the misplaced element followed by a posterior positivity, which is interpreted as an increased memory load for storage of the argument for later integration followed by thematic reanalysis (Rösler et al. 1998, Bornkessel et al. 2002, 2003, Schlesewsky et al. 2003, Bornkessel & Schlesewsky 2006). Topicalization of a non-canonical argument (non-nominative), on the other hand, leads to a long lasting increase in processing load that spans from the displaced

²³ We will ignore extraposition here.

element until its supposed gap site (base position). The consequences are longer reading times (Bayer & Marslen-Wilson 1992, Hemforth 1993: 157–170, Konieczny 1996, Fanselow et al. 1999, Weskott 2003), and left anterior negativity (LAN) (Matzke et al. 2002, Felser et al. 2003). If the initial argument is case ambiguous, it is automatically interpreted as the nominative argument (subject-first preference). Similar effects of argument reordering, as indicated by the above mentioned correlates of increased processing load, emerge at the disambiguating element.

3.1.1 Thematic processing

Against this background, we can evaluate some studies that contrasted the verb position (V2 vs. V-final) to inspect the effect of processing the arguments in conjunction with early availability of verb information. The general logic is simple: The specifics of arguments (number, case, semantic properties, primarily animacy) in a clause are dependent on the predicate. Some predicates may select non-canonical argument configurations. If the (lexical) verb appears in clause-final position, processing of the arguments applies according to the default processing routine. If the verb, however, appears very early, such as in V2-position, the processing load of the exceptional argument configuration should be reduced.

A productive type for such exceptional argument configurations are experienter object verbs which are known to exhibit an *experienter-first* preference, see (35a), instead of a subject-first preference (Verhoeven 2015, Temme & Verhoeven 2016), as in (35b).

- (35) a. [Dem Jungen]_{dat} hat [der Film]_{nom} gefallen.
 b. [Der Film]_{nom} hat [dem Jungen]_{dat} gefallen.
 ‘The boy liked the movie.’

Building on this observation, Schlesewsky & Bornkessel (2004) report ERP results that contrast the processing of experienter object verbs, as in (35) with agentive verbs, such as *folgen* ‘follow’, that both select a nominative and a dative argument. They found that in clause-final position experienter object verbs elicit an increased processing load (early parietal positivity) which they interpret as a revision process due to the exceptional thematic hierarchy of experienter object verbs. Crucially, if those verb types are contrasted in V2-position no difference between the verb types can be detected (Bornkessel 2002). Additionally, the ERP-correlates on the arguments (in either order) are identical despite slight topological variation. With case ambiguous initial arguments, both verb types show the same N400 response at the disambiguating noun phrase that is characteristic for the detection

of a non-nominative (subject) initial configuration. Only after disambiguation (at the second argument), the agentive verbs showed a weak P600 that is indicative of reanalysis in the object-before-subject cases. “Therefore, the mechanisms responsible for the establishment of thematic relations between arguments also appear to operate without drawing upon verb-specific information, even when this information is available” (Schlesewsky & Bornkessel 2004: 1227). The three main results follow closely the prediction of our conjecture about V2: First, no difference of the verb types in V2-position but in V-final position. Second, no difference during argument processing. Third, with lexical verbs in V2-position no difference appears until the processing of the last argument, i. e. the position adjacent to the base position of the verb.

Similar results have been reported by Scheepers et al. (2000). In an eye tracking study, the authors contrasted experiencer object verbs, such as *ängstigen* ‘frighten’ with experiencer subject verbs, such as *fürchten* ‘fear’. The initial argument DP in their material was always case-ambiguous, as shown in (36) below. The rationale is the same as above: Without initial verb information (V-final), object-initial clauses should cause an increase in processing load, whereas an object experiencer verb in V2-position should significantly diminish the penalty for object-initial sentences. However, Scheepers et al. (2000) report that the interaction of argument order and verb type is detectable at the same temporal locus in both sentence types. In verb-final clauses, this interaction shows up at the clause-final verb. In V2-clauses the effect appears directly after the second argument, on the adverbial *ein wenig*, i. e. the base position of the finite verb. We interpret these results as follows: verb-related argument processing surfaces as soon as the verb is lexically interpreted. In V-final clauses this cannot be done until the clause-final position has been reached. In V2-clauses this correlates to the base position of the verb, i. e. the post-argument position.

(36) a. V-final–Subject<Object vs. Object<Subject

Dass die strenge Lehrerin der stille Schüler/
 that [the strict teacher]_{nom/acc} [the quiet pupil]_{nom/acc}
 den stillen Schüler ein wenig ängstigte/ fürchtete, ...
 [the quiet pupil]_{acc} a bit frightened/ feared

b. V2–Subject<Object vs. Object<Subject

Offenbar ängstigte/ fürchtete die strenge Lehrerin
 obviously frightened/ feared [the strict teacher]_{nom/acc}
 der stille Schüler/ den stillen Schüler ein wenig, ...
 [the quiet pupil]_{nom/} [the quiet pupil]_{acc} a bit

‘Obviously the strict teacher frightened/feared the quiet pupil a bit, ...’ or
 ‘Obviously the quiet pupil frightened/feared the strict teacher a bit, ...’

(Scheepers et al. 2000: 115–117)

In sum the experimental results on thematic processing converge into the following generalization: Verb types that differ in their arguments' configuration show measurable processing differences if they appear in their clause-final base position (post-argumental). In V2-position, no processing differences can be detected between verbs that select canonical order and those that select non-canonical orders. Moreover the processing of arguments shows the default processing pattern independent of the verb's position. Verb specific interactions appear in V2-clauses only at the final argument or shortly thereafter. In V-final clauses, these interactions appear on the clause-final verb. The observations match the conjecture about V2: In V2-position, the verb is largely ignored, processing proceeds as in V-final clauses until the reconstruction site is reached.

3.1.2 Scope computing

Bott & Schlotterbeck (2015) present two studies (self-paced reading and eye tracking) investigating the scope computation of two quantifiers that appear in non-canonical order, i. e. in object<subject order. In (37a), the object *jeden seiner Schüler* must be bound by the subject *genau ein Lehrer*. Therefore, it must be interpreted in the scope of the subject quantifier, i. e. establish a scope relation that is inverse to the surface order. The structure in (37b) on the other hand can be interpreted with surface scope order. Bott & Schlotterbeck (2015) report that in V-final clauses, as in (37c), the increased processing load due to doubly quantified sentences does not turn up until the occurrence of the clause-final verb, which indicates that scope computing depends on the lexical meaning of the predicate. In the V2-clause, however, the inverse scope effect emerges already at the first spillover element *voller* whereas the strong increase in reading times for doubly quantified sentences turns up at the second spillover element *Wohlwollen*.

- (37) a. Jeden seiner Schüler lobte genau ein Lehrer
 [Each.Q of his pupils]_{acc} praised [exactly.Q one teacher]_{nom}
 voller Wohlwollen.
 full of goodwill.
- b. Jeden dieser Schüler lobte der neue Lehrer
 [Each.Q of these pupils]_{acc} praised [the.DEF new teacher]_{nom}
 voller Wohlwollen
 full of goodwill

c. V-final scheme

Jeden seiner/dieser Schüler hat genau ein/ der neue
 [Each of his/these pupils]_{acc} has [exactly one/ the new
 Lehrer voller Wohlwollen gelobt.
 teacher]_{nom} full of goodwill praised.
 ‘Exactly one/The new teacher praised each of his/these his pupils full
 of goodwill.’ (Bott & Schlotterbeck 2015: 64–65)

In sum, we observe the same patterns as in the thematic processing paradigm above. Processing effects that rely on the lexical meaning of the verb are delayed until the clause-final position in V-final clauses has been reached. In V2-clauses on the other hand, these effects are only delayed until the post-argument area, where the parser postulates the base position of the finite verb and reconstructs it.

