

6-2010

Verbal Complex Phenomena in West Central German: Empirical Domain and Multi-Causal Account

Shannon A. Dubenion-Smith

Western Washington University, shannon.dubenion-smith@wwu.edu

Follow this and additional works at: https://cedar.wwu.edu/mcl_facpubs

 Part of the [Modern Languages Commons](#)

Recommended Citation

Dubenion-Smith, Shannon A., "Verbal Complex Phenomena in West Central German: Empirical Domain and Multi-Causal Account" (2010). *Modern & Classical Languages*. 19.
https://cedar.wwu.edu/mcl_facpubs/19

This Article is brought to you for free and open access by the Humanities at Western CEDAR. It has been accepted for inclusion in Modern & Classical Languages by an authorized administrator of Western CEDAR. For more information, please contact westerncedar@wwu.edu.

Verbal Complex Phenomena in West Central German: Empirical Domain and Multi-Causal Account

Shannon A. Dubenion-Smith

Western Washington University

This paper is a synchronic investigation of verbal complex phenomena in the West Central German dialects. The types of verbal complexes attested in 187 recordings of West Central German from the Zwirner Corpus are first classified and analyzed. A *GoldVarb* analysis reveals that in subordinate clause two-verb complexes, the factor groups syntagm and verbal prefix type have statistically significant effects on word order, while in main clause two-verb complexes the factor groups syntagm, verbal prefix type, and a grammatical correlate to focus have statistically significant effects. Taking as a point of departure Lötscher 1978 and Sapp 2007, a multi-causal account of verbal complex phenomena involving grammatical, functional, and performance factors is developed, with a close examination of the role of language processing in verbal complex formation. Following Hawkins' (1994, 2004) notions of Early Immediate Constituents and Minimize Domains, it is argued that the type of verbal complex known as Verb Projection Raising can be linked in part to an advantage in language production. The paper concludes with a discussion of the speaker-hearer dichotomy as it relates to German clausal structure and the role of interfaces in the analysis of verbal complexes.*

1. Introduction.

A striking syntactic characteristic of the Continental West Germanic languages, including extraterritorial varieties such as Afrikaans and Pennsylvania Dutch, is the clustering of multiple verb forms in a VERBAL COMPLEX. Such complexes exhibit microparametric variation in the

* The present study is a condensed, revised version of portions of my doctoral dissertation (Dubenion-Smith 2008). I would like to thank Mark L. Loudon, Shaw N. Gynan, and two anonymous reviewers for their helpful comments on earlier drafts of this work, as well as Petra Fiero for her assistance with several of the dialect examples. The usual disclaimers apply.

number, type, and ordering of elements that cluster, according to language, dialect, and idiolect (see den Besten & Edmondson 1983, Evers 1975, Haegeman & van Riemsdijk 1986, Schmid & Vogel 2004, and Wurmbrand 2006 among others). For example, the relative ordering of past participle, auxiliary, and modal in the verbal complex is fixed in standard German, as illustrated in 1.¹

(1) Standard German

weil man nicht alles gelesen₃ haben₂ muss₁ 3-2-1
 because one not everything read have must
 'because you don't have to have read everything' (Duden 2005:481)

By contrast, in standard Dutch and Bernese Swiss German more than one ordering is possible.

(2) Standard Dutch

a. dat hij niets gezien₃ kan₁ hebben₂ 3-1-2
 that he nothing seen can have
 'that he can't have seen anything' (ANS 1984:600)
 b. dat hij niets kan₁ gezien₃ hebben₂ 1-3-2
 c. dat hij niets kan₁ hebben₂ gezien₃ 1-2-3

(3) Bernese Swiss German

a. das er söll₁ gseit₃ ha₂ 1-3-2
 that he is.supposed said have
 'that he is supposed to have said' (Hodler 1969:689)
 b. das er gseit₃ ha₂ söll₁ 3-2-1

¹ In this paper, I adopt the standard numbering system employed in the literature on verbal complexes. The subscripts on verb forms in the examples indicate their level of embeddedness at D-structure, assuming an OV base, and order of subcategorization. A higher number indicates a deeper level of embeddedness; V_x subcategorizes V_{x+1} . Only those verbs in the complex itself are labeled with a subscript (that is, the finite verb that in main clauses has raised to C is not labeled).

The elements that appear in the verbal complex are not restricted to verb forms but may also include non-verbal material, such as adverbs, DPs, and PPs.² Example 4 illustrates one such complex in which the PP *auf n Ruckn* ‘onto the (his) back’ appears between the auxiliary *hân* ‘have’ and past participle *brâcht* ‘brought’.

(4) Austrian German (Carinthia)

bis i n hân₁ **auf n Ruckn** brâcht₂ 1-X-2
 until I him have onto the back brought
 ‘until I got him onto his back’ (Patocka 1997:306)

Finally, a constituent may be extraposed from its canonical position in the inner field to the right of the verb cluster, as evidenced in 5.

(5) Austrian German (Upper Austria)

âft is-s eascht fai(n) putzt₃ wou(r)dn₂ **mit de Messa** 3-2-X
 then is-it first finely cleaned been with the knives
 ‘then it was first trimmed nicely with the knives’ (Patocka 1997:324)

Over the past several decades, verbal complex phenomena have attracted the attention of scholars from various research traditions. The results of this interest include, among other works, a thorough typology of the phenomena in the Bavarian dialects spoken in Austria (Patocka 1997), the treatment of verbal complex data in Dutch and Swiss German syntax atlases, in particular the *Syntactische Atlas van de Nederlandse Dialecten* (SAND 2009.2) and the *Syntaktischer Atlas der Deutschen Schweiz* (SADS), and numerous generative studies such as Haegeman 1992, a book-length investigation of West Flemish dedicated in large part to the verbal complex.

However, as Schmid & Vogel (2004:272) lament, “the number of (not only) generative explorations into the syntax of German dialects in Germany has been extremely small, and there is little hope that this situation will change soon.” Wurmbrand (1999, 2000a, 2000b, 2002, 2004, 2006) has provided us with the most complete picture of verb clusters in varieties spoken across the German-speaking area, yet detailed

² These elements are labeled “X” throughout the text.

data for the West Central German (WCG) dialects remain lacking.³ This state of affairs is reflected in the graphic from Patocka 1997:265 (see figure 1), which shows the distribution of the 2-3 vs. 3-2 order in what is known as the modal IPP construction.⁴



Figure 1. Empirical gap in the distribution of the 2-3 vs. 3-2 order, modal IPP construction (Patocka 1997:265).

The question mark located squarely over the WCG dialect area (*Westmitteldeutsch*) clearly indicates an empirical lacuna to be filled.

What data we do have come mainly from subordinate clauses. With some exceptions, such as Patocka 1997, studies that examine verbal complexes exclude those from main clauses. Sapp (2006:5), for example, does so because “comparing verb clusters in main and subordinate clauses may be comparing unlike types.” As examples 4 and 5 above illustrate, verbal complexes in subordinate and main clauses differ

³ The WCG dialect region covers Luxembourg and the German states Hesse, Rhineland-Palatinate, and Saarland, portions of North-Rhine Westphalia, Thuringia, Baden-Württemberg, and Bavaria, as well as border areas in Belgium (Arlon) and France (Alsace, Lorraine).

⁴ In figure 1, the areas in which the 2-3 and 3-2 orders (for instance, *er hat müssen₂ arbeiten₃* vs. *er hat arbeiten₃ müssen₂* ‘he had to work’) predominate in base dialect are indicated by the vertical and horizontal lines, respectively.

crucially in that the former, but not the latter, include the finite verb. Nonetheless, data from verbal complexes in main clauses are rich, meriting proper documentation, and can give valuable insight into verbal complex formation, as this paper will demonstrate. Provided that main clauses are treated separately, their inclusion here should be unproblematic.

Previous research in generative frameworks has yielded a range of formal descriptive analyses that give important insight into how verbal complexes are derived. As Wurmbrand (2006) notes, however, what remains outstanding is an explanatory account of *why* verbal complexes arise. Beyond strictly formal syntactic analyses, there has been progress on this front: Lötscher (1978), on the basis of Zurich Swiss German data, has proposed a multi-causal approach to verbal complex phenomena involving grammatical, functional, and performance rules, and Sapp (2006, 2007) has made great strides in defining the role of functional rules with his investigation of focus in Early New High German (ENHG) verbal complexes. Yet the role of performance rules and the way in which the three rule types interact require further elucidation.

The purpose of this paper is twofold. First, it classifies and analyzes subordinate and main clause verbal complex phenomena in the WCG dialects spoken in the Federal Republic of Germany, attested in transcripts of 187 dialect recordings from the *Zwirner Corpus*.⁵ Second, it contributes to our theoretical understanding of verbal complexes, complementing Lötscher's (1978) multi-causal account and Sapp's (2007) investigation of the relationship between word order in the verbal complex and focus. Following Hawkins' (1994, 2004) notions of EARLY IMMEDIATE CONSTITUENTS and MINIMIZE DOMAINS, this study links particular serializations to EXTRAPOSITION, a productive syntactic operation in German, and to processing constraints. I argue that the type of verbal complex exemplified in 4 above, known in the generative literature as VERB PROJECTION RAISING (VPR), can be linked in part to an advantage in language production.⁶ My analysis is compatible with

⁵ The WCG dialects spoken in Belgium, France, and Luxembourg have been excluded from this study.

⁶ Consider the WCG examples in (ii)a and (ii)b, derived from the underlying structures in (i)a and (i)b, respectively.

the concept of the KLAMMERNDES VERFAHREN (bracketing) outlined in Ronneberger-Sibold 1994 and the so-called speaker-hearer dichotomy. In particular, I maintain that the verbal bracket, which according to Ronneberger-Sibold 1991 and 1994 serves to mark syntactic boundaries for the benefit of the hearer, can be disrupted through VPR partly because this entails a processing benefit for the speaker.

The remainder of the paper is structured as follows. In section 2, the WCG dialect area and corpus are introduced, followed by an empirical and statistical analysis of verbal complexes in sections 3 and 4. Sections 5, 6, and 7 outline a multi-causal account of these complexes with an emphasis on performance, building on Lötscher 1978 and Sapp 2007. The paper concludes with a summary in section 8.

2. Dialect Area and Corpus.

2.1. West Central German.

Since the 19th century, a number of scholars have made proposals for the division of the German dialect space (see, for example, Behaghel 1891,

-
- (i) a. dass wir [Milch bringen₂] können₁
 that we milk bring can
- b. dass sie [da einen ordentlichen Korb voll Essen kochen₂] müssen₁
 that they there a decent basket full food cook must
- (ii) a. dass wir Milch können₁ bringen₂ 1-2 (VR)
 that we milk can bring ZWI54
 ‘that we can bring milk’
- b. dass sie da müssen₁ 1-X-2 (VPR)
 that they there must
- einen ordentlichen Korb voll Essen** kochen₂ ZWG92
 a decent basket full food cook
 ‘that they have to cook a decent basketful of food’

In (ii)a, an example of VERB RAISING (VR), only the verb *bringen* has raised from the embedded clause to the right of *können*, yielding a cluster comprising verbal elements alone, [können₁ bringen₂], with the 1-2 order. In (ii)b, an example of VPR, not only the verb *kochen*, but also part of its verbal projection, the object DP *einen ordentlichen Korb voll Essen*, have raised to the right of *müssen*, yielding the complex [müssen₁ **einen ordentlichen Korb voll Essen** kochen₂] with the 1-X-2 order.

Bernhardi 1844, Bremer 1892, Martin 1959, Mitzka 1943, and Wiesinger 1983). Niebaum & Macha (2005:217) consider Wiesinger's (1983) division, which is based on a set of phonological and morphological features, the closest to linguistic reality since it clearly indicates the existence of transitional zones. As the authors point out, however, the majority of recent overviews of German dialects differentiate one dialect region from another on the basis of sound shift boundaries, resulting in a conception of dialect space in which one dialect area begins where another ends.⁷ The Institut für Deutsche Sprache in Mannheim, which maintains the material from which the data treated in this paper are drawn, organizes the sound recordings in its archives according to this type of division. Since the question of dialect differentiation is not central here, I therefore assume divisions of the WCG dialect area according to sound shift isoglosses, adopting those in Beckers 1980 as presented in figure 2 below.

WCG belongs to the central region of the High German dialect area bordering on Low German to the north, East Central German to the east, and Upper German to the south. The WCG region can be subdivided into two larger dialect areas along isogloss 6 in figure 2, the *dat/das* line, namely Central Franconian and Rhine Franconian. The former comprises the smaller dialect areas Riparian and Moselle Franconian, the latter *Pfälzisch* and Hessian.⁸ The dialects spoken in Lorraine (*Lothringisch*) were not included in this study.

⁷ See Niebaum & Macha 2005:217, note 2 for an extensive list of works. Beckers (1980:468) points out one problem with such boundaries, namely that they are a system of division inherited from 19th-century historical linguistics to divide up the Old and Middle High German dialect space.

⁸ Since no one-word equivalent for the German dialect designation *Pfälzisch* exists in English, I use the German term here. Note that Wiesinger (1983) uses the term *Rheinfränkisch* to refer to the area labeled *Pfälzisch* in figure 2.



Figure 2. West Central German dialect area (Beckers 1980:469).

2.2. *The Corpus.*

The corpus for the present study consists of 2,578 clauses from transcripts of 187 dialect recordings in the *Datenbank Gesprochenes Deutsch* (Spoken German Databank), maintained online by the Institut für Deutsche Sprache. The transcripts, classified as *Vollmundart* (base dialect), were taken from the Zwirner Corpus compiled between 1955 and 1970 under the direction of Eberhard Zwirner.⁹ These include all 73

⁹ Transcripts with the designation *Vollmundart* were chosen because they reflect the most base-dialectal form spoken in a given locality. According to Haas & Wagener (1992:4), *Vollmundart* is defined as “gut erhaltene, alte Ortsmundart, archaischer Laut- und Formenbestand” (well-maintained, old local dialect, archaic phonological and morphological inventory). Beyond this general description, however, no more specific criteria for this designation are given, nor

available transcripts from the Central Franconian dialect area and 114 transcripts from the Rhine Franconian dialect area.¹⁰ The number of transcripts from the Rhine Franconian dialect area totals roughly 175, yet only a subset of these was selected in order to strike a better balance between the number of transcripts from both major dialect regions. To this end, only one transcript from the oldest male and female speaker per *Planquadrat* (quadrant) was included for analysis.¹¹

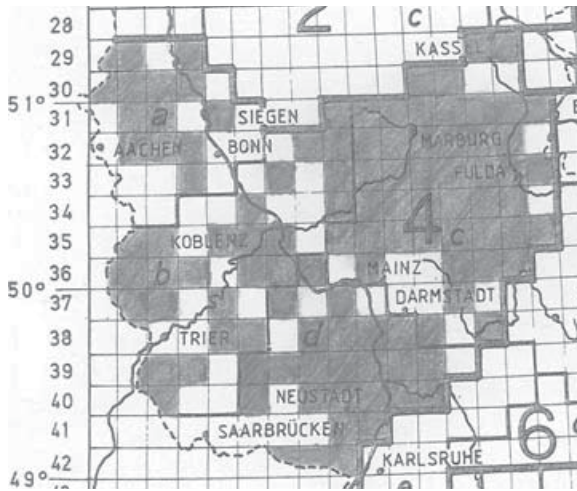


Figure 3. Quadrants represented in the corpus study
(map from Haas & Wagener 1992:1611).

is it clear how recordings in *Vollmundart* have been distinguished from those in *Halbmundart* (semi-dialect) and *Regionalmundart* (regional dialect), the other two categories. Note also that while the compilation of the Zwirner Corpus continued until 1970, the recordings on which this study is based were all made between 1955 and 1959.

¹⁰ Many recordings have not yet been transcribed and were therefore unavailable for analysis.

¹¹ The *Planquadrat* are 256 km² quadrants into which the German dialect space can be divided for cataloging purposes. Each quadrant is numbered according to coordinates on both the X and Y axes, facilitating the identification of dialect by locality.

Figure 3 above indicates the quadrants from which at least one transcript was taken. The WCG dialect area as a whole is demarcated by the heavy black line. The smaller dialect areas, further distinguished by the medium-heavy lines, are labeled “a” (Riparian), “b” (Moselle Franconian), “c” (Hessian), and “d” (Pfälzisch).

The 2,578 total tokens include 1,450 subordinate and 1,128 main clauses that fall into four complex categories: subordinate clause two- and three-verb complexes and main clause two- and three-verb complexes.¹² Only those tokens whose clausal status could be unambiguously determined were included in the corpus. Consider the examples in 6 and 7.

- (6) dass die Leute sollen **zufrieden** sein **mit uns** MC? 1-X-2-X?
 that the people should satisfied be with us ZWH55
 ‘that the people should be satisfied with us’
- (7) wenn wir sollten **in die Messe** gehen MC? 1-X-2?
 whenever we should into the mass go ZWH55
 ‘whenever we were supposed to go to mass’

Since no constituent appears between the subject *die Leute* ‘the people’ and the verb *sollen* ‘should’ in 6 or the pronominal subject *wir* ‘we’ and the verb *sollten* ‘should’ in 7, it is not possible to determine whether these are examples of main clauses with verb-second word order or subordinate clauses with the 1-X-2-(X) word order. Both clauses are introduced by a subordinating conjunction, *dass* and *wenn*, respectively; it is well known, however, that the subordinating conjunction *weil* may be followed by main clause word order in spoken German (see, for example, Gaumann 1983, Günther 1993, Louden 2000, Schwitalla 2003: 144–146, Wegener 1993). Thus, the type of conjunction alone is not sufficient to determine clausal status. For this reason, only clauses in which an element appears between the subject and first verb were included, as in 8 and 9.

¹² While 28 subordinate clause and 21 main clause complexes involving *zu* + infinitive are attested in the corpus, these were excluded from the present analysis and will be treated in a separate study.

- (8) dass man **so früh** musste₁ aufstehen₂ 1-2
 that one so early had.to stand.up ZWI94
 ‘that you had to get up so early’
- (9) dass wir **Schläge** hatten₁ gekriegt₂ 1-2
 that we blows had gotten ZW9B8
 ‘that we had been spanked’

After excluding eight clauses that did not meet this criterion, all those remaining were checked against the audio recordings, entered into a database, and then coded and classified according to verb form and verb type for further analysis.

3. Results of the Empirical Analysis.

This section presents the results of an empirical analysis of verbal complexes attested in the corpus, namely, subordinate clause two- and three-verb complexes and main clause two- and three-verb complexes. Because of space limitations, it is not possible to include the three-verb complexes in the discussion of VPR and extraposition (see Dubenion-Smith 2008:95–96, 107 for an analysis). However, an analysis of the two-verb complexes is sufficient with respect to these phenomena for the theoretical discussion of verbal complexes below. For each of the four complex categories, sentences exemplifying the syntagms attested in the corpus are presented, followed by tables summarizing their distribution. The syntagms were determined by first sorting the clauses in the database by verb form (INF, IPP, PTC, Vfin) and verb type (AUX, LEX, MOD), and then further differentiating tokens with identical verb form-type combinations until all distinct constructions had been identified.¹³

¹³ The abbreviations used throughout the text are as follows: AUX = auxiliary verb, INF = infinitive, IPP = *infinitivus pro participio*, LEX = lexical verb, MOD = modal verb, PTC = past participle, and Vfin = finite verb. For each verb form INF, IPP, PTC, or Vfin, the subscript indicates its type: AUX, LEX, or MOD. The order in which the abbreviations appear corresponds to the descending order of the verbs. If multiple word orders are possible with a given syntagm, an example with the most frequently occurring (canonical) order is provided. See the appendix for examples involving non-canonical word orders. Some of the descriptive labels for the subordinate clause syntagms have been

3.1. *Subordinate Clause Two-Verb Complexes.*

The corpus contains 1,326 subordinate clause two-verb complexes that fall into the syntagms illustrated in 10–16. The distribution of these syntagms is presented in table 1.¹⁴

(10) a. was der wieder gemacht ₂ hat ₁ what he again done has 'what he did again'	PTC _{LEX} -Vfin _{AUX} perfect with <i>haben</i> ¹⁵ ZW1G6
b. weil er krank geworden ₂ ist ₁ because he ill become is 'because he became ill'	PTC _{LEX} -Vfin _{AUX} perfect with <i>sein</i> ¹⁶ ZWP65
c. wenn die Leute das gewusst ₂ hätten ₁ if the people that known had 'if the people had known that'	PTC _{LEX} -Vfin _{AUX} subjunctive with <i>haben</i> ¹⁷ ZWI89
d. wenn ich ein anständiger Kerl if I a decent guy gewesen ₂ wäre ₁ been were 'if I had been a decent guy'	PTC _{LEX} -Vfin _{AUX} subjunctive with <i>sein</i> ZW9J8

borrowed from Sapp 2006, while those for the main clause syntagms are entirely my own.

¹⁴ In this and the tables below, the percentages beside the values in the columns headed by the possible word orders are row percentages, while those in the column labeled “total tokens” are column percentages.

¹⁵ The term “perfect” refers throughout the text to both the present perfect and pluperfect.

¹⁶ Clauses exhibiting the so-called *Zustandspassiv* (*sein*-passive, such as *die Tür ist geöffnet* ‘the door is open’) have not been included in this study.

¹⁷ No instances of the *würde* subjunctive, such as *dass er den Acker bestellen würde* ‘that he would plow the field’, are attested in the corpus.

