

## Dutch A-Scrambling Is Not Movement: Evidence from Antecedent Priming

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Early research on scrambling argued for a uniform A'-movement analysis, but further empirical discoveries (Webelhuth 1989, a.o.) provided evidence for A-related scrambling, analyzed as movement (Vanden Wyngaerd 1989, Mahajan 1990, a.o.), base generation (Neeleman 1991, Bayer & Kornfilt 1994, a.o.), or a combination of both (Zwart 1993).

A-scrambling in Dutch typically displaces a discourse-given constituent across an adjacent adjunct. Thus, in (1), mention of *dat boek van Haegeman* in the question singles out (1a), where scrambling fails to apply, as contextually inappropriate answer:

- (1) Hoe zit het met je review van dat boek van Haegeman?  
'How are you progressing with your review of that book by Haegeman?'
- a. #Nou, ik denk dat ik (eerst) zorgvuldig het boek van Haegeman ga lezen.  
*Well, I think that I (first) carefully the book by Haegeman go read*
- b. Nou, ik denk dat ik (eerst) het boek van Haegeman zorgvuldig ga lezen.  
*Well, I think that I (first) the book by Haegeman carefully go read*  
'Well, I think that I will (first) carefully read Haegeman's book.'

A-scrambling involves movement or variation in the base-position of the adjunct 'crossed' by the scrambling. The first type of proposal assumes that the adjunct has a unique attachment site and that the object moves across it ((2a)). By contrast, the second type of proposal assumes that the adjunct may be attached above or below the surface position of the object ((2b), (2c), (2d)). Such analyses may nevertheless also involve A-movement if it is assumed, in line with UTAH, that the object is generated as a complement of V ((2b), (2d)).

- (2) a. OV – fixed adjunct (Mahajan 1990, De Hoop 1992, a.o.)  
[<sub>AgrOP</sub> DP<sub>1</sub> [<sub>AgrO'</sub> [<sub>VP</sub> Adjunct [<sub>VP</sub> t<sub>1</sub> V]] AgrO ]]
- b. OV – flexible adjunct (Vanden Wyngaerd 1989)  
[<sub>AgrOP</sub> <Adjunct> [<sub>AgrOP</sub> DP<sub>1</sub> [<sub>AgrO'</sub> [<sub>VP</sub> <Adjunct> [<sub>VP</sub> t<sub>1</sub> V]] AgrO ]]]
- c. OV – flexible adjunct (Neeleman 1991, 1994, Bayer & Kornfilt 1994, a.o.)  
[<sub>VP</sub> <Adjunct> [<sub>VP</sub> DP [<sub>V</sub> <Adjunct> V]]]
- d. VO – flexible adjunct (Zwart 1993)  
[<sub>AgrOP</sub> <Adjunct> [<sub>AgrOP</sub> DP<sub>1</sub> [<sub>AgrO'</sub> AgrO [<sub>VP</sub> <Adjunct> [<sub>VP</sub> V t<sub>1</sub>]]]]]

The literature on A-scrambling has not produced conclusive arguments for either a movement or a base-generation approach. There are good reasons for this: A-movement does not exhibit any syntactic reconstruction. In theory, one should be able to use scope as a diagnostic for the presence of a trace of A-scrambling (May 1979, Lebeaux 1998, Fox 1999). In practice, this is problematic: an A-scrambled indefinite – the primary candidate for diagnosing reconstruction – receives a specific reading and will thus fail to demonstrate scope interaction even if it were to reconstruct (Kerstens 1975, De Hoop 1992, a.o.). Other scrambled QPs take surface scope.

The present study aims to address this analytical stalemate through psycholinguistic experimentation using cross-modal priming (CMP; Swinney, Onifer, Prather, & Hirshkowitz 1979): participants listen to sentences on headphones while a word or non-word string appears visually on a screen; they then perform a lexical decision on the word they see. As displaced constituents are mentally reactivated at their corresponding gap sites, lexical decisions for target words related or identical to the semantic head of the displaced

constituent should be facilitated at the gap site, in comparison to lexical decisions to unrelated words. Previous studies of A'-movement (Love & Swinney 1996, Nakano, Felser & Clahsen 2002) have found reactivation at the gap, while previous studies of A-movement (Osterhout & Swinney 1993, Friedmann et al. 2008) have found delayed reactivation some 800 ms after the gap.

Here we use CMP to investigate whether an A-scrambled direct object in Dutch gives rise to antecedent reactivation effects in the position where a movement theory would postulate a trace. We report on three experiments, concerned with sentences in which an object has A-scrambled across an adjunct (exps. 1 and 3; stimulus example in (3); \*\* indicates purported gap location) and sentences in which the object has undergone WH-movement (exp. 2).

(3) Context: Gisteren heeft een overvaller een winkelier met een mes om het leven gebracht. ('Yesterday, a robber killed a shopkeeper with a knife.')

Stimulus:

Brechtje hoorde dat hij de winkelier meer dan vijftwintig keer \*\*

*Brechtje heard that he the shopkeeper more than twenty-five times*

gestoken heeft na de kassa leeg gehaald te hebben.

*stabbed has after the till empty got to have*

'Brechtje heard that he stabbed the shopkeeper more than twenty-five times after having emptied the till.'

Identical target: *winkelier* 'shopkeeper'; unrelated target: *kandelaar* 'candlestick'

For exps. 1 and 2, there were six experimental conditions in a 3x2 design with the factors Location (pre-gap, gap, and post-verbal) and Target Type (identical, unrelated). The gap location was at the putative trace position, the pre-gap location 500 ms prior to it and the post-verbal location 750 ms after it. If displaced constituents are reactivated at their canonical pre-verbal positions, the size of the priming effect should be larger at the putative trace position than at the pre-verbal control position. If direct objects in Dutch originate in the post-verbal position, however, or if priming in A-movement is generally delayed, then the priming effect should be largest at the post-verbal test positions.

In line with expectations, exp. 2, our baseline experiment, found reactivation of WH-moved objects at verb onset. A'-movement should leave a trace and, Dutch being an OV language, its location should be at verb onset. This result also tallies with previous CMP studies.

In exp. 1 (A-scrambling) no evidence was found for reactivation at the hypothetical preverbal gap location ((2a), (2b)). There was also no evidence for a delayed reactivation about 750 ms downstream from the hypothetical gap location, as previously found with the trace in the complement position of passives and unaccusatives. The post-verbal probe point in exp. 1 was on average only 200 ms away from verb offset. The lack of reactivation at this point therefore also provides evidence against a post-verbal trace (as in (2d)).

Exp. 3 was a follow-up to exp. 1 that looked for the delayed reactivation of a potential post-verbal trace at 700 ms from verb offset. No such delayed reactivation was found, providing further evidence against a post-verbal trace in the structures under investigation.

Taken together, these results are inconsistent with a full-on cartographic analysis of Dutch A-scrambling in which the scrambled category is merged as a pre-verbal or a post-verbal complement and subsequently positions itself with respect to a (fixed) adjunct. Instead, they suggest an analysis of A-scrambling that allows the object to merge with the verbal projection either before or after the adjunct (analysis (2c); see Bayer & Kornfilt 1994, Neeleman 1991, 1994, and Fanselow 2001, 2003 for proposals along these lines).