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RESEARCH

Freedom in the Dutch middle-field: Deriving discourse structure at the syntax-pragmatics interface

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This paper experimentally explores the optionality of Dutch scrambling structures with a definite object and an adverb. Most researchers argue that such structures are not freely interchangeable, but are subject to a strict discourse template. Existing analyses are based primarily on intuitions of the researchers, while experimental support is scarce. This paper reports on two experiments to gauge the existence of a strict discourse template. The discourse status of definite objects in scrambling clauses is first probed in a fill-in-the-blanks experiment and subsequently manipulated in a speeded judgment experiment. The results of these experiments indicate that scrambling is not as restricted as is commonly claimed. Although mismatches between surface order and pragmatic interpretation lead to a penalty in judgment rates and a rise in reaction times, they nonetheless occur in production and yield fully acceptable structures. Crucially, the penalties and delays emerge only in scrambling clauses with an adverb that is sensitive to focus placement. This paper argues that scrambling does not map onto discourse structure in the strict way proposed in most literature. Instead, a more complex syntax of deriving discourse relations is proposed which submits that the Dutch scrambling pattern results from two familiar processes which apply at the syntax-pragmatics interface: reconstruction and covert raising.

Keywords: scrambling; Dutch; pragmatics; reconstruction; raising

1 Introduction

Direct objects in the Dutch middle-field can appear to the left or to the right of an adverb. This phenomenon, called *scrambling* or *object shift*, has received a lot of attention in the linguistic literature (Verhagen 1986; Vanden Wyngaerd 1989; Neeleman 1994; de Hoop 1996; 2000; 2003; Schaeffer 1997; 2000; Neeleman & Reinhart 1998; Unsworth 2005; Broekhuis 2008; Neeleman & van de Koot 2008; van Bergen & de Swart 2009; 2010; de Swart & van Bergen 2011; van de Koot et al. 2015; Broekhuis & Corver 2016: Chapter 13; Schoenmakers & de Swart 2019; Schoenmakers et al. 2020). An example of a scrambling clause with a definite object is given in (1). The object *de agent* 'the officer' is considered to be in unscrambled position in (1a) and in scrambled position in (1b).

(1) a. Patrick heeft onlangs de agent geslagen. (unscrambled)
Patrick has recently the officer punched

b. Patrick heeft de agent onlangs geslagen. (scrambled)
Patrick has the officer recently punched
'Patrick recently punched the officer.'

At first sight, the word orders appear to be freely interchangeable, as the two sentences convey the same meaning. A standard assumption in the literature, however, is that this variation is not entirely free. Scrambling is taken to be closely related to discourse

conditions. Most researchers claim that objects in scrambled position are interpreted as topical or discourse-anaphoric, and objects in unscrambled position as focal or discourse-new (Verhagen 1986; Neeleman & Reinhart 1998; Schaeffer 1997; 2000; Broekhuis 2008; Neeleman & van de Koot 2008; Broekhuis & Corver 2016: Chapter 13). The rationale behind these accounts is that scrambled objects do not surface in the topological field of the clause where new information is introduced (Verhagen 1986; Neeleman & Reinhart 1998), but instead occupy a marked position that is linked to discourse-anaphoricity (Neeleman & van de Koot 2008). Although there is some discussion about the intuitions reported in the literature (see de Hoop 2016 and Broekhuis 2016), the assumption that there is a strict "discourse template" is wide-spread. Discourse-old objects in unscrambled position are referred to as "highly disfavored" (Neeleman & Reinhart 1998: 325) and "decidedly awkward" (Neeleman & van de Koot 2008: 60). Broekhuis & Corver (2016: 1613) claim that scrambling of definite objects "is possible only if the referent of the direct object is already part of the domain of discourse." And while Broekhuis (2008: 218) suggests that it is "apparently optional" for definite objects to scramble, he concludes that "[scrambling] is blocked […] when [the object] is part of the focus of the clause." Thus, the general consensus in the literature is that the scrambled position is reserved for discourse-old (or topical) objects and the unscrambled position for discourse-new (or focal) objects.

Given these strong intuitions, it is rather surprising that van Bergen & de Swart (2009) find in a corpus study that only 14% of scrambled definites are anaphoric and only 22% of anaphoric definites are located in scrambled position. De Swart & van Bergen (2011) do not find evidence for an effect of anaphoricity in a follow-up behavioral experiment either, and, although Schoenmakers et al. (2020) do find an effect of anaphoricity in their experiment, the proportion of anaphoric definites they find in scrambled position is only from 42% to 57% (depending on the condition). These corpus and experimental data imply that the idea of a one-to-one mapping between an object's surface position and its interpretation in discourse is too strong. The current paper investigates whether a discourse template exists for discourse-new definite objects (specifically, for contrastive foci) in Dutch scrambling constructions, by collecting new experimental data. The paper is structured as follows.

Section 2 discusses previous analyses of definite object scrambling in Dutch, which lead to the prediction of a strict discourse template. This prediction is tested experimentally in Section 3, which reports on a fill-in-the-blanks task and a speeded judgment task. The experimental results indicate that mismatches between surface order and pragmatic interpretation do exist, but come at an increased processing cost. The type of adverb also plays an important role in Dutch scrambling structures (Schoenmakers & de Swart 2019). Sentences with an adverb that is sensitive to focus placement show a pattern that closely resembles those attested in the psycholinguistic literature on scope ambiguities. Specifically, both scrambled and unscrambled definites allow for a focal as well as for a non-focal interpretation, but there is a penalty in judgment scores and a delay in reaction times for form-meaning pairs that diverge from the discourse template. Strikingly, these effects do not emerge in the items with a (focus insensitive) time-point adverb.

Section 4 seeks to account for the experimental findings in a formal syntactic framework. The view that I pursue here is that scrambling involves movement that is prompted by a scrambling feature (following Grewendorf & Sabel 1999; Sauerland 1999; Kawamura 2004). The scrambling feature is optionally assigned to objects that enter the derivation. Discourse relations are derived post-syntactically and may be subjected to two familiar scope-shifting operations: reconstruction and raising (Fox 1999; 2000; Reinhart 2006). An important outcome of the analysis is that definite objects in scrambled and unscrambled position both have two possible pragmatic interpretations.

Section 5 contains the general conclusions.

