

POSTPRINT

## An OT analysis of *do*-support across varieties of German

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### Abstract

Just like most varieties of West Germanic, virtually all varieties of German use a construction in which a cognate of the English verb *do* (standard German *tun*) functions as an auxiliary and selects another verb in the bare infinitive, a construction known as *do*-periphrasis or *do*-support. The present paper provides an Optimality Theoretic (OT) analysis of this phenomenon. It builds on a previous analysis by Bader and Schmid (An OT-analysis of *do*-support in Modern German, 2006) but (i) extends it from root clauses to subordinate clauses and (ii) aims to capture all of the major distributional patterns found across (mostly non-standard) varieties of German. In so doing, the data are used as a testing ground for different models of German clause structure. At first sight, the occurrence of *do* in subordinate clauses, as found in many varieties, appears to support the standard CP-IP-VP analysis of German. In actual fact, however, the full range of data turn out to challenge, rather than support, this model. Instead, I propose an analysis within the IP-less model by Haider (Deutsche Syntax - generativ. Vorstudien zur Theorie einer projektiven Grammatik, Narr, Tübingen, 1993 et seq.). In sum, the *do*-support data will be shown to have implications not only for the analysis of clause structure but also for the OT constraints commonly assumed to govern the distribution of *do*, for the theory of non-projecting words (Toivonen in Non-projecting words, Kluwer, Dordrecht, 2003) as well as research on grammaticalization.

### Keywords

Optimality Theory, *do*-support, German clause structure, Non-projecting words, Grammaticalization

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## 1 Introduction

Just like most varieties of West Germanic, practically all varieties of German use a construction in which a cognate of the English verb *do* (standard German: *tun*) functions as an auxiliary and selects another verb in the bare infinitive (Langer 2001; Schwarz 2004)—a construction most commonly known as *do*-periphrasis, sometimes also as *do*-support. Crucially, however, different varieties differ considerably with respect to the distribution of the construction within their individual grammatical systems. An important aspect of this is the construction's distribution across different clause types.

Building on previous studies of English (Grimshaw 1997) and German (Bader and Schmid 2006), the present paper gives an Optimality Theoretic analysis of the phenomenon in question. The present analysis goes beyond the previous analysis by Bader and Schmid in that it (i) considers not only main clauses with verb second order but also subordinate clauses with verb final order and (ii) aims to consider all of the major distributional patterns found across varieties of German. It will be shown that the diversity in the distribution of *do* constitutes a valuable testing ground for competing models of German clause structure as well as for the OT constraints typically considered to be involved in the occurrence of *do*-support.

Generative analyses have usually analysed the insertion of dummy *do* as a means of filling a functional position above the VP (i.e., as an alternative to verb movement). The present study aims to show that such an analysis is insufficient for German: As will be shown, most varieties use *do*-periphrasis in subordinate clauses with verb final order. At first sight, this can be explained by (and thus lends support to) the standard VP-IP-CP analysis of German, according to which the clause-final finite verb occurs in the clause-final head of the intermediate IP/TP layer ( $I^{\circ}/T^{\circ}$ ). However, it will be shown that this analysis is challenged by a subset of the varieties in question, namely Northern Low German. In this dialect group, *do* occurs in subordinate clauses (i.e., in the putative  $I^{\circ}/T^{\circ}$ -position) *only*, whereas main clauses (where the finite verb is assumed to be in  $C^{\circ}$ ) require verb movement. Thus, under an analysis that views *do*-support exclusively as a strategy to circumvent verb movement, we would be looking at a system with *do*-support in the intermediate position  $I^{\circ}/T^{\circ}$  but with verb movement to the higher position  $C^{\circ}$ . Such a system is incompatible with the widely accepted head movement constraint (HMC) (Travis 1984) and has been predicted to be typologically impossible by Grimshaw (2013).

The data from Northern Low German will therefore be taken to challenge, rather than support, the idea that the clause-final finite verb is in  $I^{\circ}/T^{\circ}$ , and thus suggest that the use of *do* goes beyond the circumvention of verb movement. I will propose that the data are better accounted for by a framework such as that developed by Haider (1993, 2003, 2010). Haider (i) assumes that German lacks IP/TP altogether and (ii) analyses the clause-final verb cluster as a cluster of  $X^{\circ}$ -type elements, i.e., as a structure consisting of V-heads rather than V-projections. I will argue that in combination, these two assumptions offer an explanation for the Northern Low German restriction of *do* to subordinate clauses. I will argue that Northern Low German *do* is a non-projecting (i.e., syntactically clitic-like) element in the sense of

Toivonen (2003) and as such has to head-adjoin to its lexical verb. Within Haider's model, this requirement is fulfilled if (and only if) *do* occurs within the clause-final  $X^{\circ}$ -type cluster. Independent evidence for such an analysis comes from the behaviour of *do* within the clause-final verb cluster. If on the right track, the analysis has implications not only for the analysis of German clause structure but also for the constraints assumed to govern *do*-support, for the theory of non-projecting words and for research on grammaticalization.

## 2 The phenomenon: *Do*-periphrasis across varieties of German

*Do*-periphrasis is a feature common to virtually all varieties of German (Langer 2001: chap. 2; Schwarz 2004). This includes, albeit with strong restrictions, the standard language, and, more prominently, most if not all dialects. The data to be modelled here come from a range of different sources: The description of standard German follows the authoritative Duden dictionary (Duden—richtiges und gutes Deutsch 1997). The dialect data come from empirical studies focusing on individual varieties. Studies of Upper German include, among others, Schwarz (2004) for Alemannic and Eroms (1984, 1998) for Bavarian. Both Eroms and Schwarz elicit acceptability judgements; Schwarz additionally collects spoken data. Data for Central German (more specifically: Ripuarian) come from Kölligan (2004), a corpus study based on both literary texts and spoken language. Studies focusing on Low German include Harte (1950), Keseling (1968), Rohdenburg (1986, 2002) and Weber (2017). Harte (1950) and Rohdenburg (1986, 2002) draw on corpora of literary texts. Keseling (1968) and Weber (2017) investigate corpora of spoken language; Weber (2017) also elicits acceptability judgements.

Crucially, it is only the occurrence of *do*-periphrasis as such that is shared by all of the varieties mentioned above. Its precise distribution within the grammatical system of a given variety is subject to a high degree of variation. An important aspect of this is the construction's *syntactic* distribution. To capture the relevant distributional types, we must distinguish three syntactic environments, illustrated below using standard German orthography (dialect citations will follow below): (i) main clauses (verb second clauses) with the lexical verb as the fronted constituent (from here on referred to as 'VP-topicalization') (1), (ii) other main clauses with verb second or verb first order (from here on simply 'main clauses') (2) and (iii) subordinate clauses with verb final order (from here on simply 'subordinate clauses') (3). With VP-topicalization (1), the *do*-construction is typically the only option.<sup>1</sup> In the other two environments, the *do*-construction (2a, 3a) typically varies with the corresponding finite form of the lexical verb (2b, 3b). This may be

<sup>1</sup> A small number of varieties have an alternative construction in which the finite verb position is not filled by *do* but by a finite copy of the topicalized lexical verb (i) (see Fleischer 2008).

(i) Trinken      trinkt      er      nich  
*drink.inf*    *drinks*    *he*    *not*  
 'As far as drinking is concerned, he does not do that'.  
 (Prussian, Betcke 1924, cited by Fleischer 2008: 246, my translation)

considered ‘free variation’ or ‘optionality’ in the sense of Kager (1999: 404), i.e., the same input is mapped onto two equally grammatical outputs.<sup>2</sup>

- (1) Lesen tut er das gerne.  
*read does he that willingly*  
 ‘As far as reading it is concerned, he would like that.’
- (2) a. Er tut das gerne lesen.  
*he does that willingly read*  
 b. Er liest das gerne.  
*he reads that willingly*  
 ‘He likes to read that.’
- (3) a. (Ich weiß,) dass er das gerne lesen tut.  
*(I know) that he that willingly read does*  
 b. (Ich weiß,) dass er das gerne liest  
*(I know) that he that willingly reads*  
 ‘(I know) that he likes to read that.’

In standard German (just as in standard Dutch, cf. van Dale 1992: 668), *do*-periphrasis is confined to the first of the three environments: Prescriptive grammar allows its use with VP-topicalization (1), but in main clauses such as (2) and in subordinate clauses (3) *do* is deemed unacceptable (Duden—richtiges und gutes Deutsch 1997: 726). Most dialects, by contrast, allow the construction in a wider range of contexts. As shown by Langer (2001), the strong restrictions on the use of *do* in standard German, unparalleled by most non-standard varieties, are due to prescriptivism traceable from the Early New High German period onwards.

In Upper German, Central German and Southern Low German dialects, *do*-periphrasis is possible in all of the syntactic environments in (1–3). However, there is some indication that varieties of Upper German preferably use the construction in main clauses rather than in subordinate clauses. Focusing on a local variety of Central Alemannic, Schwarz (2004: 118–119) finds that in his spontaneous spoken data, *do* occurs almost exclusively in main clauses (4). Moreover, his acceptability tests show that the acceptance of *do* is higher in main clauses than in subordinate clauses. The same is reported for Swiss German (Schönenberger and Penner 1995: 319): “*Tun*-insertion is [...] essentially a root phenomenon. Subordinate clauses with *tun* are usually judged as odd.” For Bavarian, Eroms (1984: 130), too, finds

<sup>2</sup> For some varieties, it is argued that *do* fulfils a particular semantic function, such as the expression of certain aspectual (typically imperfective) values. However: (i) Even in the varieties in question, *do* does not seem to be categorically restricted to the postulated meaning. (ii) The postulated meaning is usually one that could also be expressed by the corresponding simple verb form. Thus, for example, a given instance of a *do*-construction may well receive a progressive reading, but the same would be true of the corresponding simple form. I will therefore follow Langer (2001: 85) in assuming that *do* is indeed “semantically empty”.

that his informants accept *do* more readily in main clauses compared to subordinate clauses—without, however, strictly rejecting its use in the latter clause type.

- (4) un deno duet mo'n mischä  
*and then does one=it mix*  
 'and then you mix it (= the salad)'  
 (Central Alemannic, Schwarz 2004: 119, my translation)

For Central German and a range of other varieties of German (and Dutch), on the other hand, no such asymmetry emerges. For West Central German (Riparian), Kölligan's (2004: 441) corpus study finds that *do* is distributed equally across main (5a) and subordinate clauses (5b). This is in line with the corpus-studies by Dubenion-Smith (2010, 2011) on the verb cluster in West and East Central German, which document numerous sub-clause examples of *do*. For Southern Low German (Westphalian, excluding Emsland) (Weber 2017: Section 3.4.2) and an Altai variety of Plautdietsch (Nieuweboer 1998: 175), corpus-studies find that there is no asymmetry between main and subordinate clauses. In the Dutch dialect of Heerlen, finally, located in the westernmost transition zone of Riparian in the Netherlands, *do* (Dutch *doen*) seems to occur both in main clauses and in subordinate clauses, too (Cornips 1998, 2009).

- (5) a. on dan däät der Lehrer en Reede halten  
*and then did the teacher a speech deliver*  
 'and then the teacher delivered a speech'  
 b. dat se net rosten dääten  
*that they not rust did*  
 'so they would not rust'  
 (Riparian, Kölligan 2004: 442, 443, my translations)

In Northern Low German, finally, the situation is very different: Except with VP-topicalization, this dialect group does not allow *do* in main clauses but at the same time frequently uses *do* in subordinate clauses (6). This fact was, to my knowledge, first observed by Bernhardt (1903), and it has subsequently been confirmed by numerous extensive corpus-studies (Harte 1950; Keseling 1968; Rohdenburg 1986, 2002; Weber 2017) as well as by acceptability tests (Weber 2017).

- (6) wenn wi dår förbigån doot  
*when we there pass do*  
 'when we pass by there'  
 (Northern Low German, Bernhardt 1903: 12, my translation)

In sum, then, we can distinguish four distributional types of *do*-periphrasis across varieties of German: (i) a standard German type, where *do* occurs with VP-topicalization only; (ii) a Central German type, where *do* occurs in other main

clauses and in subordinate clauses, too, and is equally distributed across these two clause types; (iii) an Upper German type, which differs from the Central German type only in that *do* is less frequent/less preferred in subordinate clauses; and (iv) a Northern Low German type, where *do* does not occur in main clauses without VP-topicalization but does occur in subordinate clauses. The labels given to these types are based on the varieties which most prototypically represent them. They are not meant to indicate, though, that e.g., all and only Upper German varieties can be assigned to the Upper German type.

I will be using the term ‘symmetrical’ for those types in which main clauses (without VP-topicalization) and subordinate clauses behave alike (either in that *do* occurs in neither clause type, as in standard German, or in that it occurs to equal extents in both clause types, as in Central German). Correspondingly, I will be using the term ‘asymmetrical’ for those distributional types in which the two clause types behave differently (either in that *do* is more frequent/more preferred in main clauses, as in Upper German, or in that *do* is restricted to verb final clauses, as in Northern Low German). The types are summarized in Table 1.

Despite the differences in distribution across clause types, there are two features that tend to apply in all varieties and clause types. First, just as in English, *do* tends to occur in finite form only (e.g., Erb 2001: 197–202). Weber (2017) shows that even those speakers who frequently produce finite *do* do not produce non-finite *do*. Likewise, it is shown that the same speakers who accept finite *do* in acceptability tests reject non-finite *do*. Thus, *do* cannot be embedded under a modal verb or under the perfect auxiliary *haben* (‘have’) (7). This finite-only property can be taken to indicate that the prime function of *do* is to realize finiteness features. Second, and again, just as in English, *do* does not typically select a verb which itself selects a bare infinitive or a participle. Thus, as a rule, *do* does not embed a modal verb or a perfect auxiliary (8) (Keseling 1968: 147; Eroms 1984: 132; Rohdenburg 1986: 89; Abraham and Fischer 1998: 40, 42; Bader and Schmid 2006: 15). Following Bech (1955), I will use indices to indicate the hierarchical structure among the verbs: Here, V1 marks the finite verb, V2 marks the verb selected by V1, and V3 marks the verb selected by V2.

**Table 1** Distribution of *do* across varieties of German

	Symmetrical		Asymmetrical	
	Standard German Type	Central German Type	Upper German Type	Northern Low German Type
VP-topicalization (verb second)	✓	✓	✓	✓
other main clause (verb second or verb first)	X	✓	✓	X
subordinate clause (verb final)	X	✓	(✓)	✓

- (7) a. \*Er muss<sub>V1</sub> das lesen<sub>V3</sub> tun<sub>V2</sub>.  
       *he must that read do.inf*  
       b. \*Er hat<sub>V1</sub> das lesen<sub>V3</sub> getan<sub>V2</sub>.  
       *he has that read done*
- (8) a. \*Er tut<sub>V1</sub> das lesen<sub>V3</sub> müssen<sub>V2</sub>.  
       *he does that read must*  
       b. \*Er tut<sub>V1</sub> das gelesen<sub>V3</sub> haben<sub>V2</sub>.  
       *he does that read have*

The diversity in the distribution of *do* as shown in Table 1 presents a challenge to any theoretical account. Within an OT approach, the constraints used in the analysis will have to generate all of the four observable distributions, and an individual constraint ranking proposed for a given system will have to generate the correct output across all three clause types.

### 3 *Do*-support in English

Previous research on dummy *do* has focused on English, where the phenomenon is typically dealt with under the label ‘*do*-support’. Generative research goes back to Chomsky (1957: 61–62) and also includes, e.g., Chomsky (1995), whose analysis builds on Pollock’s (1989) work on verb movement. In this section, I will briefly sketch Chomsky’s (1995) account as an example of a non-OT approach to *do*-support. Subsequently, I will turn to OT. After providing some general background, I will present Grimshaw’s (1997) OT-based analysis of *do*-support in English, as it forms the immediate point of reference for Bader and Schmid’s analysis (2006) as well as the present analysis of German.

As will become apparent, the OT analyses should not be seen as diverging radically from previous approaches within GB, P&P or Minimalism, but rather as building on these analyses. Many of the OT constraints proposed to play a role in the distribution of *do* explicitly make reference to (and thus presuppose), e.g., individual aspects of classical GB-theory such as X-bar theory (cf., for example, OP-SPEC (OPERATOR IN SPECIFIER): Syntactic Operators must be in specifier position). For recent work aiming at integrating Minimalism and OT see Broekhuis & Vogel (2013) and Broekhuis & Woolford (2013).

I will argue that, at least with respect to the German (dialect) data, one of the most compelling reasons for adding the OT machinery is the large amount of micro-typological as well as system-internal variation.

### 3.1 Chomsky's (1995) analysis

In the following, I will briefly present Chomsky's (1995) approach to *do*-support in English. The presentation also draws on the discussions in Haegeman and Guéron (1999) and Radford (2004).