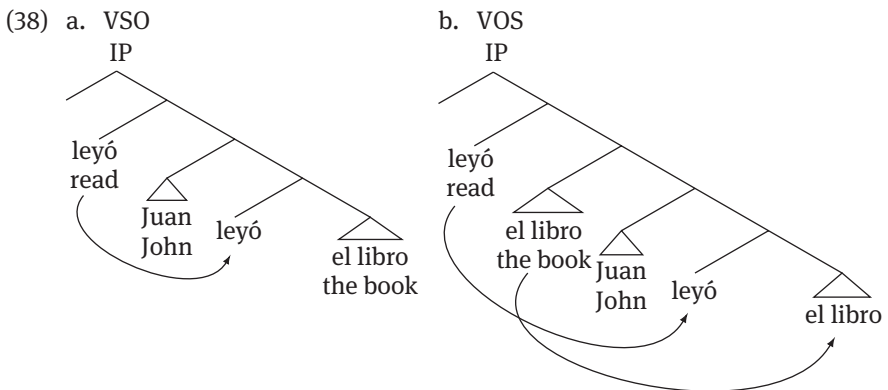
3.1.3 Immediate verb related effects

To our knowledge, the only experiment that claims to present evidence for immediate interpretation of the V2-verb is Weyerts et al. (2002). These authors claim that clause-final verbs are harder to process than verbs in V2-position. We consider that the results do not lead to the conclusions that the authors suggest, as thoroughly outlined in the critic by Schlesewsky et al. (2002). Furthermore, the claim that clause-final verbs are generally harder to process is at best an oversimplification. Specifically for German it has been argued that the processing load of the clause-final verb varies as a function of preverbal material. Konieczny (2000) reports results from a self-paced reading study that became known as the *anti-locality effect* or *anticipation hypothesis*. In German verb-final clauses, reading times on the verb turned out to be shorter with more preverbal material. Konieczny (2000) takes this as an indication of a type reduction operation: The more elements precede the clause-final verb, the faster it will be processed. This effect is more pronounced for predictable elements such as arguments but is also detectable for adjuncts (Konieczny 2000, Konieczny & Döring 2003, Levy & Keller 2013).

Should we conclude that verbs in second position exhibit longer reading times than their clause-final correspondents, because they cannot be anticipated? On the contrary. Scheepers (1997) reports that verbs in V2-position are read faster than their corresponding counterparts in clause-final position. He attributes this to an opaque clause-final wrap-up process. Although we do not deny that clause-final wrap-up may add to this, we suggest a more structured explanation: Under the assumption that the verb in V2-position is not fully interpreted it seems plausible that the processing time at this early point is rather short. A clause-final

verb, on the other hand, can immediately integrate all its arguments and modifiers and be immediately interpreted. Therefore processing of clause-final verbs is predicted to evoke longer processing time.

Additionally, there is direct evidence for the fundamental assumption that verbal heads reconstruct in a filler-gap-like fashion. Love & Swinney (1998) cite a cross-modal lexical priming study by Basilico et al. (1995)²⁴ that investigated reactivation priming effects for verbs in Spanish verb-initial structures, VSO and VOS. The rationale goes as follows: Spanish has a basic SVO structure. Both verb-initial orders are derived by fronting underlyingly post-subject material (verb and optionally object), as shown in (38). Under the assumption that displaced verbs reconstruct into their base position we expect that the verb is reconstructed into a position between the subject and object in the VSO structure in (38a). In the VOS structure (38b), on the other hand, we expect that verb and object are reconstructed into the final position, after the subject, either individually or together as VP.



- (39) a. VSO
- Vieron₁ [tus vecinos, los de la casa rosa] ## t₁ [a
 see your neighbors them from the house pink to
 todos sus hijos,
 all their sons
 hijas y nietos] [el fin de semana pasado]?
 daughters and grandchildren the end of week past
 ‘Did your neighbors from the pink house see all their sons daughters
 and grandchildren last weekend?’

²⁴ Many thanks to Inés Antón-Méndez for rummaging up the paper and sharing it with us.

b. VOS

El fin de semana pasado vieron₁ a todos sus hijos,
 [the end of week past] see [to all their sons
 hijas y nietos
 daughters and grand children]

tus vecinos, los de la casa rosa t₁?
 [your neighbors them from the house pink]

‘Last weekend see all their sons daughters and grand children your
 neighbors from the pink house.’

The prime position is indicated by ##. A related prime was *mirar* ‘look’; an unrelated prime was *lavar* ‘wash’. Basilico et al. (1995) report trace reactivation effects of the verb between the subject and the object position (##) in VSO clauses in (39a). This effect was absent between the object and the subject in the VOS structures in (39b), which ensures that the effect of the VSO structure is not based on linear distance but on the structural position. These results therefore provide positive evidence that also verbs, i. e. syntactic heads, may enter filler-gap dependencies in a similar way as it is widely accepted for dislocated phrasal constituents, and that priming detects the verb’s underlying position.

While lexical information does not seem to be interpreted immediately, the finiteness information is. Schlesewsky et al. (2000) and Meng & Bader (2000) report that a verb that immediately follows a case ambiguous *wh*-element which involves a number mismatch, as in (40a), results in longer reading times on the verb and subsequent segments.

(40) a. Welche Frauen sah der Mann am Freitag?
 [which women].PL saw.SG [the man]_{nom} on Friday
 ‘Which women did the man see on Friday?’

b. Welche Frauen sahen den Mann am Freitag?
 [which women].PL saw.PL [the man]_{acc} on Friday
 ‘Which women saw the man on Friday?’

(Schlesewsky et al. 2000: 77)

Crucially the effect emerges before the disambiguating second noun phrase has been encountered. This indicates that the first noun phrase is immediately integrated as the clausal subject, and the verb is immediately integrated as head of the VP (see also Bader & Bayer 2006: 93–94).²⁵

²⁵ Notice that *welche Frauen* could be either nominative or accusative; in (40a), the choice of nominative is excluded by the failure of number agreement with the verb.

This immediate response to agreement errors, however, leaves open whether the processor only validates morphosyntactic phenomena or also initiates a full interpretation process once the verb is lowered. There is evidence for the latter, namely that the processor starts an integration, linking and interpretation process immediately after inserting a phrase into the current phrase structure. Results from immediate interpretation processes have been detected by Friederici & Frisch (2000). They investigated three types of violation in V2-clauses and V-final clauses, as illustrated in (41).

(41) a. well-formed

Heute ⟨besuchte⟩ der Cousin den Geiger
 today visited [the cousin]_{nom} [the violinist]_{acc}
 im Krankenhaus ⟨besuchte⟩.
 [in the hospital] visited
 ‘Today, the cousin visited the violinist in the hospital.’

b. semantic violation

*Heute ⟨beizte⟩ der Cousin den Geiger am Mittag ⟨beizte⟩.
 today stained [the Cousin]_{nom} [the violinist]_{acc} at noon stained

c. number of argument violation

*Heute ⟨trödelte⟩ der Cousin den Geiger am Aufzug
 today dawdled [the cousin]_{nom} [the violinist]_{acc} [at the lift]
 ⟨trödelte⟩.
 dawdled

d. type of argument violation (case marking)

*Heute ⟨besuchte⟩ der Cousin dem Geiger
 today visited [the Cousin]_{nom} [the violinist]_{dat}
 im Krankenhaus ⟨besuchte⟩.
 [in the hospital] visited

(Friederici & Frisch 2000: 481, 490)