- e. dass die Leute auch angestellt₂ werden₁ PTC_{LEX}-Vfin_{AUX}
 that the people also hired are *werden* passive
 ‘that the people also get hired’ ZWR19
- (11) dass es gerade regnen₂ muss₁ INF_{LEX}-Vfin_{MOD}
 that it right.now rain must INF + MOD
 ‘that it has to rain right now’ ZW1P1
- (12) wenn er da ernten₂ tut₁ INF_{LEX}-Vfin_{AUX}
 when he there harvest does INF + *tun*
 ‘when he harvests there’ ZW1P3
- (13) wer sich die Augen zubinden₂ lässt₁ INF_{LEX}-Vfin_{AUX/LEX}
 who REF the eyes blindfold lets INF + *lassen*¹⁸
 ‘who has his eyes blindfolded’ ZW8G2
- (14) die auch wirklich noch schaffen₂ gehen₁ INF_{LEX}-Vfin_{LEX}
 who also really still work go INF + LEX
 ‘those who also really still go work’ ZWJ02
- (15) dass sie ihre Arbeit gemacht₂ kriegen₁ PTC_{LEX}-Vfin_{LEX}
 that they their work done get PTC + *kriegen*¹⁹
 ‘that they get their work done’ ZWI89
- (16) dass ich morgens ... mit dem Onkel PTC_{MOD}-Vfin_{AUX}
 that I mornings ... with the uncle
 hinaus gemusst₂ habe₁ modal perfect
 out had.to have ZWG50
 ‘that I had to go out with my uncle in the morning...’

¹⁸ *Lassen* occurs in the corpus with the meanings ‘to cause’ and ‘to allow’ and is treated in this study as an auxiliary verb in the former and a lexical verb in the latter sense.

¹⁹ The syntagms with *kriegen* occur in the corpus with agentive, causative, and passive semantics.

Syntagm (group)	2-1	1-2	Total tokens
PTC + AUX (perfect, subjunctive, passive)	887 (92.4%)	73 (7.6%)	960 (72.4%)
INF + MOD	227 (74.9%)	76 (25.1%)	303 (22.9%)
INF + <i>tun</i>	27 (96.4%)	1 (3.6%) ²⁰	28 (2.1%)
INF + LEX	13 (59.1%)	9 (40.9%)	22 (1.7%)
PTC + <i>kriegen</i>	8 (100%)	0 (0%)	8 (0.6%)
INF + <i>lassen</i>	4 (100%)	0 (0%)	4 (0.3%)
modal perfect	1 (100%)	0 (0%)	1 (0.1%)
Totals	1,167 (88%)	159 (12%)	1,326 (100%)

Table 1. Distribution of subordinate clause two-verb complexes by syntagm (group).

As shown in table 1, the overall preferred order is 2-1, which occurs far more frequently than the 1-2 order, at a rate of 88% to 12%.²¹ The group of syntagms involving a past participle and an auxiliary verb, namely PTC + AUX (perfect, subjunctive, passive), and INF + MOD occur most frequently in the corpus, accounting for 1,263 out of 1,326 total tokens (95.2%), and display both the 2-1 and 1-2 orders.²² INF + *tun* and INF + LEX, which occur far less frequently, also display both the 2-1 and 1-2 orders, though the 1-2 order is rare with the former syntagm.²³ Finally, the syntagms with the lowest frequencies, the PTC + *kriegen*, INF + *lassen*, and the modal perfect, display only the 2-1 order. The last syntagm is very rare in the corpus, occurring in a single token. Table 2

²⁰ With the syntagm INF + *tun*, the 1-2 order occurs only with an intervening constituent (1-X-2).

²¹ These are the expected rates.

²² Unless otherwise noted, the past participle and infinitive forms are lexical verbs. Note too that the modal verbs include *brauchen* 'need', *dürfen* 'may', *können* 'can', *müssen* 'must', *sollen* 'should', and *wollen* 'want'.

²³ The finite lexical verbs include *bleiben* 'stay', *fortgehen* 'go forth', *gehen* 'go', *haben* 'have', *helfen* 'help', *hören* 'hear', *keimen* 'sprout', and *kommen* 'come'.

shows the breakdown of word order rates for PTC + AUX (perfect, subjunctive, passive).

PTC + AUX (perfect, subjunctive, passive)	2-1	1-2	Total tokens
perfect with <i>haben</i>	514 (98.7%)	7 (1.3%)	521 (54.3%)
perfect with <i>sein</i>	224 (77.8%)	64 (22.2%)	288 (30.0%)
<i>werden</i> passive	110 (99.1%)	1 (0.9%)	111 (11.6%)
subjunctive with <i>haben</i>	22 (100%)	0 (0%)	22 (2.3%)
subjunctive with <i>sein</i>	17 (94.4%)	1 (5.6%)	18 (1.9%)

Table 2. Breakdown of word order rates for PTC + AUX.

With the perfect with *haben*, subjunctive with *sein*, and *werden* passive, the rate of the 1-2 order is very low, occurring in only 7 out of 521 tokens (1.3%), 1 out of 18 tokens (5.6%), and 1 out of 111 tokens (0.9%), respectively. The 1-2 order is far more frequent with the perfect with *sein*, occurring in 64 out of 288 (22.2%) tokens. Finally, the 1-2 order is unattested with the subjunctive with *haben*.

3.2. Subordinate Clause Three-Verb Complexes.

The corpus contains 124 subordinate clause three-verb complexes that fall into the syntagms illustrated in 17–30. The distribution of these syntagms is presented in table 3.

- (17) a. wo das Stroh PTC_{LEX}-PTC_{AUX}-Vfin_{AUX}
 where the straw perfect of passive
 gebunden₃ worden₂ ist₁ perfect of passive
 baled been is ZWG56
 ‘where the straw was baled’
- b. dass ich fast ... PTC_{LEX}-PTC_{AUX}-Vfin_{AUX}
 that I almost ... subjunctive passive
 erschlagen₃ wäre₁ worden₂ subjunctive passive
 struck.dead were been ZWB43
 ‘that I had almost been struck dead’

- (18) a. was im Winter PTC_{LEX}-INF_{AUX}-Vfin_{MOD}
 what in.the winter
 geflickt₃ muss₁ werden₂ werden passive + MOD
 mended must be ZWW48
 ‘that has to be mended in the winter’
- b. ob das ... in Betrieb PTC_{LEX}-INF_{AUX}-Vfin_{MOD}
 if that ... in service
 genommen₃ könnte₁ werden₂ werden passive +
 taken could be subjunctive MOD
 ‘if that could be introduced into service’ ZWP01
- (19) a. wo ich noch Kisten INF_{LEX}-IPP_{MOD}-Vfin_{AUX}
 where I still crates
 machen₃ habe₁ müssen₂ modal IPP
 make have must ZWR51
 ‘where I still had to make crates’
- b. wenn ich noch zehn Minuten INF_{LEX}-IPP_{MOD}-Vfin_{AUX}
 if I still ten minutes
 hätte₁ müssen₂ laufen₃ subjunctive modal IPP
 had must run ZWB43
 ‘if I had had to run another ten minutes’
- (20) wie er sie zugemauert₃ gehabt₂ hat₁ PTC_{LEX}-PTC_{AUX}-Vfin_{AUX}
 how he it bricked.up had has complex perfect
 ‘when he had bricked it up inside’ ZWG44
- (21) wenn wir X machen₃ gegangen₂ sind₁ INF_{LEX}-PTC_{LEX}-Vfin_{AUX}
 when we X make gone are INF + perfect²⁴
 ‘whenever we went to do X’ ZWH52

²⁴ ACI = *accusativus cum infinitivo*. PTC = *geblieben* ‘stayed’, *gegangen* ‘gone’, *gekommen* ‘come’.

- (22) was man geschickt₃ hat₁ gekriegt₂ PTC_{LEX}-PTC_{LEX}-Vfin_{AUX}
 what one sent has gotten PTC + *kriegen* perfect
 ‘what you have been sent’ ZWI94
- (23) die wo so das erste Mal INF_{LEX}-INF_{LEX}-Vfin_{MOD}
 who where PART the first time
 tanzen₃ dürfen₁ gehen₂ double INF + MOD²⁵
 dance may go ZWG92
 ‘who are allowed to go dancing for the first time’
- (24) wenn man ... mit zwölf PTC_{LEX}-INF_{AUX}-Vfin_{MOD}
 when one ... with twelve
 zweimal gefahren₃ will₁ haben₂ perfect + MOD
 twice driven wants have ZWQ71
 ‘if you want to have ridden twice by noon’
- (25) dass man alles ... INF_{LEX}-INF_{LEX}-Vfin_{MOD}
 that one everything ...
 baumeln₃ lassen₂ kann₁ INF + *lassen* + MOD
 dangle let can ZW630
 ‘that you can let everything dangle’
- (26) wenn das erhalten₃ geblieben₂ wäre₁ PTC_{LEX}-PTC_{LEX}-Vfin_{AUX}
 if that maintained stayed were PTC + subjunctive
 ‘if that had been maintained’ ZWA71
- (27) wie man noch keine ... Flieger INF_{LEX}-PTC_{LEX}-Vfin_{AUX}
 how one still no ... airplanes
 herumfliegen₃ gesehen₂ hat₁ ACI perfect²⁶
 fly.around seen has ZWP62
 ‘when you still didn’t see any airplanes flying around’

²⁵ INF₂ = *gehen* ‘go’, *bleiben* ‘stay’.

²⁶ PTC = *gesehen* ‘seen’, *geblieben* ‘stayed’, *gegangen* ‘gone’, *gekommen* ‘come’.

- (28) dass ihr mich heute INF_{LEX}-PTC_{LEX}-Vfin_{AUX}
 that you me today
 mal gehen₃ gelassen₂ habt₁ INF + *lassen* perfect
 MOD go let have ZWI94
 ‘that you let me go today’
- (29) wenn wir es ja INF_{LEX}-IPP_{LEX}-Vfin_{AUX}
 if we it MOD
 stehen₃ hätten₁ lassen₂ INF + *lassen* subjunctive IPP
 stand would.have let ZWI54
 ‘if we had let it stand’
- (30) wo ich heute wieder soll₁ PTC_{LEX}-INF_{LEX}-Vfin_{MOD}
 where I today again should
 noch ein Stück abgemacht₃ kriegen₂ PTC + *kriegen* + MOD
 still a bit undone get ZWG98
 mit dem Bulldog
 with the tractor
 ‘where I should get another parcel of land harvested again today
 with the tractor’

As shown in table 3, the 3-1-2 order occurs most frequently overall, in 58 out of 124 total tokens (46.8%). However, the 3-2-1 order occurs nearly as frequently, in 50 out of 124 total tokens (40.3%). Thus, there is no robust predominance of a single word order as with the subordinate clause two-verb complexes. The most frequently occurring syntagms are the perfect of passive, *werden* passive + MOD, and modal IPP, representing 91 out of 124 total tokens (73.4%). Instances of the perfect of passive are nearly equally divided between the 3-2-1 and 3-1-2 orders, though the 3-2-1 order is slightly more frequent. With the *werden* passive + MOD and modal IPP, the 3-1-2 order occurs most frequently by a wide margin. The remaining syntagms are represented by 33 out of 124 total tokens (26.6%).

Syntagm	3-2-1	3-1-2	1-3-2	1-2-3	Total tokens
perfect of passive	24 (51.1%)	23 (48.9%)	0 (0%)	0 (0%)	47 (37.9%)
<i>werden</i> passive + MOD	7 (28%)	15 (60%)	3 (12%)	0 (0%)	25 (20.2%)
modal IPP	3 (15.8%)	8 (42.1%)	4 (21.1%)	4 (21.1%)	19 (15.3%)
complex perfect	6 (100%)	0 (0%)	0 (0%)	0 (0%)	6 (4.8%)
subjunctive modal IPP	0 (0%)	2 (50%)	0 (0%)	2 (50%)	4 (3.2%)
INF + perfect	3 (75%)	1 (25%)	0 (0%)	0 (0%)	4 (3.2%)
PTC + <i>kriegen</i> perfect	1 (33.3%)	2 (66.7%)	0 (0%)	0 (0%)	3 (2.4%)
double INF + MOD	1 (33.3%)	1 (33.3%)	1 (33.3%)	0 (0%)	3 (2.4%)
<i>werden</i> passive + subjunctive modal	0 (0%)	2 (100%)	0 (0%)	0 (0%)	2 (1.6%)
subjunctive passive	1 (50%)	1 (50%)	0 (0%)	0 (0%)	2 (1.6%)
perfect + MOD	0 (0%)	2 (100%)	0 (0%)	0 (0%)	2 (1.6%)
INF + <i>lassen</i> + MOD	1 (50%)	0 (0%)	1 (50%)	0 (0%)	2 (1.6%)
PTC + subjunctive	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (0.8%)
ACI perfect	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (0.8%)
INF + <i>lassen</i> perfect	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (0.8%)
INF + <i>lassen</i> subjunctive IPP	0 (0%)	1 (100%)	0 (0%)	0 (0%)	1 (0.8%)
PTC + <i>kriegen</i> + MOD	0 (0%)	0 (0%)	1 (100%)	0 (0%)	1 (0.8%)
Totals	50 (40.3%)	58 (46.8%)	10 (8.1%)	6 (4.8%)	124 (100%)

Table 3. Distribution of subordinate clause three-verb complexes by syntagm.

Note that the orders 2-3-1 and 2-1-3 are unattested in the corpus. This fact is unsurprising: The 2-3-1 order is relatively uncommon, limited to modal constructions in Afrikaans, Swabian, and West Flemish, while the 2-1-3 order is conspicuously absent from the inventories of three-verb complexes cross-linguistically and has thus been treated extensively in the generative literature.²⁷ (See Wurmbrand 2006:239–242 and Dubenion-Smith 2008:43–62 for discussions of these word orders.)

3.3. Main Clause Two-Verb Complexes.

The corpus contains 1,114 main clause two-verb complexes that fall into the syntagms illustrated in 31–48. The distribution of these syntagms is presented in table 4.²⁸

- | | |
|--|---|
| (31) die sind schön gelb
those are beautifully yellow

geröstet ₃ worden ₂
roasted been

'those were roasted a beautiful yellow' | PTC _{LEX} -PTC _{AUX}

perfect of passive [S]
ZWB06 |
| (32) die Milchkannen müssen gewaschen ₃ werden ₂
the milkjugs must washed
'the milkjugs must be washed' | PTC _{LEX} -INF _{AUX}
passive [MOD]
ZWW19 |
| (33) a. wir hatten müssen ₂ lachen ₃
we had must laugh
'we couldn't help but laugh' | INF _{LEX} -IPP _{MOD}
modal IPP [H]
ZWH62 |
| b. wie hätte ich ihn sollen ₂ rufen ₃
how had I him should call
'how should I have called him' | INF _{LEX} -IPP _{MOD}
subjunctive modal IPP [H]
ZWI13 |

²⁷ However, Heilmann (1999) does include 2-1-3 as a grammatical order in one variety of Swabian. In addition, Schmid & Vogel (2004) claim that the 2-1-3 order is possible under very specific stress conditions. Louden (1990, 2007, forthcoming) accounts for the 2-1-3 order in Pennsylvania Dutch by linking it to extraposition.

²⁸ In the labels for the main clause two-verb syntagms, the type of inflected verb located in C is given in brackets, where H = *haben*, MOD = modal verb, S = *sein*, and W = *werden*.

- (34) da bin ich auch arbeiten₃ gegangen₂ INF_{LEX}-PTC_{LEX}
 there am I also work gone INF + perfect [H/S]²⁹
 'I also went to work there' ZW9G6
- (35) das muss interessant gewesen₃ sein₂ PTC_{LEX}-INF_{AUX}
 that must interesting been be perfect [MOD]³⁰
 'that must have been interesting' ZWH76
- (36) da mussten wir Geld verdienen₃ gehen₂ INF_{LEX}-INF_{LEX}
 there had.to we money earn go double INF [MOD]
 'then we had to go earn money' ZWP89
- (37) warum hast du den Bub schlagen₃ lassen₂ INF_{LEX}-IPP_{LEX/AUX}
 why have you the boy hit let INF + lassen IPP [H]
 'why did you let the boy get hit' ZWG44
- (38) ich habe noch gar nicht gesät₃ gehabt₂ PTC_{LEX}-PTC_{AUX}
 I have still at.all not sown had complex perfect [H]
 'I still haven't sown [any seeds]' ZWF95
- (39) wir wollten es nicht auswachsen₃ lassen₂ INF_{LEX}-INF_{LEX/AUX}
 we wanted it not grow.out let INF + lassen [MOD]
 'we didn't want to let it reach full size' ZWI54
- (40) der hatte so einen Sitz gemacht₃ gekriegt₂ PTC_{LEX}-PTC_{LEX}
 he had such a seat made gotten PTC + kriegen [H]
 'he got a seat like that made for him' ZWH55
- (41) da habe ich ihn ausstopfen₃ gelassen₂ INF_{LEX}-PTC_{LEX/AUX}
 then have I it stuffed let INF + lassen perfect [H]
 'then I had it stuffed' ZWI94

²⁹ Lexical PTC = *geholpen* 'helped', *gegangen* 'gone', *geblieben* 'stayed', *gelegt* 'laid', *gelassen* 'let', *gelernt* 'learned', *gekommen* 'come'.

³⁰ This syntagm includes constructions with both *haben* and *sein*.

- (42) ich habe dich einmal
I have you once
einen anderen Walzer sehen₂ tanzen₃
one other waltz see dance
'I saw you dancing another waltz once'
INF_{LEX}-IPP_{LEX}
ACI IPP [H]³¹
ZW9B4
- (43) mit der Maschine wird man
with the machine will one
nicht viel machen₃ können₂
not much make can
'we won't be able to do much with that machine'
INF_{LEX}-INF_{MOD}
modal future [W]
ZW2G6
- (44) es hat sich wieder gelohnt₃ gemacht₂
it has REFL again worthy made
'it was worth it again'
PTC_{LEX}-PTC_{LEX}
PTC + perfect [H/S]
ZW1P1
- (45) dann wurde laufen₃ gegangen₂
then was run gone
'then we went running'
INF_{LEX}-PTC_{LEX}
INF + passive [W]
ZWQ10
- (46) ich selbst habe noch gemusst₂ mähen₃
I myself have still had.to reap
'as for me, I still had to reap'
INF_{LEX}-PTC_{MOD}
INF + modal perfect [H]
ZWW04
- (47) bei der Dunkelheit kann
at the darkness can
allerhand getrieben₃ kommen₂
all.sorts floating come
'in darkness all sorts of things can come floating along'
PTC_{LEX}-INF_{LEX}
PTC + INF [MOD]
ZWP83

³¹ IPP = *helfen* 'help', *sehen* 'see', *lernen* 'learn'.

- (48) muss man ja auch mal INF_{LEX}-INF_{MOD}
 must one MOD also MOD
- ausruhen₃ können₂ INF + modal INF [MOD]
 rest can ZW5G6
- 'you have to be able to rest, you know'

Syntagm	3-2	2-3	Total tokens
perfect of passive [S]	476 (100%)	0 (0%)	476 (42.7%)
passive [MOD]	224 (100%)	0 (0%)	224 (20.1%)
modal IPP [H]	75 (42.1%)	103 (57.9%)	178 (16%)
INF + perfect [H/S]	31 (81.6%)	7 (16.7%)	38 (3.4%)
perfect [MOD]	34 (100%)	0 (0%)	34 (3.0%)
double INF [MOD]	21 (75%)	7 (25%)	28 (2.5%)
INF + <i>lassen</i> IPP [H]	17 (68%)	8 (32%)	25 (2.2%)
complex perfect [H]	22 (100%)	0 (0%)	22 (2.0%)
INF + <i>lassen</i> [MOD]	14 (87.5%)	2 (12.5%)	16 (1.4%)
PTC + <i>kriegen</i> [H]	14 (100%)	0 (0%)	14 (1.3%)
INF + <i>lassen</i> perfect [H]	13 (100%)	0 (0%)	13 (1.2%)
subjunctive modal IPP [H]	4 (33.3%)	8 (66.7%)	12 (1.1%)
ACI IPP [H]	4 (36.4%)	7 (63.6%)	11 (1.0%)
modal future [W]	7 (87.5%)	1 (12.5%)	8 (0.7%)
PTC + perfect [H/S]	5 (100%)	0 (0%)	5 (0.4%)
INF + passive [W]	4 (100%)	0 (0%)	4 (0.4%)
INF + modal perfect [H]	0 (0%)	2 (100%)	2 (0.2%)
PTC + INF [MOD]	2 (100%)	0 (0%)	2 (0.2%)
INF + modal INF [MOD]	2 (100%)	0 (0%)	2 (0.2%)
Totals	969 (87%)	145 (13%)	1,114 (100%)

Table 4. Distribution of main clause two-verb complexes by syntagm.

As table 4 shows, the overall preferred order is 3-2, which occurs far more frequently than the 2-3 order, at a rate of 87% to 13%. Note that this distribution is very similar to that for the subordinate clause two-verb complexes (88% 2-1 to 12% 1-2). The syntagms perfect of passive

[S], passive [MOD], and modal IPP [H] occur most frequently in the corpus, accounting for 878 out of 1,114 total tokens (78.8%). Strikingly, the 2-3 order does not occur at all with the perfect of passive [S] and passive [MOD], both involving a past participle and a form of *werden*, while this is by far the preferred order with the modal IPP [H], at a rate of 57.9%. In section 4.1, we see that this distribution can be attributed in part to the combination of verb forms and types that comprise these syntagms. Among the remaining syntagms, both the 3-2 and 2-3 orders occur with seven, but the 2-3 order is preferred with only three: the subjunctive modal IPP [H], ACI IPP [H], and INF + modal perfect [H].