In present-day standard English, *do* is disallowed in positive declaratives (9) (except for the expression of polarity focus (9c)) but it is obligatory in negative declaratives (10) and non-subject interrogatives (11)—unless the clause already contains an auxiliary (12).

- (9) a. She said that.  
 b. \*She did say that.  
 c. She DID say that.  
 (a and b: Grimshaw 1997: 383)
- (10) a. \*John left not.  
 b. John did not leave.  
 (Grimshaw 1997: 391)
- (11) a. \*What said she?  
 b. What did she say?  
 (Grimshaw 1997: 385)
- (12) a. \*What does she will say?  
 b. \*John does not will leave.  
 (a: Grimshaw 1997: 384)

Chomsky (1995: 134–143) views *do*-support in close connection with the verb-movement syntax of English, as developed by Pollock (1989), based on a contrastive analysis with French. Following Pollock, Chomsky distinguishes two mechanisms by which a verb may be combined with the inflectional features/affixes considered to be located in the head(s) of the IP-domain above the VP. In French, both lexical verbs (13a) and auxiliaries (13b) undergo V-to-I-movement, as can be seen from their position to the left of medial adverbs. In English, by contrast, only auxiliaries raise to I (14b, c) whereas lexical verbs stay in situ. For the latter type of verb, it is assumed that the verbal inflection is lowered onto the verb (14a), with subsequent LF-raising of the V/I-complex to I so as to prevent an unbound trace.

- (13) a. Il arrive souvent en retard.  
*he arrives often late*  
 b. Il est souvent invité.  
*he is often invited*  
 (Haegeman and Guéron 1999: 309)
- (14) a. \*He arrives often late.  
 b. He is often invited.  
 c. He has often eaten chocolate.  
 (Haegeman and Guéron 1999: 309)

The difference between the two languages is attributed to a parametrization of I (Chomsky 1995: 135). French is assumed to have a ‘strong’ I, which is able to attract both ‘heavy’ (i.e., theta-role-assigning) lexical verbs as well as ‘light’ auxiliary verbs. English, on the other hand, is assumed to have a ‘weak’ I, which can only attract the latter type of verb. This parametrization has been linked to the amount of agreement morphology (“rich agreement hypothesis”, Platzack and Holmberg 1989).

While the English strategy of lowering and LF-raising is possible in positive declaratives (9), it fails to apply in negative declaratives (10) because the NegP is considered to pose an obstacle to LF raising (see Chomsky 1995: 140–141 for details). As a consequence, the dummy auxiliary *do* has to be inserted to ‘support’ the affix (hence the term *do*-support) (cf. Haegeman and Guéron 1999: 316). In (non-subject) interrogatives (11), the finite verb is standardly assumed to be in C, i.e., the functional head above the IP-layer. Chomsky (1995: 139) motivates this by assuming that C contains a Q-affix that has to be completed by means of X<sup>0</sup>-movement. Given the head movement constraint (HMC, Travis 1984), the use of *do*-support in C follows from the verb’s inability to move to I (Radford 2004: 163–164). The HMC states that head-movement is a local process, i.e., intermediate heads must not be skipped. In other words, movement from V to C has to be via I. However, as English verbs do not move to I, it follows that they do not move to C, either. Instead, *do* is used to bear the affix. The fact that *do* never co-occurs with auxiliaries (12), finally, follows from the fact that auxiliaries, in contrast to lexical verbs, do undergo V-to-I movement (and thus, where required, subsequent I-to-C movement), thus rendering the insertion of *do* superfluous and therefore ungrammatical.

To sum up: The central idea is that *do* serves as a last-resort strategy. *Do* is *inserted* in those cases in which a functional position above the VP *has* to be filled by a verb but *cannot* be filled by the verb already present in the clause. As will become apparent, this central idea carries over to Grimshaw’s (1997) OT-based approach and—by extension—to Bader and Schmid’s (2006) analysis of German.

## 4 OT approaches to *do*-support in English and German

In the following, I will turn to OT. I will begin by providing some general background. Subsequently, I will sketch Grimshaw's (1997) OT-based analysis of *do*-support in English, followed by Bader and Schmid's (2006) application of that analysis to German. Finally, I will discuss a recent proposal by Vogel (2013), who offers a new perspective on the analysis of *do*-support in English (and German).

### 4.1 Some background on OT(-Syntax)

Optimality Theory was developed in the early 1990s within Generative Phonology (Prince and Smolensky 1993, published as Prince and Smolensky 2004). From the mid-'90s on, it has been extended to syntactic phenomena (e.g., Grimshaw 1997). Its central idea is that observable surface forms are the result of a competition between a universal set of (often conflicting) well-formedness constraints that govern an input-to-output-mapping.

In contrast to the rewrite rules found in (earlier) Generative Phonology, OT constraints do not apply in linear order but simultaneously (cf. Kager 1999: 1). As a rule, it is not possible to satisfy all constraints since many of them conflict with one another. Paradoxically, this follows from their universality: "Maximally general principles will inevitably conflict" (Grimshaw 1997: 399). This apparent contradiction is solved by the idea that constraints are hierarchized and violable. That is, an output may violate a given constraint and still be grammatical, so long as this violation serves the fulfilment of a higher ranking constraint. The grammatical ('optimal') output is the one causing the least severe violations. While the constraints themselves are universal, their ranking is language-specific (Prince and Smolensky 2002: 319). In the following, I will illustrate these central ideas by means of a simple example (taken from Slade 2003: 339, going back to Prince and Smolensky 2002: 318). Subsequently, I will address two of the more controversial concepts: the nature of the input and the candidates.

The example addresses the observation that Italian and English differ with respect to their requirements on clause structure (Tableaux 1 and 2). In Italian, verbs without a semantic subject (such as the weather verb *piovere* 'rain') appear without a grammatical subject in overt syntax. In English, by contrast, we find the insertion of the expletive subject 'it'. To capture this difference, two constraints are invoked: A constraint FULL-INT,<sup>3</sup> prohibiting the insertion of semantically empty elements (such as expletive 'it'), and a constraint SUBJECT, requiring that every clause have an overt subject. Both constraints are considered to be universal, i.e., present in both languages. Typological variation comes about solely by their different ranking vis à vis one another across the two languages. In Italian, FULL-INT dominates SUBJECT. In English, it is the other way round. Consequently, in Italian, it is the output candidate without expletive subject that comes out as optimal whereas in English it is the one that does contain an expletive.

<sup>3</sup> Following Prince and Smolensky (1993), Slade refers to this constraint under the label FILL. In the present paper, I will follow Grimshaw (1997) in labelling the constraint FULL-INT.

**Tableau 1** Weather verbs in Italian, based on Slade (2003: 339)

Italian: <i>Piove</i> ‘rains’		FULL-INT	SUBJECT
☞	Piove.		*
	Ciò piove.	*!	

**Tableau 2** Weather verbs in English, based on Slade (2003: 339)

English: <i>Rains</i> ‘rains’		SUBJECT	FULL-INT
	Rains.	*!	
☞	It rains.		*

The field in the upper left contains a specification of the *input* (see below). The top row, to the right of the input-field, lists the constraints considered to be relevant in the evaluation of the various output *candidates* (see below, too). Starting with the highest ranking constraint on the left, the order in which they appear indicates their hierarchization. The leftmost column, beneath the input-field, lists the output candidates. Usually, only those candidates are listed for which it is not immediately clear why they are not optimal. An asterisk (\*) marks a violation of a given constraint by a given candidate. An exclamation mark (!) next to an asterisk indicates a *fatal* violation, i.e., a violation causing the candidate to drop out of the competition. The symbol ☞ marks the optimal candidate.

A notorious problem, particularly in OT *syntax*, is the question of what exactly should be considered the input. A discussion of this question can be found in Heck et al. (2002). In my own analysis (Sect. 6) I will be using syntactic categories and syntactic functions as the input, enriched by notions of information structure. Specifically, following Bader and Schmid (2006), I will assume that the input specifies which constituent should be understood as the ‘topic’ of a given clause.

Another problem, discussed e.g. by Müller (2000: 11–12), concerns the nature of the candidates, i.e., the question of what kinds of objects are in competition with one another. Among the options discussed by Müller that could be chosen (and have been chosen) are the following two: (i) Candidates might be representations on a single structural level (such as S-structures) or (ii) they might be complete derivations. As discussed by Müller, the choice between the two is linked to the overall architecture of the grammar, more specifically to the choice between a representational and a derivational view. Following, e.g., Haider (1993, 2010), I will adopt a representational perspective, assuming candidates to be surface structures enriched by empty categories. Terms such as ‘movement’ and ‘trace’ will be used metaphorically; within a representational framework, there is no such thing as movement, there are only antecedent-gap-relations.

## 4.2 Grimshaw's (1997) analysis of *do*-support in English

Building on earlier work (e.g., Chomsky 1957, 1991, 1995), Grimshaw (1997) approaches *do*-support in present-day English from an OT perspective. Just like any other approach, the OT analysis has to explain the facts in (9–12). In the following, the central ideas of Grimshaw's analysis will be illustrated primarily by contrasting positive declaratives (9) and (object) interrogatives (11). Negative declaratives (10) will be discussed only briefly. To appreciate the analysis, it is important to note that Grimshaw assumes that subjects are generated VP-internally and may even surface inside the VP (1997: 379).<sup>4</sup> As will be seen, that way it becomes possible to analyse positive declaratives without an auxiliary as simple VPs.

Grimshaw proposes that the following five constraints (15–19) are responsible for the fact that in positive declaratives, only the simple verb form is grammatical, whereas in object interrogatives, only *do*-support may occur. In the following, these constraints will be listed, and it will briefly be explained in what way they are relevant to the (non-)occurrence of *do*-support.

- (15) OP-SPEC (OPERATOR IN SPECIFIER): Syntactic Operators must be in specifier position.

OP-SPEC requires that, for scopal reasons (cf. Grimshaw 1997: 379), *wh*-words such as *what* appear in a specifier position. The constraint is relevant to *do*-support in that the presence of a *wh*-word may enforce the presence of a functional projection above the VP whose head then has to be overtly filled (see OB-HD below).

- (16) OB-HD (OBLIGATORY HEADS): A projection has a head.

OB-HD requires that the head of a phrase be overtly filled. In the present context, this pertains to the heads of the functional projection CP and IP. OB-HD may be satisfied either by verb movement or by the insertion of the dummy auxiliary *do*. Legendre (1996: 14), who also uses the constraint (in an analysis of Bulgarian), motivates it with reference to the general principle of endocentricity: “OBHD ensures endocentricity of syntactic phrases”.

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<sup>4</sup> See Grimshaw (1997: 379) for a list of references on this topic. A discussion that also addresses German data is offered by Grewendorf (2002: 47–52). Grewendorf distinguishes “conceptual” and “empirical” arguments in favour of the hypothesis that subjects at least originate within the VP. An argument of the former type concerns theta-marking: Under the VP-internal hypothesis, the subject can be theta-marked within the projection of the theta-marker. An argument of the latter type can be seen in ‘floating’ quantifiers (e.g., *The friends have all left*). These structures can be taken to indicate that the quantifier phrase serving as the subject is generated in Spec-VP, with only the DP-part of it leaving the VP.

(17) **NO-LX-MVT** (NO LEXICAL HEAD MOVEMENT): A lexical head cannot move.

**NO-LX-MVT** forbids movement of lexical heads. In the present context, this pertains to the movement of a lexical verb to a higher functional head. ((Modal) auxiliaries are not affected.<sup>5</sup>) Consequently, **NO-LX-MVT** favours *do*-support over verb movement as a means of satisfying **OB-HD**. **NO-LX-MVT**, just like the next two constraints (i.e., **FULL-INT** and **STAY**), can be motivated by general considerations of economy.

(18) **FULL-INT** (FULL INTERPRETATION): Lexical conceptual structure is parsed.

**FULL-INT** forbids the insertion of semantically empty elements. In the present context, this pertains to the insertion of the dummy auxiliary *do*. Consequently, **FULL-INT** favours verb movement over *do*-support as a means of satisfying **OB-HD**. Hence, it is in an antagonistic relation with **NO-LX-MVT**.

(19) **STAY** (ECONOMY OF MOVEMENT): Trace is not allowed.

**STAY** is a general anti-movement-constraint. Unlike **NO-LX-MVT**, it is violated not only by head movement but also by XP-movement. In the present analysis, **STAY** never plays a crucial role in the selection of a candidate. It is listed here, however, because it occurs in the tableaux from Grimshaw (1997) and Bader and Schmid (2006) to be discussed below.

The constraint ranking proposed for English is given in (20). On the basis of this ranking, Tableaux 3 and 4 show the competition between output candidates for positive declaratives and object interrogatives (cf. Grimshaw 1997: 383).

(20) **OP-SPEC** >> **NO-LX-MVT** >> **OB-HD** >> **FULL-INT** >> **STAY**

**Tableau 3** Positive declaratives in English

		OP-SPEC	NO-LX-MVT	OB-HD	FULL-INT	STAY
VP	a.					
	b.				*!	*

<sup>5</sup> Grimshaw's definition of 'lexical' appears to continue Pollock's (1989) and Chomsky's (1995) distinction between 'heavy' and 'light' verbs. In both analyses, the criterion is theta-role-assignment. 'Lexical'/'heavy' verbs, in contrast to 'non-lexical'/'light' verbs, do not assign theta-roles (cf. Haegeman and Guéron 1999: 322; Grimshaw 1997: 386).

**Tableau 4** Object interrogatives in English

			OP-SPEC	NO-LX-MVT	OB-HD	FULL-INT	STAY
	a.	[ <sub>VP</sub> She said what]	*!				
	b.	[ <sub>CP</sub> What <sub>k</sub> – [ <sub>VP</sub> she said t <sub>k</sub> ]]			*!		*
	c.	[ <sub>CP</sub> What <sub>k</sub> said <sub>i</sub> [ <sub>VP</sub> she t <sub>i</sub> t <sub>k</sub> ]]		*!			**
EN	d.	[ <sub>CP</sub> What <sub>k</sub> did [ <sub>VP</sub> she say t <sub>k</sub> ]]				*	*

Both in positive declaratives and object interrogatives, the candidates with *do*-support violate FULL-INT. The crucial difference is that in positive declaratives the *do*-candidate does not gain anything compared to its competitor without *do*, whereas in object interrogatives the violation of FULL-INT is justified by satisfying the higher-ranking constraint OB-HD.

The declarative does not contain an operator that would have to appear in a specifier position above the VP. And since, as mentioned above, the subject, too, may appear inside the VP, there is no need for the presence of a functional projection above the VP, whose head position would then have to be filled. In the object interrogative things are different: The object interrogative contains an operator that has to appear in Spec-CP in order to satisfy OP-SPEC. The simple VP-structure with the operator in its base position (candidate a) thus violates this constraint. The presence of the operator in the specifier of CP in turn requires that the head of this projection, C°, be filled, too. Otherwise OB-HD would be violated (candidate b). OB-HD may be satisfied in two ways: Either by moving the lexical verb (thus violating NO-LX-MVT but satisfying FULL-INT) (candidate c) or by inserting *do* (thus violating FULL-INT but satisfying NO-LX-MVT) (candidate d). Since in English, NO-LX-MVT outranks FULL-INT, the candidate with *do* is selected as optimal.

Grimshaw's (1997: 389–392) analysis for negative declaratives is essentially similar to that for object interrogatives. The central idea is that (for independent reasons which cannot be further discussed here) in negative declaratives, unlike in positive declaratives, the subject cannot stay inside the VP but instead has to occur in the specifier of a higher functional projection. The precise labelling of this projection is left open by Grimshaw. Adopting traditional terminology, I will refer to this projection as IP.<sup>6</sup> And now, just as in the object interrogative the presence of the operator in Spec-CP requires that C° be filled, the presence of the subject in Spec-IP requires that I° be filled. Again, this may be achieved either by means of verb movement (21a) or by means of *do*-insertion (21b). And again,

<sup>6</sup> This appears to be largely in line with Grimshaw (2013), where negative declaratives are analysed as TPs.

since in English NO-LX-MVT outranks FULL-INT, the candidate with *do* is selected as optimal.

- (21) a. \* $[_{IP} \text{John}_k \text{ left}_i \text{ not } [_{VP} t_k t_i]]$ .  
 b.  $[_{IP} \text{John}_k \text{ did not } [_{VP} t_k \text{ leave}]]$ .

The analysis of *do* as a mere means of satisfying OB-HD without having to violate NO-LX-MVT explains why *do* does not co-occur with other auxiliaries. This is illustrated by the example of an object interrogative containing the auxiliary *will*, shown in Tableau 5. As can be seen, since the movement of an auxiliary (here: from I° to C°) does not violate NO-LX-MVT, the candidate with *do* does not gain anything compared to its competitor without *do*.

