The role of temporal cues in verb cluster reordering: evidence from processing times in optionality-contexts

Dennis Wegner (University of Wuppertal), Marcel Schlechtweg (University of Kassel) & Holden Härtl (University of Kassel)

A striking exception to the strict clause-final positioning of the finite element in German embedded clauses arises in the context of verbal clusters headed by the temporal auxiliaries werden (‘will’) and haben (‘have’). The cluster-initial positioning is occasionally mandatory in perfect clusters employing modal auxiliaries and exhibiting Infinitivus pro Participio (IPP), yet barred if there is participial morphology on the restructuring modal, as observable in (1).

(1) a. dass Anne das Meer hat sehen wollen/können/dürfen that Anne the sea has see want.IPP/can.IPP/may.IPP

‘that Anne could have seen the sea’

b. *dass Anne das Meer sehen wollen/können/dürfen hat AUX-FIN PRF.IPP.MOD

‘that Anne could have seen the sea’

c. *dass Anne das Meer hat sehen gewollt/gekommen/gedurft AUX-INH *PRF.PTCP.MOD

‘that Anne the sea has see want.PTCP/could.PTCP/may.PTCP

The latter property carries over to restructuring elements other than modals (i.e. Aux-initial clusters never exhibit participial morphology on their restructuring item), whereas the former does not and rather stems from the special properties of modals (cf. Eisenberg et al. 2001: 251). Instead, optionality ensues with verbal clusters that feature perception (AcI) verbs like sehen (‘see’), hören (‘hear’) and fühlen (‘feel’) or continuous lassen (‘let’).

(2) a. dass Timo die Frau hat singen hören that Timo the woman has sing hear.IPP

‘that Timo has heard the woman sing’

b. dass Timo die Frau singen hören hat AUX-FIN PRF.IPP.AC

‘that Timo has heard the woman sing’

c. *dass Timo die Frau hat singen gehört that Timo the woman has sing hear.PTCP

‘that Timo has heard the woman sing’

d. dass Timo die Frau wird singen hören AUX-INH FUT.AC

‘that Timo will hear the woman sing’

e. dass Timo die Frau singen hören wird AUX-FIN FUT.AC

‘that Timo will hear the woman sing’

The optionality in (2) may be used to establish a comparability that allows for an investigation of whether one of the motivating factors for the non-canonical positioning of the auxiliaries is providing cues as to the temporal semantics of the clause (see also Eisenberg et al. 2001: 257f.; Bærentzen 2004: 137f.). This is rooted in the observation that the exceptional positioning is only licit with auxiliaries associated with temporal semantics and in verbal clusters that do not provide any morphological cues of this kind. If providing the auxiliary early aids the parser in the interpretation of the computationally challenging verbal domain, this should bear advantages for the processing times of those embedded clauses in which the auxiliary has been preposed (i.e. AUX-INITIAL).

The present paper discusses this thesis against the backdrop of an experimental study employing reaction-time-based forced choice as well as acceptability judgment tasks. The former prompt participants to decide whether the embedded clause refers to a situation in the past or in the future, where the reaction times for this decision are measured from the onset of presenting the clause in question. The latter, in turn, is carried out as the supposed optionality is not a given and acceptability rates have not yet been gathered for contexts with perception verbs (see Bader & Schmid 2009 for judgment data for configurations employing modal auxiliaries as restructuring elements and Bader 2014 for an investigation of lassen (‘let’)). Furthermore, these provide a vital safety net as low acceptability rates may lead to considerably slower reaction times in the forced choice task. In both parts of the experiment, the (independent) variables are hence i) the position of the auxiliary (AUX-INITIAL vs. AUX-FINAL), and ii) the type of the auxiliary (PERFECT haben vs. FUTURE werden). Additionally, the morphological variable of whether or not participial morphology is realized is taken into account in perfect contexts.
The prediction in this experimental setup is that items of the kind AUX-INITIAL generally elicit faster reaction times than their AUX-FINAL counterparts regardless of the type of auxiliary. If participial morphology is around (and AUX-FINAL thus is the only option), however, the reaction times are expected to be roughly equivalent to those of their AUX-INITIAL counterparts. Since this effect may be assumed to remain relatively subtle, a third independent variable is introduced to strengthen the differences in reaction times (once again mirrored in the acceptability rating part of the experiment): iii) intervening (non-verbal) material between the preposed auxiliary and the verbal cluster, as laid out in (3).