3.4. Main Clause Three-Verb Complexes.

The corpus contains 14 main clause three-verb complexes that fall into the syntagms illustrated in 49–55. The distribution of these syntagms is presented in table 5.

- | | | |
|------|---|--|
| (49) | das hat alles ...
that has everything ...

gespritzt ₄ werden ₃ müssen ₂
sprayed be must

'all that had to be sprayed ...' | PTC _{LEX} -INF _{AUX} -IPP _{MOD}

<i>werden</i> passive + MOD IPP [H]
ZW0P4 |
| (50) | die hatten wir müssen ₂
those had we must

pflastern ₄ lassen ₃
pave let

'we had to have those paved' | INF _{LEX} -INF _{LEX/AUX} -IPP _{MOD}

INF + <i>lassen</i> + MOD IPP [H]
ZWP64 |
| (51) | haben sie sollen ₂ säen ₄ kommen ₃
have they should sow come

'they were supposed to come sow [seeds]' | INF _{LEX} -INF _{LEX} -IPP _{MOD}
double INF + MOD IPP [H]
ZW2K7 |

- (52) das hätte der Fährmann PTC_{LEX}-INF_{AUX}-IPP_{MOD}
 that had the ferryman
 sollen₂ gewusst₄ haben₃ perfect + subjunctive MOD IPP [H]
 should known have ZWP83
 ‘the ferryman should have known that’
- (53) da sind wir vom Amerikaner PTC_{LEX}-PTC_{LEX}-PTC_{AUX}
 there are we by.the American
 gefangen₄ genommen₃ worden₂ PTC + perfect of passive [S]
 captured taken been ZWA81
 ‘then we were taken capture by the American’
- (54) ich soll es geschafft₄ gehabt₃ haben₂ PTC_{LEX}-PTC_{AUX}-INF_{AUX}
 I should it managed had have complex perfect [MOD]
 ‘I am supposed to have managed it’ ZWG44
- (55) dann ist sie ein paar Tage INF_{LEX}-PTC_{LEX}-PTC_{AUX}
 then is it a few days
 liegen₄ gelassen₃ worden₂ INF + *lassen* perfect of passive [S]
 lie let been ZWG09
 ‘then it was left to lie for a few days’

Compared to the other complex categories, the main clause three-verb complexes are relatively scarce, as table 5 shows. Nonetheless, 4 of the 6 possible word orders are attested in the corpus: 4-3-2, 4-2-3, 3-2-4, and 2-4-3. The 4-3-2 and 2-4-3 orders occur most frequently, each in 6 out of 14 total tokens (42.9%). Syntagms involving an IPP construction account for the majority of tokens, 11 out of 14 (78.6%). As with the subordinate clause three-verb complexes, there is no robust predominance of a single word order.

Syntagm	4-3-2	4-2-3	3-2-4	2-4-3	Total tokens
<i>werden</i> passive + MOD IPP [H]	3 (100%)	0 (0%)	0 (0%)	0 (0%)	3 (21.4%)
INF + <i>lassen</i> + MOD IPP [H]	0 (0%)	1 (33.3%)	0 (0%)	2 (66.6%)	3 (21.4%)
double INF + MOD IPP [H]	0 (0%)	0 (0%)	1 (33.3%)	2 (66.6%)	3 (21.4%)
perfect + subjunctive MOD IPP [H]	0 (0%)	0 (0%)	0 (0%)	2 (100%)	2 (14.3%)
PTC + perfect of passive [S]	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (7.1%)
complex perfect [MOD]	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (7.1%)
INF + <i>lassen</i> perfect of passive [S]	1 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (7.1%)
Totals	6 (42.9%)	1 (7.1%)	1 (7.1%)	6 (42.9%)	14 (100%)

Table 5. Distribution of main clause three-verb complexes by syntagm.

3.5. Verb Projection Raising and Two-Verb Complexes.

This section deals with verb projection raising in subordinate clause two-verb complexes and main clause two-verb complexes. Recall from the previous section that 159 out of 1,326 subordinate clause two-verb complexes display the 1-2 order. Of these, 20 (12.6%) involve VPR with a constituent appearing between the members of the verb cluster. The intervening constituents fall into four types, illustrated in 56–59. Their distribution is presented in table 6.

- (56) *dass man so früh musste₁ aufstehen₂* separable prefix
 that one so early had.to stand.up ZWI94
 ‘that you had to get up so early’

- (57) die so früh wollten₁ **fertig** sein₂ adjective/adverb
 who so early wanted finished be ZWH50
 ‘who wanted to be finished so early’
- (58) dass er jeden Augenblick musste₁
 that he any moment had.to
hinter eine Hecke laufen₂ PP
 behind a hedge run ZWJ02
 ‘that he had to run behind a hedge at any moment’
- (59) dass sie da müssen₁ **einen ordentlichen Korb**
 that they there must a decent basket
voll Essen kochen₂ indefinite NP
 full food cook ZWG92
 ‘that they have to cook a decent basketful of food’

Intervening constituent	Total tokens
separable prefix	11 (55%)
adjective/adverb	4 (20%)
PP	3 (15%)
indefinite NP	2 (10%)
Total	20 (100%)

Table 6. Distribution of VPR intervening constituents, subordinate clause two-verb complexes.

Table 6 shows that the majority of intervening constituents are separable prefixes. Note that unlike standard German (but like languages such as standard Dutch), WCG readily allows separable prefixes to be stranded. This is exemplified in the following example in which the particle *an* ‘on’ does not appear raised with *schneiden* ‘cut’.³²

³² For further information on VPR constructions in a variety of Germanic languages, see Wurmbrand 2006:273–284. See Dubenion-Smith 2008:89–92, 102–105 for a discussion of separable prefix stranding in WCG.

- (60) wenn man das Thema da mal **an** will₁ schneiden₂
 when one the topic there MOD on wants cut
 ‘if you want to broach the topic’ ZW0H6

Let us now examine verb projection raising in main clause two-verb complexes. Compared to the subordinate clause two-verb complexes, the main clause two-verb complexes display VPR at a much higher rate. Of the 145 clauses with the 2-3 order (13%), 75 (51.7%) involve an intervening constituent. The attested VPR constructions fall into five types with a single intervening constituent and an additional 13 types with two or more intervening constituents. Table 7 shows the distribution of constructions with one intervening constituent, illustrated in 61–65.³³

- (61) ich habe schon zwei Mühlen
 I have already two mills
 geholfen₂ **einrichten**₃ separable prefix
 helped set.up ZW9J8
 ‘I have already helped set up two mills’
- (62) da habe ich müssen₂ **mit ihm** fahren₃ PP
 there have I must with him go ZW2K7
 ‘then I had to go with him’
- (63) da haben wir müssen₂ **schnell** springen₃ adverb/adjective
 there have we must quickly jump ZWG52
 ‘then we had to run quickly’
- (64) ich hatte müssen₂ **Schneider** lernen₃ bare N
 I had must tailor learn ZWH62
 ‘I had to become a tailor’
- (65) haben müssen₂ **die Polizei** alarmieren₃ definite NP
 have must the police alarm ZWH12
 ‘(we) had to notify the police’

³³ See Dubenion-Smith 2008:103–104 for examples involving multiple intervening constituents.

Again, we see that the majority of intervening constituents are separable prefixes. A comparison of tables 6 and 7 reveals that for both the subordinate and main clause complexes, the three most common types of intervening constituent are the same (separable prefix, PP, adjective/adverb), followed by at least one nominal category (indefinite NP, bare N, definite NP).

Intervening constituent	Total tokens
separable prefix	26 (34.7%)
PP	11 (14.7%)
adjective/adverb	9 (12%)
bare N	8 (10.7%)
definite NP	4 (5.3%)
multiple constituents	17 (22.7%)
Total	75 (100%)

Table 7. Distribution of VPR intervening constituents, main clause two-verb complexes.

3.6. Extraposition and Two-Verb Complexes.

In this section, I discuss extraposition in subordinate clause two-verb complexes and main clause two-verb complexes. As noted in section 1, verbal complexes may occur not only with elements appearing inside the cluster, but also with extraposed elements to the right of the cluster. The distribution of extraposition in the subordinate clause two-verb complexes is presented in table 8.³⁴

³⁴ Duden (2005:1223) distinguishes extraposition from another type of expansion, *Nachtrag* (afterthought):

wie 'weit is des entfernt ↑* von port 'dixon ↑
 how far is that away from Port Dixon
 'how far away is that, from Port Dixon?'

The upward arrows indicate rising intonation, and the asterisk the division between two intonational phrases consisting of *wie weit is des entfernt* 'how far away is that' and *von port dixon* 'from Port Dixon'.

Extrapolation	2-1	1-2	Total tokens
extraposed constituent	50 (90.9%)	5 (9.1%)	55 (4.1%)
nothing extraposed	1,117 (87.9%)	154 (12.1%)	1,271 (95.9%)
Total	1,167 (88%)	159 (12%)	1,326 (100%)

Table 8. Distribution of extraposition, subordinate clause two-verb complexes.

As table 8 shows, extraposition occurs in 55 out of 1,326 total tokens (4.1%). 50 out of 55 instances (90.9%) occur with the 2-1 order, while only 5 out of 55 (9.1%) occur with the 1-2 order. Thus the 1-2 order occurs less frequently than the expected rate (12%) in constructions that display extraposition.

Table 9 shows the distribution of extraposition by constituent type, illustrated in 66–72.³⁵

- (66) wenn wir das Geld verdient₂ haben₁ **in Amerika** adjunct PP
 when we the money earned have in America ZWP61
 ‘when we have earned the money in America’

Extraposition and afterthought can be differentiated according to whether the expansion is integrated into the intonational phrase of the preceding structure or whether it forms its own intonational phrase, as does *von port dixon* in the sentence above. Schwitalla (2003:117, note 12) notes that this differentiation can be difficult since prosodic integration is graded according to the number of prosodic factors present, such as a break or a stressed syllable in the expansion. However, the way of distinguishing the two types according to this criterion proved sufficient in the examination of recordings for the corpus study. See also Altmann 1981, Auer 1991, and Starke 1965 for discussion of postfield expansions.

³⁵ I follow here Engel’s (1994) distinction between argument and adjunct PPs.

- (67) was man schwarz konnte₁
 what you black could
 tauschen₂ **auf Lebensmittel** argument PP
 exchange for food ZW1G9
 ‘what you could exchange for food on the black market’
- (68) wie sie gesagt₂ haben₁ **früher** adverb³⁶
 as they said have earlier ZWA97
 ‘as they used to say’
- (69) wenn man Mist geladen₂ hatte₁ **drei Tage** temporal NP
 when one manure loaded had three days ZW1H8
 ‘when you had loaded manure for three days’
- (70) die Gurken angebaut₂ haben₁
 who cucumbers cultivated have
hier in unserem Ort locative adverb +
 here in our town adjunct PP
 ‘who have cultivated cucumbers here in our town’ ZW605
- (71) wie man das Brot gebacken₂ hat₁ **davon** *da*-compound
 as one the bread baked has from.it ZWR43
 ‘when you baked the bread with it’
- (72) ob er nun bang machen₂ wollte₁ **den Heinrich** object NP
 if he MOD scared make wanted the Heinrich ZWQ44
 ‘if he wanted to scare Heinrich’

³⁶ The corpus includes temporal, modal, and locative adverbs.

Extraposited constituent	2-1	1-2	Total tokens
adjunct PP	27 (90%)	3 (10%)	30 (54.5%)
argument PP	7 (87.5%)	1 (12.5%)	8 (14.5%)
adverb	7 (100%)	0 (0%)	7 (12.7%)
temporal NP	3 (75%)	1 (25%)	4 (7.3%)
locative adverb + adjunct PP	4 (100%)	0 (0%)	4 (7.3%)
<i>da</i> -compound	1 (100%)	0 (0%)	1 (1.8%)
object NP	1 (100%)	0 (0%)	1 (1.8%)
Totals	50 (90.9%)	5 (9.1%)	55 (100%)

Table 9. Distribution of extraposited constituents, subordinate clause two-verb complexes.

The majority of extraposited constituents are adjunct PPs, accounting for 30 out of 55 tokens (54.5%). The adjunct PPs, in combination with the other adverbials and *da*-compound, comprise 47 out of 55 total tokens (85.5%), while argument PPs make up the remaining 8 out of 55 tokens (14.5%). The occurrence of only one instance of an extraposited object NP falls in line with the increased unacceptability of object NP extraposition in the ENHG period to its general ungrammaticality in modern German (see Bies 1996).

Like the subordinate clause two-verb complexes, the main clause two-verb complexes display extraposition. The distribution of extraposition is presented in table 10.

Extraposition	3-2	2-3	Total tokens
extraposited constituent	96 (88.9%)	12 (11.1%)	108 (9.7%)
nothing extraposited	873 (86.8%)	133 (13.2%)	1,006 (90.3%)
Totals	969 (87%)	145 (13%)	1,114 (100%)

Table 10. Distribution of extraposition, main clause two-verb complexes.

As table 10 shows, extraposition occurs in 108 out of 1,114 total tokens (9.7%) at a rate significantly higher than in the subordinate clause two-verb complexes (4.1%). Ninety-six out of 108 instances (88.9%) occur with the 3-2 order, while only 12 out of 108 (11.1%) occur with the 2-3

order. Thus the 2-3 order occurs less frequently than the expected rate (13%) in constructions that display extraposition, as we saw above for the 1-2 order in the subordinate clause two-verb complexes.

Table 11 below shows the distribution of extraposition by constituent type, illustrated in 73–80.

- (73) da bin ich zweimal verwundet₃ worden₂ **im Krieg** adjunct PP
 there am I twice wounded been in.the war ZWA81
 ‘I was wounded twice in the war’
- (74) ist erzählt₃ worden₂ **von der Schule** argument PP
 has told been about the school ZWW51
 ‘was told about the school’
- (75) schwere Arbeit haben wir müssen₂ machen₃ **da** adverb³⁷
 difficult work have we must make there ZWW69
 ‘we had to do difficult work there’
- (76) da ist die Arbeit nicht gemacht₃ worden₂ **darin** *da*-compound
 there is the work not done been in.there ZWG05
 ‘the work wasn’t done in that area’
- (77) die sind immer so geschnitten₃ worden₂
 they are always thus cut been
in dem Wingert da adjunct PP + adverb
 in the vineyard there ZWG50
 ‘they were always cut that way there in the vineyard’
- (78) sind dann später
 are then later
 verkauft₃ worden₂ **als Wurzelreben** appositive
 sold been as rootvines ZWG50
 ‘(they) were sold later as rootvines’

³⁷ The corpus includes temporal and locative adverbs.

- (79) dann muss gemäht₃ werden₂ **jeden Morgen** temporal NP
 then must reaped be every morning ZWX10
 ‘then you have to reap every morning’
- (80) da ist er geschmückt₃ worden₂ **mit** preposition
 there is he decorated been with ZWB39
 ‘he was decorated with it’

Extrapolated constituent	3-2	2-3	Total tokens
adjunct PP	55 (90.2%)	6 (9.8%)	61 (56.5%)
argument PP	19 (86.4%)	3 (13.6%)	22 (20.4%)
adverb	8 (72.7%)	3 (27.3%)	11 (10.2%)
<i>da</i> -compound	6 (100%)	0 (0%)	6 (5.6%)
adjunct PP + adverb	4 (100%)	0 (0%)	4 (3.7%)
appositive	2 (100%)	0 (0%)	2 (1.9%)
temporal NP	1 (100%)	0 (0%)	1 (0.9%)
preposition	1 (100%)	0 (0%)	1 (0.9%)
Totals	96 (88.9%)	12 (11.1%)	108 (100%)

Table 11. Distribution of extraposed constituents,
 main clause two-verb complexes.

As we saw above with the subordinate clause two-verb complexes, adjunct PPs account for the majority of extraposed constituents in the main clause two-verb complexes as well, comprising 61 out of 108 total tokens (56.5%). These plus the adverbials, *da*-compound, appositives, and preposition make up 86 out of 108 total tokens (79.6%). Argument PPs account for the remaining 22 out of 108 tokens (20.4%). Extraposed object NPs do not occur in the main clause two-verb complexes.

3.7. Summary of Main Findings.

The syntagms and word orders attested in the Zwirner Corpus data were introduced in section 3.1–3.4. For the subordinate clause two- and three-verb complexes and the main clause two-verb complexes, these are presented in the summary tables 12–14 below.³⁸

³⁸ I exclude the main clause three-verb complexes here because of the extremely low token count. Only the principal syntagms are listed for the subordinate

Syntagm	Word order
INF + LEX	1-2 (40.9%)
	2-1 (59.1%)
INF + MOD	1-2 (25.1%)
	2-1 (74.9%)
perfect with <i>sein</i>	1-2 (22.2%)
	2-1 (77.8%)
subjunctive with <i>sein</i>	2-1 (94.4%)
	1-2 (5.6%)
INF + <i>tun</i>	2-1 (96.4%)
	1-2 (3.6%)
perfect with <i>haben</i>	2-1 (98.7%)
	1-2 (1.3%)
<i>werden</i> passive	2-1 (99.1%)
	1-2 (0.9%)
subjunctive with <i>haben</i>	2-1 (100%)
PTC + <i>kriegen</i>	2-1 (100%)
INF + <i>lassen</i>	2-1 (100%)
modal perfect	2-1 (100%)

Table 12. Word orders in WCG,
subordinate clause two-verb complexes.

Syntagm	Word order
modal IPP	1-2-3 (21.1%)
	1-3-2 (21.1%)
	3-1-2 (42.1%)
	3-2-1 (15.8%)
<i>werden</i> passive + MOD	3-1-2 (60%)
	1-3-2 (12%)
	3-2-1 (28%)
perfect of passive	3-2-1 (51.1%)
	3-1-2 (48.9%)

Table 13. Word orders in WCG,
subordinate clause three-verb complexes.

clause three-verb and main clause two-verb complexes. For each syntagm, the word order(s) that occur(s) more frequently than the expected rate is (are) listed first.

Syntagm	Word order
modal IPP [H]	2-3 (57.9%)
	3-2 (42.1%)
perfect of passive [S]	3-2 (100%)
passive [MOD]	3-2 (100%)

Table 14. Word orders in WCG, main clause two-verb complexes.

In the subordinate clause two-verb complexes, both the 2-1 and 1-2 orders occur, at a rate of 88% and 12%, respectively. The syntagms INF + LEX, INF + MOD, and perfect with *sein* display the non-canonical 1-2 order at rates higher than the expected rate. Four word orders are attested in the subordinate clause three-verb complexes, 3-2-1, 3-1-2, 1-3-2, and 1-2-3, occurring at respective rates of 40.3%, 46.8%, 8.1%, and 4.8%. The modal IPP displays the non-canonical word orders 1-2-3 and 1-3-2, the *werden* passive + MOD the order 1-3-2, and the perfect of passive the order 3-2-1 more frequently than the expected rates. The main clause two-verb complexes display both the 3-2 and 2-3 orders, at rates nearly identical to those in the subordinate clause two-verb complexes: 87% and 13%. The syntagm modal IPP [H] displays the non-canonical order 2-3 at a rate far higher than the expected rate. Finally, the four word orders 4-3-2, 4-2-3, 3-2-4, and 2-4-3 are attested in the main clause three-verb complexes, at respective rates of 42.9%, 7.1%, 7.1%, and 42.9%.

Sections 3.5 and 3.6 presented the distribution of elements in VPR and extraposition constructions, limited to the two-verb complexes. The analysis of VPR showed that the rate of occurrence is far higher in the main clause than in the subordinate clause complexes (51.7% vs. 12.6%) and that separable prefixes comprise the largest group of intervening constituents. Similarly, the rate of extraposition is higher in the main clause than in the subordinate clause complexes (9.7% to 4.1%). For both complex categories, the rate of the non-canonical word order is lower than the expected rate when an element is extraposed, and adjunct PPs comprise the largest group of extraposed constituents.

4. Results of the Statistical Analysis of the Zwirner Corpus Data.

This section presents the results of a statistical analysis of the Zwirner Corpus data. I take as the point of departure Sapp 2006, a study of

subordinate clause verbal complexes from ENHG to modern German. Based on a corpus of ENHG texts and experimental data, Sapp aims to determine the effect of various factors on word order, many of which have been shown in previous studies to influence serialization in the verbal complex (see, for example, Ebert 1981). The linguistic and rhythmic factors Sapp tests are class or phonological weight of the word/phrase preceding the verb cluster, VP coordination, clause type, syntagm, verbal prefix type, and extraposition. The non-linguistic factors are time period, dialect, occupation, and genre.³⁹ Finally, Sapp investigates the influence of the pragmatic factor focus (see Sapp 2006:6–8).

Sapp (2006) determines that syntagm, verbal prefix type, extraposition, time period, dialect, occupation, and genre have statistically significant effects on word order in the two-verb complexes, while in the three-verb complexes only syntagm and verbal prefix type show clear effects. Sapp (2006, 2007) also demonstrates that in both the two- and three-verb complexes, variation in word order can be linked to focus.

The results of the empirical analysis presented in section 3 suggested that word order variation in the verbal complex may be linked to several factors, namely syntagm, verbal prefix type, and extraposition—factors shown in Sapp’s (2006) study to have statistically significant effects on word order. While it is possible that the factors that have no statistically significant effect in Sapp’s study might have such an effect in the Zwirner Corpus data, here I limit the statistical analysis to syntagm, verbal prefix type, extraposition, and one additional factor linked to word order in Sapp’s (2006, 2007) work: object focus. As we see below, both syntagm and verbal prefix type have a statistically significant effect on word order in the subordinate clause two-verb complexes. In the main clause two-verb complexes, syntagm, verbal prefix type, and a grammatical correlate to focus have statistically significant effects. Because of statistical insignificance, the results for the subordinate clause three-verb complexes are not discussed.⁴⁰

³⁹ Sapp also codes his data for sex and education but cannot carry out an analysis according to these variables because of a lack of information.