2 Theoretical background

The link between Dutch scrambling and effects at the interfaces is well documented in the literature. The common assumption is that the structural position of a definite object has direct repercussions for its discourse status. Neeleman & Reinhart's (1998) take on scrambling is that the variation is entirely optional in syntax and evaluated at the syntax-phonetics interface instead. Their analysis is built on observations that there is a strong relation between sentence stress and discourse structure (e.g. Chomsky 1971; Jackendoff 1972; Cinque 1993). The main stress of a clause with default accenting falls on the most deeply embedded element (Cinque's 1993 *Nuclear Stress Rule*), and the focus of a clause must contain the element bearing the main stress. Foci are those elements that convey discourse-new information (Rochemont 1986; Vallduví 1992; Lambrecht 1994; Erteschik-Shir 1997) and contrast this information to a set of alternatives (Rooth 1992).[1] These generalizations entail that the main stress in Dutch falls on a different constituent in scrambled and unscrambled constructions (see also Verhagen 1986: Chapter 4), as scrambled objects occur in a structurally higher position.

Neeleman & Reinhart (1998) reason that scrambled and unscrambled objects must therefore have a different discourse status, and that certain objects are required to appear in scrambled position in order to escape the focus domain of the clause. They propose that the prosodic contour of a clause is used at the PF-interface to link syntactic structure to an appropriate discourse interpretation. A sentence is infelicitous for a given context if the stress pattern does not match this discourse context. Since scrambled objects are not the most deeply embedded members of VP, they do not receive main stress and consequently cannot be the focus of the sentence. Objects in unscrambled position, on the other hand, do receive main stress and are therefore located in a position that can host foci. Consider the dialogue in (2). The question selects for the object in the answer to be in focus (or, contrastive focus). A structure like (2b) is therefore not an expected response, because the object does not surface in the syntactic position in which focus is assigned by the prosodic contour.

(2) Neeleman & Reinhart (1998: 326)
Heeft je buurman gisteren de deur geverfd?
has your neighbor yesterday the door painted
'Did your neighbor paint the door yesterday?'

a. Nee, hij heeft gisteren het raam geverfd.
no he has yesterday the window painted

b. #Nee, hij heeft het raam gisteren geverfd.
no he has the window yesterday painted
'No, he painted the window yesterday.'

Neeleman & Reinhart (1998) conclude that, since discourse-anaphoric object DPs are destressed (see Reinhart 2006), they must appear in scrambled position for the derivation not to yield an infelicitous configuration.

In later work, Neeleman considers a purely phonological account of scrambling "insufficiently general" (Neeleman & van de Koot 2008: 167). While such an account may lead to the right predictions for direct objects in the scrambling structures discussed so far, Neeleman & van de Koot (2008) argue that it does not for other displaced arguments. But the impression that there is a close connection between surface order and discourse

[1] Definitions attributed to notions of discourse structure are notoriously diverse, and sometimes a different term is used to refer to the same concept. An overview of the main distinctions can be found in de Swart & de Hoop (2000). My definition of the term *focus* is relatively restrictive, which in this meaning is sometimes referred to as *contrastive* or *identificational* focus.

structure is uncontroversial. They propose that certain syntactic configurations, including definite object scrambling structures in Dutch, may be licensed or blocked by operations at the interfaces (see also Neeleman & Vermeulen 2012). Neeleman & van de Koot (2008) argue in favor of a base-generation account of scrambling. The verb is free to merge with the direct object or with the adverb first, they claim, because adverbs do not affect thematic structure. The scrambled order is syntactically marked because it requires an extra step of theta-role percolation. Neeleman & van de Koot formulate a mapping rule that projects the output of syntax onto an appropriate discourse structure, such that objects in the marked scrambled position are interpreted as discourse-anaphoric. The unscrambled position is linked to non-discourse-anaphoricity (or "discourse-newness") under an Elsewhere condition that blocks the application of a general rule (i.e. all definites can be interpreted as discourse-anaphoric) where scrambling is an option. Neeleman & van de Koot suggest that their discourse template reflects the often attested given-before-new preference (see Gundel 1988), asserting that an early presentation of given information facilitates connecting this information to the foregoing discourse context. In addition, this configuration makes it easier to parse upcoming new information.

The same type of discourse template results from the analysis in Broekhuis (2008). Broekhuis presents an optimality theoretic account of Dutch scrambling, making use of the set of constraints defined in (3) and the constraint order in (4). According to Broekhuis, direct objects move to scrambled position in order to have their case features checked. This requirement is realized in (4) by having CASE outrank the economy constraint STAY. The constraint ALIGNFOCUS states that, under neutral intonation, the most deeply embedded constituent in a clause is the sentence focus. ALIGNFOCUS outranks the other constraints and, therefore, the constraint order in (4) predicts that scrambling only applies when the object refers to discourse-old (topical) information. By ALIGNFOCUS, objects that refer to discourse-new (focal) information remain in unscrambled position.

(3) a. CASE: An NP has case (Case Filter).
b. STAY: Avoid movement.
c. ALIGNFOCUS: The prosodically unmarked focus is the rightmost constituent in its clause.

(4) ALIGNFOCUS ≫ CASE ≫ STAY

Most literature thus agrees that Dutch scrambling constructions adhere to a strict mapping from syntax to discourse structure. Definite objects refer to discourse-new (focal) information when they appear in unscrambled position, and to discourse-old (topical) information when they appear in scrambled position. The question addressed in this paper is whether definite objects in scrambling structures are also interpretable in a position different from where they are phonetically realized. If there is indeed a strict discourse template, mismatches between surface order and pragmatic interpretation are not expected to occur. But, as noted before, corpus and experimental data in van Bergen & de Swart (2009), de Swart & van Bergen (2011), and Schoenmakers et al. (2020) suggest that this prediction is too strong.

Another issue concerns scope differences between the adverbs that allow for definite object scrambling. Negation, for example, is an element that has long been known to be "associated with focus" (Jackendoff 1972), and is accordingly referred to as a *focus sensitive expression* (Beaver & Clark 2008). This means that the pragmatic interpretation of a clause containing negation depends on the location of the focus. Other types of focus sensitive expressions include quantificational adverbs (*always, usually*), exclusives (*only,*

merely), and additives (*even, too, also*). By default, these expressions occur to the left of the material they modify (see Foolen et al. 2009 for some initial distributional data). The surface position of a constituent relative to a focus sensitive expression thus seems to affect its discourse status in Dutch.