**Tableau 5** Object interrogatives with an auxiliary in English

			OP- SPEC	NO-LX- MVT	OB-HD	FULL- INT	STAY
EP°	a.	$[_{CP} \text{What}_k \text{ will}_i \text{ } [_{IP} \text{she } t_i \text{ say } t_k]]$					**
	b.	$[_{CP} \text{What}_k \text{ did } [_{IP} \text{she will say } t_k]]$				*!	*

To sum up, some of the central ideas of Grimshaw's analysis include the following: (i) Certain constructions require the presence of functional projections above the VP, whose head positions then have to be filled. (ii) The filling of a given head position may be achieved either by means of verb movement or by means of *do*-insertion. (iii) Which of the two strategies is chosen is determined by the relative ranking of NO-LX-MVT and FULL-INT. In English, relevant constructions include, among others, non-subject interrogatives and negative declaratives. The former require the filling of C°; the latter require the filling of I°. Since in English, NO-LX-MVT outranks FULL-INT, *do*-support wins out over verb movement.

### 4.3 Bader and Schmid's (2006) analysis of *do*-support in German main clauses

#### 4.3.1 Introduction

Building on the analysis by Grimshaw (1997), Bader and Schmid (2006) present an OT analysis of *do*-support in German. They consider both the standard language and a variety they dub 'Colloquial German'. Crucially, however, they restrict their analysis to main clauses with verb second order (i.e., cases such as (1) and (2)), thus disregarding subordinate clauses with verb final order (3) (2006: 25, footnote 3).

The starting point of the analysis is Grimshaw's (1997: 386) typological prediction that a language in which NO-LX-MVT is dominated by both FULL-INT and OB-HD will never feature a dummy verb equivalent to English *do*. Bader and

Schmid show that standard German is a language that shows precisely that ranking and nonetheless has *do*-support—namely in a construction not considered by Grimshaw: VP-topicalization (1). Subsequently, the authors move on to show that the ‘colloquial’ use of *do*-support in other main clauses (2a) can indeed only be generated by assuming a more English-like constraint ranking.

As presented above, Grimshaw (1997) uses the constraint OP-SPEC to motivate why English object interrogatives are CPs, i.e., why in this type of sentence a functional projection above the VP becomes necessary in the first place. For German, a full-fledged verb second language, Bader and Schmid follow the traditional analysis (going back to den Besten 1983), according to which all root clauses are CPs. To derive this property within their OT analysis, Bader and Schmid (2006: 18) propose a constraint TOPIC (22), which demands that a constituent marked with a topic feature in the input appear in the specifier of CP, i.e., the position known in traditional grammar as the *Vorfeld* (‘prefield’). To appreciate the analysis, it is important to note that this topic-marked constituent may be the verb.

(22) TOPIC: Topics are sentence initial.

It ought to be mentioned, though, that, as pointed out by one anonymous reviewer, the status of this constraint is questionable. While the assumption that topics have to be positioned in the *Vorfeld* is popular (Molnár 1991; Lambrecht 1994), Frey (2004a) argues that the canonical topic position is in fact the highest/leftmost position in the *Mittelfeld* (‘middle field’). Obvious cases of verb-second clauses with a non-topic in the *Vorfeld* include those starting with a sentence adverbial, e.g., *Leider hat keiner dem alten Mann geholfen* ‘Unfortunately no one helped the old man’ (Frey 2004b: 3). Frey (2004b) argues that there are three different ways to fill the German *Vorfeld*: (i) By base generation of certain elements that are not to be licensed clause-internally (e.g., certain evaluative adverbials) (23a). (ii) By means of a purely formal mechanism promoting the highest constituent in the *Mittelfeld* (be it base-generated there or scrambled to that position). Given that the constituent in question is usually the topic (see above), it is through this mechanism that it often is the topic that ends up in the *Vorfeld* (23b). (iii) By means of ‘true’ A-bar-movement of any element from the middle field, which always induces contrastive focus (23c). Moreover, following Öhl (2010), it should be considered that ‘topic’ is not a primitive of information structural organization. Instead, it should be derived from more general principles such as definiteness, givenness etc.

- (23) a. Kein Wunder spricht Peter so gut Französisch  
*no wonder speaks Peter so well French*  
 (Frey 2004b: 11)
- b. Den Hans<sub>1</sub> wird t<sub>1</sub>' erfreulicherweise nächstes Jahr eine  
*the Hans<sup>acc</sup> will happily next year a*  
 polnische Gräfin t<sub>1</sub> heiraten  
*Polish countess marry*  
 (Frey 2004b: 14–15)
- c. IRgendwer /\*Irgendwer wird hoffentlich heute mithelfen  
*SOMEone /\*someone will hopefully today help (my gloss)*  
 (Frey 2004b: 24)

Overall, however, within the present context, little depends on the question of what exactly causes the presence of a given constituent in the *Vorfeld*. What is relevant are the following assumptions: (i) There *is* a requirement that in a main clause, Spec-CP be filled in the first place (bringing with it the requirement that C° be filled, too). (ii) There are rules determining *which* constituent has to appear in that position. (iii) Under certain conditions, these rules require that this constituent be the V(P). I will follow Bader and Schmid (2006) in calling the relevant constraint TOPIC while duly acknowledging that it probably does not do justice to the complex facts of the verb second syntax of German. A potential way of modelling it in a more adequate way might be by assuming the co-presence of several (potentially conflicting) *Vorfeld* constraints. An example of what an analysis along those lines could look like is given in Sect. 6.6 dealing with interrogatives.

#### 4.3.2 Standard German

The constraint ranking proposed for standard German is given in (24). Note that No-LX-MVT is dominated by both FULL-INT and OB-HD so that according to Grimshaw's (1997: 386) prediction the language should not feature *do*-support.

- (24) TOPIC >> OB-HD >> FULL-INT >> NO-LX-MVT >> STAY

However, Bader and Schmid (2006) show that despite the ranking in (24), *do*-support does occur in one particular case, namely in main clauses in which the constituent marked as the topic in the input is the verb. This is shown in Tableau 6.

**Tableau 6** Main clauses with the verb as the topic in standard German

Topic: <i>lesen</i>		TOPIC	OB-HD	FULL-INT	NO-LX-MVT	STAY
	a.	[ <sub>VP</sub> er das gerne liest] <i>he that willingly reads</i>	*!			
	b.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>VP</sub> er t <sub>k</sub> gerne t <sub>i</sub> ]] <i>that reads he willingly</i>	*!		*	**
	c.	[ <sub>CP</sub> Lesen <sub>k</sub> – [ <sub>VP</sub> er das gerne t <sub>k</sub> ]] <i>read he that willingly</i>		*!		*
ESP	d.	[ <sub>CP</sub> Lesen <sub>k</sub> tut [ <sub>VP</sub> er das gerne t <sub>k</sub> ]] <i>read does he that willingly</i>			*	*

Candidates (a) and (b) violate TOPIC. In (a), all constituents remain in their base position, including the verb *lesen* ‘read’, which, as the topic of the clause, should occur in Spec-CP. In (b), a non-topic has been moved to Spec-CP, namely the object-pronoun *das* ‘that’ rather than *lesen*. Candidate (c) does satisfy TOPIC: *Lesen* occurs in the topic position Spec-CP. However, precisely because of this, there now is a problem: *Lesen* is no longer available to occur in C° to satisfy OB-HD. This would lead to ungrammaticality unless some last resort strategy is found to fill C°. The insertion of *do* (candidate d) constitutes precisely this last resort strategy.

Let us next turn to sentences in which the constituent marked as the topic is not the verb. In this type of sentence, Grimshaw’s prediction is borne out. With a non-verb as the sentence’s topic, standard German only allows verb movement; *do*-support is ungrammatical. This is shown in Tableau 7, where it is the object pronoun *das* that carries the topic feature.

**Tableau 7** Main clauses with a non-verb-topic in standard German

Topic: <i>das</i>		TOPIC	OB-HD	FULL-INT	NO-LX-MVT	STAY
	a.	[ <sub>VP</sub> er das gerne liest] <i>he that willingly reads</i>	*!			
	b.	[ <sub>CP</sub> Das <sub>k</sub> – [ <sub>VP</sub> er t <sub>k</sub> gerne liest]] <i>that he willingly reads</i>		*!		*
ESP	c.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>VP</sub> er t <sub>k</sub> gerne t <sub>i</sub> ]] <i>that reads he willingly</i>			*	**
	d.	[ <sub>CP</sub> Das <sub>k</sub> tut [ <sub>VP</sub> er t <sub>k</sub> gerne lesen]] <i>that does he willingly read</i>			*!	*

Given that this time the verb is not the topic, it is free to appear in C° to satisfy OB-HD (candidate c). The candidate may still violate NO-LX-MVT, but nonetheless it is optimal compared to its competitor with *do*-support (candidate d). This is because in German, unlike in English, NO-LX-MVT is outranked by FULL-INT.

### 4.3.3 Colloquial German

Bader and Schmid also consider the fact that in what they dub ‘Colloquial German’, *do*-support may also occur in verb second clauses without VP-topicalization (2a), but only as an optional variant of the corresponding simple verb form. To account for this fact, they propose that in colloquial German, FULL-INT does not dominate NO-LX-MVT, but rather that there is a *tie* between these two constraints (25). Tableau 8 shows the effect of this re-ranking (to be compared to Tableau 7). For the sake of brevity, only the candidate with verb-movement (candidate a) and the candidate with *do* (candidate b) are listed (corresponding to candidates c and d in Tableau 7). As can be seen, due to the tie between FULL-INT and NO-LX-MVT, the *do*-candidate’s violation of FULL-INT is no longer fatal. Rather, the candidate is now just as optimal as its competitor with verb movement. Thus, it is at this point that a significant advantage of OT becomes apparent: By means of tied constraints, OT offers a way to address system-internal variation or optionality without forcing us to resort to a “competing grammars” model (cf. Seiler 2003: 153 on this issue), i.e., in this case the assumption that variable speakers have two grammars in their head, namely one that always uses verb movement and one that always uses *do*-support.<sup>7</sup> If we followed Chomsky (1995) in relating the use of *do* to a parameter such as “strength of I”, where I is *either* strong (leading to verb movement) *or* weak (leading to *do*-support), it seems that variation could only be accounted for within a competing grammars model. In the present paper, I will follow Löhken (1997: chapter 2), Anttila (2002: 231) and Seiler (2004: 390) in assuming that tied constraints allow for different rankings which are equally accessible in actual candidate evaluations. Thus, a grammar of the type *Constraint A* <> *Constraint B* allows for the two evaluations *Constraint A* > *Constraint B* and *Constraint B* > *Constraint A*.

(25) TOPIC >> OB-HD >> FULL-INT <> NO-LX-MVT >> STAY

**Tableau 8** Main clauses with a non-verb-topic in colloquial German

Topic: <i>das</i>		TOPIC	OB-HD	FULL-INT	NO-LX-MVT	STAY
EP	a.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>t</sub> [ <sub>VP</sub> er t <sub>k</sub> gerne t <sub>i</sub> ]] <i>that reads he willingly</i>			*	**
EP	b.	[ <sub>CP</sub> Das <sub>k</sub> tut [ <sub>VP</sub> er t <sub>k</sub> gerne lesen]] <i>that does he willingly read</i>		*		*

<sup>7</sup> As is shown by Bresnan and Deo (2001: 39) such a model faces serious problems: “The competing grammar model can generate variable outputs characterized by covarying grammatical dependencies, but outputs characterized by independently varying grammatical factors lead to exponential growth of competing grammars. For example, if the grammar of a single speaker has *n* cases of independently varying output caused by reranking different constraints, we would have to assume 2<sup>*n*</sup> competing grammars for this speaker to explain this kind of variation. If the number of independent grammatically determined variable outputs *n* is only 10, the number of competing invariable grammars required is over one thousand.”.

Finally, Bader and Schmid (2006) address the fact that even in colloquial German, *do*-support tends to be rejected when the clause already contains a modal or auxiliary. As was mentioned, this tends to be true of virtually all varieties of German. Much as in English, this observation is accounted for by the assumption that *do* merely serves to satisfy OB-HD without risking a violation of NO-LX-MVT. Assuming, as Grimshaw (1997) does for English, that the movement of a modal or auxiliary does not incur a violation of NO-LX-MVT, the presence of such an element yields the insertion of *do* redundant. This is shown in Tableau 9.

**Tableau 9** Main clauses with a non-verb-topic and a modal in colloquial German

Topic: <i>das</i>		TOPIC	OB-HD	FULL-INT	NO-LX-MVT	STAY
EP*	a.	[ <sub>CP</sub> Das <sub>k</sub> muss <sub>i</sub> [ <sub>VP</sub> er t <sub>k</sub> lesen t <sub>i</sub> ]] <i>that must he read</i>				**
	b.	[ <sub>CP</sub> Das <sub>k</sub> tut [ <sub>VP</sub> er t <sub>k</sub> lesen müssen]] <i>that does he read must</i>		*!		*

#### 4.3.4 Summary and open questions

For main clauses, Bader and Schmid (2006) show that in German—much as in English—the insertion of *do* can be analysed as a purely syntactically motivated strategy to satisfy OB-HD. In German, *do*-support occurs (i) when the main verb appears in Spec-CP in satisfaction of TOPIC (both in standard German and in colloquial German) and (ii) when the main verb stays in its base position in satisfaction of NO-LX-MVT (something that only happens in colloquial German).

What is left open is an analysis of subordinate clauses. An extension of the analysis to this clause type, however, is interesting for at least two reasons: First, the fact alone that some varieties show *do*-support in this clause type is relevant to syntactic theory. For if, as Grimshaw (1997: 397) assumes, “the only virtue of *do* is that it can satisfy OB-HD”, this would imply that the position occupied by the finite verb in a German verb final clause is a VP-external, functional position. This assumption, however, is far from uncontroversial (see Sect. 5.1) and will be rendered problematic by the *do*-support data from Northern Low German. Second, as was shown in Table 1, there is a great deal of diversity in the distribution of *do* across different clause types. A comprehensive analysis would need to capture all of the attested patterns.

#### 4.4 Vogel (2013)

As has become apparent, both Chomsky’s (1995) approach and the OT analyses by Grimshaw (1997) and Bader and Schmid (2006) crucially rely on the idea that *do* is an alternative to verb movement to a functional position above the VP, an assumption that will turn out to be problematic at least for German subordinate clauses.

An analysis of *do*-support that does not make reference to functional structure above the VP is sketched by Vogel (2013). Instead, Vogel’s account crucially builds

on a particular definition of markedness. Based on a number of case studies from English (including, apart from *do*-support, the distribution of obligatory vs. optional complementizers and synthetic vs. analytic comparison of adjectives), Vogel (2013: 116) argues that where two variants alternate, the unmarked variant is not necessarily the one that is less complex. Rather, it is the one that is more widely applicable and “occurs especially in difficult environments”. With respect to the use of the analytic *do*-support variant versus the synthetic simple verb form, this means that *do*-support is in fact the unmarked form. While *do*-support occurs in interrogatives, negative declaratives and emphatic positive declaratives, the simple form occurs in one environment only: non-emphatic positive declaratives. Noticing a similar imbalance between the more widely applicable analytic adjective formation versus the more restricted synthetic strategy, Vogel concludes: “[A]nalytic forms are less marked than synthetic forms, because they are more generally applicable.”

Vogel’s conclusion ties in nicely with Ackema and Neeleman’s (2001) view on the relationship between syntax and morphology. Ackema and Neeleman (2001: 30–32), too, assume that structure-building by means of syntax is the unmarked strategy vis à vis structure-building by means of morphology. They express this in terms of the OT constraint No-MORPH (26), originally due to Grimshaw (1997: 382). No-MORPH may be regarded as a very general markedness constraint favouring analytic structures over synthetic ones and thus favouring *do*-support over a simple synthetic verb form.

- (26) No-MORPH: Do not build structures in the morphological component.  
(Ackema and Neeleman 2001: 32)

So far, however, the following problem remains: As Vogel (2013: 120) notes, the unmarked variant, i.e., *do*-support, should also be possible in “unproblematic environments”, i.e., the non-emphatic positive declarative. This, however, is not the case. At least in standard English, only the simple verb form is possible (9). (See, however, Kortmann 2004 for a survey of (unstressed) *do* in affirmative declaratives in non-standard varieties of English.) Vogel goes on to discuss two potential explanations: (i) pragmatic blocking and (ii) prescriptivism. As for (i), Vogel proposes that the synthetic and the analytic strategy build a Horn-scale (after Horn 1984), which causes the former to block the latter: “If two forms differ only in whether they express a feature by a morpheme or by a function word and build a Horn-scale, then the form that uses the morpheme blocks the form that uses the function word.” For English, Vogel assumes that this scale has been “conventionalized”, causing only the simple form to be possible in non-emphatic positive declaratives. For standard German, on the other hand, Vogel (2013: 122) favours a sociolinguistic explanation, attributing the non-occurrence of *do* to normative pressure.

