

Discussion

Processing separable complex verbs in Dutch: comments on Frazier, Flores d'Arcais, and Coolen (1993)

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Frazier, Flores d'Arcais, and Coolen (1993) report an experimental study intended to test Schreuder's (1990) 'Morphological Integration' (MI) model concerning the processing of separable and inseparable verbs. The authors (henceforth FFC) interpret their data as lending support, firstly, to (a slightly modified version of) the MI model and, secondly, to a non-interactive position with respect to the relationship between lexical/morphological and syntactic processing in sentence comprehension. In this discussion note I will show that the logic of the experiment is flawed, implying that the data do not warrant the author's conclusions. The problem is rooted in the notion of separable complex verb (SCV) that will prove considerably less well defined than desirable.

Separable complex verbs, for example *opbellen* (to call up, to phone) or *aanvallen* (to attack) consist of two members: a particle (*op*, *aan*) and a non-separable verb (*bellen*, *vallen*). In various syntactic contexts the members are set apart by intervening phrases of arbitrary length: compare subordinate clause 1 with main clause 2:

- (1) dat ze [NP . . .] opbellen
that they [NP . . .] call-up
- (2) Ze bellen [NP . . .] op.
They call [NP . . .] up.

According to the MI model, the mental lexicon contains *access nodes* for the SCV itself and for its members (particle, verb), and in addition a so-called *integration node*. An access node is activated by the corresponding lexical item (*opbellen*, *op*, *bellen*). An integration node is aroused when the access nodes for particle and verb are active simultaneously. The activation levels of access as well as integration nodes decrease gradually but the decay

rate of integration nodes is slower than that of access nodes. Integration nodes are supposed to spread activation to the access node of the SCV, thereby counteracting activation decay in the latter. This explains why the SCV can be recognized even when its members occupy non-adjacent positions in the utterance.

FFC combine this model for lexical/morphological processing with stipulations concerning syntactic processing. The lexical/morphological processor is supposed to be an autonomous module that produces its output independently, without consulting the syntactic processor. Consider FFC's examples A and B:

- (A) *Wie bied je de dranken aan?* (*aan-bieden* = to offer)
 who verb you the drinks particle
 Who do you offer the drinks (to)?
- (B) *Aan wie bied je de dranken aan?*
 to whom verb you the drinks particle
 To whom do you offer the drinks?
- (C) *Wie heb je de dranken aangeboden?* (*aangeboden* is past participle)
 who have you the drinks offered
 Who have you offered the drinks (to)?
- (D) *Aan wie heb je de dranken aangeboden?*
 to whom have you the drinks offered
 To whom have you offered the drinks?

The first *aan* in sentence B is not a particle but a preposition taking *wie* as its object. The lexical/morphological processor is not aware of that, however, and will activate the access node for particle *aan* (in addition to preposition *aan*). Subsequent recognition of *bied* as a verb fulfils the conditions for activation of the integration node for SCV *aanbieden*, causing the latter's access node to become active as well. This recognition result, the SCV *aanbieden*, is passed on to the syntactic processor together with the verb *bieden* (*to bid*) and the preposition *aan* (*to*). If now the syntactic processor attempts an analysis that includes the SCV, it will run into problems (violation of word order rules) and backtrack. In other words, a garden-path effect is predicted during the processing of sentence B. No such effect will be caused by companion sentence A without the sentence-initial *aan*.

FFC put this prediction to test in a grammaticality judgment task. In order to control for other factors that might differentially affect processing difficulty of A- and B-type sentences, FFC included sentences such as C and D where the finite verb *bied* has been replaced by a form of the auxiliary *hebben* (*have*). Since *aan + hebben* presumably does not constitute a SCV, D will not be able to lead the syntactic processor up the garden path. FFC therefore expect the following interaction between question form (NP vs. PP) and tense (present vs. perfect):

RT(B) – RT(A) > RT(D) – RT(C)

This expectation is indeed borne out by the data: the four RT averages are A 542, B 624, C 768 and D 663 ms, with the interaction highly statistically significant. FFC attribute the slower RTs in the perfect tense conditions (C/D) to the fact that the present tense is morphologically more complex (auxiliary added) than the present imperfect (no auxiliary).

A second experiment tested a prediction derived from the non-existence of SCVs in English. The crucial interaction should not appear when native speakers of English read English equivalents of the Dutch experimental sentences, as illustrated by the translations below A through D. In this control study, the RT averages amounted to A 769, B 848, C 867, and D 897 ms. The interaction between question form and tense is not statistically reliable, nor is the difference between imperfect and perfect tense conditions. The latter finding, the authors suggest, may reflect the presence of an auxiliary in both the imperfect and the perfect tense conditions.

My criticism concerns the reasoning behind control conditions C and D in the Dutch experiment. Notice that in the Dutch and the English experiments the differences between the B and the A condition are nearly identical: 82 and 79 ms, respectively. In the Dutch B condition, on FFC's theory, this difference stems from the *aan + bied* sequence causing a morphological garden-path effect. In the English study, the RT(B) – RT(A) difference must have had another – unknown – origin. This makes the RT patterns in the perfect tense conditions critical as to the interpretation. FFC argue that a morphological garden path is impossible in D because *aan + heb* is not a word in Dutch, and indeed D is even faster than C. However, this logic would collapse if *aan + heb* and *aan + bied* would not embody the intended (or an equivalent) morphological contrast. As a matter of fact, two considerations cast serious doubt on the existence of such a distinction.

First of all, by far the majority of Dutch dictionaries list *aanhebben* as a SCV – one of its meanings being *to wear* (clothing). A few other dictionaries do have an entry for *aan + hebben* but prefer to spell it as two words rather than one. I have found only one dictionary that does not mention *aanhebben* in any form. These proportions agree very well with the answers of native speakers of Dutch whom I have interviewed informally. Almost everybody accepts *aanhebben* as a SCV spelled as a single word; the remaining informants view *aan* and *hebben* as two words that need a space in between. These observations imply that *aanhebben* is almost as good a SCV as *aangebieden* – definitely too good to play a decisive role in the C and D control conditions. FFC could have avoided this problem by choosing the future auxiliary *zullen*, as in C' and D'. *Aanzullen* is definitely not a word in Dutch, as is readily confirmed by dictionaries and informants:

(C') Wie zul je de dranken aanbieden?

Who will you offer the drinks (to)?

(D') Aan wie zul je de dranken aanbieden?

My second consideration is theoretical in nature. Various linguists have argued that SCVs are phrases rather than words. Booij (1990) reviews the evidence and makes out a strong case for this view. If it is true, neither *aanbieden* nor *aanhebben* are words, and the evidence in favour of Schreuder's MI model has to be reinterpreted. For instance, one could propose that, in the mental lexicon, SCVs are represented as two-word idiomatic expressions, whose members sometimes occupy non-adjacent positions due to the normal operation of syntactic rules; that a syntactic node rather than a morphological integration node dominates both members simultaneously; and that via this node the members can prime one another. However, it is hard to see how a theory along these lines could yield differential predictions with respect to the activation of *aan + bied* versus *aan + heb* constructions in FFC's experiment. This would seem to require (1) postulating that the members of these constructions maintain different syntactic relationships with one another, and (2) somehow mapping these relationships onto different regimes for lexical activation and activation spreading. While the former probably is reasonable, the latter strikes me as entirely ad hoc.

The conclusion must be that the experimental data reported by Frazier, Flores d'Arcais, and Coolen in their 1993 paper cannot be taken as evidence for the theoretical propositions they develop with regard to the MI model and the interface between lexical/morphological and syntactic processing.

References

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