This hypothesis is tested experimentally in Schoenmakers & de Swart (2019), who study word order preferences of native speakers of Dutch in scrambling clauses with negation (5) and time-point adverbs (6) (which are not sensitive to focus placement, cf. Ruys 2001). By default, sentence (5) triggers contrastive negation if the object *het kozijn* 'the window frame' surfaces to the right of negation (5i), and sentential negation if it surfaces to the left of negation (5ii). No such meaning difference emerges in sentences with a time-point adverb, like (6).

(5) Roos heeft (het kozijn) niet (het kozijn) geverfd.
Roos has the frame not painted
'Roos did not paint the window frame.'
i. It is not the window frame that Roos painted.
ii. It is not true that Roos painted the window frame.

(6) Roos heeft (het kozijn) gisteren (het kozijn) geverfd.
Roos has the frame yesterday painted
'Roos painted the window frame yesterday.'

Schoenmakers & de Swart (2019) find in a judgment task that the unscrambled order in sentences with negation receives significantly lower acceptability ratings than the scrambled order. Moreover, participants in a sentence production task hardly ever use the unscrambled order for sentences with negation. By contrast, when the sentence contains a time-point adverb the two orders receive equally acceptable ratings at the high end of the scale, and the choice of word order in production is more balanced (40% scrambled). The authors conclude that Dutch scrambling preferences are governed by whether or not the adverb is sensitive to focus placement, and propose that speakers utilize scrambling of definite objects as a tool to avoid expressing the marked contrastive reading of utterances with negation.

However, Schoenmakers & de Swart's (2019) conclusion on the contrastive reading of an unscrambled definite object in the scope of negation as a focus sensitive expression is based on their own intuitions only, since their stimulus sentences were not disambiguated in any way. The question remains how the objects in structures like (5) and (6) are interpreted. This brings us back to the question whether mismatches between surface order and discourse structure are extant in Dutch scrambling constructions.

3 Experiments

This section presents two experiments that investigate whether Dutch scrambling constructions can accommodate "inverse readings" when the discourse context licenses the mismatch. In particular, the question is whether definite objects in scrambled position can be interpreted as focal, and definite objects in unscrambled position as non-focal. First, the question is addressed to what extent a strict discourse template is followed in an off-line fill-in-the-blanks task in Section 3.1. The results suggest that while pragmatic interpretation is informed by surface order, not all unscrambled objects are focal and, conversely, some scrambled objects are. The hypothesis that Dutch scrambling allows for inverse readings is further tested in a speeded judgment task in Section 3.2. A common finding in the psycholinguistic literature on scope ambiguities is that the computation of

an inverse reading in scope ambiguous sentences incurs additional processing difficulty (see Brasoveanu & Dotlačil 2019). If inverse discourse readings are indeed available in Dutch scrambling structures, they are expected to come at a higher processing cost here as well, measured in the experiment by an expected decrease in judgment scores and an increase in reaction times. An additional prediction is that, since time-point adverbs do not affect discourse structure, this effect emerges only in sentences with adverbs that are sensitive to focus placement.

3.1 Fill-in-the-blanks task

This experiment investigates the influence of word order on discourse structure, seeking evidence for the existence of mismatches between syntax and pragmatics. Participants were asked to fill in the blanks in sentences with a focus sensitive adverb, like (7), and sentences with a time-point adverb, like (8). The first clause of these sentences contained a scrambling construction. Participants were free to fill in the blank with any element they saw fit. The blank was placed in a second clause, following the contrastive connector *maar* 'but' and negation.

(7) a. Sophie heeft vaak de kok beledigd, maar niet [BLANK].
Sophie has often the cook insulted but not

b. Sophie heeft de kok vaak beledigd, maar niet [BLANK].
Sophie has the cook often insulted but not

(8) a. Sophie heeft toen de kok beledigd, maar niet [BLANK].
Sophie has then the cook insulted but not

b. Sophie heeft de kok toen beledigd, maar niet [BLANK].
Sophie has the cook then insulted but not

Contrastive stripping constructions like (7) and (8) require their conjuncts to be discourse-semantically parallel (Schwabe 2000; Umbach 2005). The element that follows negation in the second conjunct is contrasted with an element in the first conjunct, thereby selecting the latter as the (contrastive) focus. The syntactic category of the participant's response thus reflects their selection of the (contrastive) focus in the first conjunct. If the blank is filled with a DP, the participant selected the object as the focus of the first conjunct, but if the blank is filled with a verb, the participant selected the verb (phrase) as the focus. The hypothesis tested in this experiment is that scrambling directly affects discourse structure in case the adverb is sensitive to focus placement, specifically, that the default focus placement in such sentences is on (part of) the content of the adverb's c-command domain. Thus, DP responses are expected to be penalized after scrambled clauses in sentences with a focus sensitive adverb like (7b), because the object *de kok* 'the cook' in the first conjunct is not located within the adverb's c-command domain. This penalty does not apply to sentences with a time-point adverb, like (8b), because these adverbs are not sensitive to focus placement. Verb responses are not penalized after either word order, as the lexical verb is located within the adverb's c-command domain regardless of the scrambling manipulation.

DP responses may moreover be disfavored because of a structural priming effect. The first and second conjunct both involve a scopal element (an adverb or negation). Participants may want to mimic the word order used in the first conjunct in their response, regardless of putative interpretative effects. However, the negation in the second conjunct is already given in the stimulus sentences, rendering the scrambled word order impossible in the second conjunct. DP responses are therefore expected to be disfavored when the scrambled word order is used in the first conjunct, as this would violate structural priming

Table 1: Expected response penalties per condition.

Example	Condition	DP	Verb
(7a)	Focus sensitive, unscrambled		
(7b)	Focus sensitive, scrambled	##	
(8a)	Time-point, unscrambled		
(8b)	Time-point, scrambled	#	

preferences. The structural priming effect is independent of the type of adverb. The penalties for each condition are presented in Table 1, and lead to the following predictions:

i. Verb responses are expected in every condition;
ii. More DP responses are expected after unscrambled structures than after scrambled structures (in line with a strict discourse template and structural priming preferences);
iii. This effect is stronger in sentences with a focus sensitive expression than in sentences with a time-point adverb (in line with Schoenmakers & de Swart 2019).

3.1.1 Participants

39 native Dutch students (35 female; ages 18–26, $M = 19.59$, $SD = 1.68$) participated in an online experiment, receiving course credit for their participation.