Vogel’s analysis has the great advantage of offering an explanation for the use of *do* in cases in which it cannot be motivated as a means of circumventing verb movement to a functional position above the VP, an explanation which, as I will argue, is needed for the occurrence of *do* in German subordinate clauses. However, two points appear to require further discussion: First, it does not become clear why

in English pragmatic blocking applies in non-emphatic positive declaratives only. The second point concerns the relation between pragmatic blocking and prescriptivism as explanations for the non-use of *do*: I would like to suggest that the two may not be alternative explanations after all. Rather, prescriptivism might work *through an enhancement of* the principle of pragmatic blocking. Let us imagine a non-standard OT grammar in which NO-MORPH (favouring *do*) and pragmatic blocking (conceptualized as an OT constraint favouring the simple form) are tied. This would result in free variation between the *do*-form and the synthetic verb form, which is exactly what we find in most non-standard varieties of German. Standardization could then be reconstructed as constraint re-ranking, with pragmatic blocking being made to dominate NO-MORPH. Thus, to integrate prescriptivism into an OT model, we would not need any ‘prescriptive constraints’. Rather, prescriptivism would work through conscious constraint promotion/demotion.<sup>8</sup>

## 5 Extending Bader and Schmid’s (2006) analysis to subordinate clauses

In the remainder of this paper, I will aim to develop a more comprehensive OT analysis of *do*-support in German. Taking Bader and Schmid’s (2006) account as a starting point, I aim to (i) extend it to subordinate clauses and (ii) capture the considerable amount of variation in the distribution of *do* across different clause types as found across different varieties (cf. Table 1).

Certain aspects of the clause structure of German immediately relevant to the present problem are controversial. I will argue that the *do*-support data provide a valuable testing ground for some of these controversies. The relevant aspects include (i) the question of whether German has an IP (e.g., Haider 1993, 2003, 2010; Sabel 2000; Vikner 2005; Berman 2003; Sternefeld 2006) and (ii) the analysis of the clause-final verb cluster (see Wurmbrand 2006 for a detailed overview), more specifically the question of whether each verb projects its own VP or whether the cluster is better analysed as consisting of  $X^{\circ}$ -type elements forming a complex projection base. In the following, I will present two competing models in more detail and subsequently test them against the *do*-support data: the ‘standard’ VP-IP-CP model and a model developed by Haider (1993, 2003, 2010).

The VP-IP-CP model is chosen because at first sight, it seems to offer a straightforward explanation for the use of *do* in line with previous analyses: As the model assumes the clause-final finite verb to be in a functional position (namely  $I^{\circ}$ ), *do* might continue to be analysed as an alternative to verb movement. And in fact, the use of *do* has indeed been used as an argument in favour of an IP-layer in German (Sabel 2000). However, I will argue that this analysis is challenged by the data from

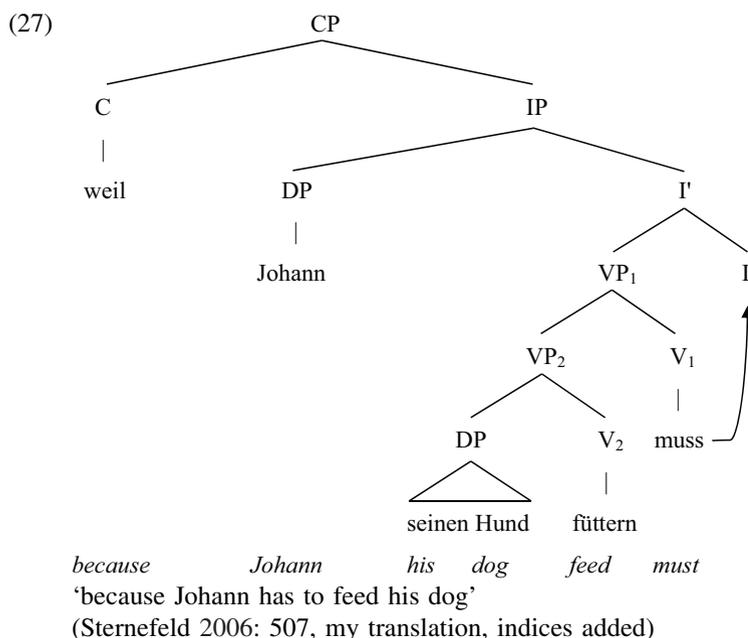
<sup>8</sup> One anonymous reviewer objects that it is insufficient to capture prescriptivism in terms of a particular constraint *ranking*. He/She argues that what is necessary is a distinction on the level of the constraints themselves, i.e., a distinction between “natural” and “unnatural” (i.e., prescriptive) constraints, with FULL-INT being an example of the latter type. Such a distinction may well be justified. However, I take this distinction as one that is primarily concerned with the historical *origin* of constraints. The main issue of the present paper, though, is the *synchronic* functioning of constraints in interaction with one another; the analysis is largely agnostic to their histories.

Northern Low German, the dialect group that has *do* in subordinate clauses *only*. It will be shown that given the standard model, the Northern Low German pattern can only be generated by giving up the widely accepted HMC.

Within Haider's model, a different problem arises: As it assumes the finite verb to be in its base position, the use of *do* can no longer be analysed as an alternative to verb movement, which raises the question of how else *do* is motivated. In Sect. 6, I will make a proposal for an alternative motivation, and I will argue that once such an alternative is accepted, Haider's model may enable us to accommodate the full range of systems of *do*-support, including the rather puzzling distribution of the Northern Low German type.

### 5.1 On the structure of German subordinate clauses

Sternefeld (2006: 507) states that “if it is possible to speak of any such thing as a generative ‘standard analysis’ of German at all” (my translation<sup>9</sup>), it would look something like (27). This standard analysis can be found, for example, in Grewendorf (1988: 46ff.), Haegeman (1991: 525ff.) and Borsley and Suchsland (1997: 90ff.).



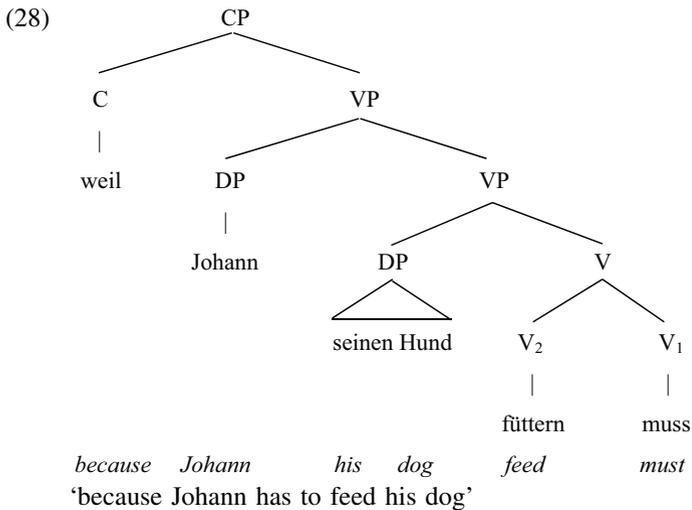
What we see in (27) is the standard VP-IP-CP model. As can be seen, both VP and IP are considered head-final. Thus, with the exception of CP, the model in (27) represents the mirror image of the traditional analysis proposed for English (cf. Chomsky 1981, 1986). In a subordinate clause such as (27), the finite verb (*muss*) is

<sup>9</sup> Original in German: “Wenn man von so etwas wie einer generativen “Standardanalyse” des Deutschen überhaupt sprechen kann”.

assumed to leave the VP and move rightward to the clause-final head of IP to pick up its finite morphology or check its finiteness features, respectively. Moreover, the clause-final verb cluster (the sequence *füttern muss*) is analysed as recursion of verb projections. In other words, it is assumed that each verb projects its own VP.

An alternative analysis is presented by Haider (1993, 2003, 2010). It differs from the one in (27) in (at least) two respects immediately relevant to the present problem. First, according to Haider, there is only one functional projection above the VP, namely (an equivalent of) CP.<sup>10</sup> In other words, Haider argues against the presence of any intermediate functional projections such as IP (as well as  $\nu$ P). Instead, it is assumed that the verb remains in its base position  $V^\circ$ , an assumption also shared, e.g., by Vikner (2005) and Sternefeld (2006) and one that has become the standard analysis in frameworks such as LFG (Berman 2003).<sup>11</sup>

Second, Haider rejects the idea that in a left-branching verb cluster (the sequence *füttern muss* in (27)), each verb projects its own VP. Instead, Haider analyses such sequences as complex  $X^\circ$ -type structures.<sup>12</sup> (See Wurmbrand 2007, however, for arguments against this view.) Projection levels higher than  $X^\circ$  do not come into play unless the finite verb is fronted to the left edge of the verb cluster, see Sect. 6.4. Adopting these assumptions, the tree for the subordinate clause in (27) may be re-drawn as in (28).<sup>13</sup>



<sup>10</sup> Haider accepts the term CP only for subordinate clauses, i.e., the clause type in which the head of the projection in question is indeed filled by a complementizer. For main clauses, where the same position is filled by the finite verb, Haider uses the term ‘functional phrase’ (FP). According to Haider, subordinate clauses (i.e., CPs) and main clauses (i.e., FPs) do not differ structurally, but categorially (1993: 18–29). For simplicity, I will be using the terms  $C^\circ$  and CP both for main and subordinate clauses.

<sup>11</sup> See Berman (2003: 52–53) (within the framework of LFG) for an example of how verbal inflection may work in the absence of an I/T-node.

<sup>12</sup> See Schallert (2014) for an extensive elaboration of how selection and ordering work within Haider’s model.

<sup>13</sup> As pointed out by one anonymous reviewer, there are problems with a structure like (28): It is not clear how merge could be defined in this way without violating endocentricity.

One of the central arguments against both V-to-I-movement and VP recursion is the so-called ‘compactness’ property of left-branching verb chains. First, Haider uses data from VP-topicalization to show that the right edge of the VP may contain extraposed material such as the adverb *damit* ‘with it’ in (29).

- (29) [<sub>VP</sub> [<sub>VP</sub> Gerechnet<sub>V2</sub>] *damit*] *hat*<sub>V1</sub> *sie* *nicht* *mehr*.  
           *reckoned*       *it.with* *has* *she* *not* *anymore*  
 ‘She had not reckoned with it anymore.’  
 (Haider 2003: 93, my translation, indices and bracketing added)

Against this background, the hypothesis of V-to-I-movement predicts that elements such as *damit* should be able to intervene between V2 and V1 within the clause-final verb chain, too. The same prediction is made by the hypothesis of VP recursion even if we reject the idea of V-to-I. This is because in both cases there would be a right VP-boundary between V2 (*gerechnet*) and V1 (*hat*). Under the hypothesis of V-to-I-movement, it would be the boundary between VP and I° (30a). Giving up the idea of V-to-I but still maintaining VP recursion, it would be the boundary between VP2 and the base position of V1 (30b). Crucially, however, the prediction is not borne out. The left-branching verb chain is strictly compact. Non-verbal interveners are not allowed.<sup>14</sup>

- (30) a. \**dass* [<sub>IP</sub> *sie* *nicht* *mehr* [<sub>VP</sub> [<sub>VP</sub> *gerechnet*<sub>V2</sub>] *damit*] *hat*<sub>V1</sub>]  
 b. \**dass* *sie* *nicht* *mehr* [<sub>VP1</sub> [<sub>VP2</sub> [<sub>VP2</sub> *gerechnet*<sub>V2</sub>] *damit*] *hat*<sub>V1</sub>]  
       *that* *she* *not* *anymore* *reckoned* *it.with* *has*  
 ‘that she has not reckoned with it anymore’  
 (Haider 2003: 93, my translation, indices and bracketing added)

According to Haider, the head-cluster is base generated. For a recent alternative analysis see, e.g., Salzmann (2013), who advocates a derivational account. According to Salzmann, the cluster does not arise in syntax but at PF. In syntax, there are stacked VPs (and they are stacked in a *right*-branching fashion). Cluster formation only takes place at LF through an operation involving adjacent verbal terminals.

<sup>14</sup> As pointed out by one anonymous reviewer, this could alternatively be explained by the fact that *damit* has the status of a prepositional object and as such cannot move past V2 in subordinate contexts. However, adjuncts, such as adverbial clauses, appear to show the same asymmetry:

- (i) a. *Gekommen, um zu bleiben, ist er nicht.*  
       *Come.ptcp to stay is he not*  
       ‘He has not come to stay.’  
 b. ?? *dass er nicht gekommen, um zu bleiben, ist.*  
       *that he not come.ptcp to stay is*  
       ‘that he has not come to stay’

Nonetheless, it should be mentioned that the status of the ‘no-intervener’-property as an argument in favour of complex head formation has been criticized in more general terms. Wurmbrand (2007), for example, who argues in favour of stacked VPs, explains this property with reference to prosodic restrictions.

An argument specifically against V-to-I-movement (originally due to Höhle 1991) is the existence of so-called ‘immobile’ complex verbs such as *uraufführen* (‘to premiere’) (see also Haider 1993: 62, 2010: 58–61; Vikner 2005; Sternefeld 2006: 511–519; Schallert 2014: 69–70). The crucial property of these verbs (often back-formations from nouns) is that they may occur in finite form in a subordinate clause (31a) but fail to undergo verb second movement (i.e., fail to occur in C°) (31b-c), neither moving as a whole (31b) nor stranding their separable prefix(es) (31c).

- (31) a. als sie es uraufführten.  
       when they it original.on.put.  
       ‘when they premiered it.’  
       b. \*Uraufführten sie es?  
       original.on.put they it  
       Intended: ‘Did they premiere it?’  
       c. \*Führten sie es urauf?  
       put they it original.on  
       Intended: ‘Did they premiere it?’  
       (Sternefeld 2006: 511, my translation)

According to Haider (2010: 58), the fact that verbs like *uraufführen* do not move to C° shows that they do not move at all—an argument based on cross-linguistic evidence: “What we know from languages with V-movement is this: whenever a verb has moved to an *intermediate* functional head position, it cannot be prevented from moving to a higher functional position if movement to this position is required.” Consequently, if verbs like *uraufführen* apparently do not move but nonetheless may occur in the finite-verb-position in a subordinate clause, this position has to be the verb’s base position.<sup>15</sup>

<sup>15</sup> The precise reason why these verbs do not move to C° is still a matter of debate (cf. Sternefeld 2006: 511–519). With respect to ‘doubly prefixed’ verbs such as *uraufführen*, Haider (2010: 59) explains it by arguing that separable prefixes obligatorily have to be stranded (i.e., they may only have a gap as their sister node). In (31b), this requirement is met for neither *ur-* nor *auf-*; in (31c), it is only fulfilled for *auf*. With the two remaining options, where one prefix is pied-piped and one is stranded (\**Sie urführten es auf*, \**Sie aufführten es ur*), again, the requirement is only fulfilled for one of the two.

This, however, does not explain why similar behaviour is shown by certain verbs with just one prefix or prefix-like element, such as *bausparen* (‘building-save’, i.e., ‘to save with a building society’). Vikner (2005) therefore proposes an alternative explanation: He argues that immobile verbs have a hybrid status between a syntactically simple element (i.e., words in a strictly morphological sense) and a syntactically complex element and that they simultaneously have to fulfil the requirements of both types: Consequently, they neither move as a whole (because C° is a position reserved for heads, i.e., syntactically simple elements), nor can the verbal part move on its own because this would violate lexical integrity.

For our present purposes, however, nothing hinges on the exact reason *why* these verbs do not move to C°. What is crucial is the mere fact *that* they do not move to C°, as this is taken to indicate that they do not move at all and thus could not have moved to I° even when they appear in finite form in a subordinate clause. Thus, even though Vikner favours a different explanation than Haider, his conclusion is the same: “I agree [...] about the consequences for the analysis of verb movement in Dutch, German, and Swiss German. The reason why it is only possible for finite forms of these verbs to occur in clause-final position in embedded clauses is that this position is the base-generated position, and thus no conflict can arise as to whether the prefix-like part must or must not be carried along under verb movement. [...] In other words, Dutch, German, and Swiss German do not have V-to-I movement.” (Vikner 2005: 112–113).

To sum up: According to the standard analysis, the clause-final finite verb in a German subordinate clause appears in the head of a functional projection ( $I^\circ$ ) taking VP as its complement. According to Haider, on the other hand, the verb remains in its base position, where it is part of a complex  $X^\circ$ -type cluster. This latter idea is of particular importance to the analysis proposed in Sect. 6.4. I will suggest that in Northern Low German, i.e., in the dialect in which *do* is restricted to subordinate clauses, *do* is lexically specified as a non-projecting word in the sense of Toivonen (2003). Non-projecting words are heads that fail to project a maximal projection and have to be head-adjoined to an adjacent head—an analysis often invoked for clitics. The restriction of *do* to subordinate clauses, then, follows from the fact that only in this position does *do* occur immediately adjacent to its lexical verb, which is taken to function as its  $X^\circ$ -host. Further support for this analysis comes from the behaviour of *do* within the verb cluster.