⁴⁰ See Dubenion-Smith 2008:134–140 for an analysis of the subordinate clause three-verb complexes. The low token count precludes an analysis of the main clause three-verb complexes.

The Zwierner Corpus data were analyzed with the statistics package *GoldVarb X*.⁴¹ *GoldVarb* is a multivariate analysis application originally developed for use in sociolinguistics that allows the researcher to determine the effect of various independent variables or FACTORS, organized into FACTOR GROUPS, on the occurrence of a single dependent variable. For each factor, the program outputs a PROBABILISTIC WEIGHT or FACTOR WEIGHT, a value ranging from 0 to 1.0. A value below 0.5 indicates that the factor has a disfavoring effect on the occurrence of the dependent variable; a value above 0.5—a favoring effect. Values very close to 0.5 indicate that a factor has neither a disfavoring nor a favoring effect on the occurrence of the dependent variable. Within a particular factor group, only factors for which all possible word orders are attested may be included in the statistical analysis as an independent factor, otherwise *GoldVarb* will not run the analysis. These so-called *KNOCKOUT* factors must either be combined with other factors in logical groupings or be eliminated from the analysis altogether. In the present study, the dependent variable is word order, and examples of the factor groups tested are syntagm and focus.

Recall from section 3.1 that in the subordinate clause two-verb complexes, the 1-2 order occurs at an overall rate of 12%, the expected rate. Generally speaking, factors for which the rate of 1-2 is higher than the expected rate will be favoring factors, while factors for which the rate of 1-2 is lower than the expected rate will be disfavoring factors. This principle holds for the main clause two-verb complexes as well. Note, however, that because of the mechanics of the program, the rates of occurrence and factor weights do not always correspond exactly. In the tables below, factor weights are presented from highest to lowest. Following common practice, the results of the tests to follow will be considered statistically significant when $p \leq 0.05$.

4.1. Syntagm and Two-Verb Complexes.

In this section, I consider the effect of syntagm on word order in subordinate and main clause verb complexes. I begin with subordinate clause two-verb complexes. In the corpus, syntagms with an infinitive display the 1-2 order at a far higher rate than those with a past participle.

⁴¹ For information on *GoldVarb*, see Paolillo 2002, Robinson et al. 2001, Tagliamonte 2006, and Young & Bayley 1996.

Table 15 shows that the former favor, and the latter disfavor, the 1-2 order.

Syntagm	2-1	1-2	Factor weight
INF + LEX, MOD, <i>tun, lassen</i>	271 (75.9%)	86 (24.1%)	0.713
PTC + AUX (perfect, passive, subjunctive)	896 (92.5%)	73 (7.5%)	0.417
Total	1167 (88%)	159 (12%)	
$p < 0.001$			

Table 15. Effect of general syntagm on word order, subordinate clause complexes.

Table 16 presents the factor weights for these syntagms broken down into specific types.⁴²

Syntagm	2-1	1-2	Factor weight
INF + LEX	13 (59.1%)	9 (40.9%)	0.921
INF + MOD	227 (74.9%)	76 (25.1%)	0.849
perfect with <i>sein</i>	224 (77.8%)	64 (22.2%)	0.828
INF + other (<i>tun, lassen</i>)	31 (96.9%)	1 (3.1%)	0.352
subjunctive (<i>haben, sein</i>)	39 (97.5%)	1 (2.5%)	0.301
perfect with <i>haben</i>	514 (98.7%)	7 (1.3%)	0.186
<i>werden</i> passive	110 (99.1%)	1 (0.9%)	0.133
Total	1158 (87.9%)	159 (12.1%)	
$p < 0.001$			

Table 16. Effect of specific syntagm on word order, subordinate clause complexes.

⁴² INF + *lassen*, the subjunctive with *haben*, PTC + *kriegen*, and the modal perfect only occur with the 2-1 order and are therefore *KNOCKOUT* factors. In table 16, INF + *lassen* and the subjunctive with *haben* have thus been collapsed with INF + *tun* and the subjunctive with *sein*, respectively, while PTC + *kriegen* and the modal perfect have been excluded.

As the table illustrates, the syntagms INF + LEX, INF + MOD, and perfect with *sein* favor the 1-2 order, while this order is disfavored by INF + other (*tun, lassen*), the subjunctive (*haben, sein*), the perfect with *haben*, and the *werden* passive. The syntagms can be placed on a hierarchy according to factor weight: INF + LEX > INF + MOD > perfect with *sein* > perfect with *haben* > *werden* passive. This hierarchy is similar to those found in previous studies of ENHG. Compare the hierarchies in 81a–d.⁴³

- (81) a. INF + LEX > INF + MOD > perfect with *sein*
 > perfect with *haben* > *werden* passive (Zwirner Corpus)
- b. INF + MOD > perfect with *sein* > perfect with *haben*
 > *werden* passive (Bies 1996:58)
- c. perfect with *sein* > INF + MOD > perfect with *haben*
 > *werden* passive (Ebert 1992:5)
- d. INF + LEX, AUX > INF + MOD > perfect with *sein*
 > perfect with *haben* > *werden* passive (Sapp 2006:56)

The four hierarchies are nearly identical, with the exception of the relative ordering of the constructions perfect with *sein* and INF + MOD on Ebert's hierarchy. Despite this deviation, the order perfect with *sein* > perfect with *haben* > *werden* passive holds in each case. Thus, it may be concluded that the relationship between syntagm and word order in the subordinate clause two-verb complexes has not changed from Early New High German to modern German, as far as the WCG dialects are concerned.

Let us now consider main clause two-verb complexes. Since 11 of the main clause two-verb syntagms, including two of the three principal syntagms, are unattested with either the 3-2 or 2-3 order and are therefore *KNOCKOUT* factors, it was not possible to conduct a statistical analysis with each separate syntagm. However, it was possible

⁴³ For purposes of comparison, the *sein* passive and future constructions have been excluded in the hierarchies from Bies 1996, Ebert 1992, and Sapp 2006. Constructions are listed in the descending order of preference for the 1-2 order.

to analyze the syntagms in three larger groupings, namely syntagms involving an IPP, an infinitive, or a past participle.⁴⁴ Recall that subordinate clause two-verb complexes with an infinitive favor, and those with a past participle disfavor, the 1-2 order. This generalization holds for the main clause two-verb complexes as well. As table 17 shows, syntagms with two infinitives favor the 2-3 order, as do the syntagms with an IPP. The syntagms with a past participle, on the other hand, disfavor the 2-3 order.

Verb form	3-2	2-3	Factor weight
IPP	100 (44.2%)	126 (55.8%)	0.977
infinitive	44 (81.5%)	10 (18.5%)	0.815
past participle	825 (98.9%)	9 (1.1%)	0.247
Total	969 (87%)	145 (13%)	
$p < 0.001$			

Table 17. Effect of verb form on word order, main clause complexes.

The syntagms may also be categorized according to whether the lexical verb occurs with another lexical verb, a modal, or an auxiliary.⁴⁵ Table 18 shows that when a lexical verb is combined with a modal or another lexical verb, the 2-3 order is favored. In contrast, combinations of a lexical and an auxiliary verb disfavor the 2-3 order.

⁴⁴ IPP = modal IPP [H], INF + *lassen* IPP [H], subjunctive modal IPP [H], and ACI IPP [H]; infinitive = double INF [MOD], INF + *lassen* [MOD], modal future [W], and INF + modal INF [MOD]; past participle = perfect of passive [S], passive [MOD], INF + perfect [H/S], perfect [MOD], complex perfect [H], PTC + *kriegen* [H], INF + *lassen* perfect [H], PTC + perfect [H/S], INF + passive [W], INF + modal perfect [H], and PTC + INF [MOD]. Since a participle can occur both with another participle or with an infinitive, only those syntagms with two infinitives are included in the infinitive grouping.

⁴⁵ For the syntagms with *lassen*, the tokens have been assigned to either the lexical verb or auxiliary grouping, depending on the function of *lassen* in the sentence.

Verb types	3-2	2-3	Factor weight
LEX + MOD	88 (43.6%)	114 (56.4%)	0.980
LEX + LEX	107 (80.5%)	26 (19.5%)	0.903
LEX + AUX	774 (99.4%)	5 (0.6%)	0.199
Total	969 (87%)	145 (13%)	
$p < 0.001$			

Table 18. Effect of verb types on word order, main clause complexes.

In conjunction, the hierarchies IPP > infinitive > past participle and LEX + MOD > LEX + LEX > LEX + AUX correspond roughly to the hierarchy for the subordinate clause two-verb complexes, namely INF + LEX > INF + MOD > perfect with *sein* > perfect with *haben* > *werden* passive, whereby complexes involving a lexical or modal verb and an infinitive more greatly favor the 1-2 order than those involving an auxiliary verb and a past participle. These hierarchies are also reflected in the three most frequently occurring main clause two-verb syntagms, the perfect of passive [S], passive [MOD], and modal IPP [H], presented in table 19.

Syntagm	3-2	2-3	Total
perfect of passive [S]	476 (100%)	0 (0%)	476 (42.7%)
passive [MOD]	224 (100%)	0 (0%)	224 (20.1%)
modal IPP [H]	79 (41.6%)	111 (58.4%)	190 (17.1%)

Table 19. Distribution of the three most frequently occurring syntagms, main clause complexes.

Here the additive effect of verb form and verb type is particularly striking. With the perfect of passive [S] and passive [MOD], which involve a past participle and the auxiliary *werden*, both at one end of their respective hierarchies, 0 out of a total 700 tokens (0%) occur with the 2-3 order. The modal IPP [H], on the other hand, which involves verbal elements at the other end of the hierarchies, an IPP and a modal, displays the 2-3 order at a rate of 58.4%, far higher than the expected rate of 13%.

4.2. Verbal Prefix Type and Two-Verb Complexes.

This section deals with the effect of verbal prefix type on word order in subordinate and main clause complexes. I begin with the subordinate clause two-verb complexes. The results in table 20 reveal that the 1-2 order is favored by the presence of a stressed separable prefix on the non-finite verb in the complex and disfavored by the presence of an unstressed prefix or the absence of any prefix.

Prefix type	2-1	1-2	Factor weight
stressed	302 (80.1%)	75 (19.9%)	0.662
unstressed	670 (94.6%)	38 (5.4%)	0.438
no prefix	195 (80.9%)	46 (19.1%)	0.421
Total	1167 (88%)	159 (12%)	
$p < 0.001$			

Table 20. Effect of verbal prefix type on word order, subordinate clause complexes.

Sapp (2006:61–62) points out that the correlation between stressed separable prefix and the 1-2 order might be attributed to an interaction between verbal prefix type and syntagm. Past participles typically begin with the unstressed prefix *ge-*, and as we saw in section 4.1, syntagms involving a past participle disfavor the 1-2 order. Sapp tests for this interaction using *GoldVarb*'s cross-tabulation function. The results of the cross-tabulation for the Zwirner Corpus data are presented in table 21 below.

These results show that the factor groups syntagm and verbal prefix type are, in fact, independent of each other. For both syntagm groupings, that is, syntagms involving either a participle or an infinitive, the rate of 1-2 is above the expected rates (8% and 24%) when the prefix on the non-finite verb is stressed and below the expected rates for the other two prefix types. Note, however, that for all three prefix types the rate of 1-2 is higher for the infinitive grouping than for the participle grouping. It may be concluded, then, that while syntagm and verbal prefix type are independent factor groups, their effect on word order is additive.

Verbal prefix type	Word order	Participle	Infinitive	Total
stressed	1-2	38 (13%)	37 (40%)	75 (20%)
	2-1	246 (87%)	56 (60%)	302 (80%)
unstressed	1-2	35 (5%)	3 (8%)	38 (5%)
	2-1	637 (95%)	33 (92%)	670 (95%)
no prefix	1-2	0 (0%)	46 (20%)	46 (19%)
	2-1	13 (100%)	182 (80%)	195 (81%)
Totals	1-2	73 (8%)	86 (24%)	159 (12%)
	2-1	896 (92%)	271 (76%)	1167 (88%)

Table 21. Cross-tabulation of verbal prefix type with syntagm, subordinate clause complexes.

Like the subordinate clause two-verb complexes, the main clause two-verb complexes exhibit an effect of verbal prefix type on word order, illustrated in table 22.

Prefix type	3-2	2-3	Factor weight
stressed	287 (86.7%)	44 (13.3%)	0.654
no prefix	155 (62.8%)	92 (37.2%)	0.641
unstressed	527 (98.3%)	9 (1.7%)	0.341
Total	969 (87%)	145 (13%)	
$p < 0.001$			

Table 22. Effect of verbal prefix type on word order, main clause complexes.

The results show that a stressed separable prefix or no prefix on the main lexical verb in the complex favors the 2-3 order. Yet unlike the subordinate clause two-verb complexes in which the presence of an unstressed prefix or the absence of any prefix has a disfavoring effect on the 1-2 order, only unstressed prefixes have a disfavoring effect in the main clause two-verb complexes overall.

As with the subordinate clause two-verb complexes, an interaction between verbal prefix type and syntagm can be tested for using

GoldVarb's cross-tabulation function, the results of which are presented in table 23.

Verbal prefix type	Word order	Infinitive	Participle	IPP	Total
stressed	2-3	2 (25%)	2 (1%)	40 (60%)	44 (13%)
	3-2	6 (75%)	254 (99%)	27 (40%)	287 (87%)
no prefix	2-3	8 (19%)	7 (11%)	77 (55%)	92 (37%)
	3-2	35 (81%)	58 (89%)	62 (45%)	155 (63%)
unstressed	2-3	0 (0%)	0 (0%)	9 (45%)	9 (2%)
	3-2	3 (100%)	513 (100%)	11 (55%)	527 (98%)
Totals	2-3	10 (19%)	9 (1%)	126 (56%)	145 (13%)
	3-2	44 (81%)	825 (99%)	100 (44%)	969 (87%)

Table 23. Cross-tabulation of verbal prefix type with syntagm, main clause complexes.

The results of the cross-tabulation suggest that the effect of verbal prefix type on word order is not independent of syntagm. For syntagms involving two infinitives or an IPP, the rate of 2-3 is above the expected rates (19% and 56%) when the prefix on the main lexical verb is stressed and at or around the expected rates when there is no prefix. For syntagms involving a participle, on the other hand, the rate of 2-3 is at the expected rate (1%) when the prefix is stressed but far above the expected rate when there is no prefix. The fact that the verbal prefix types stressed and no prefix favor the 2-3 order with different syntagms indicates an interaction between the factor groups verbal prefix type and syntagm. Table 24 shows the effect of verbal prefix type on the groupings infinitive/IPP and participle separately.

Infinitive/IPP				Participle			
Prefix type	3-2	2-3	Factor weight	Prefix type	3-2	2-3	Factor weight
stressed	33 44%	42 56.0%	0.545	no prefix	58 89.2%	7 10.8%	0.989
no prefix	97 53.3%	85 46.7%	0.497	stressed	254 99.2%	2 0.8%	0.365
un-stressed	14 60.9%	9 39.1%	0.377	Total	312 97.2%	9 2.8%	
Total	144 51.4%	136 48.6%		$p <$ 0.001			
$p =$ 0.043							

Table 24. Effect of verbal prefix type on word order, main clause complexes, infinitive/IPP, and participle.

The favoring effect of a stressed separable prefix on the 2–3 order in the syntagms with two infinitives or an IPP appears less robust than in table 22, while the favoring effect of the absence of a verbal prefix on syntagms with a participle is even clearer.⁴⁶

4.3. *Focus and Two-Verb Complexes.*

As discussed in section 4, Sapp (2006, 2007) investigates the relationship between word order in the verbal complex and object focus, in particular contrastive and new information focus, and, by extension, old information focus.⁴⁷ Sapp (2006:58–59, 2007:302–303) finds that contrastive

⁴⁶ The unstressed prefixes cannot be tested with the participle grouping because tokens with this prefix type do not occur with the 2-3 order.

⁴⁷ Consider the sentences in (i).

- (i) a. What did Petra do?
Petra [_{Foc} READ].
b. Who read?
[_{Foc} PETRA] read.

focus strongly favors the 1-2 order in his ENHG corpus. New information focus also favors the 1-2 order, though less so than contrastive focus. Old information focus, on the other hand, somewhat disfavors the 1-2 order. Sapp (2006:81, 2007:304) also determines that new information and contrastive focus favor every attested order except 3-2-1 (1-3-2/1-2-3/3-1-2 in combination) in the subordinate clause three-verb complexes.

Sapp (2006:37, 2007:303) concedes the difficulties inherent in ascertaining the information status of clauses in a written language. Without the intonation cues present in spoken language it is not always possible to correctly determine focus. For this reason, Sapp (2006:58–61) seeks to corroborate his findings based on information structure with focus-related linguistic correlates.

One such correlate is the status of the object NP preceding the verb cluster. Definite NPs, including pronouns, tend to represent old information, while indefinite NPs tend to represent new information and, by extension, new information focus. Sapp also examines the intervening NPs (including pronouns and QPs) in VPR constructions. He assumes

If we assume that information can be old or new, then the old information in (i)a is *Petra* and in (i)b the fact that someone read. Accordingly, the new information focus in (i)a and (i)b is *read* and *Petra*, respectively.

Consider now the sentences in (ii).

- (ii) a. Did Cornelius read?
 No, [_{Foc} SANDRA] read.
 b. Did Sandra read or did Cornelius read?
 [_{Foc} SANDRA] read.

In these examples, the focus on *Sandra*, which can either be new (iia) or old (iib) to the discourse, contrasts it with something that has already been mentioned, namely *Cornelius*.

Sapp determined the focus status of each clause in his corpus as follows. If an argument could be viewed as a contrast to another argument, then the clause was marked “contrastive.” Clauses containing an argument that had not yet been mentioned within the present section of text, or within the last one or two pages if the text was not divided into sections, were marked “new.” Clauses not marked “contrastive” or “new” were marked “old.”

that an NP that remains inside the VP and is raised, regardless of its definiteness, is focused.⁴⁸

A second piece of evidence that Sapp considers is scrambling, which has been shown to correlate with focus in German (see Haider & Rosengren 2003). If an object appears to the left of either an adverbial immediately preceding the verb cluster or a negator, it is scrambled and represents old information, and if it appears to the right, it is not scrambled and represents new or contrastive information.

In the present study, I chose to preliminarily limit the examination of focus to grammatical correlates. Since the occurrence of objects with adverbials or negators is too rare in the Zwirner Corpus data to determine whether objects have been scrambled, I analyzed only the information status of preceding/intervening object NPs.⁴⁹

The preceding NPs in the subordinate clause two-verb complexes are assignable to four groups: definite, indefinite, non-NP, and zero. The definite NPs include NPs preceded by a definite article, possessive pronoun, or NumP, as well as proper names and pronouns.⁵⁰ The indefinite NPs include bare Ns, NPs preceded by an indefinite article, a QP (*jeder* 'every', *kein* 'no', *alle* 'all'), or a quantificational adverb (*viel* 'much', *ein bisschen* 'a bit'), as well as *etwas* 'something', *etwas* + adjective, *alles* 'everything', and *nichts* 'nothing'. Finally, adjectives, adverbs, *nicht* 'not', modal particles, and *da*-compounds comprise the group of non-NPs. Since the syntagms *werden* passive, perfect with *sein*, and subjunctive with *sein* may not occur with object NPs, tokens with these constructions were excluded from the analysis.

⁴⁸ Sapp (2006:59) points out that new but not contrastive information focus can be linked to the status of the precluster NP because both indefinite and definite NPs can be focused contrastively.

⁴⁹ An anonymous reviewer warned against the automatic equation of definiteness and indefiniteness with old and new information, respectively. Indeed, this association should be viewed as a strong tendency, one which holds in the Zwirner Corpus data. I plan to investigate focus directly in a future study.

⁵⁰ An anonymous reviewer pointed out that an NP preceded by an NumP is not necessarily definite (for example, *es waren (einmal) zwei Könige* 'once upon a time there were two kings'). In the Zwirner Corpus data, all such NPs are, in fact, definite.

The effect of the information status of the preceding object NP on word order is inconclusive. Table 25 shows factor weights for definites and no constituent above and below 0.5, respectively, and for non-NPs and indefinites around 0.5. However, with $p = 0.168$, the results for the factor group are statistically insignificant.

Preceding constituent	2-1	1-2	Factor weight
definites	191 (88.8%)	24 (11.2%)	0.589
non-NPs	290 (87.6%)	41 (12.4%)	0.514
indefinites	132 (91%)	13 (9%)	0.497
none	183 (93.4%)	13 (6.6%)	0.382
Total	796 (89.7%)	91 (10.3%)	
$p = 0.168$			

Table 25. Effect of the information status of the preceding constituent on word order, subordinate clauses.

The addition of intervening NPs in the VPR constructions to the indefinite NPs results in a factor weight for this factor above 0.5, but this has little effect on the factor weights overall. As can be seen in table 26, the values are even closer to 0.5 than in table 25, and the p -value is higher.

Preceding (or intervening) constituent	2-1	1-2	Factor weight
indefinites plus intervening NPs	132 (88%)	18 (12%)	0.571
non-NPs	290 (88.4%)	38 (11.6%)	0.529
definites	191 (89.7%)	22 (10.3%)	0.499
none	183 (93.4%)	13 (6.6%)	0.400
Total	796 (89.7%)	91 (10.3%)	
$p = 0.242$			

Table 26. Effect of the information status of the preceding/intervening constituent on word order, subordinate clauses.