3.1.2 Materials

Two factors were crossed in a 2×2 within-participants, within-items design: *object position* (unscrambled vs. scrambled) and *adverb type* (focus sensitive vs. time-point). The experiment contained twelve target sentences like (7) and (8), consisting of a first clause containing the subject (all proper nouns), an auxiliary, an adverb, and a transitive lexical verb with a definite object. Care was taken that both the verb and the object had readily available alternatives (as judged by two independent researchers), and each lexical adverb was used in only one stimulus item. The item set was rather small as a result of these conditions. The second conjunct was always a *but*-clause with negation followed by an ellipsis (…). This design was adopted deliberately to limit response possibilities. A Latin square was used in list distribution. 48 filler sentences were added to the lists, designed in such a way that they could only elicit a response that was either a verb that was not a participle, or a noun that was not a singular definite. No noun phrase or lexical verb occurred more than once throughout the experiment. At least the first three items of each list were filler items and the lists had no consecutive target items. The experiment was conducted in Qualtrics.

3.1.3 Procedure

The experiment was an online questionnaire in which participants were asked to complete sentences using one or a few words. After the last item was presented, participants were asked whether they had ideas about the experiment's purpose, and, if so, what they were. None of the answers were close to the true motivation of the experiment. There was no clear structure in the participants' answers, nor is there reason to believe that participants were able to identify the target sentences.

3.1.4 Analysis and results

Text responses of each participant were annotated as DP (contrasting with the direct object), V (contrasting with the lexical verb), or "other". This last category included responses with contrasting adverbs (4.91% of all responses; e.g. *yesterday* – *today*) and

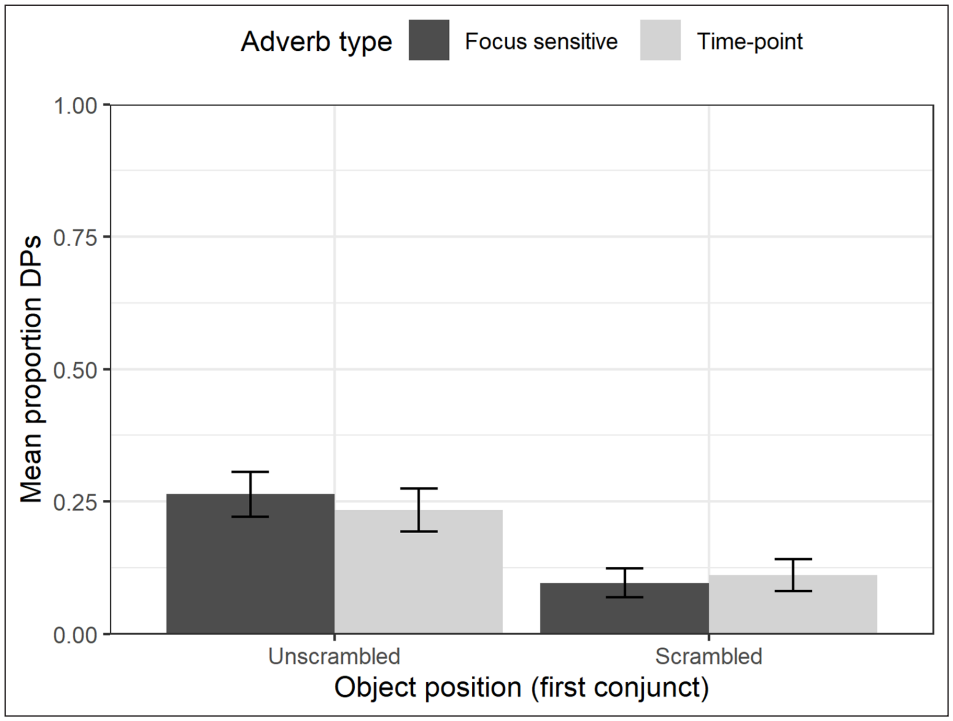

Figure 1: Mean proportion of DP responses per condition (error bars indicate the within-subjects standard error of the mean).

responses that contrasted with the full VP (0.43% of all responses; e.g. *fed the dog – water the plants*). It is worth noting here that participants performed very well in the task. Open production tasks often lead to a large variety of responses, yet only few responses in this experiment were not target-like. These responses were excluded from statistical analysis. Figure 1 visually represents the mean proportion of DP responses per condition. The vast majority of responses were verbs, but this preference is clearly stronger following scrambled structures. The adverb type manipulation did not elicit a noticeable difference in responses.

A mixed-effects logistic regression was performed on the data using R (version 4.0.3) and the *lme4* package (Bates et al. 2015) with response type as the binary dependent variable in the model. The variables *object position* and *adverb type* were entered into the model as fixed effects. Both two-level factors were coded using deviation contrasts (contrasts of –.5, .5). The initial model had the maximum random structure with intercepts for participants and items and by-participant and by-item random slopes for the effect of both independent variables. When the model failed to converge, the random structure was simplified by stepwise removal of the smallest variance component. The final model included intercepts for participants and items, and a by-participant random slope for the effect of *object position*.

The data indicate that more DP responses were given when the stimulus sentence contained an unscrambled structure in the first conjunct than when it contained a scrambled structure ($\beta = -4.33$, $SE = 1.75$, $z = -2.48$, $p = .013$). Whether the adverb was focus sensitive or not did not affect the DP/V ratio in a significant manner ($\beta = -0.11$, $SE = 0.45$, $z = -0.25$, $p = 0.8$). The interaction between the two variables did not reach significance ($\beta = -0.74$, $SE = 0.91$, $z = -0.81$, $p = 0.42$).

3.1.5 Discussion

The grand majority of responses in this task is comprised of verbs. This finding is not unexpected, given that the lexical verb in the first conjunct invariably surfaces on the right side of the adverb. Verb responses do not violate discourse parallels or priming preferences in

any of the conditions. Moreover, the number of accessible candidate antonyms was possibly considerably smaller for the verbs than for the objects, making it easier to choose one of them quickly. There is, for example, only a limited number of antonyms for the verb *insult* (e.g. *compliment, praise, admire*), whereas the list of alternatives for objects like *the cook* is much more open-ended. This might render certain verb responses easier to access than DP responses, a possibility supported by the fact that participants tended to respond with the same verbs. The accessibility of DP alternatives was possibly restricted further by the discourse prominence of definite objects and the lack of a preceding discourse context.