## 5.2 Applying Bader and Schmid's rankings to subordinate clauses

In the present section, I will apply Bader and Schmid's (2006) OT analysis to subordinate clauses, starting with the rankings they propose for standard German and what they call 'Colloquial German', repeated below as (32) and (33), respectively. First, this will be done within the standard VP-IP-CP model (27); subsequently it will be done within Haider's model (28). Recall that as far as main clauses are concerned, the standard German ranking generates *do*-support only with VP-topicalization. The ranking for colloquial German also generates optional *do*-support in other types of main clauses.

(32) TOPIC >> OB-HD >> FULL-INT >> NO-LX-MVT >> STAY

(33) TOPIC >> OB-HD >> FULL-INT <> NO-LX-MVT >> STAY

Given the formulation of TOPIC as in (22), *all* of the subordinate-clause-candidates listed in the following tableaux will violate this constraint because all constituents remain in the *Mittelfeld*. In cases like this, "all [candidates] survive and are passed on for evaluation by the next constraint down the hierarchy" (Kager 1999: 24).

### 5.2.1 Within the standard model

The following Tableaux 10 and 11 show the competition between *do*-support and the simple verb form in subordinate clauses within the standard model. At this point, the central aspect of the standard model is that it assumes that German has a head-final IP. Tableau 10 is based on the ranking for standard German; Tableau 11 is based on the ranking for colloquial German. Each tableau lists a candidate (a) with the finite main verb remaining inside the VP, a (superficially identical) candidate (b) with the finite verb moving from  $V^\circ$  to  $I^\circ$  and a candidate (c) with the non-finite main verb inside the VP and *do* in  $I^\circ$ .

**Tableau 10** Subordinate clauses based on B&S's ranking for standard German (standard model)

			TOPIC	OB- HD	FULL- INT	NO-LX- MVT	STAY
	a.	[ <sub>CP</sub> dass [ <sub>IP</sub> er <sub>k</sub> [ <sub>VP</sub> t <sub>k</sub> das liest ] - ]] <i>that he that reads</i>	*	*!			*
IP°	b.	[ <sub>CP</sub> dass [ <sub>IP</sub> er <sub>k</sub> [ <sub>VP</sub> t <sub>k</sub> das t <sub>i</sub> ] liest <sub>t<sub>i</sub></sub> ]] <i>that he that reads</i>	*			*	**
	c.	[ <sub>CP</sub> dass [ <sub>IP</sub> er <sub>k</sub> [ <sub>VP</sub> t <sub>k</sub> das lesen ] tut ]] <i>that he that read does</i>	*		*!		*

**Tableau 11** Subordinate clauses based on B&S's ranking for Colloquial German (standard model)

			TOPIC	OB- HD	FULL- INT	NO-LX- MVT	STAY
	a.	[ <sub>CP</sub> dass [ <sub>IP</sub> er <sub>k</sub> [ <sub>VP</sub> t <sub>k</sub> das liest ] - ]] <i>that he that reads</i>	*	*!			*
IP°	b.	[ <sub>CP</sub> dass [ <sub>IP</sub> er <sub>k</sub> [ <sub>VP</sub> t <sub>k</sub> das t <sub>i</sub> ] liest <sub>t<sub>i</sub></sub> ]] <i>that he that reads</i>	*			*	**
IP°	c.	[ <sub>CP</sub> dass [ <sub>IP</sub> er <sub>k</sub> [ <sub>VP</sub> t <sub>k</sub> das lesen ] tut ]] <i>that he that read does</i>	*		*		*

As can be seen, candidate (a) drops out of the competition both in standard German and in colloquial German. As it leaves the head-final I° unfilled, it violates the high-ranked constraint OB-HD. Both the verb-movement candidate (b) and the *do*-support candidate (c) by contrast do fulfil OB-HD, but they each violate one of the two next-highest constraints. Candidate (b) violates NO-LX-MVT; candidate (c) violates FULL-INT. In standard German, (c)'s violation is fatal. As FULL-INT outranks NO-LX-MVT, only candidate (b) is optimal. In colloquial German, things are different: Due to the tie between FULL-INT and NO-LX-MVT, both (b) and (c) are optimal.

Combining for each of the two rankings the tableau for subordinate clauses with the respective tableaux for main clauses (both with the verb and with a non-verb as the topic) shown earlier, it becomes apparent what kinds of overall systems are generated: The standard German ranking correctly generates *do*-support exclusively with VP-topicalization (Tableau 6). In main clauses with a non-verb as the topic (Tableau 7) and in subordinate clauses (Tableau 10) only the simple verb form is selected as optimal. The ranking for colloquial German, by contrast, generates *do*-support as an optional variant in both of the latter two clause types as well (cf. Tableaux 8 and 11). In other words, under the IP-hypothesis, what Bader and Schmid (2006) dub 'Colloquial German' corresponds to what in Table 1 is referred to as the Central German system. In sum, then, under the IP-hypothesis Bader and Schmid's (2006) rankings generate the two symmetrical systems (standard German,

Central German). What is left unaccounted for are the two asymmetrical systems (Upper German, Northern Low German). In the following paragraphs I will argue that only one of two unaccounted-for systems can be generated without any major problems: namely, Upper German. Northern Low German, by contrast, will be shown to represent a system that is predicted by Grimshaw (2013) to be typologically impossible because it requires inconsistent constraint rankings.

In the following paragraphs, I will develop an analysis for Upper German. Let us begin by assuming an idealized version of this system in which *do* (i) is obligatory with VP-topicalization, (ii) is optional in other main clauses, and (iii) is ungrammatical in subordinate clauses. The idealization concerns the fact that in subordinate clauses, *do* is not, strictly speaking, impossible but merely less preferred. This fact will be addressed once the idealized version has been generated. Within the standard VP-IP-CP-model (27), the idealized version of Upper German corresponds to a system in which the verb only has to move to the intermediate functional position  $I^\circ$  (namely in subordinate clauses), while movement to the higher functional position  $C^\circ$  (as required in main clauses) may optionally be replaced by the insertion of *do*. A similar system has already been found, namely in the Northern Italian dialect of Monno, as described by Benincà and Poletto (2004) and analysed within OT by Grimshaw (2013).

The dialect of Monno represents a rare example of *do*-support (*fa*-Support) in a variety of Romance. Just like English, Monnese uses *do*-support when  $C^\circ$  has to be filled, as is the case in polar interrogatives (34a). Verb movement to  $C^\circ$  is ungrammatical (34b). By contrast, when  $I^\circ$  has to be filled, as is the case in negative declaratives, the situation is reversed. Here, *do*-support is ungrammatical (35a). Instead, the lexical verb has to be moved (35b). Benincà and Poletto (2004: 80) interpret this observation such that “Monnese has apparently lost I-to-C, but not V-to-I”.

- (34) a. *fa-l            majà?*  
           *does-he    eat?*  
       b. *\*maja-l?*  
           *eats-he?*  
           ‘Does he eat?’  
           (Benincà and Poletto 2004: 52)

- (35) a. *\*fo            mia    savè-l*  
           *I.do    not    know-it*  
       b. *l            so    mia*  
           *it        I.know not*  
           ‘I do not know it.’  
           (Benincà and Poletto 2004: 70–71)

In order to capture this asymmetry within an OT analysis, Grimshaw (2013: 271) splits the original constraint  $\text{No-Lx-Mvt}$  from Grimshaw (1997) up into the two constraints  $\text{*LINF}$  (36) und  $\text{*LINA}$ ’ (37).

(36) \*LINF: No lexical head within a functional head

(37) \*LINA': No lexical head within an A' functional head

\*LINF can be regarded as the continuation of No-LX-MVT. The constraint is violated whenever a lexical head (here: a lexical verb) is moved to a functional head, irrespective of the type of functional head that is involved. (Hence, I will stick to the original abbreviation No-LX-MVT.) \*LINA', on the other hand, is a more specific version of No-LX-MVT. \*LINA' is violated only when the lexical verb is moved to the head of an A-bar-projection (such as C°), but not when it is moved to the head of an A-projection (such as I°).

Using a constraint such as \*LINA', it becomes possible to generate asymmetrical systems of the Monnese and Upper German types. A system such as Monnese, with obligatory *do*-support in C° and obligatory verb movement to I°, is generated by a ranking where \*LINA' dominates FULL-INT, and FULL-INT in turn dominates No-LX-MVT (Grimshaw 2013: 278). For Upper German, where *do*-support in C° is not obligatory but instead varies with verb movement, a slight modification is necessary: We have to assume a tie between \*LINA' and FULL-INT rather than dominance of the former over the latter. The complete ranking is shown in (38). Its application is shown in Tableaux 12 through 14.

(38) TOPIC >> OB-HD >> \*LINA' <> FULL-INT >> NO-LX-MVT >> STAY

**Tableau 12** Main clauses with the verb as the topic in Upper German (standard model)

Topic: <i>lesen</i>		TO PIC	OB- HD	*LINA'	FULL- INT	NO-LX- MVT	STAY
	a.	[ <sub>VP</sub> er das liest] <i>he that reads</i>	*!				
	b.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>IP</sub> er <sub>m</sub> [ <sub>VP</sub> t <sub>m</sub> t <sub>k</sub> t <sub>i</sub> ' ]]] <i>that reads he</i>	*!	*		*	****
	c.	[ <sub>CP</sub> Lesen <sub>k</sub> – [ <sub>IP</sub> er <sub>m</sub> [ <sub>VP</sub> t <sub>m</sub> das t <sub>k</sub> ]]] <i>read he that</i>		*!			**
EP*	d.	[ <sub>CP</sub> Lesen <sub>k</sub> tut <sub>i</sub> [ <sub>IP</sub> er <sub>m</sub> [ <sub>VP</sub> t <sub>m</sub> das t <sub>k</sub> ] t <sub>i</sub> ]] <i>read does he that</i>			*		***

**Tableau 13** Main clauses with a non-verb-topic in Upper German (standard model)

Topic: <i>das</i>		TO PIC	OB- HD	*LINA'	FULL- INT	NO-LX- MVT	STAY
EP*	a.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>IP</sub> er <sub>m</sub> [ <sub>VP</sub> t <sub>m</sub> t <sub>k</sub> t <sub>i</sub> ' ]]] <i>that reads he</i>		*		*	****
EP*	b.	[ <sub>CP</sub> Das <sub>k</sub> tut <sub>i</sub> [ <sub>IP</sub> er <sub>m</sub> [ <sub>VP</sub> t <sub>m</sub> t <sub>k</sub> lesen ] t <sub>i</sub> ]] <i>that does he read</i>			*		***

**Tableau 14** Subordinate clauses in Upper German (standard model)

			TO PIC	OB- HD	*LINA'	FULL- INT	NO-LX- MVT	STAY
np	a.	[ <sub>CP</sub> dass [ <sub>IP</sub> er <sub>k</sub> [ <sub>VP</sub> t <sub>k</sub> das t <sub>i</sub> ] liest <sub>t</sub> ]] <i>that he that reads</i>	*				*	**
	b.	[ <sub>CP</sub> dass [ <sub>IP</sub> er <sub>k</sub> [ <sub>VP</sub> t <sub>k</sub> das lesen ] tut ]] <i>that he that read does</i>	*			*!		*

As far as main clauses with the verb as the topic are concerned (Tableau 12), the new constraint \*LINA' does not affect the competition. As in Bader and Schmid's analyses for both standard German and colloquial German, the first three candidates without *do* violate either TOPIC or OB-HD whereas the final candidate with *do* only violates the lower-ranked constraint FULL-INT and is thus selected as optimal.

What is more interesting is a comparison between main clauses with a non-verb-topic (Tableau 13) and subordinate clauses (Tableau 14). In both clause types, the *do*-support candidate (b) violates FULL-INT. In main clauses—and in main clauses only—the *do*-candidate is still optimal. This is because in main clauses (i.e., with the finite verb in C°), as opposed to subordinate clauses (i.e., with the finite verb in I°), the competitor with verb-movement violates not only the lower-ranked constraint NO-LX-MVT, but also \*LINA', which is tied to FULL-INT. Consequently, in main clauses both verb movement and *do*-support are optimal whereas in subordinate clauses, only verb movement is possible.

While the tableaux do generate what was described as an idealized version of Upper German, they do not entirely do justice to the empirical facts as described in Sect. 2. As described, there is solid evidence for a *preference* of *do* in main clauses compared to subordinate clauses (Schwarz 2004: 118–119; Eroms 1984: 130), but there is no categorical restriction. *Preference* differences of this kind could be handled by Stochastic OT (Boersma 1997; Bresnan and Deo 2001). Its central idea is that at each evaluation, there is a certain amount of perturbation in the ranking of constraints so that their position is not fixed but rather represents the peak of a probability curve. Applied to the present problem, we would still assume that FULL-INT ranks higher than NO-LX-MVT, but we would assume a small degree of overlap between the curve of FULL-INT and the curve of NO-LX-MVT. As a consequence, in subordinate clauses, the verb raising candidate would still win *most* of the time, but it would no longer win *every* time.

Let us next turn to the other hitherto unaccounted-for system: Northern Low German. In the following paragraphs I would like to show that unlike the asymmetrical system of the Upper German type, the asymmetrical system of the Northern Low German type cannot easily be generated under the IP-hypothesis. This is because under this hypothesis, Northern Low German would have to be analysed as a system with *do*-support in I° (or, in more recent terminology: T°) (subordinate clauses) and verb movement to C° (main clauses). Such a system is

explicitly ruled out by Grimshaw (2013: 279): “Are we predicting the existence of ‘Anti-Monnese’, a language with *do*-Support in T [...] but with a lexical verb occurring in the C position? The answer is that Anti-Monnese cannot be generated [...]”

The reason for this is that a system of this type would require inconsistent constraint rankings: In order to get verb-movement as the only optimal candidate in C°, we need a ranking in which FULL-INT outranks NO-LX-MVT (as well as \*LINA’). (This can be seen by contrasting Tableau 6 with Tableau 7). With such a ranking, however, we will inevitably get verb-movement as the only optimal candidate in I°, too. (This can be seen in Tableau 10.) In order to get *do*-support as an optimal candidate in I°, we need a ranking in which NO-LX-MVT is at least tied to FULL-INT. (This can be seen by contrasting Tableau 11 with Tableau 10.) With such a ranking, however, we would get *do*-support in C°, too. (This can be seen in Tableau 8.)

In order to generate the Northern Low German system, we would need a constraint X that prohibits a lexical verb in I° without at the same time prohibiting a lexical verb in C°. In other words, we would need the logical counterpart to \*LINA’. This constraint X would have to dominate FULL-INT, and FULL-INT would in turn have to dominate NO-LX-MVT (as well as \*LINA’). Such a constraint X, however, cannot exist without inherently violating the widely accepted HMC; after all, according to the HMC, movement from V° to C° is via I°. This in turn implies that any constraint prohibiting a lexical verb in I° will inevitably also prohibit a lexical verb in C°. This is illustrated by approaches to *do*-support in English which motivate the use of *do* in C° as a mere consequence of the verb’s inability to move to I°/T° (cf. Section 3.1). Recall that Radford (2004: 163–164), following Pollock (1989) and Chomsky (1995), assumes that T° in English is weak and thus inaccessible to lexical verbs. Crucially, due to the HMC, the weakness of T° also prevents lexical verbs from occurring in C°: A sentence such as \**Know you not the cause?* is ungrammatical. This is because (i) “[*know*] cannot move through T into C (because verbs can no longer move from V to T in present-day English)” and (ii) because “*know* cannot move directly to C (because this would violate the HMC requirement for movement to be local)” (Radford 2004: 163). Thus, due to the HMC, even notions such as “weak T°”, which at first sight appear to be directed against lexical verbs in T° only, in reality prohibit lexical verbs in C°, too. As a consequence, it becomes impossible to generate a grammatical system in which lexical verbs obligatorily move to the higher position C° while their movement to the lower position I° can be replaced by the insertion of *do*. This in turn means that the Northern Low German system cannot be generated without sacrificing the HMC.

To sum up: Under the IP-hypothesis, three of the four observable distributions of *do*-support can be generated easily: namely standard German, Central German and Upper German.<sup>16</sup> Northern Low German, by contrast, can only be generated by invoking a constraint that prohibits lexical verbs in the lower position I° but not in

<sup>16</sup> Note that the newly introduced constraint \*LINA’ does not impact the generability of the two systems already accounted for within the standard model. For standard German, we would simply have to assume that \*LINA’ is outranked by FULL-INT. For Central German we would have to assume that it is on a tie with FULL-INT and NO-LX-MVT.

the higher position C°. Postulating such a constraint, however, would come at a high price: It would force us to give up the commonly accepted HMC.