Thus, there is a possible effect of object focus on word order in the subordinate clause two-verb complexes as indicated by the occurrence of precluster indefinite NPs and intervening NPs in the VPR constructions. Because of statistical insignificance, however, no firm conclusions may be drawn.

To test the effect of focus in the main clause two-verb complexes, I once again examined the occurrence of precluster NPs. These NPs are assignable to the same four groups as for the subordinate clause complexes: definite, indefinite, non-NP, and zero. The definite NPs include NPs preceded by a definite article, possessive pronoun, or NumP, as well as proper names and pronouns. Included in the group of indefinite NPs are bare Ns, NPs preceded by an indefinite article, a QP (*jeder* 'every', *kein* 'no', *alle* 'all'), or a quantificational adverb (*viel* 'much', *ein bisschen* 'a bit'), as well as *etwas* 'something', *etwas* + adjective, *manch* 'many a' + adjective, *alles* 'everything', and *nichts* 'nothing'. Finally, adjectives, adverbs, *nicht* 'not', modal particles, and *da*-compounds comprise the group of non-NPs. Since the majority of tokens involving a participle are passive constructions (perfect of passive [S], passive [MOD]), which may not occur with an object NP, only the groupings infinitive and IPP were included in the analysis.

As table 27 shows, only when no constituent precedes the verb cluster is the 2-3 order favored. In contrast, the occurrence of any constituent, whether a definite or indefinite NP or non-NP, disfavors the 2-3 order.

Preceding constituent	3-2	2-3	Factor weight
none	14 (22.2%)	49 (77.8%)	0.800
non-NPs	62 (55.4%)	50 (44.6%)	0.439
definites	33 (57.9%)	24 (42.1%)	0.391
indefinites	27 (69.2%)	12 (30.8%)	0.291
Total	136 (50.2%)	135 (49.8%)	
$p < 0.001$			

Table 27. Effect of the information status of the preceding constituent on word order, main clauses (infinitive and IPP).

When the intervening NPs in the VPR constructions are added to the indefinite NPs, however, the 2-3 order is favored by the absence of a

constituent and by indefinites plus intervening NPs, and disfavored by definites and non-NPs. These results are shown in table 28.

Preceding (or intervening) constituent	3-2	2-3	Factor weight
none	14 (33.3%)	28 (66.7%)	0.721
indefinites plus intervening NPs	27 (37.5%)	45 (62.5%)	0.617
definites	33 (58.9%)	23 (41.1%)	0.384
non-NPs	62 (61.4%)	39 (38.6%)	0.384
Total	136 (50.2%)	135 (49.8%)	
$p = 0.001$			

Table 28. Effect of the information status of the preceding/intervening constituent on word order, main clauses (infinitive and IPP).

Thus, it may be concluded for the main clause two-verb complexes that object focus, as indicated by the occurrence of precluster indefinite NPs and intervening NPs in the VPR constructions, has an effect on word order in the Zwirner Corpus data.

4.4. *Extrapolation and Two-Verb Complexes.*

The final factor group tested in the statistical analysis is extrapolation. Sapp (2006:57–58) demonstrates that the rate of 1-2 in his corpus is far higher than the expected rate when some constituent is extrapolated, but very close to the expected rate when no extrapolated constituent appears to the right of the verb cluster. However, Sapp's (2007:303–304) analysis reveals that when extrapolated adjunct PPs and argument NPs/PPs are tested separately, the latter but not the former favor the 1-2 order. Since Bies (1996) shows that extrapolated arguments in her ENHG corpus tend to be heavy or focused, Sapp (2007:304) concludes that the correlation in his data between the 1-2 order and argument extrapolation can be attributed to focus, not to extrapolation in general. He takes these findings as a further piece of indirect evidence for the effect of focus on word order.

The effect of extrapolation on the 1-2 order in the subordinate clause complexes is shown in table 29.

Extrapolation	2-1	1-2	Factor weight
other extraposed constituent	11 (91.7%)	1 (8.3%)	0.552
nothing extraposed	1117 (87.9%)	154 (12.1%)	0.502
extraposed argument	8 (88.9%)	1 (11.1%)	0.439
extraposed adjunct PP	31 (91.2%)	3 (8.8%)	0.417
Total	1167 (88%)	159 (12%)	
$p = 0.908$			

Table 29. Effect of extrapolation on word order, subordinate clause complexes.

Factor weights for extraposed arguments and adjuncts PPs indicate that these have a disfavoring effect on the occurrence of the 1-2 order, while the factor weight for other extraposed constituents points to a slight favoring effect. No firm conclusions may be drawn, however, since the results are statistically insignificant with $p = 0.908$.

The results of the analysis of extrapolation in the main clause complexes are presented in table 30. Recall from section 3.6 that no argument NPs are attested in these data.

Extrapolation	3-2	2-3	Factor weight
other extraposed constituent	18 (85.7%)	3 (14.3%)	0.762
extraposed argument PP	19 (86.4%)	3 (13.6%)	0.695
nothing extraposed	872 (86.8%)	133 (13.2%)	0.494
extraposed adjunct PP	59 (90.8%)	6 (9.2%)	0.423
Total	968 (87%)	145 (13%)	
$p = 0.806$			

Table 30. Effect of extrapolation on word order, main clause complexes.

In contrast to extraposed adjunct PPs, extraposed argument PPs and other extraposed constituents have factor weights that indicate a favoring

effect on the 2-3 order. However, no firm conclusions may be drawn since the results are statistically insignificant with $p = 0.806$.

4.5. Summary of Main Findings.

Four factor groups (syntagm, verbal prefix type, focus, and extraposition) were tested with the statistical analysis program *GoldVerb* to determine their effect on word order in the subordinate and main clause two-verb complexes. The factor groups syntagm and verbal prefix were shown to have statistically significant effects on word order in both the subordinate and main clause complexes. Focus, as indicated by the occurrence of pre-cluster indefinite NPs and intervening NPs in the VPR constructions, has a statistically significant effect on word order only in the main clause complexes with the groupings infinitive and IPP. Finally, extraposition has no statistically significant effect on word order in either the subordinate or main clause complexes.

A glance at the corpus and the factor groups that have a statistically significant effect on word order in the subordinate and main clause two-verb complexes reveals that 156 out of 159 complexes with the 1-2 order and all 145 out of 145 complexes with the 2-3 order can be linked to one or more of these factor groups. One-hundred forty-nine out of 159 subordinate clause two-verb complexes and 136 out of 145 main clause two-verb complexes involve a syntagm or verb form that favors the 1-2 or 2-3 order, respectively. As for the factor group verbal prefix type, the rates are 75 out of 159 subordinate clause two-verb complexes and 49 out of 145 main clause two-verb complexes. Finally, the factor group focus can be linked to the 2-3 order in 45 out of 135 main clause two-verb complexes in the groupings infinitive and IPP.

Recall from section 1 that Lötscher (1978) proposed the interplay of grammatical, functional, and performance rules to account for word order variation in the verbal complex. In sections 4.1–4.3, we saw how word order in the verbal complex is influenced by the linguistic (grammatical) factor groups syntagm and verbal prefix type as well as the functional factor group focus. While performance has not yet come to the fore, one important finding from section 3.5 was the high rate of VPR in the main clause two-verb complexes. In section 6, I argue that the occurrence of VPR, alone and in conjunction with extraposition, which in this section was not conclusively shown to affect word order, can be attributed in part to the third set of rules in Lötscher's account, namely

performance rules. First, however, let us turn to a discussion of the multi-causal account of word order in the verbal complex proposed in Lötscher 1978.

5. A Multi-Causal Account of Word Order in the Verbal Complex.

In recent decades, a substantial amount of generative literature on verbal complexes has appeared. As Wurmbrand (2006:249) points out in her empirical and theoretical overview, most analyses rest on the notion that verbal complexes arise through syntactic movement (see, for example, den Dikken & Hoekstra 1997, Haegeman 1995, 1998a, 1998b, Koopman & Szabolcsi 2000, Robbers 1997, Zwart 1996).⁵¹ In her evaluation of these analyses, Wurmbrand (2006:285–286) maintains that an explanatory syntactic analysis must be able to predict the attested and unattested word orders in verbal complexes cross-dialectally, on the basis of independent principles found elsewhere in the grammar. She notes, however, that the rules formulated to derive verbal complexes are often no more than stipulated parameters that provide only a formal description of the word order facts. She concludes the following:

While it is undoubtedly the case that descriptive accounts [...] are unattractive for their lack of explanatory value, it is not clear at the current stage of the research on verb clusters that it is trivial (possible at all) to come up with an alternative that does not suffer from these very same inadequacies (Wurmbrand 2006:294).

Wurmbrand (2006:234) sums up below what seems to be the current state of affairs, ending with a challenge for further research:

Many interesting accounts have been suggested addressing the question of *how* verb clusters are derived. However, what still appears to be an open question is that of *why* the elements of a verb cluster are inverted in certain languages and constructions. An answer to the question of what the (deep) motivation of verb-cluster formation is and why this phenomenon exists only in certain languages is still outstanding, and any new insight into this question would be highly beneficial not only

⁵¹ For alternative approaches, see Haegeman & Van Riemsdijk 1986 (reanalysis and inversion), Hinrichs & Nakezawa 1994 (HPSG), Steedman 1985 (categorical grammar), and Williams 2004 (CAT), among others.

to the study of verb clusters and restructuring, but also to our general understanding of clause structure and the architecture of grammar.⁵²

It would thus appear that an explanation for verbal complex phenomena perhaps cannot be adequately captured solely by a formal syntactic account.⁵³ The question arises, then, whether the bulk of the explanation for variation in the verbal complex might not instead lie outside the core syntax. Indeed, when we look beyond the core syntax, we discover important insights into why such variation exists.

To my knowledge, Lötscher (1978) is the first to discuss the multifaceted nature of verbal complex phenomena. In his study of verb placement in Zurich German and other varieties, he writes the following:

Es ist also die Frage zu beantworten, ob es, wenn schon keine einfache Einzelregel formulierbar ist, doch wenigstens eine kleine Anzahl von generellen Regeln gibt, die die Vielfalt systematisch geordnet darstellbar machen. Dabei muß die zusätzliche Komplikation berücksichtigt werden, daß für die Erklärung der Wortstellung wohl kaum ein einziger Regeltyp vorausgesetzt werden kann. Vielmehr lassen sich mindestens drei interagierende, aber primär voneinander unabhängige Arten von Regeln ansetzen: Erstens grammatisch bedingte Regeln—Regeln wie die der Adjektivstellung bei Nomen, der Verbzweitstellung usw., die mehr oder weniger willkürlich eine Abfolge bestimmen, die aber auch anders aussehen könnten; performanzbedingte Regeln—Regeln, welche es ermöglichen, performanzmäßig allzu komplexe Strukturen in leichter zu verarbeitende Strukturen umzubilden, wie etwa die verschiedenen Extrapositionsregeln in vielen Sprachen; endlich funktional bedingte Regeln—Regeln, deren Zweck die Ermöglichung des Ausdrucks von bestimmten funktionalen Satzverhältnissen im Sinne der Thema-Rhema-Unterscheidung ist. Alle drei Regeltypen wirken bei der Formation eines bestimmten Satzes natürlich mit, und so sind ihre Interaktionen oft nicht leicht zu erfassen. Dennoch würden wohl die

⁵² Schmid & Vogel (2004:242) set out a similar challenge: “What is needed is a *systematic* account not just of *how* orders are derived, but *why* dialects choose *which* subsets of the possible orders under *which* circumstances, thereby using a minimum of stipulative assumptions.”

⁵³ One word order fact about which formal syntactic accounts have provided interesting insights is the rare cross-linguistic occurrence of the 2-1-3 order discussed in section 3.2. See Wurmbrand 2006 for details.

Gegebenheiten allzu sehr simplifiziert, wollte man sämtliche Stellungsphänomene von einem einzigen Gesichtspunkt her darstellen (Lötscher 1978:10–11).⁵⁴

In the remainder of section 5, I examine the components of Lötscher's catholic approach to verbal complex formation—grammar, function, and performance—in succession, taking into account Sapp's (2007) work and the results of the empirical and statistical analyses of the Zwirner Corpus data presented in sections 3 and 4.

5.1. *Grammar.*

Lötscher (1978:12) formulates a grammatical rule in terms of the position of the verbal elements in a complex in relation to one another. In effect, the instantiation of this rule arranges the verbal elements in their order of subcategorization from right to left, as in standard German for the majority of syntagms, to yield a left-branching structure.⁵⁵ The basic

⁵⁴ “If no single simple rule can be formulated, the question remains, then, whether there are at least a small number of general rules that can provide some order to the variation. Here the additional complicating factor, that surely no single type of rule can be assumed to explain word order, must be taken into account. Rather, at least three interacting, but fundamentally independent, types of rules may be applied: the first of these is grammatical rules—rules such as the placement of adjectives with nouns, verb-second, etc., which determine an order more or less arbitrarily but could also take a different form; performance rules—rules that enable structures, which in terms of performance are too complex, to be transformed into structures that are easier to process, such as the different extraposition rules in many languages; and, finally, functional rules—rules whose purpose is to enable the expression of certain functional sentential relationships along the lines of the theme-rheme differentiation. All three types of rules play a role in the formation of a particular sentence, and for this reason, their interactions are often not easily captured. Nonetheless, it would be an oversimplification if one tried to explain all of these word order phenomena from a single point of view” (my translation, SADS).

⁵⁵ With the modal IPP/subjunctive modal IPP (as in *was sie dennoch nicht hätte sagen sollen* ‘what she nonetheless should not have said’), the obligatory word order in standard German is 1-3-2. The syntagms causative/ACI IPP (as in *warum du mich hast kommen lassen* ‘why you had me come’), future MOD + INF (as in *dass sie bald wird ausziehen müssen* ‘that she will have to move out soon’), and INF + modal INF + MOD (as in *weil du den Kindern müsstest helfen*

orderings derived through this rule may then be altered through inversion in interaction with a performance rule and are subject to functional rules (Lötscher 1978:12–13, 17–18).

I propose here that Lötscher's (1978) grammatical rule be modified and expanded to encompass a rule and factors that interact and feed verbal complex formation. First, a grammatical rule defines, for a particular grammar, the range of word order variation in the verbal complex.⁵⁶ This moves us already beyond the scope of a purely core-syntactic investigation concerned with exactly how the orders permitted and not permitted may be predicted, motivated, and constrained. In contrast to such an investigation, I take for granted the range of variation for a given grammar.⁵⁷ A set of grammatical factors then constrains the orders defined by the grammatical rule. In sections 4.1 and 4.2, we saw that in the Zwierner Corpus data, the grammatical factor groups syntagm and verbal prefix type have statistically significant effects on word order in subordinate and main clause two-verb complexes. Given a set of all possible word orders in a particular grammar, there will be a number of subsets of these possible word orders, linked to different syntagms.⁵⁸ The factor group verbal prefix type may then influence the occurrence of a particular word order within these subsets of word orders.

In the Zwierner Corpus data, for example, two word orders are possible in the subordinate clause two-verb complexes: 2-1 and 1-2. Not

können 'because you would have to help the children') allow both the 1-3-2 and 3-2-1 orders. (See Dubenion-Smith 2008:43–62 for a discussion of these word orders.)

⁵⁶ This set is subject to cross-linguistic, inter- and intraregional, as well as inter- and intraspeaker variation (see Dubenion-Smith 2008:29–70, 108–113). A grammar may be defined at any of these levels.

⁵⁷ This proposal is supported by the fact that the range in variation in standard German, for example, is an artifact of leveling through the process of standardization and cannot, to a large extent, be derived from grammar-internal principles. Thus it seems reasonable to take as the starting point different sets of possible word orders associated with different grammars.

⁵⁸ The constraints placed by syntagm on word order can also take the form of preference. For example, the full set of possible word orders defined by the grammatical rule may be possible for two particular syntagms, but the preference between these orders may vary.

every syntagm allows both these orders, however; while both are attested with INF + MOD, for example, only the 2-1 order is attested with PTC + *kriegen*.⁵⁹ Which of the two word orders, 2-1 or 1-2, is realized in complexes with the syntagm INF + MOD is further determined in part by the type of verbal prefix on the lexical verb.

5.2. *Function.*

Lötscher suggests that functional rules also determine word order in the verbal complex. Lötscher (1978:4–6, 17–18) discusses a correspondence between certain word orders, specifically in main clause verbal complexes involving a modal and lexical verb plus a non-verbal element, and the position of both sentential accent and rhematic/thematic material.

Sapp (2007) more closely examines the relationship between word order and function—focus in particular. As discussed in section 4.3, Sapp found that in his ENHG corpus, new information and contrastive object focus favor the 1-2 order in subordinate clause two-verb complexes, while in subordinate clause three-verb complexes, focus favors all attested orders but 3-2-1 when taken together. Sapp supports this finding with evidence from scrambling, extraposition, and experiments testing the effect of focus on word order in modern German (see Sapp 2007:305–315). As for the Zwirner Corpus data, it was shown in section 4.3 that there is a statistically significant link between focus, as indicated by the occurrence of precluster indefinite NPs and intervening NPs in the VPR constructions, and the 2-3 order in 45 out of 135 main clause two-verb complexes in the groupings infinitive and IPP.

5.3. *Performance.*

The last of Lötscher's (1978) rules deals with the connection between word order and performance. Recall that this rule allows structures that in terms of performance are too complex to be restructured to facilitate processing. On the basis of psycholinguistic evidence indicating that left-branching structures are more difficult to parse than right-branching ones, Lötscher (1978:12–17) proposes a rule to invert the elements in the strictly left-branching verbal complexes generated by the grammatical rule described in section 5.1 above. This inversion rule applies not only

⁵⁹ For purposes of illustration, I assume that the unattested word order is ungrammatical.

to verbal elements, but non-verbal elements as well, allowing for the derivation of VPR constructions. Similarly, Kaufmann (2007:157–158, 198), following Haider 2003:91, 119–123, associates V(P)R structures with lower costs in parsing. He concludes that “the raising of VPs may be the speaker’s attempt to reduce the hearer’s processing load by producing less complex, right-branching structures” (p. 198).

The assumption that right branching structures are easier to parse than left-branching ones would seem to rest on the notion that the structural and semantic/thematic analysis of arguments is postponed in left-branching phrases, where the occurrence of the head is delayed. This delay places a load on working memory that can be alleviated through mechanisms that enable earlier analysis, for example, through V(P)R. These assumptions are compatible with head-driven approaches to parsing, as advocated by Pritchett (1991). However, it has been argued, on the basis of more recent psycholinguistic evidence from German (Bader & Lasser 1994) and Korean (Koh 1997) and confirmed, for example, in later studies of Japanese (Aoshima et al. 2003, Kamide & Mitchell 1999 among others), that the structural analysis of arguments occurs before the appearance of the verbal head, which belies a head-driven approach. Furthermore, the semantic/thematic interpretation of arguments has been shown to proceed incrementally (see, for example, Bornkessel et al. 2003 and Schlesewsky et al. 2003). If an incremental pre-head attachment account is assumed to be correct, then arguments for the advantage of right-branching V(P)R constructions for the hearer are weakened. In addition, an account that assumes the production of V(P)R structures for the benefit of the hearer entails SPEAKER ALTRUISM, the notion that the speaker “packages” utterances in ways easiest for the hearer to parse, which has been shown in the literature to be problematic (see Kirby 1999:60–62, 135–136).⁶⁰

Alternatively, the occurrence of V(P)R constructions may be associated with lower derivational costs of some sort for the speaker, as Kaufmann (2007:157–158) also suggests. In section 6, I first outline a speaker-oriented account of VPR based on principles of language

⁶⁰ This is not to say that there is no advantage of V(P)R constructions for parsing; Bach et al. (1986), for example, demonstrate the advantage of crossed dependencies in Dutch over nested dependencies in German, associated with VR constructions.

processing proposed in Hawkins 1994 and 2004, linking this process to a productive syntactic operation in spoken German (including the Zwirner Corpus data), namely extraposition.⁶¹ I then place VPR in the broader context of speaker-hearer dichotomies, specifically those linked to bracketing, a salient characteristic of German.

6. Performance Efficiency in Word Order.

Building on earlier groundbreaking work, Hawkins (2004) aims to define the relationship between word order preferences in performance and fixed word order conventions in grammars. Noting the commonly held view, dating back to Chomsky 1965, that performance has not significantly shaped grammars, Hawkins maintains that grammars are, in fact, inextricably linked to performance preferences. He defines this linkage in the Performance-Grammar Correspondence Hypothesis (PGCH):

(82) Performance-Grammar Correspondence Hypothesis (PGCH)

Grammars have conventionalized syntactic structures in proportion to their degree of preference in performance, as evidenced by patterns of selection in corpora and by ease of processing in psycholinguistic experiments (Hawkins 2004:3).

To test this hypothesis, Hawkins (2003, 2004) develops a set of general principles of efficiency and complexity that underlie word order preferences in performance and grammars: MINIMIZE DOMAINS, MINIMIZE FORMS, and MAXIMIZE ON-LINE PROCESSING. Here I limit the discussion to Minimize Domains since this is the key principle of the analysis of VPR presented in section 6.1.

Hawkins (2004:25) captures the main idea of Minimize Domains with the slogan “Express the most with least.” This principle is defined in 83.