In verb-final clauses, the responses to the violations in (41) were detected at the clause-final verb, consisting of an early negativity (N400/left lateralized negativity) and a later positivity (P600). The negative components are interpreted as semantic or syntactic violations followed by a repair process, which is indicated by the positive component. In V2-clauses, however, the components that emerged immediately at the second NP, showed more violation-specific variation. The semantic violation in (41b) only evoked an N400, a typical response to semantic anomaly. We assume that the verb is reconstructed, the

syntactic structure is built, and the result is in conflict with semantic normality. According to our theory, the conflict does not emanate from the prediction of the verb at the V2-position but from the interpretation at the reconstruction site of the verb. The number-of-argument violation (41c) confronts the processor with a surplus argument for an intransitive verb. After syntactic integration of the surplus element, the interpretation procedure will result in a violation of the argument structure. This results in an N400, followed by structural reanalyses, as reflected by the P600 component. The type of argument violation in (41d) does not show an immediate negative component in the V2-clause because the clause is not necessarily ungrammatical at this point. There are grammatical continuations.²⁶ The P600 therefore might only reflect structural delay without semantic anomaly. While Friederici & Frisch (2000) assume that in V2-clauses the arguments are checked against the predictions of the verbs, we assume basically the opposite: In V2-clauses, the processor tries to complete the clause after every potential argument and pushes it to interpretation. In V-final clauses, the argument structure creates a prediction of the verb. Because the verb distinctively marks the end of the clause, the content will automatically be pushed to interpretation. There, all mismatches result in immediate negativities followed by positivities, which are taken to reflect repair mechanisms.

3.1.4 Intermediate summary

The review of the literature on German sentence processing processing has revealed that subject agreement is evaluated immediately at the V2-position. For processes that are dependent on the lexical semantics of the verb, mostly argument structure, the early availability of such information in the V2-position

²⁶ These continuations include benefactive constructions as in (i) and dative possessive structures as in (ii) that are common in several German varieties.

- (i) *Heute besuchte der Cousin dem Geiger zuliebe eine
today visited [the Cousin]_{nom} [[the violinist]_{dat} for the sake] a
Freundin im Krankenhaus.
friend in the hospital
'Today visited the cousin a friend in the hospital for the sake of the violinist.'*
- (ii) *Heute besuchte der Cousin dem Geiger seine Frau im Krankenhaus.
today visited [the Cousin]_{nom} [[the violinist]_{dat} his wife] in the hospital
'Today visited the cousin the violinist's wife in the hospital.'*

does not seem to facilitate the processing of the arguments. More specifically, it seems that the arguments are processed with the same processing routines as in V-final clauses. Verb-related effects appear at roughly the clause-final position, i. e. the hypothesized base position of the finite verb.

3.2 Diagnosing verb reconstruction: A self-paced reading experiment

In order to diagnose reconstruction effects of the displaced finite verb into its base position, we build on the observation concerning the NPI-verb *brauchen*, discussed in Section 2.2.2.

3.2.1 Previous research on processing NPIs

Previous research on processing NPIs showed that participants are sensitive to specific licensing condition: Participants reject sentences that lack a licenser, as in (42b) and reject sentences in which the licenser is not in a c-command relation with the NPI, as in (42c).

- (42) a. Kein Mann, der einen Bart hatte, war jemals glücklich.
 no man who a beard had was ever.NPI happy
 ‘No man who had a beard was ever happy.’
- b. *Ein Mann, der einen Bart hatte, war jemals glücklich.
 a man who a beard had was ever.NPI happy
 ‘A man who had a beard was ever happy.’
- c. *Ein Mann, der keinen Bart hatte, war jemals glücklich.
 a man who no beard had was ever.NPI happy
 ‘A man who had no beard was ever happy.’

(Drenhaus et al. 2005: 146)

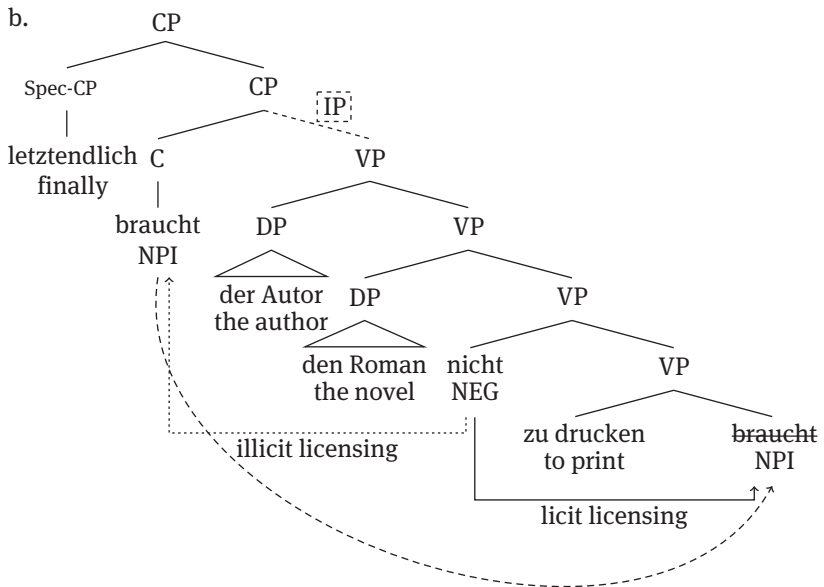
In on-line processing, participants show immediate responses to licensing violations directly at the NPI (*jemals*). Violations yield prolonged reading times (RTs) for roughly three segments (Parker & Phillips 2016) or N400 effects (Saddy et al. 2004). However, illusory licensers, such as in (42c) lead to significant deviations: more errors and longer response latencies in speeded acceptability judgments (Drenhaus et al. 2005: 148–149), delayed effect of reading time increase

(Parker & Phillips 2016: 326–327), and a smaller N400 effect (Drenhaus et al. 2005: 155–157).

3.2.2 Rationale of the experiment

Recall at this point that in cases like (43a), the NPI can only be licensed in its base position and not in surface position, as illustrated in (43b). So in order to check the licensing requirements of *brauchen* (or other NPIs), these elements have to be reconstructed into the base position, as discussed in Section 2.2.2.

- (43) a. Letztendlich *braucht* der Autor den Roman nicht zu drucken ~~*braucht*~~.
 ‘Finally, the author doesn’t have to print the novel.’



In all cases with the V2-moved verbal NPI, the NPI precedes and c-commands its licenser. We predict where the V2-verb should be interpreted, namely in its base position. Nevertheless, no violation of NPI-licensing becomes apparent. It is the base position where we expect to observe the above mentioned effect of licensing failure, namely after the infinitive *zu drucken* ‘to print’. We assume furthermore that the processor has a built-in preference to resolve such a pending dependency as early as possible. For filler-gap dependencies (especially *wh*-movement),

this has been thoroughly demonstrated and is widely accepted as the *active filler hypothesis* (see Frazier & Clifton 1989: 95). It builds on experimental evidence that indicates that the processor integrates the filler (displaced element) anticipatorily, before encountering explicit cues for the formation of the ultimate dependency. If the next incoming segment reveals that the position that was connected to the filler is filled by a surface element, a reanalysis process takes place. This results in an increased processing load known as the *filled gap effect* (Stowe 1986).

3.2.3 Procedure, materials, and predictions

Following this insight, we provided for more than one possible reconstruction site for the finite verb. We conducted a self-paced reading study, in which 41 students of the university of Konstanz (age 18–34 years, mean 23 year; 11 male) read the material word by word by means of pressing a button. The subjects saw only one word at a time (stationary window paradigm) and had no visual cues that would allow them to predict the length of the sentences. Our target sentences provided for two possible positions into which the NPI *brauchen* could reconstruct, as illustrated in (44).²⁷ Both positions, #1 in (44a) and #2 in (44b) are licit positions for the NPI because they are verbal positions that are locally c-commanded by the negator *nicht*.