### 5.2.2 Within Haider's model

The following Tableaux 15 and 16 again show the competition between *do*-support and the simple verb form in subordinate clauses based on Bader and Schmid's (2006) constraint rankings, this time, however, within Haider's model. Tableau 15 is based on the ranking for standard German; Tableau 16 is based on the ranking for colloquial German. At this point, the central aspect of Haider's model is that it assumes that German does not have an IP.

**Tableau 15** Subordinate clauses based on B&S's ranking for standard German (Haider's model)

			TO PIC	OB- HD	FULL- INT	NO- LX- MVT	STAY
IP°	a.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das liest]] <i>that he that reads</i>	*				
	b.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das lesen tut]] <i>that he that read does</i>	*		*!		

**Tableau 16** Subordinate clauses based on B&S's ranking for colloquial German (Haider's model)

			TO PIC	OB- HD	FULL- INT	NO- LX- MVT	STAY
IP°	a.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das liest]] <i>that he that reads</i>	*				
	b.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das lesen tut]] <i>that he that read does</i>	*		*!		

As can be seen, in both varieties only the candidate with the simple verb form (candidate a) is selected as optimal. Given that within Haider's model, there is no clause-final functional head to be filled, the *do*-support candidate (candidate b) violates FULL-INT without gaining anything compared to the simple verb form. Consequently, it drops out not only in standard German (as was already the case under the IP-hypothesis, cf. Tableau 10), but even in colloquial German (where under the IP-hypothesis, both *do*-support and the simple form were selected as optimal, cf. Tableau 11).

Again, combining for each of the two rankings the tableau for subordinate clauses with the respective tableaux for main clauses (both with the verb and with a

non-verb as the topic) as shown earlier, it becomes apparent what kinds of overall systems are generated: The standard German ranking again correctly generates *do*-support exclusively with VP-topicalization (Tableau 6). In main clauses with a non-verb as the topic (Tableau 7) and in subordinate clauses (Tableau 15) only the simple verb form is selected as optimal. The ranking for colloquial German, on the other hand, also generates optional *do*-support in main clauses with a non-verb as the topic (Tableau 8) but, crucially, not in subordinate clauses (Tableau 16). Thus, while under the IP-hypothesis the ranking for what Bader and Schmid dub ‘Colloquial German’ led to the Central German system, it now leads to what was earlier described as an idealized version of Upper German. In sum, then, under the hypothesis that German does not have an IP, Bader and Schmid’s (2006) rankings do not generate any of the systems that use *do*-support in subordinate clauses (in particular: Central German and Northern Low German).

In order to generate the hitherto unaccounted-for distributions, we would—at least for German—have to diverge from the standard assumption that *do* is only used where a functional position above the VP *has* to be filled by a verb but *cannot* be filled by the verb already present in the clause. If, as Grimshaw argues, “the only virtue of *do* is that it can satisfy OB-HD” (Grimshaw 1997: 397), and if, as Haider argues, there is no clause-final functional head position to be filled, this leads to the prediction that *do* should never show up in German subordinate clauses. Thus, if we want to remain faithful to Haider’s model, it seems that we are forced to assume that *do* can be motivated by some constraint other than OB-HD after all.

### 5.2.3 Summary

As was shown, given the constraints found in previous OT analyses of *do*-support, neither the standard model nor Haider’s model can generate the full range of distributions of *do* found across varieties of German. Within the standard model, we can easily generate standard German, Central German and Upper German. However, generating Northern Low German would only be possible by giving up the HMC. Within Haider’s model, we can so far only generate systems lacking *do* in subordinate clauses, such as standard German and an idealized version of Upper German. To generate the remaining systems, we would have to give up the idea that the only function of *do* is to fill a functional position above the VP.

## 6 A modified analysis within Haider’s model

I would like to argue that, given the HMC’s status as a widely accepted and cross-linguistically well-supported principle, it appears undesirable to give it up. Rather, it seems more plausible to assume that the virtue of *do*, at least in German, goes beyond the mere fulfilment of OB-HD. I will therefore propose a modified analysis within Haider’s model. As will be shown, an advantage of this model is that it may provide an explanation for the restriction of Northern Low German *do* to subordinate clauses.

## 6.1 Motivating *do* without reference to **OB-Hb**

Within Haider's model, it is necessary to motivate the use of *do* without any reference to functional positions above the VP that have to be filled. Of the previous approaches presented in Sects. 3 and 4, the only one to do so is Vogel (2013). Recall that Vogel considers the variation between the simple verb and the *do*-form as an example of the more general phenomenon of variation between a synthetic/morphological and an analytic/syntactic strategy for the expression of a given feature. Another such example discussed by Vogel is the variation between synthetic and analytic comparative and superlative forms of adjectives (e.g., *luckier* vs. *more lucky*). Based on the observation that the analytic strategies tend to be more widely applicable, Vogel argues that they are less marked (Vogel 2013: 124). In the following, I will adopt this idea, implementing it into OT by means of the constraint **NO-MORPH** (26) already cited in Sect. 4.4. I will regard **NO-MORPH** as a constraint which, whenever the same feature can be expressed either by a function word or by a bound morpheme, will favour the function word. With respect to the present problem, **NO-MORPH** will thus favour the *do*-form over the simple form because the former realizes the verb's finiteness features by means of a function word whereas the latter realizes them by means of a bound affix attached to the lexical verb.

To account for the fact that we still find the simple form at all, despite its more marked status, Vogel (2013: 120) refers to the principle of pragmatic blocking. Although plausible, I will stick to the previous analyses by Grimshaw (1997) and Bader and Schmid (2006) in assuming that the constraint responsible for favouring the simple form is **FULL-INT**. In the following, I will propose that the variation between the simple form and the *do*-form results from the antagonistic demands of **NO-MORPH** and **FULL-INT**. More specifically, the system-internal variation ('optionality') that is characteristic of most non-standard varieties (at least in some clause types) is the result of a tie (or at least some overlap) between these two constraints. The fact that in certain cases only one variant is possible will be argued to be due to additional constraints working on top of this basic antagonism.

As discussed in Sect. 5.2, given the formulation of **Topic** as in (22), in subordinate clauses all the candidates discussed here will violate this constraint so that it is lower-ranking constraints only that distinguish between individual candidates.

## 6.2 Central German

Let us start with an analysis for Central German, i.e., the variety in which the use of *do* is least restricted. Following the considerations outlined above, Central German can be generated within Haider's model by a ranking such as (39), assuming a tie between **NO-MORPH** and **FULL-INT**. In Tableaux 17 through 19 this ranking is applied to the three clause types we have to distinguish.<sup>17</sup>

<sup>17</sup> Note that the position of **NO-LX-MVT** relative to **NO-MORPH** and **FULL-INT** can in fact not be determined for Central German. It may either be lower, which is the option chosen in (39), or it may be on a tie with them. The outcome would be the same for all three clause types.

## (39) TOPIC &gt;&gt; OB-HD &gt;&gt; NO-MORPH &lt;&gt; FULL-INT &gt;&gt; NO-LX-MVT &gt;&gt; STAY

**Tableau 17** Main clauses with the verb as the topic in Central German (Haider's model)

Input: {Subj., Obj., V. <sub>-[topic]</sub> }		TO PIC	OB- HD	NO- MORPH	FULL- INT	NO-LX- MVT	STAY
	a.	[ <sub>VP</sub> er das liest] <i>he that reads</i>	*!		*		
	b.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>VP</sub> er t <sub>k</sub> t <sub>i</sub> ]] <i>that reads he</i>	*!		*	*	**
	c.	[ <sub>CP</sub> Lesen <sub>k</sub> – [ <sub>VP</sub> er das t <sub>k</sub> ]] <i>read he that</i>		*!			*
ESP	d.	[ <sub>CP</sub> Lesen <sub>k</sub> tut [ <sub>VP</sub> er das t <sub>k</sub> ]] <i>read does he that</i>			*		*

**Tableau 18** Main clauses with a non-verb-topic in Central German (Haider's model)

Input: {Subj., Obj. <sub>-[topic]</sub> , V.}		TO PIC	OB- HD	NO- MORPH	FULL- INT	NO-LX- MVT	STAY
ESP	a.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>VP</sub> er t <sub>k</sub> t <sub>i</sub> ]] <i>that reads he</i>			*	*	**
ESP	b.	[ <sub>CP</sub> Das <sub>k</sub> tut [ <sub>VP</sub> er t <sub>k</sub> lesen]] <i>that does he read</i>			*		*

**Tableau 19** Subordinate clauses in Central German (Haider's model)

Input: {complementizer, Subj., Obj., V.}		TO PIC	OB- HD	NO- MORPH	FULL- INT	NO-LX- MVT	STAY
ESP	a.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das liest]] <i>that he that reads</i>	*		*		
ESP	b.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das lesen tut]] <i>that he that read does</i>	*		*		

Let us start the discussion of the tableaux with the two non-VP-topicalization environments (i.e., Tableaux 18 and 19). In both cases, both the simple form and the *do*-form are optimal because each candidate only violates one of the two tied constraints NO-MORPH or FULL-INT, respectively. In the case of VP-topicalization (Tableau 17), by contrast, only the *do*-form is possible because any candidate that does not use *do* violates one of the two higher ranking constraints TOPIC or OB-HD. In other words, in the case of VP-topicalization, the optionality granted by the tie between NO-MORPH and FULL-INT is overridden by the requirements of higher ranking constraints that can only be satisfied by the use of *do*.

### 6.3 Upper German

Let us next turn to Upper German, again, first by assuming an idealized version in which *do* in subordinate clauses is ungrammatical (and not merely less preferred, as is empirically more accurate). Such a system can be generated within Haider's model by a ranking such as (40), assuming a tie between NO-LX-MVT and FULL-INT. In Tableaux 20 through 22 this ranking is applied to the three clause types we have to distinguish.

(40) TOPIC >> OB-HD >> NO-LX-MVT <> FULL-INT >> NO-MORPH >> STAY

**Tableau 20** Main clauses with the verb as the topic in Upper German (Haider's model)

Input: {Subj., Obj., V. <sub>[topic]</sub> }		TO PIC	OB- HD	NO-LX- MVT	FULL- INT	NO- MORPH	STAY
	a.	[ <sub>VP</sub> er das liest] <i>he that reads</i>	*!			*	
	b.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>VP</sub> er t <sub>k</sub> t <sub>i</sub> ]] <i>that reads he</i>	*!	*		*	**
	c.	[ <sub>CP</sub> Lesen <sub>k</sub> – [ <sub>VP</sub> er das t <sub>k</sub> ]] <i>read he that</i>		*!			*
ESP	d.	[ <sub>CP</sub> Lesen <sub>k</sub> tut [ <sub>VP</sub> er das t <sub>k</sub> ]] <i>read does he that</i>			*		*

**Tableau 21** Main clauses with a non-verb-topic in Upper German (Haider's model)

Input: {Subj., Obj. <sub>[topic]</sub> , V.}		TO PIC	OB- HD	NO- LX- MVT	FULL- INT	NO- MORPH	STAY
ESP	a.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>VP</sub> er t <sub>k</sub> t <sub>i</sub> ]] <i>that reads he</i>			*	*	**
ESP	b.	[ <sub>CP</sub> Das <sub>k</sub> tut [ <sub>VP</sub> er t <sub>k</sub> lesen]] <i>that does he read</i>			*		*

**Tableau 22** Subordinate clauses in Central German (Haider's model)

Input: {complementizer, Subj., Obj., V.}		TO PIC	OB- HD	NO- LX- MVT	FULL- INT	NO- MORPH	STAY
ESP	a.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das liest]] <i>that he that reads</i>	*			*	
	b.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das lesen tut]] <i>that he that read does</i>	*		*!		

With VP-topicalization (Tableau 20), again, only the candidate with *do* is optimal because all other candidates violate either TOPIC or OB-HD. In the subordinate clause (Tableau 22), where the finite verb is in its base position, only the simple form is optimal. This is because the only constraint that favours *do* in this environment is NO-MORPH, and NO-MORPH is outranked by FULL-INT. In the main clause with non-verb-topic (Tableau 21), by contrast, both the *do*-form and the simple form are optimal. This is because in main clauses, where the finite verb is in C°, *do* is not only favoured by NO-MORPH but also by NO-LX-MVT, which is tied to FULL-INT.

To get from this idealized version of Upper German, which categorically forbids *do* in subordinate clauses, to the empirically attested system, which merely disprefers *do* in this environment (vis à vis main clauses), we might again turn to Stochastic OT. We would still rank the two tied constraints NO-LX-MVT and FULL-INT higher than NO-MORPH but we would allow for a small overlap between the former two and the latter. That way, *do* would occasionally come out as optimal even in subordinate clauses.

#### 6.4 Standard German

Let us next turn to standard German. Standard German can be generated by a ranking as in (41), where FULL-INT outranks both NO-MORPH and NO-LX-MVT. As a consequence, *do* is only possible with VP-topicalization (Tableau 23) but not in other main clauses (Tableau 24) or in subordinate clauses (Tableau 25). The relative ranking of NO-LX-MVT and NO-MORPH cannot be determined and does not play a role here. I will simply assume a tie, just as in Central German.

(41) TOPIC >> OB-HD >> FULL-INT >> NO-LX-MVT <> NO-MORPH >> STAY

**Tableau 23** Main clauses with the verb as the topic in standard German (Haider's model)

Top Input: {Subj., Obj., V <sub>[topic]</sub> }		TO PIC	OB- HD	FULL- INT	NO-LX- MVT	NO- MORPH	STAY
a.	[ <sub>VP</sub> er das liest] <i>he that reads</i>	*!				*	
b.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>VP</sub> er t <sub>k</sub> t <sub>i</sub> ]] <i>that reads he</i>	*!			*	*	**
c.	[ <sub>CP</sub> Lesen <sub>k</sub> – [ <sub>VP</sub> er das t <sub>k</sub> ]] <i>read he that</i>		*!				*
<sup>EP</sup> d.	[ <sub>CP</sub> Lesen <sub>k</sub> tut [ <sub>VP</sub> er das t <sub>k</sub> ]] <i>read does he that</i>			*			*

**Tableau 24** Main clauses with a non-verb-topic in standard German (Haider’s model)

Input: {Subj., Obj. <sub>-[topic]</sub> , V.}			TO PIC	OB- HD	FULL- INT	NO-LX- MVT	NO- MORPH	STAY
ESP	a.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>i</sub> [ <sub>VP</sub> er t <sub>k</sub> t <sub>i</sub> ]] <i>that reads he</i>				*	*	**
	b.	[ <sub>CP</sub> Das <sub>k</sub> tut [ <sub>VP</sub> er t <sub>k</sub> lesen]] <i>that does he read</i>			*!			*

**Tableau 25** Subordinate clauses in standard German (Haider’s model)

Input: {complementizer, Subj., Obj., V.}			TO PIC	OB- HD	FULL- INT	NO-LX- MVT	NO- MORPH	STAY
ESP	a.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das liest]] <i>that he that reads</i>	*				*	
	b.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das lesen tut]] <i>that he that read does</i>	*		*!			

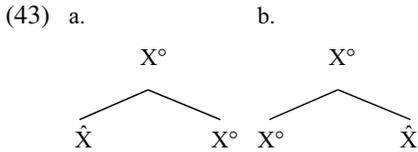
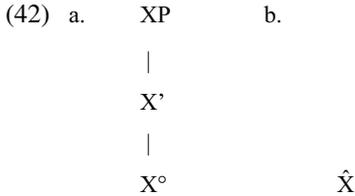
## 6.5 Northern Low German

Finally, let us turn to Northern Low German, the system that does not allow *do* in main clauses outside of VP-topicalization. As was argued in Sect. 5.2.1, within the standard VP-IP-CP model, Northern Low German would correspond to a system explicitly ruled out by Grimshaw (2013: 279) and one that could only be generated by giving up the HMC. Consequently, the Northern Low German data were taken as the central argument to reject the standard model. In the following, I would like to argue that Haider’s model, by contrast, may offer an explanation for why *do* is largely restricted to subordinate clauses in this dialect.

It is at this point that the second major difference between Haider’s model and the standard model becomes relevant: namely, Haider’s assumption that the clause-final verb cluster is a cluster of heads rather than V-projections. I would like to propose that the inability of *do* to occur in main clauses follows from a lexically determined structural deficiency: from the fact that Northern Low German *do* is a non-projecting word in the sense of Toivonen (2003) and as such has to head-adjoin to its lexical verb. Within Haider’s model, this requirement is met if (and only if) *do* occurs within the clause-final X°-type cluster.