(83) Minimize Domains (MiD)

The human processor prefers to minimize the connected sequences of linguistic forms and their conventionally associated syntactic and semantic properties in which relations of combination and/or depen-

⁶¹ In the following, I use the term “processing” in its broad sense to refer to both parsing and production.

gency are processed. The degree of this preference is proportional to the number of relations whose domains can be minimized in competing sequences or structures, and to the extent of the minimization difference in each domain (Hawkins 2004:31).⁶²

This principle follows from the observation that in languages that display variation in the size of the domain in which relations of combination and/or dependency are processed, there are clear preferences in performance for minimized domains. When domain sizes have been fixed in a grammar, this same preference is reflected in the grammatical convention, according to the PGCH.

One instantiation of MiD is the principle EARLY IMMEDIATE CONSTITUENTS (EIC), developed in Hawkins 1990 and 1994, which states that words and constituents occur in the orders they do so that syntactic groupings called PHRASAL COMBINATION DOMAINS (PCDs), consisting of a phrasal mother node M and its IMMEDIATE CONSTITUENTS (ICs), can be produced and recognized in performance as rapidly and efficiently as possible.⁶³ The formal definitions of PCD and EIC are given in 84 and 85.

⁶² Hawkins (2004:31–32) gives the following definitions for the terms COMBINATION, DEPENDENCY, and DOMAIN.

Combination: Two categories A and B are in a relation of combination iff they occur within the same mother phrase and maximal projections (phrasal combination), or if they occur within the same lexical co-occurrence frame (lexical combination).

Dependency: Two categories A and B are in a relation of dependency iff the parsing of B requires access to A for the assignment of syntactic or semantic properties to B with respect to which B is zero-specified or ambiguously or polysemously specified.

Domain: A combinatorial or dependency domain consists of the smallest connected sequence of terminal elements and their associated syntactic and semantic properties that must be processed for the production and/or recognition of the combinatorial or dependency relation in question.

⁶³ Hawkins (1994:73) defines ICs as “all and only the phonetically realized lexical, functional, and phrasal categories most immediately dominated by M in surface structure, excluding any phrasal categories that are non-maximal projections of the head.” Here he makes the conventional distinction between

(84) Phrasal Combination Domain (PCD)

The PCD for a mother node M and its I(mmediate) C(onstituent)s consists of the smallest string of terminal elements (plus all M-dominated non-terminals over the terminals) on the basis of which the processor can construct M and its ICs (Hawkins 2004:107).

(85) Early Immediate Constituents (EIC)

The human processor prefers linear orders that minimize PCDs (by maximizing their IC-to-nonIC [or IC-to-word] ratios), in proportion to the minimization difference between competing orders (Hawkins 2004:107).

I now illustrate these principles and the mechanics of the metric involved in measuring IC-to-word ratios, beginning with the following sentences, which exemplify a performance rule of English commonly known as HEAVY NP SHIFT:

(86) a. Mary [_{VP} **gave** [_{NP} **the book that she had been searching for**

1 2 3 4 5 6 7 8 9

since last Christmas][_{PP} **to Bill**]]

10 11 12 13

b. Mary [_{VP} **gave** [_{PP} **to Bill**][_{NP} **the** book that she had been searching

1 2 3 4

for since last Christmas]]

(Hawkins 2004:26)

In these sentences, the VP consists of three ICs: V, NP, and PP. In 86a, these ICs can be constructed within a thirteen-word PCD, extending from the word that constructs the first IC (V), *gave*, to the word that constructs the last IC (PP), *to*. (NP is constructed at its left edge at D, *the*.⁶⁴) The IC-to-word ratio, which measures the words that must be processed to construct the ICs of a phrase, is calculated by dividing the

lexical categories, such as N, V, Adj, and P, and functional categories, such as C, I, and D.

⁶⁴ VP, PP, and NP are constructed here according to what Hawkins (1994:342–359) terms “Mother Node Construction.”

number of ICs by the number of words in the PCD. The higher the ratio, the more minimal the PCD. This follows since a higher ratio is achieved when a given number of ICs can be constructed within fewer words.⁶⁵ Thus, the ratio for 86a is $3/13 = 23\%$. In 86b, on the other hand, the same three ICs can be constructed on the basis of a much smaller PCD consisting of only four words, yielding a much higher IC-to-word ratio of $3/4 = 75\%$.

Given this difference in IC-to-word ratios, we would thus predict a preference in performance for 86a over 86b, a prediction supported by the results of a corpus study presented in Hawkins 1994:182–184.⁶⁶ Hawkins (1994:83–95, 121–249; 2004:103–123) provides compelling cross-linguistic evidence that certain patterns of word order preference in performance can be derived from EIC and, more generally, MiD. I forego further discussion of the evidence here since the main purpose of this section is to introduce the mechanics of the EIC calculations.

The sentences in 86 above involve a single phrase, VP, with three ICs. In cases where more than one phrase or PCD is involved, it is necessary to determine the IC-to-word ratio for each PCD and calculate an aggregate score.⁶⁷ I now illustrate such a calculation on the basis of obligatory CP extraposition in German. Consider the following sentences:

⁶⁵ As Hawkins (2004:32, footnote 3) points out, the IC-to word ratio is a shortcut for the IC-to-non-IC ratio, which more precisely captures how much non-IC material must be processed in IC construction. While the metrics yield different ratios, what is important here is the *relative* difference between these ratios. Crucially, Wasow (2002) has shown that the differences in the predictions of these two metrics are statistically insignificant. For a discussion of the clear practical advantages of counting words over non-ICs, see Hawkins 1994:74–76.

⁶⁶ Hawkins (2004:111) notes that the heaviness of NP and PP is not the only factor that determines their relative ordering. Wasow (1997) shows that the types of collocation involved in sequences of [V PP] play an important role. Thus the ordering patterns for Heavy NP Shift depend on multiple preferences; see Hawkins 2004:111–117 for discussion.

⁶⁷ Hawkins (1994, 2004) presents aggregate scores as percentages, adding up individual percentages for each PCD and dividing the result by the total number of PCDs. I choose here to express aggregates as the sum of percentages since it magnifies differences, making them clearer.

- (87) a. *er [_{CP1} hatte [_{VP} [_{CP2} dass er nicht lange
 he had that he not long
 leben würde] gewusst]]
 live would known

‘he had known that he did not have long to live’

(Hawkins 1994:302)

- b. er [_{CP1} hatte [_{VP} gewusst [_{CP2} dass er nicht lange leben würde]]]

Let us assume that C_1 (*hatte*) constructs CP_1 , V (*gewusst*) VP , and C_2 (*dass*) CP_2 . Let us further assume that CP_2 is attached to VP when extraposed. The IC-to-word ratios for 87a and 87b can then be calculated, according to Hawkins (1994:305), as follows:

- (88) a. *er [_{CP1} hatte [_{VP} [_{CP2} dass er nicht lange leben würde] gewusst]]

 CP₁: 2/8 = 25%

 VP: 2/7 = 29%

AGR = 54

- b. er [_{CP1} hatte [_{VP} gewusst [_{CP2} dass er nicht lange leben würde]]]

 CP₁: 2/2 = 100%

 VP: 2/2 = 100%

AGR = 200

We see that the aggregate score for 88b is far higher than the score for 88a, indeed an optimal score of 200, which is reflected in the grammaticality of 88a vis-à-vis 88b. Notice that the results support the PGCH since the preference pattern in performance has been grammaticalized. Hawkins (1994:95–102, 250–341; 2004:123–136) discusses EIC predictions for preferences in grammar in detail; again I leave a discussion of these details aside.

The benefits of domain minimization and EIC for the hearer seem clear since the ICs in a smaller domain can be parsed more quickly. Indeed, in its initial formulation in Hawkins 1990 and 1994, the PCD is

referred to as the “Constituent Recognition Domain” (CRD), the definition of which entails the *parsing* of terminal and non-terminal nodes. Likewise, the original definition of EIC makes reference to the “human parser.” In Hawkins 2004, on the other hand, the author formulates his principles more neutrally in order to capture the benefits for both the hearer *and* speaker, using the terminology “construct” and “human processor.” Hawkins (2004:106) cites evidence from production experiments (see Stallings 1998) that confirm the benefits for the speaker and argues that in fact, the metric involved in measuring EIC as outlined above is more plausible from the speaker’s perspective than from the hearer’s.⁶⁸ Hawkins (2004:271) readily admits that the benefits for the speaker and hearer, as they relate to his principles, must be more clearly defined. I assume here, in light of issues raised in section 5.3 above, benefits for the speaker in domain minimization, an assumption supported by independent evidence, as we see in section 6.2 below.⁶⁹

6.1. Minimize Domains: VPR and Extraposition in the Zwirner Corpus.

With the tools of the IC-to-word ratio calculation in hand, let us now examine how Hawkins’ principles of MiD and EIC can account, in part, for constructions involving VPR formation and extraposition attested in the Zwirner Corpus data. For the derivation of the sample sentences

⁶⁸ Consider the following sentence:

The man [_{VP} **waited** [_{PP1} **for his son**]] [_{PP2} **in** the cold but not unpleasant wind]]
 1 2 3 4 5

According to the procedure outlined in the main text, the PCD for this sentence stretches across five words, from V *waited* to P₂ *in*. This implies that PP₂ will be constructed at the occurrence of *in*. Note, however, that the attachment of PP₂ is potentially ambiguous: if PP₂ were [_{PP2} *in* distress], then it would be attached lower in the tree to DP. As Hawkins (2004:106) points out, the speaker knows the structure of PP₂ in advance since he/she is producing the utterance and can accordingly construct PP₂ in the correct place upon reaching *in*. In contrast, the hearer does not have access to this information and must (potentially) hear more of the phrase until the correct place of attachment can be determined.

⁶⁹ For discussion of the speaker-hearer dichotomy, see, for example, Ferreira & Dell 2000, Haspelmath 2002:165–166, Hawkins 1994:425–427; 1998:762–764; 2001:5, note 4; 2002:218–219; 2003:148; 2004:24–25, 110–111, Moore & Polinsky 2003:20–22, and Polinsky 2002:186.

below, I assume Haegeman's (1992) analysis, which treats VPR as rightward adjunction of the VP with its arguments to a maximal projection, preceded by optional scrambling. Furthermore, I adopt Frey & Pittner's (1998) analysis of adverbials, which, as they argue, are generated in different base positions according to semantic class and may undergo scrambling. Full underlying and surface representations for the sample sentences are provided in the footnotes; however, to facilitate EIC calculations, simplified structures appear in the main text.⁷⁰

I begin with a main clause involving both extraposition and VPR:⁷¹

- (89) *habe sollen₂ in die Stadt gehen₃ mit der Wäsche*
 have should in the city go with the laundry ZWG79
 '(I) was supposed to go into town with the laundry'

Based on this derivation, I posit the clausal structure in 90 as the "basic" order associated with 89.⁷²

- (90) [_{CP} *habe* [_{VP₂} [_{VP₃} [_{PP₁} *mit der Wäsche*]] [_{PP₂} *in die Stadt*] *gehen*] *sollen*]]

This sentence, comprising the projections CP, VP₂, and VP₃, consists of the following ICs:

1. CP = C (*habe*), VP₂
2. VP₂ = V₂ (*sollen*), VP₃
3. VP₃ = V₃ (*gehen*), PP₁, PP₂

⁷⁰ For full syntactic tree structures, see Dubenion-Smith 2008:215–227.

⁷¹ Full underlying and surface representations for 89 in the main text are as follows:

- a. [_{CP} C [_{AgrP} [_{DP} (*ich*)] [_{TP} [_{VP₁} [_{VP₂} [_{VP₃} [_{PP₁} *mit der Wäsche*]] [_{PP₂} *in die Stadt*] *gehen*] *sollen*] *haben*] T] Agr]]
- b. [_{CP} [_{DP} (*ich*)]_b *habe*₁ [_{AgrP} *t_b* [_{TP} [_{VP₁} [_{VP*₂} [_{VP₂} *t_a* *sollen*]] [_{VP₃} *t_c* [_{PP₂} *in die Stadt*] *gehen*]_a] *t₁*] *t₁*] [_{PP₁} *mit der Wäsche*]_c]]

⁷² The phrases that do not contain lexical material—AgrP, TP, and VP₁—have been omitted here, in keeping with common practice in performing EIC calculations.

I assume that C constructs CP, V₂ VP₂, V₃ VP₃, P₁ (*mit*) PP₁, and P₂ (*in*) PP₂. Given these ICs and their constructors, the IC-to-word ratios and aggregate score for the basic sentence in 90 are as follows:

(91) [_{CP} habe [_{VP₂}[_{VP₃}[_{PP₁} mit der Wäsche]]_{PP₂} in die Stadt] gehen] sollen]]

CP: 2/9 = 22%

VP₂: 2/2 = 100%

VP₃: 3/7 = 43%
AGR = 165

I now calculate the ratios and aggregate score for a theoretical sentence with extraposed PP₁ that has been attached to VP₂. Following Hawkins 1994 and 2004, I assume discontinuous constituency.⁷³

(92) [_{CP} habe [_{VP₂}[_{VP₃}[_{PP₂} in die Stadt] gehen] sollen]]_{VP₃}[_{PP₁} mit der Wäsche]]]

CP: 2/6 = 33%
VP₂: 2/2 = 100%

VP₃: 3/6 = 50%
AGR = 183

If we compare the aggregate scores in 91 and 92, we see that the extraposition of PP₁ results in an improvement of the aggregate score over the score for the competing basic clause, like CP extraposition in 88 above.

⁷³ In the derivation of the attested sentence in note 71, PP₁ is attached to AgrP. Whether PP₁ is attached to VP₂ or AgrP is inconsequential for the calculations here and those to follow; for purposes of presentation it is more convenient to show PP₁ attached to VP₂. The same holds for the extraposed PP in 103 of the main text. Note also that here and in subsequent structures, the origin of discontinuous constituents is indicated by the bracket notation. In 92 of the main text, for example, we see that the origin of extraposed PP₁ is VP₃.

The aggregate score calculations for a second theoretical sentence with VPR (raising of VP₃) alone and the attested sentence with both VPR and extraposition are as follows:⁷⁴

- (93) [_{CP} habe [_{VP2} sollen][_{VP3}[_{PP1} mit der Wäsche][_{PP2} in die Stadt] gehen]]
- CP: 2/2 = 100%
- VP₂: 2/8 = 25%
- VP₃: 3/7 = 43%
- AGR = 168
- (94) [_{CP} habe [_{VP2} sollen][_{VP3}[_{PP2} in die Stadt] gehen][_{VP3}[_{PP1} mit der Wäsche]]]
- CP: 2/2 = 100%
- VP₂: 2/5 = 40%
- VP₃: 3/5 = 60%
- AGR = 200

We see that in 93, VPR alone results in an aggregate score only slightly higher than the score for the basic sentence, but in 94, VPR and extraposition together show an additive effect with a greater improvement in aggregate score than with either operation alone.

Next, I calculate the aggregate scores for a pair of attested main clauses with similar S-structures that display VPR alone.⁷⁵

⁷⁴ Hubert Haider (p.c.), as cited in Heilmann 1999:96, views the succession of verbs such as *habe sollen* in 93 of the main text as a special case of verb-second, whereby the whole cluster has raised to C. Weiß (1998:54), on the basis of cliticization data from Bavarian, argues against this analysis. Consider the following sentence:

na han'e miassn₂ de Duam-uar av-zoing₃
 then has.he must the tower-clock wind
 'then he had to wind the clock in the tower' (Weiß 1998:54)

A clitic may only appear on the finite verb, as does the subject clitic *e* 'he' in the sentence above. If a complex verb *han miassn* were raised to C, then the appearance of *e* would be unexpected. Thus Haider's analysis may be ruled out.

(95) hatte müssen₂ **tief in den Sack** greifen₃ ZWH62
 have must deep into the sack grab
 ‘(he) had to reach deep into the bag’ (i.e., shell out a lot of money)

(96) hat müssen₂ **dem Lehrer den Stecken** schneiden₃ ZWG79
 has must the teacher the stick cut
 ‘(one) had to cut the stick for the teacher’

I assume that 95 and 96 are related to the basic sentences in 97 and 98, respectively.

(97) [_{CP} hatte [_{VP₂}[_{VP₃}[_{PP} tief in den Sack] greifen] müssen]]

(98) [_{CP} hat [_{VP₂}[_{VP₃}[_{DP₁} dem Lehrer][_{DP₂} den Stecken] schneiden] müssen]]

I begin with 97, which consists of three projections: CP, VP₂, and VP₃. For present purposes, we need be concerned with only CP and VP₂. The ICs of these phrases are as follows:

1. CP = C (*hatte*), VP₂
2. VP₂ = V₂ (*müssen*), VP₃

I assume that C constructs CP, V₂ VP₂, and V₃ (*greifen*) VP₃.

Below are the calculations of the aggregate scores for the basic 99 and attested 100 sentence with VPR.

⁷⁵ Full underlying and surface representations for 95 and 96 in the main text are as follows:

- (95') a. [_{CP} C [_{AgrP}[_{DP} (er)]] [_{TP}[_{VP₁}[_{VP₂}[_{VP₃}[_{PP} tief in den Sack] greifen] müssen] haben] T] Agr]]
 b. [_{CP}[_{DP} (er)]_b hatte₁ [_{AgrP} t_b [_{TP}[_{VP₁}[_{VP*₂}[_{VP₂} t_a müssen] [_{VP₃}[_{PP} tief in den Sack] greifen]_a] t₁] t₁]]]]
- (96') a. [_{CP} C [_{AgrP}[_{DP} (der)]] [_{TP}[_{VP₁}[_{VP₂}[_{VP₃}[_{DP₁} dem Lehrer] [_{DP₂} den Stecken] schneiden] müssen] haben] T] Agr]]
 b. [_{CP}[_{DP} (man)]_b hat₁ [_{AgrP} t_b [_{TP}[_{VP₁}[_{VP*₂}[_{VP₂} t_a müssen] [_{VP₃}[_{DP₁} dem Lehrer] [_{DP₂} den Stecken] schneiden]_a] t₁] t₁]]]]

(99) [_{CP} hatte [_{VP₂}[_{VP₃}[_{PP} tief in den Sack] greifen] müssen]]
 ----- CP: 2/7 = 29%
 ----- VP₂: 2/2 = 100%
 AGR = 129

(100) [_{CP} hatte [_{VP₂} müssen][_{VP₂}[_{VP₃}[_{PP} tief in den Sack] greifen]]]
 ----- CP: 2/2 = 100%

 VP₂: 2/6 = 33%
 AGR = 133

As in 93, in 100 the occurrence of VPR alone, involving a VP with an embedded PP, improves the aggregate score only slightly.

For 98, I assume the same projections and ICs as for 97.

1. CP = C (*hat*), VP₂
2. VP₂ = V₂ (*müssen*), VP₃

However, there is a difference between these sentences in the constituent structure of VP₃ and the way in which this phrase is constructed. While in 97 the ICs of VP₃ are V₃ and PP, and V₃ constructs VP₃, in 98 the ICs of VP₃ are V₃, DP₁, and DP₂. Furthermore, as Hawkins (1994:393–397) argues, an accusative- or dative-marked determiner can construct VP.⁷⁶ Thus, in 98 above, VP₃ is constructed upon the occurrence of the dative-marked D₁ (*dem*) of DP₁. Based on these assumptions, then, the following are the aggregate score calculations for the basic sentence 101 and the attested sentence with VPR 102.

⁷⁶ VP can be constructed by an accusative- or dative-marked determiner according to what Hawkins (1994:361–366) terms “Grandmother Node Construction.”

(101) [CP hat [VP2[VP3[DP1 dem Lehrer][DP2 den Stecken] schneiden] müssen]

CP: 2/7 = 29%

VP₂: 2/6 = 33%

AGR = 62

(102) [CP hat [VP2 müssen][VP2[VP3[DP1 dem Lehrer][DP2 den Stecken] schneiden]]]

CP: 2/2 = 100%

VP₂: 2/2 = 100%

AGR = 200

We see that VPR with left-edge construction of VP₃ results in a far improved aggregate score.

I now calculate aggregate scores for the following subordinate clause, which displays both extraposition and VPR:⁷⁷

(103) wo ich heute wieder soll₁ **noch ein Stück**

where I today again should still a bit

abgemacht₃ kriegen₂ **mit dem Bulldog**

undone get with the tractor

‘where I should get another parcel of land harvested again today
with the tractor’ ZWG98

Based on this derivation, I posit the clausal structure in 104, in which AgrP and TP have been conflated as IP for expository reasons, as the basic order associated with 103.

⁷⁷ Full underlying and surface representations for 103 in the main text are as follows:

- a. [CP wo [AgrP[DP ich][TP[VP1[VP2[VP3[Adv heute][Adv wieder][V3[PP mit dem Bulldog][DP noch ein Stück] abgemacht]]kriegen]sollen]T]Agr]]
- b. [CP wo [AgrP*[AgrP[DP ich][TP*[TP[VP*1[VP1[Adv heute][Adv wieder]t_bt₁t_d]t₁t_d]soll₁][VP2[VP3 t_at_b[V3 t_c[DP noch ein Stück]abgemacht]]kriegen]_d[PP mit dem Bulldog]_c]]

- (104) [_{CP} *wo* [_{IP} [_{DP₁} *ich*]] [_{VP₂} [_{VP₃} [_{Adv₁} *heute*]] [_{Adv₂} *wieder*]] [_{PP} *mit dem Bulldog*]
 [_{DP₂} *noch ein Stück*] *abgemacht*] *kriegen*] *soll*]]

As we can see, the sentence in 104 consists of four projections, CP, IP, VP₂, and VP₃, with the following ICs:

1. CP = C (*wo*), IP
2. IP = I (*soll*), DP₁, VP₂
3. VP₂ = V₂ (*kriegen*), VP₃
4. VP₃ = V₃ (*abgemacht*), Adv₁, Adv₂, PP, DP₂

I assume that C constructs CP, V₂ VP₂, V₃ VP₃, P (*mit*) PP, and D₂ (*ein*) DP₂. The construction of IP, on the other hand, is less straightforward. As the phrasal head, I can construct IP. Additionally, Hawkins (1994: 384–385, 398) proposes that in languages such as German, S (IP) can be constructed by the complementizer C or by a nominative-marked NP (DP) at the left edge of S.⁷⁸ Therefore, both *wo* and *ich* can also construct IP in 104.