- (44) a. Letztendlich *braucht* der Autor den Roman *nicht*
 zu drucken #1 *braucht*...
- b. Letztendlich *braucht* der Autor den Roman zu drucken #1
 finally needs the author the novel to print
 unter Umständen *nicht*
 eventually not
 zu verbieten #2 *braucht* ...
 to forbid

²⁷ As pointed out by a reviewer, there are two potential reconstruction sites ahead, namely right after *Roman* and right after *nicht*. In these cases, which are not under investigation here, *brauchen* is the non-modal verb as in *I need an aspirin*. Strictly speaking, the verb should also reconstruct into these earlier sites. Searching for related effects would require a different experimental set-up though.

If participants insert *brauchen* automatically in #1, as expected under filler-gap parsing, the result is an ungrammatical structure.²⁸ The licensing conditions of the NPI are violated as seen in (45a) below. To measure such a potential effect we constructed control sentences, in which the NPI verb *brauchen* was replaced by *beschließen* ‘to decide’ because it appears in the same syntactic environment, selects a *zu*-infinitive and constitutes a plausible replacement in the relevant contexts. Crucially, however, *beschließen* is not an NPI and therefore yields a grammatical structure if it is inserted in #1, as illustrated by the contrast between (45a) and (45b). On the other hand, *beschließen* is fully compatible with negation. The difference between the two verbs can therefore be stated by the following rule: *brauchen* is ungrammatical in a position not in the scope of a negation whereas *beschließen* is grammatical whether in the scope of negation or not.

- (45) a. * Letztendlich *braucht* der Autor den Roman zu drucken #1 ...
 b. Letztendlich *beschließt* der Autor den Roman zu drucken #1 ...

The material consisted of 32 experimental items interspersed with 35 fillers (20 from a different experiment) resulting in 67 stimuli per participant. The target sentences were preceded by a context sentence, as in (46a). The items varied in a $2 \times 2 \times 2$ design with the factors MATRIX.VERB, ILLUSORY.NEG, and LICENSING.NEG. The finite matrix verb was either the modal NPI verb *brauchen* ‘have to’, as in (46b) or the neutral verb *beschließen* ‘decide’, as in (46c). The factorial combination of the two negation positions result in four different negation patterns in (46b) and (46c): no negation, only early negation, only late negation, and double negation. Actually, only the second negation is relevant for the licensing of the NPI *brauchen* in the final structure, hence the term *licensing negation*. The first negation only appears to be related to the licensing of the NPI in the incomplete initial substring. In the final structure, however, the first negation is irrelevant for the licensing configuration because it does not c-command the V-head of the matrix clause VP, hence the term *illusory negation*.²⁹ Half of the items were followed by a comprehension question, as in (46d), to ensure that participants had actually read the sentences.

²⁸ To be sure, there is no reason for the parser to hypothesize more than the minimally converging structure; this excludes the expectation of a converging structure that leads to the successful gap filling at #2.

²⁹ This means that two of the eight experimental condition are finally ungrammatical which, however, does not affect measures at earlier points.

- (46) a. An author has trouble with his publisher because of his new novel. He talks to his lawyer whether he should forbid the printing.
- b. +NPI (±ILLUSORY.NEG) (±LICENSOR.NEG)
 Letztendlich *braucht* der the Autor den Roman (*nicht*) zu drucken #1
 finally NPI the author the novel not to print
 unter Umständen
 under circumstances
 (*nicht*) zu verbieten #2, um das mediale Interesse zu wecken.
 not to forbid for the medial interest to arouse
 ‘Thus, the author does(n’t) have to forbid to (not) print the novel this time in order to arouse the attention of the media.’
- c. –NPI (±ILLUSORY.NEG) (±LICENSOR.NEG)
 Letztendlich *beschließt* der Autor den Roman (*nicht*) zu drucken #1
 finally decides the author the novel not to print
 unter Umständen (*nicht*) zu verbieten #2, um das mediale
 under circumstances not to forbid for the medial
 Interesse zu wecken.
 interest to arouse
 ‘Thus, the author does(n’t) decide to forbid to (not) print the novel this time in order to arouse the attention of the media.’
- d. Hat der Autor mit seinem Anwalt gesprochen?
 ‘Did the author talk to his lawyer’
 Correct answer: Ja ‘Yes’ wrong answer: Nein ‘No’

The predictions are the following: Reconstruction of the finite verb being an automatized process, the finite verb will always be reconstructed into the earliest syntactically possible position. Consequently, we predict longer reading times from #1 onwards, i. e. *drucken*, in the +NPI, –ILLUSORY.NEG-condition. We expect the same effect to appear at #2, i. e. *verbieten*, in the +NPI, –LICENSOR.NEG-condition.

3.2.4 Results and discussion

The results are presented in Figures 1 and 2.³⁰ In line with our prediction, the +NPI, –ILLUSORY.NEG-condition showed significantly prolonged reading times in comparison to the other conditions from the infinitive *drucken* onward, see

³⁰ A detailed description of the results and the statistical analysis is given in Freitag (2019).

Figure 1. This indicates that the licensing conditions of the NPI-verb *brauchen* are evaluated at this position. The observed effects match the correlates, which have been reported for non-licensed NPIs in surface position.

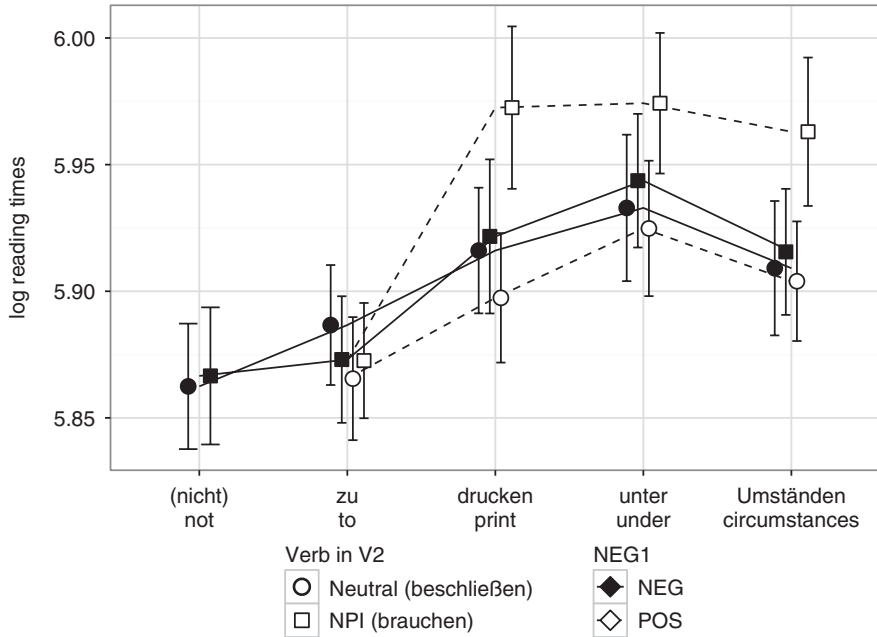


Figure 1: Mean reading times for the low VP + adverb region of experiment 1 (95% CI).

At the second region of interest the second infinitive *verbieten* – the results are less straightforward, see Figure 2. Although we could not detect any effect in the NPI-conditions, we found a simple complexity effect for the control verb with longer reading times for the condition with two occurrences of negation than for the non-negated condition. In the spillover region however, we found significantly longer reading times for the NPI with only the illusory negation (+NPI, +ILLUSORY.NEG, -LICENSOR.NEG) at the word *mediale*. We assume that this indicates a delayed effect of evaluating the licensing conditions. While the non-negated condition is clearly out, and the doubly negated condition, albeit very complex, is clearly grammatical, this condition is ungrammatical too although harder to diagnose. Interestingly, at the clause-final verb, we found a 3-way interaction that revealed shorter RTs for the control verb in the completely non-negative condition. This indicates that the processing load related to (double)-negation, ungrammaticality, or NPI-licensing continues until the end of the sentence.