Nevertheless, DP responses were given after both scrambled and unscrambled structures. That is, scrambled objects in the first conjunct were sometimes selected as the (contrastive) focus, and, since the majority of responses were verbs, most unscrambled objects in the first conjunct were not. This pattern diverges from the discourse template assumed in most literature, and the results of this task are therefore an indication that this discourse template is too strict. Still, unscrambled structures were followed by a DP continuation more often than scrambled structures, in spite of the huge verb bias. This finding might simply reflect a structural priming preference, but it could also be taken to suggest that even though discourse relations are not *determined* by the order of constituents at the surface, they might still be *informed* by it (see also Schoenmakers et al. 2020).

Finally, it is rather striking that the data do not reveal a difference between sentences with a focus sensitive or a time-point adverb. This finding sharply contrasts with previous findings in the experimental literature (see Schoenmakers & de Swart 2019). However, it might be that an off-line task is simply not sensitive enough to capture early effects of the experimental manipulation. Participants in this experiment could make use of an extended period of time to resolve anomalies in form–meaning mapping and, moreover, were able to change their initial answers at any given time. Speeded decision tasks, by contrast, delimit and/or measure the time window of a participant's response, and can potentially capture cognitive processes that occur prior to more conscious decision making. Participants in speeded judgment tasks read stimulus sentences in an auto-paced, word-by-word fashion and, at the end of each sentence, judge it as either acceptable or unacceptable as quickly as possible. Their reaction times are measured from the moment the sentence ends until the moment a judgment is given. An advantage of using a speeded judgment task to investigate scrambling is that both reaction times and acceptability judgments are recorded, thereby providing insight in how suitable the two word orders are for the available discourse interpretations as well as an index of the cognitive effort associated with each combination.

The next section reports on a speeded judgment task in which the relation between scrambling, discourse structure, and focus sensitivity in language comprehension is investigated, using stimulus material adapted from that in the fill-in-the-blanks task. But first, a word is in order on how exactly this task taps into sentence processing. Given that language comprehension proceeds incrementally (Phillips 2003), and on the assumption that the parser does not generate multiple representations in parallel when processing ambiguous sentences (e.g. Warner & Glas 1987; Meng & Bader 2000), participants must make certain syntactic commitments during the experimental trial on the basis of the information they already have. In case the parsed structure turns out to be incorrect at the point of disambiguation, it must be revised to save the derivation or to accommodate the intended interpretation (a possible account for scrambling structures is provided in Section 4). Reanalysis is a cognitively costly operation, as the parser has to detect the error and find a way to resolve it (Ferreira & Henderson 1991; Fodor & Inoue 1994; 1998; Sturt et al. 2001). Researchers generally agree that processing difficulty is reflected in increased reaction times, but it has also been shown to affect judgment scores (Fanselow & Frisch 2006; Hofmeister et al. 2014).

The experiment presented in the next section investigates what happens when a structure computed for a scrambling clause is incompatible with the later disambiguated discourse representation. Note that the disambiguation in the experiment is at the very last word of the clause, which is directly followed by the moment of judgment. If sentences with a mismatch between syntax and pragmatics are indeed acceptable, as suggested in Schoenmakers & de Swart (2019) and by the fill-in-the-blanks data, effects of reanalysis are expected to emerge in the reaction time data as well as in the judgment scores. Hence, data from a speeded judgment task are potentially informative about the cognitive processes that take place in the comprehension of scrambling clauses.

3.2 Speeded judgment task

This section investigates whether Dutch scrambling adheres to a strict discourse template in a speeded judgment task. The type of adverb is again predicted to influence structural preferences, in that focus sensitive adverbs affect discourse structure whereas time-point adverbs do not. Participants read sentences like (9) through (12) in an auto-paced, word-by-word fashion. In addition to the manipulations of *object position* (unscrambled vs. scrambled) and *adverb type* (focus sensitive vs. time-point) in the first conjunct, there was a manipulation of *continuation type* (DP vs. VP). Specifically, the second conjunct determines whether the focus of the first conjunct is the direct object, as in (9) and (11), or the verb, as in (10) and (12). Participants were asked whether or not the sentence had likely been produced by a native speaker of Dutch at the end of each sentence. This definition of acceptability was chosen because it helps simulate spoken language and it guides participants towards judgments of native-speaker ability rather than frequency or plausibility (Schütze & Sprouse 2014), and, as Schütze (2016: 184) puts it, "certainly […] one cannot hope for the terms *grammatical* or *acceptable* to have their intended meanings for naive subjects." The judgment scores were logged and reaction times were measured during the participant's decision-making.

(9) a. Sophie heeft vaak de kok beledigd, maar niet [$_{DP}$ de ober].
Sophie has often the cook insulted but not the waiter

b. Sophie heeft de kok vaak beledigd, maar niet [$_{DP}$ de ober].
Sophie has the cook often insulted but not the waiter
'Sophie often insulted the cook, but not the waiter.'

(10) a. Sophie heeft vaak de kok beledigd, maar niet [$_{VP}$ geslagen].
Sophie has often the cook insulted but not punched

b. Sophie heeft de kok vaak beledigd, maar niet [$_{VP}$ geslagen].
Sophie has the cook often insulted but not punched
'Sophie often insulted the cook, but did not punch (him).'

(11) a. Sophie heeft toen de kok beledigd, maar niet [$_{DP}$ de ober].
Sophie has then the cook insulted but not the waiter

b. Sophie heeft de kok toen beledigd, maar niet [$_{DP}$ de ober].
Sophie has the cook then insulted but not the waiter
'Sophie insulted the cook then, but not the waiter.'

(12) a. Sophie heeft toen de kok beledigd, maar niet [$_{VP}$ geslagen].
Sophie has then the cook insulted but not punched

b. Sophie heeft de kok toen beledigd, maar niet [$_{VP}$ geslagen].
Sophie has the cook then insulted but not punched
'Sophie insulted the cook then, but did not punch (him).'

3.2.1 Participants

80 native speakers of Dutch (55 female; ages 17–65, $M = 25.59$, $SD = 9.95$) participated in the experiment, receiving a five euro gift card or course credit for their participation. Data from six participants were discarded because they systematically rated ungrammatical filler items as grammatical or vice versa (with a 70% threshold), or responded incorrectly to more than one third of the comprehension questions.