Toivonen (2003) proposes that projection is a lexical property. A given lexical item may be specified either as projecting or as non-projecting. A projecting element (X) forms the head of a standard X-bar-structure, with (at least) two levels of projection above X°: X' und XP (42a). A non-projecting element, by contrast, lacks this dominating structure (42b). Toivonen uses the circumflex accent (X̂) to indicate iconically that these elements have a “roof” and do not project any further

(2003: 3). As a consequence, they fail to take complements, specifiers or phrasal modifiers. Instead, it is hypothesized that “non-projecting words must be head-adjoined” (2003: 70), with the non-projecting word ( $\hat{X}$ ) either preceding (43a) or following (43b) the head ( $X^\circ$ ). I will adopt this hypothesis in the form of an OT constraint (44).



(44) **HD-ADJ (HEAD-ADJUNCTION):** A non-projecting word must be head-adjoined.  
(Adapted from Toivonen 2003: 70)

Analyses operating with head-adjunction have often been proposed for elements commonly referred to as clitics, i.e., morphemes (usually of the grammatical rather than lexical type) that are phonologically dependent. Typical examples include the weak personal pronouns found in Germanic and Romance as analysed by Cardinaletti and Starke (1999). An analysis along similar lines for a verbal element is presented by Haddican (2007) for the (British) English anaphoric *do* (*Terry will eat pizza and Ines will do, too*). Crucially, however, as shown at length by Toivonen (2003: 45–50), syntactic and phonological (in)dependence do not necessarily coincide. This is important because Northern Low German *do* does not show any signs of phonological reduction (Weber 2017: chapter 5).

The hypothesis that *do* is stuck within the  $X^\circ$ -type cluster would seem to be supported by another observation: Northern Low German *do* not only fails to occur in  $C^\circ$ , it also disallows fronting to the left edge of the verb cluster. In subordinate clauses, many varieties of Continental West Germanic allow fronting of V1 to the left of the non-finite verb(s) (see, e.g., Wurmbrand 2006 for an extensive overview). In standard German, this occurs in certain three-verb clusters, obligatorily so in those containing an *Infinitivus pro Participio* (IPP), where the fronted verb is the perfect auxiliary *haben* (45). In many other languages/varieties, fronting of V1 is possible even in clusters of just two verbs (Wurmbrand 2006: 237); well-known examples include standard Dutch (Zwart 2011: 43) (46) and West Flemish (Haegeman and van Riemsdijk 1986) (47).

- (45) hätte<sub>V1</sub> aus der Tasche ziehen<sub>V3</sub> müssen<sub>V2</sub>  
*Had out.of the pocket pull must.inf*  
 ‘would have had to pull it out of the pocket’  
 (standard German, Haider 2003: 117,  
 my translation, indices, bracketing added)
- (46) a. dat Tasman {door} is<sub>V1</sub> {door} gevaren<sub>V2</sub>  
*that Tasman through is through sailed*  
 ‘that Tasman sailed on’  
 (standard Dutch, Zwart 2011: 49)
- b. dat Jan {een huis} wil<sub>V1</sub> {\*een huis} kopen<sub>V2</sub>  
*that Jan a house wants a house buy*  
 ‘that Jan wants to buy a house’  
 (standard Dutch, Haegeman and van Riemsdijk 1986: 419)
- (47) da Jan wilt<sub>V1</sub> een hus kopen<sub>V2</sub>  
*that Jan wants a house buy*  
 ‘that Jan wants to buy a house’  
 (West Flemish, Haegeman and van Riemsdijk 1986: 419)

Crucially, once V1 is fronted, the compactness-property may be lifted, i.e., non-verbal material may appear between V1 and the non-finite verb(s), a phenomenon known as verb projection raising (VPR) (Haegeman and van Riemsdijk 1986; see Wurmbrand 2006: 273–284 for a detailed overview). However, there is typological variation with respect to the extent to which individual varieties actually allow intervening material (Wurmbrand 2006: 275). While varieties like standard German (45) and West Flemish (47) allow phrasal interveners, standard Dutch tends to restrict the cluster-internal position to single word items such as separable prefixes (46a), disallowing phrasal interveners (Zwart 2011: 49) (46b). According to Haider (2003), the presence of phrasal interveners shows that the fronted V1 occurs in a position outside the original X<sup>o</sup>-type cluster, with a VP-boundary between them. Thus, the German example in (45) may be bracketed as in (48).<sup>18</sup>

- (48) [VP hätte<sub>IV1</sub> [VP aus der Tasche [V<sup>o</sup> ziehen<sub>V3</sub> müssen<sub>V2</sub> e<sub>i</sub> ] ] ]  
*had out.of the pocket pull must.inf*  
 ‘would have had to pull it out of the pocket’  
 (Haider 2003: 117, my translation, indices and bracketing added)

With respect to the present problem, it is therefore of interest to see if there is a connection between the (in)ability of *do* to occur in C<sup>o</sup> and its (in)ability to undergo fronting to the left edge of the cluster (in particular in a VPR-construction). However, relevant data can only be drawn from those varieties that allow verb-fronting in comparable clusters in the first place. As for what is meant by

<sup>18</sup> Note that Haider reserves this analysis for those languages that do allow phrasal interveners, such as standard German and West Flemish. For standard Dutch, on the other hand, Haider proposes X<sup>o</sup>-cluster-internal operations.

‘comparable’: (i) *Do* typically selects a V2 which itself does not select a V3, i.e., it only occurs in a *two-verb-cluster*. (ii) *Do* occurs in finite form only, i.e., it only occurs in a *subordinate-clause-cluster*. (iii) *Do* selects an infinitive rather than a participle, which makes the construction more similar to a modal + infinitive-cluster than an auxiliary + participle-cluster. Consequently, particularly interesting are those varieties in which the 1-2 order is possible in a two-verb subordinate-clause-cluster with a modal verb as the V1, as illustrated by the Dutch (46b) and West Flemish (47) examples. For varieties of this type, it has to be established (i) if the 1-2 order is possible with *do*, too, and (ii) if there is a connection between the (in)ability of *do* to occur in the 1-2 order and its (in)ability to occur in C°.

Let us begin by looking at those varieties that do allow *do* in C°. Here, we can draw on relevant data from Zurich German (Upper German, Alemannic) and the southeastern Dutch dialect of Heerlen as well as West and East Central German. In Zurich German, modal verbs generally precede their lexical verb (Seiler 2004: 371), including the option of phrasal interveners (Lötscher 1978: 3–4). And at least for Henk van Riemsdijk, (also) a speaker of Zurich German, *do*, too, is only acceptable in a subordinate clause when it precedes its lexical verb (Erb 2001: 192, footnote 5). A similar situation seems to hold in Heerlen Dutch. In this dialect, infinitive-selecting verbs almost categorically precede their lexical verb (Cornips 2009: 208–209), and *do* does not seem to behave exceptionally in this respect. A different situation, though, is reported for West and East Central German. Based on extensive corpus data, Dubenion-Smith (2010: 138, 2011: 300) shows that *do* is less likely than a modal verb to precede its lexical verb.

Let us next turn to those varieties that do not allow *do* in C°, i.e., the Northern Low German type. Here we can draw on the corpus study and acceptability tests conducted by Weber (2017). First of all, though, it must be noted that in most dialects of Low German, auxiliary fronting does not seem to occur at all. In fact, according to den Besten and Edmondson (1983: 157–158), Low German, along with West Frisian, stands out among Continental West Germanic in that it has a strictly left-branching cluster, thus always putting the finite verb at the end, even in three-verb-clusters such as (49), where standard German would require the fronting of V1 (cf. (45)). (Note that Low German (like Frisian) also does not show the IPP-effect.)

- (49) dat he dat book lesen<sub>V3</sub> kunnt<sub>V2</sub> hett<sub>V1</sub>  
 that he the book read.inf can.ptcp has  
 ‘that he has been able to read the book’  
 (den Besten and Edmondson 1983: 158)

As is shown by Weber (2017), however, some varieties of Low German, including some of those that use *do* in subordinate clauses only, do in fact show deviations from the strictly left-branching order. Relevant varieties include Northern Brandenburgish and East Pomeranian. A corpus analysis shows that in these varieties, the order 1-2, including phrasal interveners, is robustly attested with modal verbs (50a), but it does not occur with periphrastic *do* (50b). Additionally, acceptability tests show that even those speakers who (i) in general accept *do*-periphrasis (namely in the 2-1-order) and (ii) also accept the 1-2-order (with a modal verb), reject *do*-periphrasis in the 1-2-order. The same situation seems to hold in the

variety of Plautdietsch spoken in the village of Kant in Kyrgyzstan, as described by Hooge (1973, 1975). In this variety, too, *do* is found almost exclusively in subordinate clauses (1975: 611), and even though in subordinate clauses the 1-2-order predominates (1973: 336), *do* has to occur in final position (1975: 611), i.e., *do*-periphrasis occurs in the 2-1-order.

- (50) a. wenn se man bloß ers möchten<sub>V1</sub> de Flinten  
*if they ptcl ptcl first might the guns*  
 in't Döörp laten<sub>V2</sub>  
*in=the village leave*  
 'if only they would leave the (hunting) guns in the village for a start'  
 b. wenn se em in'e Hacken bieten<sub>V2</sub> doon<sub>V1</sub>  
*when they him in=the heels bite do*  
 'when they bite at his heels'  
 (Northern Brandenburgish, DDR-Corpus, recording DR416AW1)

To sum up: Among those varieties that allow *do* in C° we find both varieties that seem to favour the fronting of *do* (Zurich German, Heerlen Dutch) and varieties that restrict it, though not necessarily categorically so (Central German). Among those varieties that do not allow *do* in C° (Northern Brandenburgish, East Pomeranian, the Kant variety of Plautdietsch), on the other hand, we find a categorical restriction on the fronting of *do*. In other words: Wherever *do* does not occur in C°, it also does not undergo fronting to the left edge of the cluster. (The converse, however, does not seem to hold true.)

If we assume that Northern Low German *do* is an  $\hat{X}$ -type element, its inability to undergo fronting follows naturally. Within Haider's model, both in C°<sup>19</sup> (51) and in the fronted position of the verb cluster (52), *do* would occur outside the X°-type cluster; in both cases its sister node would not be V° but VP so that HD-ADJ would be violated. Only in final position is *do* part of the X°-type cluster (53) with a sister node V° so that HD-ADJ is fulfilled.

- (51) \*[<sub>CP</sub> [<sub>DP</sub>Sie] C° tut<sub>V1</sub> [<sub>VP</sub> gerne ein Buch lesen<sub>V2</sub>]]  
*She does willingly a book read*  
 'She likes to read a book.'  
 (52) \*dass sie gerne [<sub>VP</sub> tut<sub>V1</sub> [<sub>VP</sub> ein Buch lesen<sub>V2</sub>]]  
*that she willingly does a book read*  
 'that she likes to read a book'  
 (53) dass sie gerne ein Buch [<sub>V°</sub> lesen<sub>V2</sub> tut<sub>V1</sub>]  
*that she willingly a book read does*  
 'that she likes to read a book'

Within the standard VP-IP-CP (27) model, by contrast, the asymmetry between main and subordinate clauses would remain unexplained because *do* would be in a functional position with an XP as its sister in either clause type: In main clauses it

<sup>19</sup> See footnote 10.

would be in  $C^\circ$  with a sister node IP, in subordinate clauses it would be in  $I^\circ$  with a sister node VP; in either case, the head-adjunction-requirement would be violated. It is not clear to me how *do* could head-adjoin within the standard model. It might be assumed that *do* head-adjoins to its lexical verb under  $I^\circ$ , i.e., after the lexical verb has moved to that position. However, if that is the case, it does not become apparent what would stop this verb+*do*-complex to move to  $C^\circ$  in main clauses. An alternative would be to assume that *do* head-adjoins to its lexical verb in the verb's base position. However, this would require head-adjunction via movement: *Do* would need to get to the clitic-position from/via  $I^\circ$ , and leave a trace there, otherwise the high-ranking constraint OB-HD would be violated, which would make the structure inferior to a simple-verb-competitor, which would not cause this violation. Within Haider's model, by contrast, *do* is base-generated in a position in which the head-adjunction requirement is met, and no additional movement operation would be required.

There is as yet, however, one major problem with the analysis that Northern Low German *do* is an  $\bar{X}$ -type element and is therefore stuck within the clause-final  $X^\circ$ -type cluster: Verb second clauses with VP-topicalization. HD-ADJ will forbid *do* in  $C^\circ$  irrespective of the type of phrase in Spec-CP. Thus, verb second clauses with (parts of) the VP in Spec-CP ought not to behave differently from any other type of verb second clause. This, however, is not the case. Only in verb second clauses with a non-verb-topic is *do* ungrammatical; in those with VP-topicalization it is perfectly fine.

A solution to this problem is offered by assuming that HD-ADJ may indeed be treated as an OT constraint. As such, it will be violable, and its violation will be tolerable so long as it enables the fulfilment of a higher ranked constraint. The Northern Low German distribution of *do* can be generated by a ranking such as (54), where HD-ADJ outranks NO-MORPH and NO-LX-MVT but is outranked by TOPIC and OB-HD. In other words: HD-ADJ may be violated if (and only if) TOPIC forces the main verb to occur in Spec-CP, in which case OB-HD would be violated if it were not for the insertion of *do*. Based on this ranking, Tableaux 26 through 28 show the competition for our three clause types.

- (54) TOPIC >> OB-HD >> HD-ADJ >> NO-MORPH <> FULL-INT >>  
NO-LX-MVT >> STAY

**Tableau 26** Main clauses with the verb as the topic in Northern Low German (Haider's model)

Input: {Subj., Obj, V. <sub>[topic]</sub> }		TO PIC	OB- HD	HD- ADJ	NO- MORPH	FULL- INT	NO-LX- MVT	STAY
a.	[ <sub>VP</sub> er das liest] <i>he that reads</i>	*!			*			
b.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>t</sub> [ <sub>VP</sub> er t <sub>k</sub> t <sub>i</sub> ]] <i>that reads he</i>	*!			*		*	**
c.	[ <sub>CP</sub> Lesen <sub>k</sub> – [ <sub>VP</sub> er das t <sub>k</sub> ]] <i>read he that</i>		*!					*
ESP	[ <sub>CP</sub> Lesen <sub>k</sub> tut [ <sub>VP</sub> er das t <sub>k</sub> ]] <i>read does he that</i>			*		*		*

**Tableau 27** Main clauses with a non-verb-topic in Northern Low German (Haider's model)

Top Input: {Subj., Obj. <sub>[topic]</sub> , V.}			TO PIC	OB- HD	HD- ADJ	NO- MORPH	FULL- INT	NO-LX- MVT	STAY
EP	a.	[ <sub>CP</sub> Das <sub>k</sub> liest <sub>t</sub> [ <sub>VP</sub> er t <sub>k</sub> t <sub>i</sub> ]] <i>that reads he</i>				*		*	**
	b.	[ <sub>CP</sub> Das <sub>k</sub> tut [ <sub>VP</sub> er t <sub>k</sub> lesen]] <i>that does he read</i>			*!		*		*

**Tableau 28** Subordinate clauses in Northern Low German (Haider's model)

Input: {complementizer, Subj., Obj., V.}			TO PIC	OB- HD	HD- ADJ	NO- MORPH	FULL- INT	NO-LX- MVT	STAY
EP	a.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das liest]] <i>that he that reads</i>	*			*			
EP	b.	[ <sub>CP</sub> dass [ <sub>VP</sub> er das lesen tut]] <i>that he that read does</i>	*				*		

In both types of main clauses, i.e., both in those with the verb as the topic (Tableau 26) and in those with a non-verb-topic (Tableau 27), the *do*-support-candidate violates HD-ADJ because *do* occurs in C° and thus outside the clause-final X°-type cluster. With the verb as the topic, the *do*-candidate is nonetheless optimal. This is because all other candidates violate one of the higher ranked constraints TOPIC and OB-HD. In main clauses with a non-verb-topic the situation is different: Here the verb-raising-candidate constitutes a candidate that only violates lower ranked constraints. Consequently, the *do*-candidate's violation of OB-HD is fatal.

With regard to subordinate clauses (Tableau 28), the crucial point is that *do* occurs within the X°-type cluster so that the *do*-support-candidate does not violate HD-ADJ. Rather, (except for TOPIC) the highest-ranked constraint violated by it is FULL-INT. Its competitor with the simple verb form does fulfil even FULL-INT but—unlike the *do*-candidate—violates NO-MORPH. Due to the tie between FULL-INT and NO-MORPH both candidates come out as optimal. In other words, we get *do*-support as an optional variant of the simple form, which is what we observe in actual language use.

At first sight, it may seem odd to assume that a lexical property of *do*—i.e., the requirement that it be head-adjoined—may be overruled by syntactic constraints such as TOPIC and OB-HD. However, a comparable phenomenon has been reported for periphrastic *do* in other varieties. As Abraham and Fischer (1998: 40) observe, in some Upper German dialects *do* retains agentive semantics. Consequently, it is incompatible with non-agentive lexical verbs such as *wollen* 'want' (55a). Crucially, however, this property does not show up with VP-topicalization, where *do* does occur with non-agentive verbs (55b). In other words, here, too, a lexical property of *do* is overruled by the need to fulfil TOPIC and OB-HD.