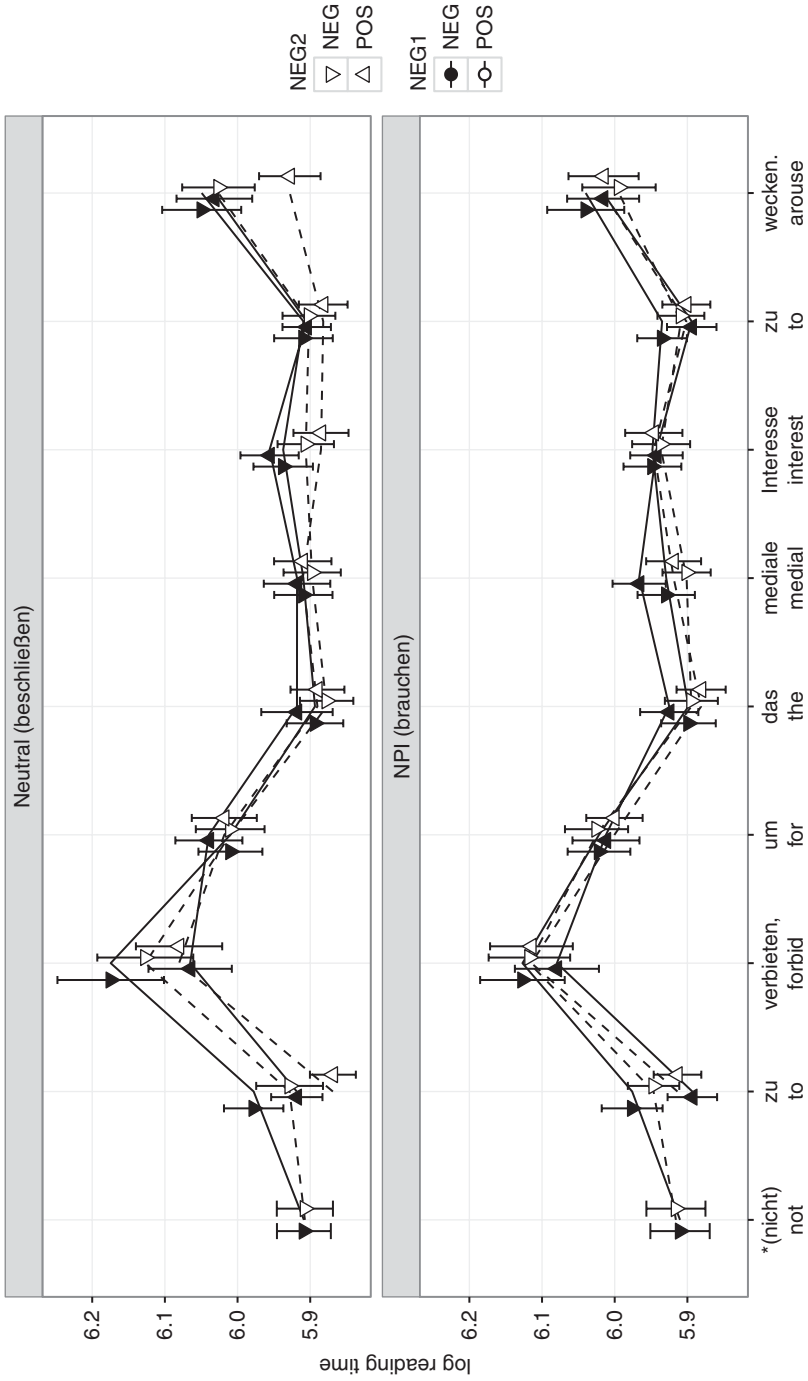


Figure 2: Mean reading times for the high VP + spillover region of experiment 1 (95% CI).

One weakness of the material is that in the first region, where we found the predicted effect, the distance between the position of the negation and the reconstruction site of the NPI is very small. An alternative explanation can therefore be that the prolonged reading times in the +NPI, -ILLUSORY.NEG-condition is a consequence of the missing negation. If the NPI is interpreted in the C-domain, a negation is expected. If this expectation is not satisfied, the reading times increase on the following elements. Clearly, a follow-up experiment needs to be performed in order to falsify the predictions of this hypothesis. However, we expect that this effect would emerge in the same way at the second VP region (*nicht zu verbieten*), contrary to the results. The fact that the effect in the second region is delayed and sensitive to the illusory negation renders it more plausible that the effect is tied to an interpretative mechanism of NPI-licensing rather than to a simple expectation of a negation. Moreover, an expectation-based approach is not able to explain the special status of the illusory licensing, which, however, has been reported in other experiments employing different experimental methods.

In sum, the result of the experiment closely match the predictions of the reconstruction hypothesis in the first region and are fully compatible with the predictions in the second region if we consider the increase in complexity at that point.

4 The dynamics of parsing with respect to the finite verb's reconstruction

According to the grammar, the C-position, which hosts the finite verb, is a functional position. We have amply demonstrated that the position in which the verb as a lexical item is interpreted is elsewhere, namely in the VP. If so, the verb in C is not or at least not fully semantically interpreted before it is lowered into the reconstruction site. One consequence of this is that the V2-position must under no circumstances be confused with the head of a head-initial VP. At the same time, we are familiar with and subscribe to the insight that the human parsing device exploits the input maximally in favor of the rapid establishment of a mental representation. How can this be harmonized with the verb's reconstruction into its base position and the apparent delay in full interpretation? It can if we allow ourselves to conceive of parsing as a dynamic process in which different and occasionally incongruous semantic representations may follow each other in a rapid sequence.

Let us adopt Kimball's (1973) principle of *Early Closure* (EC). EC determines that a phrase is closed as soon as possible, i. e., unless the next node parsed is

an immediate constituent of the phrase. EC is a principle of parsimony by making minimal assumptions about the upcoming input. The sentence will be closed as soon as it has reached minimal completeness under the control of the competence grammar. Assume the parser has received the three constituents *Johann*, *hat* and *ein Buch*. The parse proceeds as in (47). Given that the finite verb is in C and needs to be lowered into its base position, (47d) is a step that copies the finite verb into its base position. At this point, EC applies, and the proposition could in principle be shunted to the general cognitive system.

- (47) a. Johann
 b. Johann hat
 c. Johann hat ein Buch
 d. Johann ~~hat~~ ein Buch hat EC
 e. Johann ~~hat~~ ein Buch hat verloren LC
 f. Johann ~~hat~~ ein Buch ~~hat~~ verloren hat EC
 Johann a book lost has

At this stage, the mental representation is roughly POSSESS (johann, book). However, EC must not be understood as stopping the integration of further material for good. If the parser receives the verbal form *verloren*, this form can be integrated in such a way that the VP [*ein Buch hat*] will be changed into [*ein Buch verloren hat*]. The principle by which the parse is extended is known as *Late Closure* (LC) (Frazier 1978). LC (a. k. a. *Recency*) demands that new material is integrated into the current node that is under construction and not elsewhere as it would, for example, be the case in the apposition construction *Johann hat ein Buch, ... verloren von Hedwig und wieder gefunden von seinem Freund Willi* ('Johann has/owns a book, lost by Hedwig and found again by his friend Willi'). How can LC integrate the non-finite verb *verloren* into (47d)? It can do so by attaching *verloren* to the VP [*ein Buch hat*] and lowering the finite verb *hat* one step down to the end of the newly created VP. Here, EC applies again, and the resulting sentence is again ready for being shunted out of the parser's work space.