Below, I present the aggregate score calculations for four sentences: the basic sentence 105, theoretical versions with extraposition 106 and VPR 107 alone, and the attested sentence 108 with both extraposition and VPR. To simplify the calculations, I do not include the ratios for CP and VP₂ since these remain constant, and I assume that DP₁ constructs IP.⁷⁹

⁷⁸ DP and C construct IP by Grandmother Node Construction and Sister Node Construction, respectively. See Hawkins 1994:359–361 for discussion.

⁷⁹ In each of the sentences in 105–108 of the main text, the PCDs for CP and VP₂ consist of two words, *wo ich* and *abgemacht kriegen*, respectively. If it is assumed that C constructs IP here, it is not clear how the IC-to-word ratios for IP would be calculated since C is not an IC of IP, yet the PCD for IP must begin at the leftmost IC that constructs it.

(105) [_{CP} wo [_{IP} [_{DP1} ich][_{VP2} [_{VP3} [_{Adv1} heute][_{Adv2} wieder][_{PP} mit dem Bulldog]
 ----- IP
 ----- VP₃
 [_{DP2} noch ein Stück] abgemacht] kriegen] soll]]
 ----- IP: 3/12 = 25%
 ----- VP₃: 5/9 = 56%
 AGR = 81

(106) [_{CP} wo [_{IP} [_{DP1} ich][_{VP2} [_{VP3} [_{Adv1} heute][_{Adv2} wieder][_{DP2} noch ein Stück]
 ----- IP
 ----- VP₃
 abgemacht] kriegen] soll][_{VP3}[_{PP} mit dem Bulldog]]]
 ----- IP: 3/9 = 33%
 ----- VP₃: 5/9 = 56%
 AGR = 89

(107) [_{CP} wo [_{IP} [_{DP1} ich][_{VP*1} [_{VP3} [_{Adv1} heute][_{Adv2} wieder]]] soll]
 ----- IP
 ----- VP₃
 [_{VP2}[_{VP3}[_{PP} mit dem Bulldog][_{DP2} noch ein Stück] abgemacht] kriegen]]
 ----- IP: 3/12 = 25%
 ----- VP₃: 5/10 = 50%
 AGR = 75

- (108) [_{CP} wo [_{IP} [_{DP1} ich][_{VP*1} [_{VP3} [_{Adv1} heute][_{Adv2} wieder]]]] soll] IP
----- VP₃

 [_{VP2}[_{VP3}[_{DP2} noch ein Stück] abgemacht] kriegen][_{VP3}[_{PP} mit
----- IP: 3/9 = 33%

VP₃: 5/9 = 56%
AGR = 89
 dem Bulldog]]]

As we can see, extraposition alone results in an aggregate score higher than that of the basic sentence, but VPR alone results in a lower score. Additionally, we see that the score for the sentence with extraposition and VPR together is identical to that for the sentence with extraposition alone.

For cases in which aggregate scores for competing structures are non-optimal and need to be further distinguished since they are very close or identical, Hawkins (1994:82–83) proposes an on-line EIC metric that takes into account not only the size of the PCD but also the position of the ICs within the domain. The idea behind this metric is the preference for a leftward skewing of ICs within a domain.⁸⁰ On-line

⁸⁰ Hawkins' (1994:82–83) procedure for calculating on-line EIC ratios is as follows:

Calculating left-to-right IC-to-non-IC ratios: The L-to-R IC-to-non-IC ratio for a non-optimal CRD [PCD] is measured by first counting the ICs in the domain from left to right (starting from 1), and then counting the non-ICs (or words alone) in the domain (again starting from 1). The first IC is then divided by the total number of non-ICs that it dominates (for example, 1/2); the second IC is divided by the highest total for the non-ICs that it dominates (for example, if this IC dominates the third through seventh non-IC in the domain, then 2/7 is the ratio for the second IC); and so on for all subsequent ICs. The ratio for each IC is expressed as a percentage, and these percentages are then aggregated to achieve a score for the whole CRD [PCD].

As Hawkins (2004:50–51) notes, the on-line EIC metric is in the spirit of another of his principles, Maximize On-line Processing (MaOP), which is formulated first and foremost from the perspective of the hearer, unlike MiD. While it is beyond the scope of the present discussion to outline this principle

calculations for the four sentences are as follows, again including ratios only for those projections for which they do not remain constant, namely IP and VP₃:

(109) [CP wo [IP [DP₁ ich][VP₂ [VP₃ [Adv₁ heute][Adv₂ wieder][PP mit dem Bulldog] 1/1 IP
 1/1 2/2 3/5 VP₃
 [DP₂ noch ein Stück] abgemacht] kriegen] soll]]
 2/11 3/12 IP = 48%
 4/8 5/9 VP₃ = 73%
 AGR = 121

(110) [CP wo [IP [DP₁ ich][VP₂ [VP₃ [Adv₁ heute][Adv₂ wieder][DP₂ noch ein Stück] 1/1 IP
 1/1 2/2 3/5 VP₃
 abgemacht] kriegen] soll][VP₃ [PP mit dem Bulldog]]]
 2/8 3/9 IP = 53%
 4/6 5/9 VP₃ = 77%
 AGR = 130

(111) [CP wo [IP [DP₁ ich][VP₂ [VP₃ [Adv₁ heute][Adv₂ wieder]]] soll] 1/1 IP
 1/1 2/2 VP₃
 [VP₂ [VP₃ [PP mit dem Bulldog][DP₂ noch ein Stück] abgemacht] 3/6 4/9 5/10 VP₃ = 69%
 kriegen]] 3/12 IP = 58%
 AGR = 127

here (see Hawkins 2004:49–61 for details), I am concerned with the potential processing benefits for the speaker.

(112)	[_{CP} wo [_{IP} [_{DP1} ich] _{1/1}][_{VP2} [_{VP3} [_{Adv1} heute] _{1/1}][_{Adv2} wieder]]] soll]	2/4	IP
			VP ₃
	[_{VP2} [_{VP3} [_{DP2} noch ein Stück] abgemacht] kriegen][_{VP3} [_{PP} mit	3/9	IP = 61%
	3/6	4/7	VP ₃ = 73%
	dem Bulldog]]]		AGR = 134

The aggregate scores reveal that if the position of ICs within each PCD is taken into account, then both extraposition and VPR alone result in a score higher than that of the basic sentence, and, in combination, the highest score.⁸¹

Finally, I calculate aggregate scores for a subordinate clause that displays only VPR.⁸²

(113)	dass sie da müssen ₁		
	that they there must		
	einen ordentlichen Korb voll Essen kochen ₂		
	a decent basket full food cook		
	‘that they have to cook a decent basketful of food’		ZWG92

I posit that 113 is related to the basic sentence 114 with conflated IP.

(114)	[_{CP} dass [_{IP} [_{DP1} sie][_{VP} [_{Adv} da]		
	[_{DP2} einen ordentlichen Korb voll Essen] kochen] müssen]]]		

114 consists of three projections, CP, IP, and VP, with the following ICs:

⁸¹ Note that the on-line EIC calculations corroborate the results of the static EIC calculations for the main clauses as well.

⁸² Full underlying and surface representations for 113 in the main text are as follows:

- a. [_{CP} dass [_{AGR}P[_{DP1} sie][_{TP}[_{VP1}[_{VP2}[_{V2}[_{Adv} da][_{DP2} einen ordentlichen Korb voll Essen]kochen]]müssen]T]Agr]]
- b. [_{CP} dass [_{AGR}P*[[_{AGR}P[_{DP1} sie][_{TP}*[[_{TP}[_{VP}*1[[_{VP1}[_{Adv} da] t_a t_b t₁ t_b]müssen]₁][_{VP2}[_{V2} t_a [_{DP2} einen ordentlichen Korb voll essen]kochen]]_b]]]]

1. CP = C (*dass*), IP
2. IP = I (*müssen*), DP₁, VP
3. VP = V (*kochen*), Adv, DP₂

I assume that C constructs CP, DP₁ IP, accusative-marked DP₂ VP, and D₂ (*einen*) DP₂.

In the following, I present the aggregate scores for the basic sentence 115 and attested sentence 116, based on ratios for only the relevant phrases, IP and VP.

(115) [CP dass [IP[DP₁ sie][VP[Adv da][DP₂ einen ordentlichen Korb voll Essen]
 ----- IP
 ----- VP
 kochen] müssen]]
 ----- IP: 3/9 = 33%
 ---- VP: 3/7 = 43%
 AGR = 76

(116) [CP dass [IP[DP₁ sie][VP[Adv da]] müssen][VP[DP₂ einen ordentlichen Korb
 ----- IP
 ----- VP
 voll Essen] kochen]]
 ----- IP: 3/4 = 75%
 ----- VP: 3/8 = 38%
 AGR = 113

A comparison of the scores for 115 and 116 reveals an improved score for the attested VPR construction over that for the competing basic order.

In conclusion, the example calculations presented above suggest a potential processing-related motivation for VPR, namely more efficient language production through domain minimization and/or leftward skewing of ICs within a domain. In this respect, VPR, an operation involving rightward movement, is related to the more general syntactic operation of extraposition, which also involves rightward movement and can result in more efficient structures. Extraposition was shown in section 3.6 to be productive in WCG verbal complexes. In addition, a sample of 1,082

subordinate and main clauses without a verbal complex from 80 Zwierner Corpus transcripts display extraposition in 366 (33.8%) of these. To be sure, I am not arguing here that the occurrence of VPR constructions in production—let alone the grammaticalization of VPR—can be predicted solely on the basis of MiD.⁸³ Rather, efficiency in language production is just one of the factors that can account for the occurrence of VPR.

6.2. *Discussion.*

Section 6 began with an introduction to Hawkins' (1994, 2004) efficiency principles Minimize Domains and Early Immediate Constituents. The first principle, MiD, reflects the hypothesis that the shortest possible strings of words necessary to process relations of combination and/or dependency are preferred. The second principle, EIC, follows from the first and predicts the preference for the minimal string of words, the Phrasal Combination Domain (PCD), on the basis of which a mother node M and its Immediate Constituents (ICs) can be constructed. The degree of preference is proportional to the difference in minimization between competing orders.

Applying the metrics for determining aggregate IC-to-word ratios, it was demonstrated, on the basis of clauses from the Zwierner Corpus data, that VPR, alone or in combination with extraposition, can result in smaller PCDs than those found in competing basic orders. Consideration of the relative position of ICs within the PCD also revealed a potential processing advantage for extraposition and VPR when this did not follow from domain minimization alone. The increased efficiency was construed as a factor contributing to the occurrence of VPR.

The connection between performance and VPR follows from Lötscher's (1978) proposal that V(P)R arises in order to make sentences easier to parse, taken up in Kaufmann's (2007) recent work. However, the approach in this paper differs from the others in that it presents the potential processing advantages of VPR solely from the perspective of the speaker. This view fits well with the notion of the KLAMMERNDES VERFAHREN (bracketing), which involves the creation of discontinuous constituents. This phenomenon, discussed in detail in Ronneberger-

⁸³ However, see Kaufmann (2007:200), who suggests that for some groups of Mennonite Low German speakers, VPR is a grammaticalized performance rule, according to Hawkins' PGCH.

Sibold 1994, is a characteristic (and, for observers like Mark Twain, notorious) feature of German syntax that has developed over the course of centuries from Old High German to modern German and is a development that continues today. Nübling (2006:91) outlines three main types of bracketing as follows, with underlined words indicating the left and right brackets:

(117) Main clause bracket

a. Grammatical or verbal bracket

sie hat [das Spiel nach nur
she has the game after only

44 Minuten und drei Sätzen] verloren
44 minutes and three sets lost

‘she lost the game after only 44 minutes and three sets’

b. Lexical bracket

er zieht [den Vorhang] zu / auf
he pulls the curtain shut open
‘he closes / opens the curtain’

c. Copula bracket

er ist [seit drei Jahren] Lehrer
he is since three years teacher
‘he has been a teacher for three years’

(118) Nominal bracket

das [weltberühmte, aber leider vergriffene] Buch
the world-famous but unfortunately out-of-print book
‘the book that is world-famous, but unfortunately out of print’

(119) Subordinate clause bracket

obwohl [sie das Buch nie] gelesen hatte
although she the book never read had
‘although she had never read the book’

Following Ronneberger-Sibold (1994:115), Nübling (2006:91, 97–98) sees the function of bracketing in the marking of boundaries in syntactic decoding for the benefit of the hearer.⁸⁴ Extraposition and VPR, operations which disrupt this bracketing, are from this perspective a disadvantage for the *hearer*, but as we have seen, can nonetheless provide processing benefits—if not for the hearer, then for the *speaker*.⁸⁵ As Ronneberger-Sibold (1991:228–229) points out, this competition between the hearer and speaker is found in other linguistic domains such as phonology and morphology (see Ronneberger-Sibold 1980).⁸⁶

7. Grammar, Function, Performance.

Let us now see how the grammatical, functional, and performance factors that have been shown to influence word order in the verbal complex may be unified in a single account. To facilitate discussion, I give a graphic representation of the interactions between these factors in figure 4 below.

The interactions may be exemplified by comparing word order in main clause two-verb complexes in two grammars: standard German and West Central German. We begin with all logically possible word orders, namely 3-2 and 2-3. For each grammar, a grammatical rule first determines which of these word orders is allowed. In standard German, the core syntax licenses only the 3-2 order, so no further factors may influence word order. In West Central German, on the other hand, the grammar licenses both the 3-2 and 2-3 orders, which allows the occurrence of these word orders to be influenced by additional factors. The factor group syntagm first comes into play in the form of a filter.⁸⁷ Recall from section 3.3 that the perfect of passive [S], for example,

⁸⁴ Hawkins (1994:402) also mentions that the brace may “facilitate gathering up the ICs in processing, distinguishing them from the ICs of higher containing phrases.”

⁸⁵ See also Nübling 2006:261–262; Hawkins (1994:402) notes that the German VP bracket is regularly disrupted in order to shorten the VP PCD.

⁸⁶ Szczepaniak (2006:17), for example, discusses the tension inherent in phonological differences between “syllable languages” and “word languages,” the former advantageous for the speaker, the latter for the hearer.

⁸⁷ An important question that I plan to address in future work is why particular syntagms favor or disfavor particular word orders.

allows only the 3-2 order in WCG, so here again, no further factors may influence word order. In contrast, the modal IPP [H] allows both the 3-2 and 2-3 orders. The occurrence of these word orders may, in turn, be accounted for by an interaction of grammar, function, and performance.⁸⁸

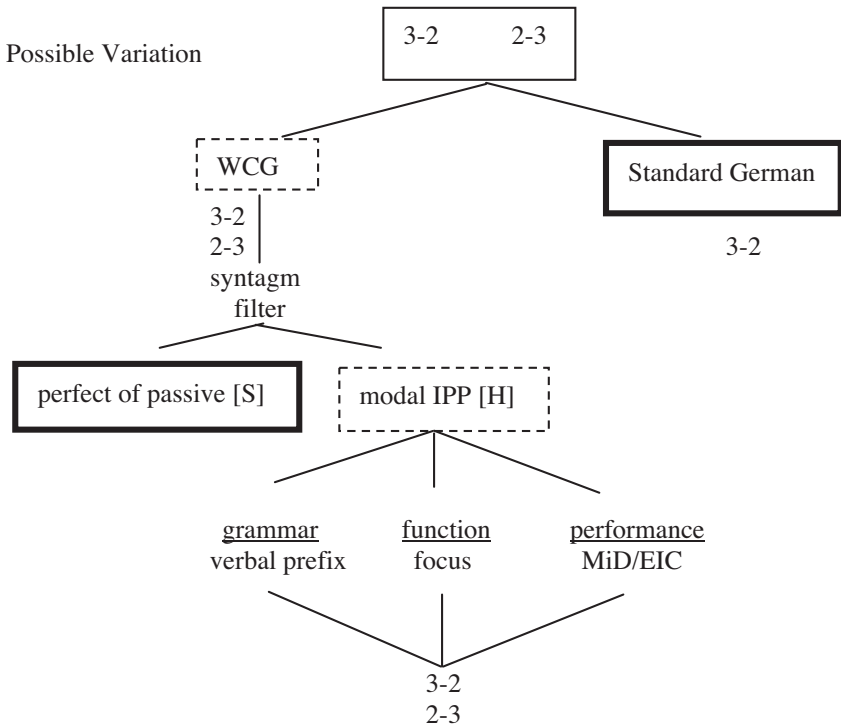


Figure 4. Interaction of grammar, function, and performance in WCG.

⁸⁸ Recall from section 5.1 that in evaluating the main clause two-verb complexes on the whole, the factor group syntagm comes into play twice, first as a filter and then again as a grammatical factor that interacts with the factor group verbal prefix type and the functional and performance factors. This is because syntagm serves not only to differentiate between types of verbal complexes that display variation and those that do not; among those that do, the degree of preference for particular word orders varies by syntagm, as we saw in section 3.1–3.4.

What remains outstanding is a principled way to determine exactly how grammar, function, and performance interact. Indeed, Lötscher (1978:11) is correct in the notion that “alle drei Regeltypen wirken bei der Formation eines bestimmten Satzes natürlich mit, und so sind ihre Interaktionen oft nicht leicht zu erfassen” (All three types of rules play a role in the formation of a particular sentence, and for this reason, their interactions are often not easily captured). It seems clear that the grammatical rule must apply first since if a grammar allows no variation, then none of the factors, for example, the presence of a stressed separable prefix, will have an effect on word order.⁸⁹ However, it is difficult to pinpoint the extent to which each factor can account for particular word orders and what the possible additive effects are. I leave this issue to further research.⁹⁰

Finally, the question arises as to how the movements involved in verbal complex formation are triggered. Sapp (2006:302–305) argues, following Haider & Rosengren’s (2003) approach to scrambling in German, that the movements associated with focus are not syntactically triggered but are optional movements that take place at the syntax-semantics/pragmatics interface because they are “pragmatically felicitous.” Similarly, movement as a result of grammatical- and performance-related factors could be seen to occur at this and additional interfaces. The key here is that verbal complex phenomena ought not to be analyzed solely in terms of core-syntactic operations, for they can more adequately be captured with concomitant reference to interfaces.

⁸⁹ This raises the interesting question of how grammaticality is to be defined. Schmid & Vogel (2004) find that in standard German the 3-1-2 order is possible with the syntagm future MOD + INF under certain focus conditions, while 3-2-1 and 1-3-2 are considered the “normal” orders. Under the analysis outlined here, the 3-1-2 order would have to be included in the set of orders allowed by the grammar, though it is not considered grammatical in the handbooks (see, for instance, Duden).

⁹⁰ For some interesting discussions of the link between performance and information structure, see Hawkins 1994:111–117, 237–242; 2004:122–123, Moore & Polinsky 2002:21–22, and Polinsky 2002:196–197.

8. Conclusion.

The main goal of this paper has been twofold. First, it classified the types of verbal complex phenomena that occur in WCG, a dialect region that so far has been neglected in this regard, and determined the factors that influence word order in these complexes. In the empirical part of the study, it was shown that the subordinate and main clause two- and three-verb complexes attested in the corpus display multiple word orders, VPR, and extraposition. The subsequent statistical analysis revealed that the factor groups syntagm, verbal prefix type, and focus have statistically significant effects on word order. Second, the paper outlined a multi-causal account of verbal complex phenomena, taking as the point of departure Lötscher 1978 and Sapp 2007. By demonstrating how VPR can be motivated in part as a result of more efficient processing for the speaker, this study furthers our understanding of verbal complexes beyond Lötscher and Sapp's contributions. Given the insights that accounting for verbal complex word order in terms of interactions at interfaces provides, this study can be viewed as a model for investigations of other phenomena that have been proven difficult to explain solely in terms of core-syntactic operations.

