

Optionality in Verb-Cluster Formation

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1 Introduction

We present a syntactic analysis of verb-clusters in German which is based on experimentally elicited grammaticality judgments. We will first give a review of the major experimental findings and then sketch a syntactic analysis based on Williams (2003). Finally, we discuss several consequences of our results for current issues in syntactic theory.

2 Summary of data

The empirical evidence that we will present is based on a series of experiments making use of the method of speeded grammaticality judgments. This method requires from participants to make rapid, spontaneous grammaticality judgments (mean judgment times < 1sec). Experimental sentences are embedded within a much larger set of filler sentences. 2-verb, 3-verb, and 4-verb clusters were investigated. With one exception noted below, all experiments presented sentences visually. The main findings can be summarized as follows.

(i) The six possible permutations of a 3-verb cluster are shown in (1).

(1) Translation ‘... that Peter had to read a book.’

- a. ...*dass Peter ein Buch* (*HAT*) lesen (*HAT*) **müssen** (**HAT*).
that P. a book has-1 read-3 has-1 must-2 has-1
- b. ...*dass Peter ein Buch* (**HAT*) **müssen** (**HAT*) lesen (**HAT*).
that P. a book has-1 must-2 has-1 read-3 has-1

As indicated in (1), the two orders $V_3Aux_1Mod_2$ and $Aux_1V_3Mod_2$ were accepted whereas all other orders were rejected. Importantly, this pattern was independent of the regional background of the participants (all students). A further experiment with auditory stimulus presentation showed that the acceptance of the two orders $Aux_1V_3Mod_2$ and $V_3Aux_1Mod_2$ was independent of whether the nuclear pitch accent was on the object in front of the cluster or on the main verb.

(ii) 4-verb clusters consisting of a modal verb in the perfect tense embedding a main verb in the passive voice were also tested. Of the 24 possible permutations, the 8 shown in (2) were included in the experiment.

(2) Translation ‘... that a book had to be read.’

- a. ...*dass ein Buch* (HAT) *gelesen* (HAT) *werden* (HAT) *müssen* (*HAT).
 that a book has-1 read-4 has-1 be-3 has-1 must-2 has-1
- b. ...*dass ein Buch* (??HAT) *müssen* (*HAT) *gelesen* (*HAT) *werden* (*HAT).
 that a book has-1 must-2 has-1 read-4 has-1 be-3 has-1

As indicated in (2-a), when the embedded verbs were in nested order, the perfect auxiliary was accepted in all positions in which it preceded the modal verb. When the modal verb was fronted as in (2-b), the order in which the perfect auxiliary preceded the modal verb was accepted marginally (39%); all other orders were rejected.

(iii) In addition to the use illustrated in (1) and (2), German modal verbs have usages with non-verbal complements. According to the grammar of Standard German, modal verbs behave like main verbs when used with either a DP or PP complement. In the perfect tense, they appear as past participles and precede the auxiliary. However, an additional study shows that many speakers also accept the reverse order shown in (3).

- (3)... *dass Peter nach Paris* HAT *müssen*.
 that P. to Paris has must
 ‘... that Peter had to go to Paris.’

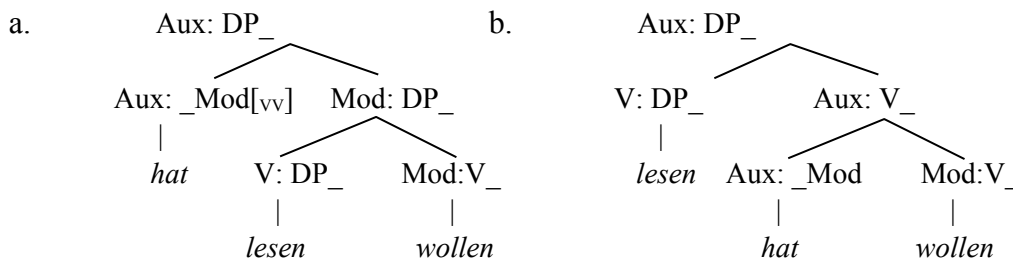
With regard to the two non-standard clusters $V_3Aux_1Mod_2$ and Aux_1Mod_2 ((1-a) and (3)), there was quite a few variability in the judgment data. Note that these two clusters have the common subpart Aux_1Mod_2 (*hat müssen*). In Aux_1Mod_2 , this subpart occurs on its own, in $V_3Aux_1Mod_2$, it occurs with an additional infinitival verb. In Standard German, a subsequence like *hat müssen* is never allowed. The data show a strong correlation between judgments for Aux_1Mod_2 and $V_3Aux_1Mod_2$ ($r=.79$, $p<.001$). Speakers either accept both, or they reject both.

3 Discussion

Given the judgment data summarized above, we can identify two grammatical systems. Participants who closely adhere to the grammar of Standard German obligatorily front the auxiliary to the beginning of the verb cluster in 3- and 4-verb clusters. Participants who are more liberal allow a certain amount of optionality with regard to the position of the finite auxiliary within verb clusters. In particular, for 3-verb and 4-verb clusters, all orders seem to be accepted in which all verbs besides the perfect auxiliary appear in nested order, and the auxiliary is to the left of the modal verb. In other words, auxiliary fronting is obligatory but the domain of inversion is free. Since this pattern was independent of the regional background of participants, we call it Colloquial German. For 2-verb clusters, Standard German participants only

allowed the order Mod_2Aux_1 whereas Colloquial German participants allowed auxiliary fronting in 2-verb clusters as well.

A major challenge posed by these data is how to best account for the optionality of auxiliary placement in Colloquial German. We will present an analysis which modifies and extends the verb-cluster analysis proposed in Williams (2003) which is framed in a restricted variant of categorial grammar. In addition to the standard operation of functional application one further operation is allowed, namely functional composition. Sample syntactic trees for the two orders permitted for 3-verb clusters are provided in (4) ('X:Y_' denotes a node of category X which subcategorizes for a category Y to its left; further details are provided in our presentation).



Given the availability of competing analysis also making use of functional composition for deriving verb clusters (Combinatorial Categorial Grammar, HPSG), the main question is how well each theory accounts for the observed optionality in auxiliary placement. Closely related to this question is the further question of whether there is a deeper motivation for the particular array of verb-clusters orders found in Colloquial German. Given the current interest in drawing the exact boundary between grammar proper and external functional motivations (cf. in particular Newmeyer, 2005), verb-cluster formation is of particular relevance because it is an area of grammar subject to seemingly arbitrary variation. Furthermore, there is a long tradition of assuming that parsing considerations are a shaping factor for verb-cluster formation (e.g., Loetscher, 1978). We will hypothesize that all acceptable orders are parsing-optimal in terms of branching direction, but some unacceptable orders are too. This implies that the distinction between grammatical and ungrammatical orders must still be coded within the grammar itself.

References

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