At first sight, one may find such revision cumbersome, but closer inspection shows that the change is less dramatic than it seems. Bader & Bayer (2006: 2), following earlier work by Mitchell (1994) and Gorrell (1995), distinguish between processes of structure assembly and processes of linking (and checking, which does not play a role here). *Structure assembly* concerns the processes that compute phrase-structure trees. *Linking* concerns the processes that associate phrases within the phrase-structure tree with argument structure positions. In the transition from (47d) to (47f), the DP *ein Buch* has to be re-linked from the (main) verb *hat* to the verb *verlieren*. This is possible because *hat* disappears

from the structure by being lowered to the next potential reconstruction site of the finite verb. The object status of the DP does not change. We can, of course, not be sure what the human parser *actually* does within milliseconds, but assuming that (47d) has received a conclusive semantic interpretation, we see here a drastic semantic change toward a totally different proposition. FRITZ OWNS A BOOK \Rightarrow FRITZ LOST A BOOK. Although this semantic shift is remarkable, processing the sentence *Fritz hat ein Buch verloren* is far from giving rise to a conscious garden path. The reason is that there is no garden path involved.³¹ In a garden path, normally, a constituent gets relocated into another phrase as, for example, in *When you [run a mile] ... looks like nothing* \Rightarrow *When you [run] [a mile looks like nothing]*. Here *a mile* needs to be taken out of the current VP and inserted as the subject into a new sentence. Notice that in our example, the DP *ein Buch* is not taken out of its minimal VP; it is simply relinked within its VP after the latter has been enriched by the new predicate *verloren*, and the original verbal head, namely *hat*, has been lowered to clause-final position. If we are right, the prediction is that successive lowering of the finite verb in on-line comprehension may run through different semantic representations without giving rise to anything comparable with garden path effects. Given that German V2 (and V1) clauses are not in any sense harder to comprehend than V-final clauses, the almost inevitable conclusion must be that semantic “garden paths” must be rather harmless in comparison with genuine structure-based garden paths.

This does not mean that we want to downplay the effects of temporary semantic ambiguity. The following example is a real life spoken sentence from a radio program that was heard by the first author.

31 Wikipedia informs us that

A garden path sentence is a grammatically correct sentence that starts in such a way that a reader's most likely interpretation will be incorrect; the reader is lured into a parse that turns out to be a dead end or yields a clearly unintended meaning. (Source: https://en.wikipedia.org/wiki/Garden_path_sentence)

This definition is far too unrestricted. Next to cases of structural reassignment, it declares any sentence a *garden path* in which an expectation of the hearer has not been satisfied by the input. If the pronoun *he* in *John believes that he won* is preferentially interpreted as coreferential with John, the revelation that *he* actually refers to Bill would amount to a garden path. This is obviously wrong. A garden path in the narrow sense that we are using is a sentence in which some constituent X needs to be removed from its current structure Y and be re-inserted into a new structure Z; as a consequence, structure Y – the garden path – has to be abandoned. This is the case in, say, *John gave her earrings* if it is continued with the phrase *to Sue*. The dative of *her* has to be removed from the structure and reanalyzed as a possessive pronoun of the DP *her earrings*. Restructuring in this sense is far more specific than general revision of *unintended meaning*.

- (48) Der junge Mann trug ein grünes Kleid durch den Laden.
 the young man carried a green dress through the shop
 ‘The young man carried a green dress across the shop.’

This sentence gives rise to a strong effect of semantic revision because *tragen* can mean ‘to wear’. After merger with the DP *ein grünes Kleid* and before the advent of further input, this interpretation is extremely strong. The hearer lands invariably at the proposition that the young man wore a green dress.³² In spite of this, the “repair” that follows when more input enters the structure, lacks the garden path flavor entirely. The transition into the semantic representation corresponding to (48) is effortless. It is like seeing one picture and immediately after seeing another picture. The absence of a (structural) garden path effect is immediately explained in the present theory of V2 parsing by successive lowering of the finite verb. Consider how the parse develops over time.

- (49) a. Der junge Mann
 b. Der junge Mann trug
 c. Der junge Mann ~~trug~~ ein grünes Kleid trug EC
 d. Der junge Mann ~~trug~~ ein grünes Kleid trug durch den Laden LC
 e. Der junge Mann ~~trug~~ ein grünes Kleid ~~trug~~ durch den Laden trug EC
 the young man a green dress through the shop carried

At (49c), the interpretation is that the young man wore a green female dress. This meaning is abandoned without a garden path-like restructuring and is remodeled after attachment of the directional PP *durch den Laden* and further lowering of the verb *tragen*. After merger with this PP, the verb’s meaning has changed from ‘wear’ to ‘carry’: The young man, whose outfit, of course, remains without any mention, carried a green female dress across the shop.

This example shows rather clearly what is going on during comprehension of a V2, clause: The finite verb is lowered into its closest base position, in agreement with minimal assumptions about the input. Upon further input, this can be performed recursively until no further input comes in and the end of the parse has been reached. Intermediate shifts in meaning are obviously computed but do not appear to hamper the parsing process in a serious way.

³² Since in German the noun *Kleid* is reserved for a female dress, the immediate reaction to the sentence is that this young man dressed like a woman.

5 Conclusions

The syntax and semantics of German gives quite a number of cues that the lexical part of the finite verb in V2- or V1-constructions is interpreted in its base position. This position is beyond any doubt the clause-final position. This means that German is in its underlying structure a genuine head-final language. Thus, German can in no way be confused with a language whose VP is headed by an initial head. Various tests reveal that the only way to arrive at proper generalizations about the competence grammar of the language requires the verb's reconstruction into the clause-final position.

While this view is shared by many linguists who work in generative grammar, it is not so obvious how the structural assumptions map onto processes of on-line comprehension that have been studied in theoretical and experimental psycholinguistics so far. According to the common sense view, every word is integrated and exhaustively interpreted at the very moment it is received. At first sight, this view seems to clash with the linguistic structure that assumes the finite verb to be reconstructed. However, we have presented experimental studies that do not support the fully incremental perspective but rather support our hypothesis that whenever the lexical verb meaning is needed, the processes are delayed until the reconstruction site in V2, clauses has been reached. In an experiment about the on-line reading of sentences with the NPI-verb *brauchen* in 2nd position, it could be shown that the human parser in fact does quite exactly what is expected from the view of the competence grammar: The verb *brauchen* is mentally lowered to the next possible landing site. If it can be lowered to a position that is locally c-commanded by negation (or some other relevant operator), the parse converges. If it is, however, lowered to a position that is not locally c-commanded by negation, the parse collapses. In the present experiment, this could be demonstrated with enhanced reading times.

Naturally various questions about V2 and V2-parsing remain. A very interesting topic is certainly the status of dummy insertion as, for instance, seen in *tun*- or verb-doubling constructions. Although our observations and intuitions seem to be on the right track, it remains open how these cases can be integrated into the theory of grammar. Likewise it remains to be seen how these structures are processed. Nevertheless the convergence of linguistic and experimental psycholinguistic research should be taken as an indication that our present understanding of the V2-phenomenon is on a promising track of theory-building.