- (55) a. \*Ich tue das nicht wollen.  
*I do that not want*  
 ‘I do not want that.’  
 b. Wollen tu ich schon.  
*want do I ptcl*  
 ‘As far as wanting is concerned, I do want to.’  
 (Abraham and Fischer 1998: 40, my translation)

## 6.6 A note on interrogatives

Given the strong comparison made to *do*-support in English, I would at least briefly like to address interrogatives as well. Following Bader and Schmid (2006: 7), German root *wh*-interrogatives are similar to declaratives in that they are V2-structures, containing the *wh*-phrase in Spec-CP and the finite verb in C° (56).<sup>20</sup> That way, they are also similar to (non-subject) interrogatives in English as analysed by Grimshaw (1997) (cf. Tableau 4).

With respect to *do*-support, too, interrogatives tend to pattern with declaratives: In those varieties that allow *do* in declaratives, *do* also occurs in interrogatives, as e.g. in Upper German (e.g., Abraham and Fischer 1998: 46; Schwarz 2004: 22, 33–34, 125). In Northern Low German, on the other hand, *do* occurs in matrix interrogatives as little as it does in matrix declaratives.<sup>21,22</sup> Thus, for the most part, the analyses presented in Sects. 6.2 through 6.5 extend to interrogatives: Once a *wh*-phrase occurs in Spec-CP, C° has to be filled, too. Otherwise, OB-Hd would be violated (56a). As usual, OB-Hd may be satisfied in two ways: either by moving the

<sup>20</sup> If we assume, as e.g., Radford (2004: 220) does for English, that polar questions contain a ‘null question operator’ in Spec-CP, the analysis also extends to polar questions.

<sup>21</sup> There is one (seeming) exception: Northern Low German *do* can occur in a particular type of *wat*-question (‘what’-question) in which *wat* serves as an adjunct roughly equivalent to standard German *warum* ‘why’. This construction is associated with a clearly identifiable pragmatic function, namely the expression of reproach (i). Note, however, that in this construction, *do* usually takes a *to*-infinitive rather than the bare infinitive it takes with VP-topicalization and in subordinate clauses. Following most Low German dictionaries, I will assume that we are looking at a different (and presumably idiomatized) *do*-construction here.

(i) *wat deihst du dâr hentogahn?*  
*What do you there there.to.go*  
 ‘Why are you so foolish as to go there?’ (my translation)  
 (Niedersächsisches Wörterbuch 2004, column 311)

<sup>22</sup> Indirect questions in subordinate clauses with verb final order, on the other hand, behave like any other type of subordinate clause in that they frequently show *do*-periphrasis (i).

(i) *da weit man naher nu nich, wie dat komen daat*  
*there knows one afterwards then not how that come does*  
 ‘Then in the end you don’t know why that is’ (my translation)  
 (North Saxon, Zwirner-Corpus, recording ZWY12)

inflected lexical verb (violating NO-MORPH and NO-LX-MVT but satisfying FULL-INT) (56b) or by inserting *do* (violating FULL-INT but satisfying NO-MORPH and NO-LX-MVT) (56c). Given the rankings proposed in Sects. 6.2 through 6.5, it is predicted that Upper German and Central German will allow the *do*-form (56c) alongside the simple form (56b) because at least one of the *do*-friendly constraints NO-MORPH and/ or NO-LX-MVT is tied to the anti-dummy constraint FULL-INT. For standard German and Northern Low German, it is predicted that they will only allow the simple form (56b): In standard German, all *do*-friendly constraints are outranked by FULL-INT. In Northern Low German, the occurrence of *do* in C° would violate the high-ranking constraint HD-ADJ.

- (56) a. \*[CP Was<sub>k</sub> – [VP er t<sub>k</sub> gerne liest]?  
           *what he willingly reads*  
       b. [CP Was<sub>k</sub> liest<sub>i</sub> [VP er t<sub>k</sub> gerne t<sub>i</sub>]?  
           *what reads he willingly*  
       c. [CP Was<sub>k</sub> tut [VP er t<sub>k</sub> gerne lesen]?  
           *what does he willingly read*  
           (Intended:) ‘What does he like to read?’

What is worthy of discussion, though, is the question of how to get the ‘correct’ constituent (i.e., here: the *wh*-operator *was* ‘what’) into the *Vorfeld* in the first place. Resorting to TOPIC is not an option: Even though the constituent questioned in a *wh*-interrogative *may* be topic, it needn’t be. As far as (56) is concerned, for example, it appears more appropriate to regard *er* ‘he’ as the topic. Following Grimshaw (1997), we might motivate the placement of the operator in Spec-CP by means of OP-SPEC (15). In that case, we would be looking at the co-presence of two different (and potentially conflicting) *Vorfeld*-constraints. In declaratives, this co-presence would hardly make itself felt: Given that declaratives do not contain an operator in the input, OP-SPEC would simply be irrelevant in this clause type. For interrogatives such as (56), on the other hand, we would indeed have to assume that OP-SPEC and TOPIC are in conflict with each other: If *er* is the topic, then TOPIC will claim Spec-CP for *er* whereas OP-SPEC will claim that position for the operator *was*. Given that the grammatical structure is the one with the operator in Spec-CP,<sup>23</sup> we would have to conclude that TOPIC, which has so far always been our highest ranking constraint, is outranked by OP-SPEC. In other words, the left edge of our constraint hierarchy for German (across all of the varieties discussed here) would look something like (57). In Tableau 29, this partial ranking is applied to a matrix interrogative.

- (57) OP-SPEC >> TOPIC >> OB-HD ...

<sup>23</sup> The other alternative, i.e., with the topic in Spec-CP and the operator in situ, is restricted to so-called echo questions: *Er liest was gerne?*

**Tableau 29** Root interrogatives

Input: {Subj- <sub>[topic]</sub> , Obj- <sub>[wh]</sub> , V.}		OP-SPEC	TOPIC	OB-HD
a.	[ <sub>CP</sub> Er <sub>j</sub> – [ <sub>VP</sub> t <sub>j</sub> was liest]] <i>he what reads</i>	*!		*
b.	[ <sub>CP</sub> Er <sub>j</sub> liest <sub>t<sub>i</sub></sub> [ <sub>VP</sub> t <sub>j</sub> was t <sub>i</sub> ]] <i>he reads what</i>	*!		
c.	[ <sub>CP</sub> Er <sub>j</sub> tut [ <sub>VP</sub> t <sub>j</sub> was lesen]] <i>he does what read</i>	*!		
d.	[ <sub>CP</sub> Was <sub>k</sub> – [ <sub>VP</sub> er t <sub>k</sub> liest]] <i>what he reads</i>		*	*!
<sup>ESP</sup> e.	[ <sub>CP</sub> Was <sub>k</sub> liest <sub>t<sub>j</sub></sub> [ <sub>VP</sub> er t <sub>k</sub> t <sub>j</sub> ]] <i>what reads he</i>		*	
<sup>ESP</sup> f.	[ <sub>CP</sub> Was <sub>k</sub> tut [ <sub>VP</sub> er t <sub>k</sub> lesen]] <i>what does he read</i>		*	

Candidates a though c have the topic (*er*) in the *Vorfeld* and the operator (*was*) in the *Mittelfeld*, thus violating OP-SPEC but satisfying TOPIC. With candidates d through f it is the other way round. Due to OP-SPEC dominating TOPIC, the former three candidates drop out. The competition between the latter three is decided by lower-ranking constraints: Across all varieties, the next-highest constraint is OB-HD, which eliminates candidate d with empty C°. What we are left with are candidates e and f, differing only in whether they use the simple verb form or *do*-support. As was discussed at length in Sects. 6.2 through 6.5, the competition between these two variants is decided by the relative ranking of even lower-ranking constraints such as FULL-INT and NO-MORPH, and it is at this point that we find variation across varieties of German.

In sum: It seems that interrogatives can be handled in much the same way as declaratives. The difference is that the element in Spec-CP is not the topic but rather an operator, which makes it necessary to resort to OP-SPEC.

## 6.7 Summary

Working within Haider's model, we were initially faced with the problem that by using constraints from previous OT analyses only (Grimshaw 1997, 2013; Bader and Schmid 2006), we were unable to generate any of the well-attested systems with *do* in subordinate clauses. This is because within Haider's model there is no

functional head to be filled and thus, following previous OT analyses, no need for the use of *do* (Recall Grimshaw's 1997: 397 statement that "the only virtue of *do* is that it can satisfy OB-HD").

Consequently, it was proposed to motivate the insertion of *do* without any reference to functional structure above the VP. Following Vogel (2013), the use of *do*-periphrasis rather than the semantically equivalent simple verb form was derived from the fact that analytic constructions are unmarked vis à vis a semantically equivalent synthetic form. This was captured by means of the constraint NO-MORPH. Next, it was suggested that most non-standard varieties of German are characterized by a tie (Central German, Northern Low German) or at least some degree of overlap (Upper German) between NO-MORPH and FULL-INT. This tie/overlap is taken to be at the heart of the system-internal variation ('optionality') between the *do*-form and the simple form that is characteristic of most non-standard varieties (at least in some clause types). In certain cases, however, only one of the two options is possible. This was explained by the fact that other constraints work on top of the basic tie/overlap between NO-MORPH and FULL-INT: In all varieties, VP-topicalization obligatorily requires *do*-support. This is because in this case, only the *do*-form can simultaneously fulfil both of the high ranking constraints TOPIC and OB-HD. In Northern Low German, the *do*-form is impossible in main clauses, leaving only the simple-verb option. This was explained by the fact that in Northern Low German, *do* is syntactically clitic-like and must head-adjoin to a left-adjacent V°. Within Haider's model, this requirement is met if and only if *do* occurs in final position. Supporting evidence in favour of this analysis was seen in the element's inability to undergo fronting to the left edge of the cluster. Standard German, finally, stands out in allowing *do* with VP-topicalization *only*. This was explained by its exceptionally high positioning of FULL-INT vis à vis most of the constraints that favour *do* (such as NO-MORPH and NO-LX-MVT). This high positioning of FULL-INT, paralleled by none of the non-standard varieties (but paralleled by another standard language, namely Dutch), may be seen as a result of prescriptivism. As shown by Langer (2001), the abandonment of *do* in standard German was not an internal development but a result of conscious prescriptive influence.<sup>24</sup>

## 7 Conclusion and outlook

Bader and Schmid (2006) have shown that the use of periphrastic *do* in German main clauses may be analysed similarly to its English counterpart, namely as a means to satisfy OB-HD. In the present analysis it was shown that the situation becomes more complex if we take into account (i) subordinate clauses with verb final order and (ii) the considerable diversity in the distribution of *do* across different syntactic environments as found across varieties of German. In the following, I will summarize the main points and briefly discuss a few more general conclusions concerning (i) some merits of OT, (ii) the analysis of German clause

<sup>24</sup> See footnote 8, though, for an objection against conceptualizing prescriptivism only at the level of the ranking of the constraints rather than at the level of the constraints themselves.

structure and the constraints that govern *do*-support, and (iii) the theory of non-projecting words and grammaticalization.

As for (i): The phenomenon of *do*-periphrasis/*do*-support is a feature that is shared by most, if not all varieties of German, and, in fact, by all West Germanic languages except for Afrikaans (cf. Langer 2001: 13). The differences lie in the *distribution* of *do* within the individual grammatical systems. In the present paper, I have argued that OT provides a well-suited framework for (i) modelling the distribution of *do* system-internally and (ii) modelling cross-linguistic variation in the system-internal distribution of *do*: The central idea is that depending on the syntactic environment (clause type), the presence of *do* satisfies and violates different sets of constraints. This is what governs the system-internal distribution of *do*. Moreover, the ranking of the relevant constraints is subject to cross-linguistic variation, leading to cross-linguistic variation in the distribution of *do*. Another selling point of OT is that it can easily accommodate the system-internal variation or optionality that is a major aspect of *do*-periphrasis. All it takes is to assume a tie between some of the constraints favouring/disfavouring *do*.

As for (ii): The data from *do*-periphrasis presented here were seen to provide a testing ground for competing models of German clause structure and the OT constraints considered to play a role in the distribution of *do*. This is because certain assumptions concerning the former are inseparable from certain assumptions concerning the latter. If we want to maintain that in German, just as in English, “the only virtue of *do* is that it can satisfy OB-HD” (Grimshaw 1997: 397), the occurrence of *do* in subordinate clauses, as found in many varieties, appears to force us to assume that the finite verb in a German subordinate clause is in a functional position (such as I° or T), as is assumed by the standard model. However, as soon as the use of *do* in subordinate clauses is analysed as a means to circumvent verb movement to I°/T°, the fact that, at least in Northern Low German, *do* does not occur in main clauses (i.e., in C°) becomes all the more mysterious. This is because due to the HMC, a language circumventing verb movement to the lower position I°/T° would be expected also to circumvent verb movement to the higher position C°. Consequently, we would have to dismiss the HMC and acknowledge that precisely the kind of system predicted to be typologically impossible by Grimshaw (2013: 279), i.e., “a language with *do*-Support in T [...] but with a lexical verb occurring in the C position”, does in fact exist.

If, on the other hand, we adopt a model that does not locate the clause-final finite verb in a functional position, we will be forced to revise the idea that “the only virtue of *do* is that it can satisfy OB-HD”. It was here argued that this second option appears more plausible. Following Vogel (2013), I motivated the use of the analytic *do*-form on the basis of its status as the unmarked variant vis à vis the synthetic simple form. Once we accept that *do* can be motivated in such a way, Haider’s IP-less model appears better suited to the data. In particular, it may offer an explanation for the Northern Low German distribution of *do*. It was proposed that in this dialect group, *do* is syntactically clitic-like in that it is required to be head-adjoined to its lexical verb. Within Haider’s model, this requirement is met if and only if *do* occurs within the clause-final X°-type cluster. Supporting evidence was drawn from verb cluster formation.

As for (iii): If the analysis of Northern Low German *do* as a syntactically clitic-like element is on the right track, this finding will be of interest to the theory of non-projecting words, to grammaticalization theory and to the reconstruction of one grammaticalization path in particular. As for the theory of non-projecting words: According to Toivonen (2003: 90), the parameter  $\pm$ projecting is in principle independent of a word's syntactic category. However, most elements previously analysed along the lines of a non-projecting word seem to come from the nominal domain. Cardinaletti and Starke (1999) propose an analysis of this type within their typology of strong, weak and clitic pronouns. Toivonen's (2003) analysis is based on Swedish verbal particles, which most prototypically seem to be derived from prepositions and adjectives. Seiler (2003), finally, proposes an analysis in terms of a non-projecting element for a prepositional dative marker in Upper German. Haddican's (2007) analysis of (British) English anaphoric *do* (*Terry will eat pizza and Ines will do, too*) is a rare example of a similar approach to a verbal element. Inspired by Cardinaletti and Starke's (1999) study, he analyses anaphoric *do* as a "structurally deficient relative of *do so*" (2007: 539), deficient in the sense that, similar to a non-projecting word, it fails to take a phrasal (here: VP) complement. If the present analysis is on the right track, this would give further support to the assumption that the parameter  $\pm$ projecting is indeed independent of word class and applies to the verbal domain, too.

As for grammaticalization: The term refers to "the process whereby lexical items and constructions come in certain linguistic contexts to serve grammatical functions, and, once grammaticalized, continue to develop new grammatical functions" (Hopper and Traugott 2003: xv). Often, this goes hand in hand with a decrease in formal independence such that an independent word may, via intermediate stages, become an affix (58).

(58) content item > grammatical word > clitic > inflectional affix  
(Hopper and Traugott 2003: 7)

However, both Toivonen (2003: 194–195) and Seiler (2003: 149–150) object that the literature on grammaticalization does not provide precise criteria for what should be seen as more or less grammaticalized. They propose that the parameter  $\pm$ projecting may serve as a tool for capturing the different stages of grammaticalization in a more precise way. The difference in the degree of grammaticalization between *do* in Northern Low German and *do* in other varieties could be described in precisely this way: In most varieties, *do* is a projecting grammatical word whereas in Northern Low German it has become reduced to a non-projecting grammatical word. It is one step closer to a true clitic, from which it still differs, though, in maintaining phonological independence. In this context, it is interesting to recall that the suffix of the weak preterite in Germanic is considered to derive from the past tense forms of the Proto-Germanic verb *\*dōn* 'do' (e.g., Kiparsky 2009; Hill 2010). Even though this view dominates, it is still disputed, constituting what Hill (2010: 411) describes as "one of the oldest and most controversial problems in the historical morphology of the Germanic branch of Indo-European". If the analysis of present-day Northern Low German *do* is on the

right track, this might lend further support to the dominant view: As pointed out by one anonymous reviewer, we might here be witnessing a *dejà-vu* of the first round of grammaticalization.

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