(3) a. dass Timo die Frau hat/wird lauthals singen hören AUX-INiT PRF.IPP/FUT.ACi ADV

\[ \text{that Timo the woman has/will loudly sing hear.IPP/INF} \]

‘that Timo has heard/will hear the woman sing loudly’

b. dass Timo die Frau hat/wird in der Dusche singen hören AUX-INiT PRF.IPP/FUT.ACi PP

\[ \text{that Timo the woman has/will in the shower sing hear.IPP/INF} \]

‘that Timo has heard/will hear the woman sing in the shower’

As the examples in (3) – usually discussed under the heading of VP-raising – show, the intervening material comes in two types: adverbial modifiers, as in (3a), and prepositional phrases, as in (3b).

Additionally, in order to show that differences in reaction times are not just due to computing formal dependencies as soon as possible but rather crucially depend on temporal semantics, i.e. the availability of temporal cues, the effect of a coherent temporal adverbal priming a specific temporal reading prior to the appearance of the temporal auxiliary is introduced as variable iv), as observable in (4).

(4) a. dass Timo die Frau morgen wird singen hören AUX-INiT FUT.ACi T.ADV

\[ \text{that Timo the woman tomorrow will sing hear} \]

‘that Timo has heard the woman sing’

b. dass Timo die Frau morgen singen hören wird AUX-FIN FUT.ACi T.ADV

\[ \text{that Timo the woman tomorrow sing hear will} \]

‘that Timo has heard the woman sing’

The presence of a lexical item priming a future or perfect interpretation is expected to weaken the effect of preposing: the processing advantage of coming across the auxiliary early should be less strong if another element already provides evidence regarding the temporal semantics of the clause.

Should the results of the experimental study indicate that there is indeed a processing advantage to the preposing of temporal auxiliaries, this bears theoretical implications for the compositional make-up of perfect and future configurations. While the signalling-function of the future auxiliary werden (‘will’) for a future interpretation is trivial (regardless of discussions concerning the modal characteristics of future auxiliaries, see, amongst many others, Welke 2005: 365ff. and Salkie 2010), haben (‘have’) is traditionally conceived to be a marker of finiteness rather than perfect semantics and thus unlikely to serve a signalling-function for a perfect interpretation. This claim, however, is put into question by the identity of passive and perfect participles: there is substantial evidence in favour of the assumption that passive and perfect participles are syntactically as well as semantically identical, i.e. there is only one kind of second (or ‘past’) participle. This participle bears diathetic as well as aspectual properties, where the contribution of either passive or perfect crucially hinges on the properties of the predicate that the participle is derived from (cf. Breul & Wegner 2017). Crucially, however, it is also sensitive to its functional context: unlike HAVE contributes active properties by introducing an external argument otherwise suppressed by participial morphology (cf. Ackema 1999; Ackema & Marell 2012), but it may also be taken to serve as a cue for perfect semantics (cf. Breul 2014: 465). In fact, it can be shown to contribute perfect semantics in case the participle’s aspectual properties do not suffice for the denotation of a perfect situation, which is what it only does in case a simple change of state is around (i.e. with unaccusatives, as opposed to transitive and unergative predicates) (cf. Wegner 2019).

In conclusion, the present paper provides new insights into the role of temporal semantics as a potential motivation for the preposing of the auxiliaries haben (‘have’) and werden (‘will’). With the help of reaction-time-based forced choice as well as acceptability judgment tasks, it is investigated whether preposing has an effect on the processing of (embedded) clauses featuring complex verbal domains and whether the optionality usually claimed for clusters with perception verbs and continuative lassen (‘let’) may be substantiated. This does not just bear implications for the compositional semantics of perfect configurations, but also has repercussions for the intricate relation between acceptability and processing.