References

- Abraham, Werner. 2013. *Deutsche Syntax im Sprachenvergleich: Grundlegung einer typologischen Syntax des Deutschen*. 3. überarbeitete und erweiterte Auflage. Tübingen: Stauffenburg.
- Abraham, Werner & Annette Fischer. 1998. Das grammatische Optimalisierungsszenario von *tun* als Hilfsverb. In Karin Donhauser & Ludwig M. Eichinger (eds.), *Deutsche Grammatik – Thema in Variationen: Festschrift für Hans-Werner Eroms zum 60. Geburtstag*. Heidelberg: Winter.
- Anderson, Stephen R. 1993. Wackernagel's revenge: Clitics, morphology, and the syntax of second position. *Language* 69(1). 68–98.
- Bader, Markus & Josef Bayer. 2006. *Case and linking in language comprehension: Evidence from German*. Vol. 34. Dordrecht: Springer.
- Bader, Markus & Tanja Schmid. 2006. An OT-analysis of *do*-support in Modern German. Manuscript Universität Konstanz, available at Rutgers Optimality Archive, <http://roa.rutgers.edu/>, ROA-837.
- Baroni, Marco, Silvia Bernardini, Adriano Ferraresi & Eros Zanchetta. 2009. The WaCky wide web: A collection of very large linguistically processed web-crawled corpora. *Language Resources and Evaluation* 43(3). 209–226.
- Barss, Andrew. 1986. *Chains and anaphoric dependence: On reconstruction and its implications*. Cambridge, MA: MIT. (Doctoral dissertation).
- Basilico, David, Pilar Piñar & Inès Antòn-Mèndez. 1995. Canonical word order and the processing of verbal traces in Spanish. The Proceedings of the Eighth Annual CUNY Conference on Human Sentence Processing, Tucson, Arizona.
- Bayer, Josef. 1984. COMP in Bavarian syntax. *The Linguistic Review* 3(3). 209–274.
- Bayer, Josef. 2014. Syntactic and phonological properties of *wh*-operators and *wh*-movement in Bavarian. In Günther Grewendorf & Helmut Weiss (eds.), *Bavarian syntax: Contributions to the theory of syntax*, 23–50. Amsterdam: John Benjamins.
- Bayer, Josef. 2017. Prima la musica, dopo le parole: A small note on a big topic. In Gautam Sengupta, Shruti Sircar, Madhavi Gayathri Raman & Rahul Balusu (eds.), *Perspectives on the architecture and acquisition of syntax: Essays in honour of R. Amritavalli*, 195–213. Singapore: Springer.
- Bayer, Josef. 2018. Criterial freezing in the syntax of particles. In Jutta Hartmann, Marion Jäger, Andreas Konietzko & Susanne Winkler (eds.), *Freezing: Theoretical approaches and empirical domains*, 225–236. Berlin: De Gruyter.
- Bayer, Josef & William Marslen-Wilson. 1992. Configurationality in the light of language comprehension: The order of arguments in German. Manuscript Friedrich-Schiller-Universität Jena/Birkbeck College London.
- Behaghel, Otto. 1932. *Deutsche Syntax: Eine geschichtliche Darstellung*. Vol. 4, Wortstellung. Periodenbau. Heidelberg: Winter.
- Bidese, Ermenegildo, Andrea Padovan & Alessandra Tomaselli. 2012. A binary system of complementizers in Cimbrian relative clauses. *Working Papers in Scandinavian Syntax* 90. 1–21.
- Bidese, Ermenegildo, Andrea Padovan & Alessandra Tomaselli. 2013. Bilingual competence, complementizer selection and mood in Cimbrian. In Werner Abraham & Elisabeth Leiss (eds.), *Dialektologie in neuem Gewand: Zu Mikro-/Varietätenlinguistik, Sprachenvergleich und Universalgrammatik*, 47–58. Hamburg: Buske.

- Bierwisch, Manfred. 1983. How on-line is language processing? In Giovanni B. Flores d'Arcais & Robert J. Jarvella (eds.), *The process of language understanding*, 113–168. Chichester: John Wiley & Sons.
- Bornkessel, Ina. 2002. *The argument dependency model: A neurocognitive approach to incremental interpretation*. Leipzig: Max Planck Institute of Cognitive Neuroscience.
- Bornkessel, Ina & Matthias Schlesewsky. 2006. The role of contrast in the local licensing of scrambling in German: Evidence from online comprehension. *Journal of Germanic Linguistics* 18(1). 1–43.
- Bornkessel, Ina, Matthias Schlesewsky & Angela Friederici. 2002. Grammar overrides frequency: Evidence from the online processing of flexible word order. *Cognition* 85. B21–B30.
- Bornkessel, Ina, Matthias Schlesewsky & Angela D. Friederici. 2003. Contextual information modulates initial processes of syntactic integration: The role of inter- versus intrasentential predictions. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 29(5). 871–882.
- Bott, Oliver & Fabian Schlotterbeck. 2015. The processing domain of scope interaction. *Journal of Semantics* 32(1). 39–92.
- Chomsky, Noam. 1995. *The minimalist program*. Cambridge, MA: MIT Press.
- Drenhaus, Heiner, Stefan Frisch & Douglas Saddy. 2005. Processing negative polarity items: When negation comes through the backdoor. In Stefan Kepser & Marga Reis (eds.), *Linguistic evidence: Empirical, theoretical and computational perspectives*, 145–164. Berlin: De Gruyter.
- Fanselow, Gisbert, Reinhold Kliegl & Matthias Schlesewsky. 1999. Processing difficulty and principles of grammar. In Susan Kemper & Reinhold Kliegl (eds.), *Constraints on language: Aging, grammar and memory*, 171–201. Dordrecht: Kluwer.
- Felser, Claudia, Harald Clahsen & Thomas F. Münte. 2003. Storage and integration in the processing of filler-gap dependencies: An ERP study of topicalization and *wh*-movement in German. *Brain and Language* 87(3). 345–354.
- Fleischer, Jürg. 2008. Zur topikalisierenden Infinitivverdopplung in deutschen Dialekten: *Trinken trinkt er nicht, aber rauchen raucht er* (mit einem Exkurs zum Jiddischen). In Peter Ernst & Franz Patocka (eds.), *Dialektgeographie der Zukunft: Akten des 2. Kongresses der Internationalen Gesellschaft für Dialektologie des Deutschen (IGDD) am Institut für Germanistik der Universität Wien, 20. bis 23. September 2006*, 243–268. Stuttgart: Steiner.
- Frazier, Lyn. 1978. *On comprehending sentences: Syntactic parsing strategies*. Storrs, CT: University of Connecticut. (Doctoral dissertation).
- Frazier, Lyn & Charles Clifton. 1989. Successive cyclicity in the grammar and the parser. *Language and Cognitive Processes* 4(2). 93–126.
- Freitag, Constantin. 2019. *Verb-second in grammar, processing, and acquisition: What you see is not what you get*. Universität Konstanz. (Doctoral dissertation).
- Friederici, Angela D. & Stefan Frisch. 2000. Verb argument structure processing: The role of verb-specific and argument-specific information. *Journal of Memory and Language* 43(3). 476–507.
- Glück, Helmut & Michael Rödel (eds.). 2016. *Metzler Lexikon Sprache*. 5th revised and extended edition. Stuttgart: Metzler.
- Gorrell, Paul. 1995. *Syntax and parsing*. Cambridge: Cambridge University Press.
- Haegeman, Liliane. 1992. *Theory and description in generative syntax: A case study in West Flemish*. Cambridge: Cambridge University Press.