3.2.2 Materials

Three factors were crossed in a 2 × 2 × 2 design: *object position* (unscrambled vs. scrambled), *continuation type* (DP vs. VP), and *adverb type* (focus sensitive vs. time-point). The stimulus items were the same as in the fill-in-the-blanks task, supplemented with the continuation responses with the highest cloze values. These responses were verbs or definite DPs contrasting with the corresponding constituents in the first conjunct. The first conjunct of the target items again appeared in either scrambled or unscrambled order. The variable *adverb type* was added as a between-subjects factor due to small size of the item set.[2] The test items were distributed in a Latin square design. 48 grammatical and ungrammatical filler sentences based on the filler items in the fill-in-the-blanks task were added to the lists. Twelve of the grammatical filler items were followed by a comprehension question that could be answered with *yes* or *no*. No noun phrase or lexical verb occurred more than once throughout the experiment. At least the first three items of each list were filler items and the lists had no consecutive target items. The experiment was conducted in PsychoPy (version 1.90.3).

3.2.3 Procedure

The experiment was a speeded judgment task in which participants were seated in front of a computer screen to read sentences in an auto-paced, word-by-word fashion. Each word appeared on the screen for 300 ms followed by a 300 ms blank screen. A presentation time of 300 ms is common in this type of experiment and is claimed to be "long enough to complete all normal comprehension processes like lexical access, syntactic integration, and semantic interpretation, but too short to engage in any kind of deliberate reasoning" (Bader & Häussler 2010: 275–276). After the last word of the sentence was presented, a red question mark appeared on the screen. Participants were asked to judge the sentences on the screen for acceptability (yes/no) using the outer buttons on a button box while the red question mark was presented on the screen. Participants were urged to respond as quickly as possible and their reaction times were measured during judgment. In case a participant failed to respond within 2000 ms, the experiment skipped to the next sentence logging a late response, because such long reaction times are unlikely to reflect online processing events. These late responses were discarded from statistical analysis, resulting in a loss of 5.41% of all trials. Late responses were distributed evenly across the target conditions.

3.2.4 Analysis and results

This section first discusses the judgment data in Section 3.2.4.1 and continues to the reaction time data in Section 3.2.4.2.

[2] The participant groups did not differ in terms of reaction times on the shared filler sentences ($t = –0.83$, $p = .411$) or in their accuracy on the comprehension questions ($z = 0.058$, $p = .954$). There was a significant difference between the groups in terms of their endorsement rates of the shared filler sentences ($z = 2.27$, $p = .023$). Participants in the group with focus sensitive adverbs were slightly more permissive of fillers items than participants in the group with time-point adverbs (with respective ratings of 96.5% vs. 92.5% for grammatical fillers and 8.8% vs. 7.5% for ungrammatical fillers). Considering the general pattern, however, it seems safe to presume that the two groups used comparable criteria in their judgments.

Table 2: Mean acceptability rates per condition.

	Scrambled		Unscrambled	
	DP	VP	DP	VP
Focus sensitive adverbs	87.0%	93.5%	95.5%	88.3%
Time-point adverbs	88.3%	97.1%	87.6%	94.1%

3.2.4.1 Judgment scores

The mean acceptability rates per condition are given in Table 2. In every condition, the grand majority of items was accepted (>85%). The data were compared in a generalized linear mixed-effects model with the judgment scores (yes/no) as the binary dependent variable. The variables *object position*, *adverb type*, and *continuation type* were added to the model as fixed effects. All three two-level variables were coded using deviation contrasts (contrasts of –.5, .5). The model included random intercepts for item and participant. Inclusion of additional random slopes led to singularity and convergence problems.

The data do not provide evidence for a difference in judgments between scrambled and unscrambled structures ($\beta = 0.09$, $SE = 0.30$, $z = 0.30$, $p = .767$) or between structures with a focus sensitive expression and structures with a time-point adverb ($\beta = –0.25$, $SE = 0.45$, $z = –0.56$, $p = .574$). Moreover, scrambled and unscrambled structures received similar judgments across the two adverb types ($\beta = –0.67$, $SE = 0.61$, $z = –1.10$, $p = .272$). There was an overall preference for verbal continuations ($\beta = –0.63$, $SE = 0.31$, $z = 2.04$, $p = .042$), which was stronger in sentences with a time-point adverb than in sentences with a focus sensitive expression ($\beta = 1.57$, $SE = 0.62$, $z = 2.56$, $p = .011$). The significance of this effect is not surprising, because only focus sensitive expressions are assumed to affect discourse structure.

Finally, unscrambled structures were accepted more often than scrambled structures with DP continuations, and scrambled structures were accepted more often than unscrambled structures with verbal continuations ($\beta = –1.46$, $SE = 0.61$, $z = –2.39$, $p = .017$). This pattern either reflects the hypothesized effect of an erroneous mapping between syntax and pragmatics, or a structural priming effect. Although the non-significance of the three-way interaction ($\beta = –1.44$, $SE = 1.22$, $z = –1.18$, $p = .237$) hints that the observed pattern is due to a priming effect, a closer look at the data indicates that this cannot be the case: verbal continuations in sentences with time-point adverbs were accepted more often than DP continuations, regardless of the object's position in the first conjunct. Hence, participants did not accept sentences more often if the relative order of object and adverb was identical in the two conjuncts. The conclusion must be that the strong overall preference for verbal continuations overshadows a possible three-way interaction effect. The reaction time data reported in the next subsection provide a more fine-grained measure to examine a mapping effect that is sensitive to the type of adverb.

Most importantly, the judgment data indicate that utterances in all four conditions are considered highly likely to be produced by a native speaker of Dutch. This finding does not corroborate the claim that Dutch scrambling adheres to a strict discourse template.

3.2.4.2 Reaction times

The reaction time data in milliseconds were log-transformed to reduce a skew in the distribution prior to statistical analysis. A linear mixed-effects analysis was performed on the log-transformed data.[3] Only reaction times of trials which were judged as acceptable were

[3] Some researchers argue that log-transformations of data do not improve statistical power or Type I error control (e.g. Schramm & Rouder 2019). Here, an lmer model on the untransformed reaction time data yields qualitatively identical results.

entered into the model, which was designed as follows. The log-transformed reaction times constituted the dependent variable, with the variables *object position*, *adverb type*, and *continuation type* entered as fixed effects. All factors were coded using deviation contrasts (contrasts of –.5, .5). The initial model had the maximum random structure. When the model failed to converge, the random structure was simplified by step-wise removal of the smallest variance component. The final model included intercepts for participants and items, and a by-participant random slope for the effect of *continuation type*. The condition means for the log-transformed reaction times are presented in Figure 2.