APPENDIX

Subordinate clause two-verb complexes

- | | | | |
|----|--|---------------------------------------|-----|
| 1. | dass wir Schläge hatten ₁ gekriegt ₂
that we blows had gotten
'that we had been spanked' | perfect with <i>haben</i>
ZW9B8 | 1-2 |
| 2. | wenn der Vater heim ist ₁ gekommen ₂
when the father home is come
'when father came home' | perfect with <i>sein</i>
ZWP89 | 1-2 |
| 3. | dass die Glocken
that the bells

nach Rom wären ₁ geflogen ₂
to Rome had flown

'that the bells had flown to Rome' | subjunctive with <i>sein</i>
ZWQ77 | 1-2 |

4. wo der Mist mit heraus wird₁ befördert₂ werden passive 1-2
 where the manure with out is hauled ZWV96
 'with which the manure gets hauled away'
5. dass wir Milch können₁ bringen₂ INF + MOD 1-2
 that we milk can bringen ZWI54
 'that we can bring milk'
6. dass die Kinder so INF + tun 1-X-2
 that the children like.that ZWI94
 ihm täten₁ immer nachlaufen₂
 him did always run.after
 'that the children would always run after him like that'
7. wenn die dann blieben₁ stehen₂ INF + LEX 1-2
 when they then stayed stand ZWQ83
 'when they stayed still then'

Subordinate clause three-verb complexes

8. wie da der Baum perfect of passive 3-1-2
 how there the tree ZWB39
 aufgestellt₃ ist₁ worden₂
 put.up is been
 'how the tree was put up there'
9. dass die Kirmes subjunctive passive 3-2-1
 that the fair ZWP63
 das Heu noch nicht gemacht₃ worden₂ wäre₁
 the hay still not made been was
 'that the hay still hadn't been cut by the fair'
10. dass auch viel werden passive + MOD 3-2-1
 that also much ZW6G9
 draußen gedroschen₃ werden₂ muss₁
 outside threshed be must
 'that a lot of threshing has to take place outside, too'

11. wie das allgemein *werden* passive + MOD 1-3-2
 how that generally ZWH83
 soll₁ gemacht₃ werden₂
 should done be
 'how that should be done generally'
12. dass man zufrieden sein₃ können₂ hat₁ modal IPP 3-2-1
 that one satisfied be can has ZWG33
 'such that you could be satisfied'
13. was man hat₁ kaufen₃ wollen₂ modal IPP 1-3-2
 what one has buy want ZWG09
 'what you wanted to buy'
14. was ich da habe₁ müssen₂ schuften₃ modal IPP 1-2-3
 what I there have must work ZWV96
 'how much I had to work there'
15. dass er was anderes subjunctive modal IPP 3-1-2
 that he something else ZWR19
 lernen₃ hätte₁ können₂
 learn had can
 'that he could have become something else'
 (that is, learned another trade)
16. ehe ich schlafen₃ war₁ gegangen₂ INF + perfect 3-1-2
 before I sleep was gone ZWQ10
 'before I had gone to sleep'
17. wer das hingelegt₃ gekriegt₂ hat₁ PTC + *kriegen* perfect 3-2-1
 who that laid gotten has ZWG66
 'whoever had that placed in front of him'
18. wenn es brachliegen₃ bleiben₂ müsste₁ double INF + MOD 3-2-1
 if it lie.fallow stay had ZW7G7
 'if it had to remain lying fallow'
19. dass ... Welsch ... double INF + MOD 1-3-2
 that ... Welsch ... ZWP61

200 Taler ... kann₁ abheben₃ gehen₂
 200 Taler ... can withdraw go

'that ... Welsch can go withdraw 200 Taler ...'

20. dass man dann manches INF + *lassen* + MOD 1-3-2
 that one then some ZWG92

muss₁ sein₃ lassen₂
 must be let

'that you have to let some things be'

Main clause two-verb complexes

21. ich habe sie nicht essen₃ können₂ modal IPP [H] 3-2
 I have it not eat can ZW8O3
 'I couldn't eat it'

22. die hätten Häuser dafür subjunctive modal IPP [H] 3-2
 they had houses for.that ZWA70

bauen₃ sollen₂
 build should

'they should have built houses for that'

23. habe ich geholfen₂ bohren₃ INF + perfect [H/S] 2-3
 have I helped drill ZWP89
 'I helped drill'

24. musst du doch mal gehen₂ gucken₃ double INF [MOD] 2-3
 must you PART PART go look ZW9B3
 'you have to go take a look'

25. ich habe ihn lassen₂ laufen₃ INF + *lassen* IPP [H] 2-3
 I have him let run ZWX02
 'I let him run with it'

26. man konnte sich lassen₂ geben₃ INF + *lassen* [MOD] 2-3
 one could REFL let give ZWW69
 'you could have someone give you (X)'

27. ich habe hauptsächlich Kartoffeln ACI IPP [H] 3-2
 I have mainly potatoes ZW9G0
 ausmachen₃ helfen₂
 dig.up help
 ‘I mainly helped dig up potatoes’
28. da werden wir müssen₂ aufhören₃ modal future [W] 2-3
 there will we must stop ZWI54
 ‘we’ll have to stop there’

Main clause three-verb complexes

29. dann hätten wir INF + lassen + MOD IPP [H] 4-2-3
 then had we ZWW58
 die Dränage ruhig liegen₄ können₂ lassen₃
 the drainage PART lie can let
 ‘then we could have gone ahead and left the drainage lying’
30. hat da auch double INF + MOD IPP [H] 3-2-4
 has there also ZWG03
 helfen₃ wollen₂ spinnen₄
 help want spin
 ‘[she] also wanted to help spin (yarn)’

REFERENCES

- Geerts, Guido, Walter Haeseryn, Jaap de Rooij, & Maarten C. van den Toorn (eds). 1984. *Algemene Nederlandse Spraakkunst*. Groningen: Wolters-Noordhoff.
- Altmann, Hans. 1981. *Formen der “Herausstellung” im Deutschen: Rechtsversetzung, Linksversetzung, Freies Thema und verwandte Konstruktionen*. Tübingen: Max Niemeyer.
- Aoshima, Sachiko, Colin Phillips, & Amy Weinberg. 2003. Theoretical implications of the parsing of Japanese *wh*-scrambling constructions. *Proceedings of the 22nd West Coast conference on formal linguistics*, ed. by Gina Garding & Mimu Tsujimura, 29–42. Somerville, MA: Cascadilla Press.

- Auer, Peter. 1991. Vom Ende deutscher Sätze. *Zeitschrift für Germanistische Linguistik* 19. 139–157.
- Bach, Emmon, Colin Brown, & William Marslen-Wilson. 1986. Crossed and nested dependencies in German and Dutch: A psycholinguistic study. *Language and Cognitive Processes* 1. 249–262.
- Bader, Markus, & Inge Lasser. 1994. German verb-final clauses and sentence processing: Evidence for immediate attachment. *Perspectives on sentence processing*, ed. by Charles Clifton, Lyn Frazier, & Keith Rayner, 225–242. Hillsdale, NJ: Erlbaum.
- Beckers, Hartmut. 1980. Westmitteldeutsch. *Lexikon der germanistischen Linguistik*, vol. 3, ed. by Hans Peter Althaus, Helmut Henne, & Herbert Ernst Wiegand, 468–474. Tübingen: Max Niemeyer.
- Behaghel, Otto. 1891. Geschichte der deutschen Sprache. *Grundriß der germanischen Philologie*, vol. 1, ed. by Hermann Paul, 526–633. Strasbourg.
- Bernhardi, Karl. 1844. *Sprachkarte von Deutschland*. Kassel: J. J. Bohné.
- Besten, Hans den, & Jerold A. Edmondson. 1983. The verbal complex in Continental West Germanic. *On the formal syntax of the Westgermanic*, ed. by Werner Abraham, 155–216. Amsterdam: John Benjamins.
- Bies, Ann. 1996. *Syntax and discourse factors in Early New High German: Evidence for verb-final word order*. Philadelphia, PA: UPenn MA Thesis.
- Bornkessel, Ina, Matthias Schlesewsky, & Angela Friederici. 2003. Eliciting thematic reanalysis effects: The role of syntax-independent information during parsing. *Language and Cognitive Processes* 18. 268–298.
- Bremer, Otto. 1892. Deutsche Mundarten. *Brockhaus' Konversationslexikon*. 14th edn., vol. 5, 27–35. Leipzig: F. A. Brockhaus.
- Chomsky, Noam. 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.
- Dikken, Marcel den, & Eric Hoekstra. 1997. Parasitic participles. *Linguistics* 35. 1057–1089.
- Dubenion-Smith, Shannon A. 2008. *Verbal complex phenomena in the West Central German dialects*. Madison, WI: University of Wisconsin–Madison dissertation.
- Duden—Grammatik der deutschen Gegenwartssprache. Der Duden in zwölf Bänden*. 2005. 7th edn., vol. 4. Mannheim: Bibliographisches Institut.
- Ebert, Robert Peter. 1981. Social and stylistic variation in the order of auxiliary and non-finite verb in dependent clauses in Early New High German. *Beiträge zur Geschichte der Deutschen Sprache und Literatur* 103. 204–237.
- Ebert, Robert Peter. 1992. Word order change in the usage of adolescents and young adults in 16th-century Nuremberg: The position of auxiliary and verb in dependent clauses. Princeton, NJ: Princeton University Manuscript.
- Engel, Ulrich. 1994. *Syntax der deutschen Gegenwartssprache*. Berlin: Erich Schmidt Verlag.

- Evers, Arnold. 1975. *The transformational cycle of Dutch and German*. Utrecht, The Netherlands: Utrecht University dissertation.
- Ferreira, Victor, & Gary Dell. 2000. The effect of ambiguity and lexical availability on syntactic and lexical production. *Cognitive Psychology* 40. 296–340.
- Frey, Werner, & Karin Pittner. 1998. Zur Positionierung der Adverbiale im deutschen Mittelfeld. *Linguistische Berichte* 176. 489–534.
- Gaumann, Ulrike. 1983. *Weil die machen jetzt bald zu: Angabe- und Junktivsatz in der deutschen Gegenwartssprache*. Göttingen: Kümmerle.
- Günther, Susanne. 1993. ...weil–man kann es ja wissenschaftlich untersuchen– Diskurspragmatische Aspekte der Wortstellung in WEIL-Sätzen. *Linguistische Berichte* 143. 37–59.
- Haas, Walter, & Peter Wagener (eds.). 1992. *Gesamtkatalog der Tonaufnahmen des Deutschen Spracharchivs. (Phonai, 38/39)* Tübingen: Max Niemeyer.
- Haegeman, Liliane. 1992. *Theory and description in generative syntax: A case study in West Flemish*. Cambridge: Cambridge University Press.
- Haegeman, Liliane. 1995. IPP constructions and V-movement in West Flemish. *Geneva Generative Papers*, vol. 3.1, ed. by Michal Starke, Eric Haeberli, & Christopher Laenzlinger, 50–76. Geneva: Department of Linguistics, University of Geneva.
- Haegeman, Liliane. 1998a. V-positions and the middle field in West Flemish. *Syntax* 1. 259–299.
- Haegeman, Liliane. 1998b. Verb movement in embedded clauses in West Flemish. *Linguistic Inquiry* 29. 631–656.
- Haegeman, Liliane, & Henk van Riemsdijk. 1986. Verb projection raising, scope, and the typology of rules affecting verbs. *Linguistic Inquiry* 17. 417–466.
- Haider, Hubert. 2003. V-clustering and clause unions. *Verb constructions in German and Dutch*, ed. by Pieter Seuren & Gerard Kempen, 90–126. Amsterdam: John Benjamins.
- Haider, Hubert, & Inger Rosengren. 2003. Scrambling: Nontriggered chain formation in OV languages. *Journal of Germanic Linguistics* 15. 203–267.
- Haspelmath, Martin. 2002. On understanding word order asymmetries. *Theoretical Linguistics* 28. 159–170.
- Hawkins, John. 1990. A parsing theory of word order universals. *Linguistic Inquiry* 21. 223–261.
- Hawkins, John. 1994. *A performance theory of order and constituency*. Cambridge: Cambridge University Press.
- Hawkins, John. 1998. Some issues in a performance theory of word order. *Constituent order in the languages of Europe*, ed. by Anna Siewierska, 729–781. Berlin: De Gruyter.

- Hawkins, John. 2001. Why are categories adjacent? *Journal of Linguistics* 37. 1–34.
- Hawkins, John. 2002. Issues at the performance-grammar interface: Some comments on the commentaries. *Theoretical Linguistics* 28. 211–227.
- Hawkins, John. 2003. Efficiency and complexity in grammars: Three general principles. *The nature of explanation in linguistic theory*, ed. by John Moore & Maria Polinsky, 121–152. Stanford: CSLI.
- Hawkins, John. 2004. *Efficiency and complexity in grammars*. Oxford: Oxford University Press.
- Heilmann, Axel. 1999. *Die VP im Schwäbischen*. Stuttgart: University of Stuttgart dissertation.
- Hinrichs, Erhard, & Tsuneko Nakezawa. 1994. Linearizing finite AUX in German verbal complexes. *German in head-driven phrase structure grammar*, ed. by John Nerbonne, Klaus Netter, & Carl Pollard, 11–38. Stanford: CSLI.
- Hodler, Werner. 1969. *Berndeutsche Syntax*. Berne: Francke.
- Kamide, Yuki, & Don C. Mitchell. 1999. Incremental pre-head attachment in Japanese parsing. *Language and Cognitive Process* 14. 631–662.
- Kaufmann, Göz. 2007. The verb cluster in Mennonite Low German: A new approach to an old topic. *Linguistische Berichte* 210. 147–207.
- Kirby, Simon. 1999. *Function, selection, and innateness*. Oxford: Oxford University Press.
- Koh, Sungryong. 1997. The resolution of the dative NP ambiguity in Korean. *Journal of Psycholinguistic Research* 26. 265–273.
- Koopman, Hilda, & Anna Szabolcsi. 2000. *Verbal complexes*. Cambridge, MA: MIT Press.
- Louden, Mark L. 2000. Pragmatics of verb-second in German. Talk given at the Germanic Linguistics Annual Conference (GLAC–6), University of Wisconsin–Milwaukee.
- Louden, Mark L. 2007. Synchronic and diachronic aspects of verb clusters in Pennsylvania Dutch. Talk given at the Germanic Linguistics Annual Conference (GLAC–13), Pennsylvania State University.
- Louden, Mark L. Forthcoming. Synchrony and diachrony of verb clusters in Pennsylvania Dutch. *German language islands: Generative and structural perspectives*, ed. by Michael T. Putnam. Somerville, MA: Cascadilla Press.
- Lötscher, Andreas. 1978. Zur Verbstellung im Zürichdeutschen und in anderen Varianten des Deutschen. *Zeitschrift für Dialektologie und Linguistik* 45. 1–29.
- Martin, Bernhard. 1959. *Die deutschen Mundarten mit 21 Karten im Text*. 2nd revised edn. Marburg: Elwert.
- Mitzka, Walter. 1943. *Deutsche Mundarten*. Heidelberg: Carl Winter.

- Moore, John, & Maria Polinsky. 2003. Explanations in linguistics. *The nature of explanation in linguistic theory*, ed. by John Moore & Maria Polinsky, 1–30. Stanford: CSLI.
- Niebaum, Hermann, & Jürgen Macha. 2005. *Einführung in die Dialektologie des Deutschen*. 2nd edn. Tübingen: Max Niemeyer.
- Nübling, Damaris. 2006. Syntaktischer Wandel. *Historische Sprachwissenschaft des Deutschen: Eine Einführung in die Prinzipien des Sprachwandels*, 90–105. Tübingen: Gunter Narr.
- Paolillo, John C. 2002. *Analyzing linguistic variation: Statistical models and methods*. Stanford: CSLI.
- Patocka, Franz. 1997. *Satzgliedstellung in den bairischen Dialekten Österreichs*. Frankfurt am Main: Peter Lang.
- Polinsky, Maria. 2002. Efficiency preferences: Refinements, rankings, and unresolved questions. *Theoretical Linguistics* 28. 177–202.
- Pritchett, Bradley. 1991. Head position and parsing ambiguity. *Journal of Psycholinguistic Research* 20. 251–270.
- Robbers, Karin. 1997. *Non-finite verbal complements in Afrikaans: A comparative approach*. Amsterdam: University of Amsterdam dissertation.
- Robinson, John, Helen Lawrence, & Sali Tagliamonte. 2001. *GoldVarb 2001: A multivariate analysis application for Windows*. Available at <http://courses.essex.ac.uk/lg/lg654/GoldVarb2001forPCmanual.htm>. Accessed June 20, 2008.
- Ronneberger-Sibold, Elke. 1980. *Sprachverwendung–Sprachsystem: Ökonomie und Wandel*. Tübingen: Max Niemeyer.
- Ronneberger-Sibold, Elke. 1991. Funktionale Betrachtungen zu Diskontinuität und Klammerbildung im Deutschen. *Sprachwandel und seine Prinzipien: Beiträge zum 8. Bochum-Essener Kolloquium über “Sprachwandel und seine Prinzipien” vom 19.10–21.10.1990 an der Ruhruniversität Bochum*, ed. by Norbert Boretzky, Werner Enninger, Benedikt Jeßling, & Thomas Stolz, 206–236. Bochum: Brockmeyer.
- Ronneberger-Sibold, Elke. 1994. Konservative Nominalflexion und “klammerndes Verfahren” im Deutschen. *Funktionale Untersuchungen zur deutschen Nominal- und Verbalmorphologie*, ed. by Klaus-Michael Köpcke, 115–130. Tübingen: Max Niemeyer.
- SADS–*Syntaktischer Atlas der deutschen Schweiz*. Research project at the University of Zurich, Department of German (project director: Elvira Glaser). Swiss National Science Foundation 1114-57121.99.
- SAND–*Syntactische Atlas van de Nederlandse Dialecten*. 2009. Vol. 2. Amsterdam: Amsterdam University Press.
- Sapp, Christopher. 2006. *Verb order in subordinate clauses: From Early New High German to modern German*. Bloomington, IN: Indiana University doctoral dissertation.

- Sapp, Christopher. 2007. Focus and verb order in Early New High German: Historical and contemporary evidence. *Roots: Linguistics in search of its evidential base*, ed. by Sam Featherston & Wolfgang Sternefeld, 299–318. Berlin: De Gruyter.
- Schlesewsky, Matthias, Gisbert Fanselow, & Stefan Frisch. 2003. Case as a trigger for reanalysis: Some arguments from the processing of double case ungrammaticalities in German. *Experimental studies in linguistics* 1, ed. by Susann Fischer, Ruben van de Vijver, & Ralf Vogel, 31–60. (*Linguistics in Potsdam* 21). Potsdam: Potsdam University Press.
- Schmid, Tanja, & Ralf Vogel. 2004. Dialectal variation in German 3-verb clusters: A surface-oriented optimality theoretic account. *Journal of Comparative Germanic Linguistics* 7. 235–274.
- Schwitalla, Johannes. 2003. *Gesprochenes Deutsch: Eine Einführung*. Berlin: Erich Schmidt.
- Stallings, Lynn. 1998. *Evaluating heaviness: Relative weight in the spoken production of Heavy-NP Shift*. Los Angeles, CA: University of Southern California doctoral dissertation.
- Starke, Günther. 1965. Ausrahmung oder Nachtrag? Ein Beitrag zur Begriffsbestimmung von Erscheinungen der Auflockerung im modernen deutschen Satzbau. *Sprachpflege* 1. 7–12.
- Steedman, Mark. 1985. Dependency and coordination in the grammar of Dutch and English. *Language* 61. 523–568.
- Szczepaniak, Renata. 2006. Phonologischer Wandel. *Historische Sprachwissenschaft des Deutschen: Eine Einführung in die Prinzipien des Sprachwandels*, 11–42. Tübingen: Gunter Narr.
- Tagliamonte, Sali A. 2006. *Analysing sociolinguistic variation*. Cambridge: Cambridge University Press.
- Wasow, Thomas. 1997. Remarks on grammatical weight. *Language Variation and Change* 9. 81–105.
- Wasow, Thomas. 2002. *Postverbal behavior*. Stanford: CSLI.
- Wegener, Heide. 1993. *weil—das hat schon seinen Grund*. Zur Verbstellung in Kausalsätzen mit *weil* im gegenwärtigen Deutsch. *Deutsche Sprache* 21. 289–305.
- Weiß, Helmut. 1998. *Syntax des Bairischen: Studien zur Grammatik einer natürlichen Sprache*. Tübingen: Max Niemeyer.
- Wiesinger, Peter. 1983. Die Einteilung der deutschen Dialekte. *Dialektologie: Ein Handbuch zur deutschen und allgemeinen Dialektforschung*. 2. Halbband, ed. by Werner Besch, Ulrich Knoop, Wolfgang Putschke, & Herbert Ernst Wiegand, 807–900. Berlin: de Gruyter.
- Williams, Edwin. 2004. The structure of clusters. *Verb clusters: A study of Hungarian, German, and Dutch*, ed. by Katalin É. Kiss & Henk van Riemsdijk, 173–201. Amsterdam: John Benjamins.

- Wurmbrand, Susanne. 1999. Where do verbs cluster: West Germanic perspectives. Presentation at the workshop on *Verb Clusters*, Ótvevény, Hungary.
- Wurmbrand, Susanne. 2000a. Verb clusters: Variation at the right periphery. Talk given at the workshop on Syntactic Microvariation, Meertens Institute, Amsterdam.
- Wurmbrand, Susanne. 2000b. Summary of verb cluster questionnaire. Talk given at the Third Workshop on Verb Clusters, Budapest.
- Wurmbrand, Susanne. 2002. Empirische Dialektstudien. Talk given at the University of Vienna, *Übungen zur Grammatik des Deutschen: Dialektsyntax*.
- Wurmbrand, Susanne. 2004. West Germanic verb clusters: The empirical domain. *Verb clusters: A study of Hungarian, German, and Dutch*, ed. by Katalin É. Kiss & Henk van Riemsdijk, 43–85. Amsterdam: John Benjamins.
- Wurmbrand, Susanne. 2006. Verb clusters, verb raising, and restructuring. *The Blackwell companion to syntax*, vol. 5, ed. by Martin Everaert & Henk van Riemsdijk, 229–343. Oxford: Blackwell.
- Young, Richard, & Robert Bayley. 1996. VARBRUL analysis for second language acquisition research. *Second language acquisition and linguistic variation*, ed. by Robert Bayley & Dennis Preston, 253–306. Amsterdam: John Benjamins.
- Zwart, C. Jan-Wouter. 1996. Verb clusters in Continental West Germanic Dialects. *Microparametric syntax and dialect variation*, ed. by James Black & Virginia Motapanyane, 229–258. Amsterdam: John Benjamins.

Department of Modern and Classical Languages
Western Washington University
516 High St. HU 243A
Bellingham, WA 98225
[shannon.dubenion-smith@wwu.edu]