- Haider, Hubert. 2012. *Symmetry breaking in syntax*. Cambridge: Cambridge University Press.
- Hale, Ken. 1983. Warlpiri and the grammar of non-configurational languages. *Natural Language & Linguistic Theory* 1(1). 5–47.
- Hemforth, Barbara. 1993. *Kognitives Parsing: Repräsentation und Verarbeitung sprachlichen Wissens*. Sankt Augustin: infix.
- Hemforth, Barbara & Lars Konieczny (eds.). 2000. *German sentence processing*. Dordrecht: Kluwer.
- Heycock, Caroline. 1995. Asymmetries in reconstruction. *Linguistic Inquiry* 26(4). 547–570.
- Hoekstra, Jarich. 2016. Beyond *do*-support and *tun*-periphrasis: The case of finite verb doubling in Karrharde North Frisian. *Journal of Germanic Linguistics* 28(4). 317–348.
- Hornstein, Norbert, Jairo Nunes & Kleanthes K. Grohmann. 2005. *Understanding minimalism*. Cambridge: Cambridge University Press.
- Kimball, John P. 1973. Seven principles of surface structure parsing in natural language. *Cognition* 2(1). 15–47.
- Konieczny, Lars. 1996. *Human sentence processing: A semantics-oriented parsing approach*. Albert-Ludwigs-Universität zu Freiburg. (Doctoral dissertation).
- Konieczny, Lars. 2000. Locality and parsing complexity. *Journal of Psycholinguistic Research* 29(6). 627–645.
- Konieczny, Lars & Philipp Döring. 2003. Anticipation of clause-final heads: Evidence from eye-tracking and SRNs. In Peter Slezak (ed.), *Proceedings of the 4th international conference on cognitive science and the 7th conference of the Australasian society for cognitive science*, 330–335.
- König, Ekkehard & Volker Gast. 2012. *Understanding English-German contrasts*. Berlin: Erich Schmidt Verlag.
- Kremers, Joost. 2009. A prosodic approach to particle verbs. *Linguistische Berichte* 217. 81–96.
- Lasnik, Howard. 1981. Restricting the theory of transformations: A case study. In Norbert Hornstein & David Lightfoot (eds.), *Explanation in linguistics: The logical problem of language acquisition*, 152–173. London: Longman.
- Legate, Julie Anne. 2008. Warlpiri and the theory of second position clitics. *Natural Language & Linguistic Theory* 26(1). 3–60.
- Levy, Roger & Frank Keller. 2013. Expectation and locality effects in German verb-final structures. *Journal of Memory and Language* 68. 199–222.
- Lewis Jr., Robert Eugene. 2013. *Complementizer agreement in Najdi Arabic*. Lawrence: University of Kansas. (Master's Thesis).
- Love, Tracy E. & David A. Swinney. 1998. The influence of canonical word order on structural processing. In Dieter Hillert (ed.), *Sentence processing: A crosslinguistic perspective*, 153–166. New York: Academic Press.
- Maienborn, Claudia. 2003. *Die logische Form von Kopula-Sätzen*. Berlin: Akademie-Verlag.
- Matzke, Mike, Heinke Mai, Wido Nager, Jascha Rüsseler & Thomas Münte. 2002. The costs of freedom: An ERP-study of non-canonical sentences. *Clinical Neurophysiology* 113(6). 844–852.
- Meinunger, André. 2004. Interface restrictions on verb second. In Ralf Vogel (ed.), *Three papers on German verb movement*, 51–81. Potsdam: Universitätsverlag.
- Meng, Michael & Markus Bader. 2000. Mode of disambiguation and garden-path strength: An investigation of subject-object ambiguities in German. *Language and Speech* 43(1). 43–74.

- Miestamo, Matti. 2007. Negation: An overview of typological research. *Language and Linguistics Compass* 1(5). 552–570.
- Mitchell, Don C. 1994. Sentence parsing. In Morton Gernsbacher (ed.), *Handbook of psycholinguistics*, 375–409. New York: Academic Press.
- Miyashita, Mizuki. 2006. Tohono o’odham. In Keith Brown (ed.), *Encyclopedia of language & linguistics*, Second Edition, 735–737. Oxford: Elsevier.
- Müller, Gereon. 2004. Verb-second as vP-first. *The Journal of Comparative Germanic Linguistics* 7(3). 179–234.
- Nuñez, Jairo M. 2011. The copy theory. In Cedric Boeckx (ed.), *The Oxford handbook of linguistic minimalism*, 143–172. Oxford: Oxford University Press.
- Parker, Dan & Colin Phillips. 2016. Negative polarity illusions and the format of hierarchical encodings in memory. *Cognition* 157. 321–339.
- Rizzi, Luigi. 1990. *Relativized minimality*. Cambridge, MA: MIT Press.
- Rösler, Frank, Thomas Pechmann, Judith Streb, Brigitte Röder & Erwin Hennighausen. 1998. Parsing of sentences in a language with varying word order: Word-by-word variations of processing demands are revealed by event-related brain potentials. *Journal of Memory and Language* 38(2). 150–176.
- Rothmayr, Antonia. 2009. *The structure of stative verbs*. Amsterdam: John Benjamins.
- Saddy, Douglas, Heiner Drenhaus & Stefan Frisch. 2004. Processing polarity items: Contrastive licensing costs. *Brain and Language* 90. 495–502.
- Scheepers, Christoph. 1997. *Menschliche Satzverarbeitung: Syntaktische und thematische Aspekte der Wortstellung im Deutschen*. Albert-Ludwigs-Universität zu Freiburg. (Doctoral dissertation).
- Scheepers, Christoph, Barbara Hemforth & Lars Konieczny. 2000. Linking syntactic functions with thematic roles: Psych-verbs and the resolution of subject-object ambiguity. In Barbara Hemforth & Lars Konieczny (eds.), *German sentence processing*, 95–135. Dordrecht: Kluwer.
- Schlesewsky, Matthias & Ina Bornkessel. 2004. On incremental interpretation: Degrees of meaning accessed during sentence comprehension. *Lingua* 114(9–10). 1213–1234.
- Schlesewsky, Matthias, Ina Bornkessel & Stefan Frisch. 2003. The neurophysiological basis of word order variations in German. *Brain and Language* 86(1). 116–128.
- Schlesewsky, Matthias, Ina Bornkessel & Martin Meyer. 2002. Why a “word order difference” is not always a “word order” difference: A reply to Weyerts, Penke, Münte, Heinze, and Clahsen. *Journal of Psycholinguistic Research* 31(5). 437–445.
- Schlesewsky, Matthias, Gisbert Fanselow, Reinhold Kliegl & Josef Krems. 2000. The subject preference in the processing of locally ambiguous wh-questions in German. In Barbara Hemforth & Lars Konieczny (eds.), *German sentence processing*, 65–93. Dordrecht: Kluwer.
- Schwarz, Christian. 2004. *Die tun-Periphrase im Deutschen*. Ludwig-Maximilians-Universität München. (Magisterarbeit).
- Sportiche, Dominique. 2006. Reconstruction, binding, and scope. In Martin Everaert & Henk van Riemsdijk (eds.), *The Blackwell companion to syntax*, 35–93. Oxford: Blackwell Publishing.
- Stowe, Laurie A. 1986. Parsing wh-constructions: Evidence for on-line gap location. *Language and Cognitive Processes* 1(3). 227–245.
- Temme, Anne & Elisabeth Verhoeven. 2016. Verb class, case, and order: A crosslinguistic experiment on non-nominative experiencers. *Linguistics* 54(4). 769–813.

- Travis, Lisa deMena. 1984. *Parameters and effects of word order variation*. Cambridge, MA: MIT. (Doctoral dissertation).
- Verhoeven, Elisabeth. 2015. Thematic asymmetries do matter! A corpus study of German word order. *Journal of Germanic Linguistics* 27(1). 45–104.
- Weiss, Helmut. 2005. Inflected complementizers in Continental West Germanic dialects. *Zeitschrift für Dialektologie und Linguistik* 72(2). 148–166.
- Weskott, Thomas. 2003. *Information structure as a processing guide: The left periphery of German verb-second sentences and its interpretation in context*. Universität Leipzig. (Doctoral dissertation).
- Weyerts, Helga, Martina Penke, Thomas F. Münte, Hans-Jochen Heinze & Harald Clahsen. 2002. Word order in sentence processing: An experimental study of verb placement in German. *Journal of Psycholinguistic Research* 31(3). 211–268.
- Zanuttini, Raffaella. 2001. Sentential negation. In Mark Baltin & Chris Collins (eds.), *The handbook of contemporary syntactic theory*, 511–535. Oxford: Blackwell.
- Zeijlstra, Hedde. 2007. Negation in natural language: On the form and meaning of negative elements. *Language and Linguistics Compass* 1(5). 498–518.
- Zepeda, Ofelia. 1983. *A Papago grammar*. Tucson, AZ: The University of Arizona Press.