Reaction times did not differ significantly between items with a scrambled or unscrambled structure ($\beta = 0.00$, $SE = 0.03$, $t = 0.16$, $p = .871$), between items with a focus sensitive or time-point adverb ($\beta = 0.09$, $SE = 0.08$, $t = 1.19$, $p = .240$), or between items with a DP or verbal continuation ($\beta = 0.00$, $SE = 0.05$, $t = 0.03$, $p = .978$). There were no differences in reaction times between scrambled and unscrambled items depending on the type of adverb ($\beta = –0.05$, $SE = 0.06$, $t = –0.92$, $p = .360$), nor differences between items with a focus sensitive or time-point adverb depending on the type of continuation ($\beta = –0.02$, $SE = 0.06$, $t = –0.28$, $p = .777$). However, there were significant delays when there was a structural mismatch between the first and the second conjunct ($\beta = 0.21$, $SE = 0.06$, $t = 3.53$, $p < .001$). Crucially, this mismatch only led to a significant slowdown in items with a focus sensitive adverb ($\beta = 0.25$, $SE = 0.12$, $t = 2.09$, $p = .037$), indicating that the effect is not due to a purely syntactic mismatch (i.e. a priming effect). Rather, it is due to a mismatch between syntax and discourse structure.[4,5]

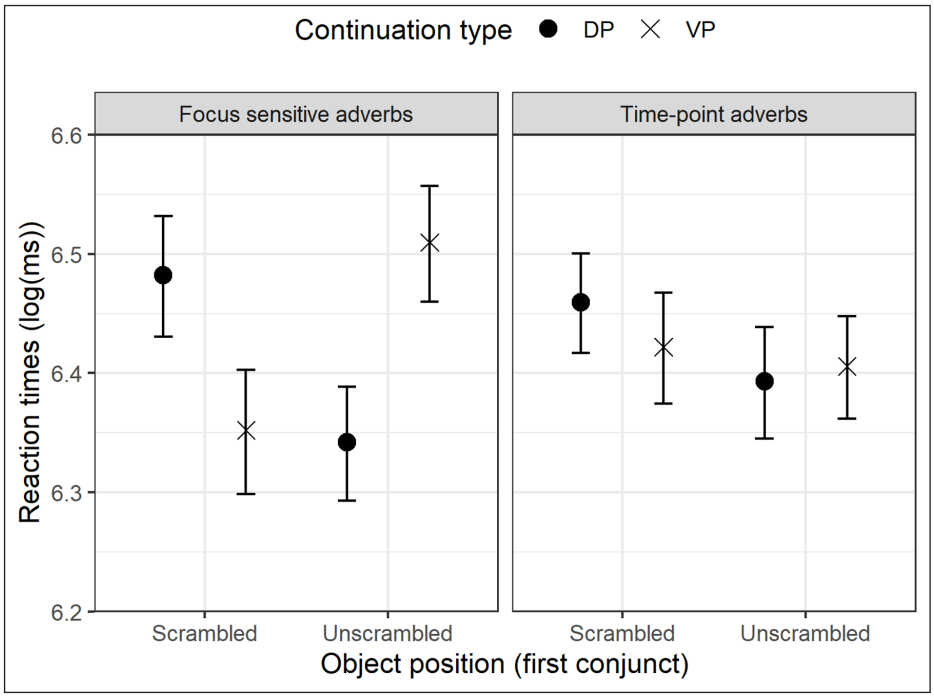

Figure 2: Condition means for log-transformed reaction times (error bars indicate the within-subjects standard error of the mean).

[4] Separate 2 × 2 models on items with a focus sensitive or a time-point adverb confirm that the interaction effect between *object position* and *continuation type* reaches significance in the former model only. Such cross-over interactions cannot be "transformed away" (Loftus 1978), so the absence of one in the items with a time-point adverb is striking.

[5] Four of the focus sensitive adverbs in the experiment can be analyzed as operators instead of adverbs, in that they adjoin to DP instead of VP. Exclusion of these items did not lead to a qualitative difference in the statistical analysis (in fact, the three-way interaction effect was clearer without these items: $\beta = 0.37$, $SE = 0.13$, $t = 2.74$, $p = .006$).

3.2.5 Discussion

The main findings of the speeded judgment task are that Dutch scrambling structures are perfectly acceptable even if there is a mismatch between syntax and discourse structure, and that, although these mismatches were hardly ever rejected, they did cause lower judgment scores as well as a delay in reaction times as compared to the matched conditions. This was only the case when the adverb was sensitive to focus placement, which means that there was no "hidden" interaction effect among the items with a time-point adverb that is merely harder to notice by intuition because time-point adverbs are not truth-conditional (as suggested in e.g. Ruys 2001). Since the processing difficulty associated with scrambling constructions is affected by the focus sensitivity of the adverb, the effect cannot be attributed to a structural priming effect either. Moreover, the results indicate that the object's discourse status is not determined by a mapping rule like the one proposed in Neeleman & van de Koot (2008), as it is sensitive to the object's syntactic environment. In particular, it is sensitive to whether or not the object is located in the c-command domain of a focus sensitive expression. Lexical information about the nature of the adverb is therefore crucial to the behavior of definite objects in Dutch scrambling structures. Clearly, definite objects in Dutch scrambling constructions can be interpreted at a position different from where they are phonetically realized. Mismatches between syntax and pragmatics are a genuine option in Dutch scrambling structures.

4 Deriving discourse relations in Dutch scrambling

This section presents a syntactic account of the experimental data presented in Section 3. It is important to note that the account proposed here is just one possible grammatical system for capturing the new facts. The experiments in the previous section do not test this proposal, instead the experimental data are logically prior to it and therefore feed it. The main claim of the proposal presented here is that the locus of scrambling is in syntax, while discourse-interpretive effects are derived post-syntactically at the syntax-pragmatics interface.

Building on the finding that mismatches between syntax and pragmatics are available in Dutch scrambling structures, I argue that such mismatches are derived by familiar scope-shifting operations that render movement invisible to interpretation or to phonetics. These operations allow constituents to be interpreted at a position different from where they are phonetically realized (Fox 1999; 2000; Reinhart 2006). It follows that this analysis requires scrambling to involve movement (following e.g. Vanden Wyngaerd 1989; Schaeffer 1997; 2000; Broekhuis 2008). I furthermore assume that discourse relations are uniquely represented at a distinct grammatical level dedicated to information structure (e.g. Vallduví 1992; Lambrecht 1994; Bailyn 1995; 2012; Erteschik-Shir 1997; Zubizarreta 1998), which I will refer to as Functional Form (after Bailyn 1995; 2012), and that discourse relations are derived from c-command (cf. Neeleman & van de Koot 2012). Specifically, focus sensitive adverbs by default accommodate the sentence focus within their scope, but some freedom is allowed in their relative placement (see also Foolen et al. 2009).

A definite object's discourse status depends on its syntactic environment. The default discourse reading of a definite object is focal (discourse-new) when located within the c-command domain of a focus sensitive expression, and non-focal (discourse-old) when located outside of this domain. However, this discourse template can be overruled by contextual factors, as demonstrated in the experiments presented in Section 3. Additional processing difficulty is incurred when this happens, reflected in the behavioral data as a decrease in judgment scores and a rise in judgment times. No such effect emerged in sentences with a time-point adverb; here definite objects can be interpreted as focal (discourse-new) or non-focal (discourse-old) without incurring additional processing difficulty, regardless of their position relative to the adverb. We can conclude from this that

time-point adverbs do not affect discourse structure.[6] I will exclude these adverbs from further analysis and concentrate on scrambling structures with a focus sensitive adverb instead. Importantly, an analysis of the discourse effects in scrambling must adequately represent the cognitive consequences associated with revisions of the discourse representation, given that the processor has as one of its tasks to identify discourse relations. In this section, I argue that the processing difficulty associated with mismatches in scrambling structures is a reflection of scope-shifting operations that are required to achieve the inverse reading.

The data presented in the last section closely resemble patterns attested in the experimental literature on scope ambiguities. Consider the ambiguous sentence and its possible readings in (13).

(13) A kid climbed every tree.
  a. $\exists x$, x a kid, such that $\forall y$, y a tree, x climbed y. (surface-true)
  b. $\forall y$, y a tree, $\exists x$, x a kid, such that x climbed y. (inverse)

A well-established finding in the psycholinguistic literature is that the interpreter initially consults the linear order of elements to determine scope relations, as in (13a), and that computation of the inverse reading in (13b) comes at an increased processing cost (e.g. Tunstall 1998; Anderson 2004; Reinhart 2006). Various theories of scope relations have been proposed to account for these behavioral effects (see Brasoveanu & Dotlačil 2019 for an overview). For instance, Neeleman & van de Koot (2012) propose that the inverse reading is computed by means of scope extension (after Williams 1994).

Another analysis of scope ambiguous constructions argues that the inverse reading is derived by covert scope-shifting operations (Fox 1999; 2000; Reinhart 2006). In what follows, a version of this analysis will be adopted to account for Dutch scrambling constructions. Scope-shifting operations come in two flavors, *reconstruction* and *Quantifier Raising*, and create a configuration for which the structural representations at LF and PF do not match. These operations are subject to economy principles and apply only when an interpretation cannot otherwise be derived. Fox (1999) argues that sentences like (14) demonstrate the availability of scope reconstruction. This sentence is ambiguous with regard to the content of the quantifier's scope. The sentence has a reading in which a specific person from New York is very likely to win the lottery, and a broader reading in which the city of New York is very likely to yield a winner.

(14) [$_{QP}$ Someone from New York] is very likely ~~someone from New York~~ to win the lottery.

According to Fox, the ambiguity in (14) is due to the fact that QP's scope can be construed at its base position or at its landing site. In the former case, the quantifier is interpreted at a position that is different from where it is phonetically realized, and, as Fox (1999: 158) puts it, "the semantic effects of movement are "undone"."

Quantifier Raising, by contrast, is a scope-shifting operation that yields the exact opposite effect. Scope-ambiguous sentences like (13), repeated here as (15), are normally interpreted in linear fashion, see (15a). In order to derive the inverse reading, the QP *every tree* raises to a position to the left of *a kid* at LF. This covert operation is illustrated in (15b).

[6] Time-point adverbs are known to have a rather free distribution in the universal hierarchy of adverb types (Cinque 1999). Therefore, another possible explanation for the absence of a significant effect among these items in the experimental data is that the time-point adverbs were generated in (or moved to) different positions in the clause (see also Broekhuis & Corver 2016: Section 8.2.3).

(15) A kid climbed every tree.

a. [a kid [every tree [~~a kid~~ climbed ~~every tree~~]]]
∃*x* : *x* a kid ∀*y* : *y* a tree (*x* climbed *y*).
'There is a kid who climbed every tree.'

b. [every tree [a kid [~~every tree~~ [~~a kid~~ climbed ~~every tree~~]]]]
∀*y* : *y* a tree ∃*x* : *x* a kid (*x* climbed *y*).
'For every tree, there is a kid who climbed it.'

The interpretation site of the quantified phrase in (15b) is again different from where it is phonetically realized, although this time the movement is invisible at PF, while it does trigger a semantic effect. I propose that the experimental data from Section 3 can be explained by incorporating pragmatic equivalents of scope reconstruction and Quantifier Raising into the analysis.

Having established that mismatches between syntax and pragmatics are grammatical but marked in Dutch scrambling constructions, I now proceed to present a syntactic account for them. I assume that scrambling is movement prompted by a scrambling feature [+Σ] (see Grewendorf & Sabel 1999; Sauerland 1999; Kawamura 2004), which is optionally assigned to lexical items that enter the derivation. Crucially, the [+Σ] feature does not have (discourse-)semantic content (see Haider 2020). Definite objects that are equipped with the [+Σ] feature move to a scrambled position in syntax, while [–Σ] objects remain in unscrambled position. With the addition of pragmatic equivalents of the scope-shifting operations described above, the analysis predicts that both word orders in scrambling constructions have two possible sites for pragmatic interpretation.

The structure in (16) represents the base order of a scrambling clause. I assume that direct objects are generated as complements of the verb and that (focus sensitive) adverbs adjoin to *v*P. The object DP in this example does not carry the [+Σ] feature and thus remains in unscrambled position. Because the object is located within the c-command domain of the focus sensitive adverb, it is by default interpreted as focal (discourse-new). The mapping between syntax and pragmatics can then proceed straightforwardly: if the object is selected as the focus in discourse, its discourse status matches its syntactic environment.

(16)

[$_{vP}$	vaak	… [$_{VP}$	de	kok$_{[-\Sigma]}$	beledigen]]	
	often		the	cook	insult	

Suppose now that the context that follows requires the verb instead of the object to be in focus. In this scenario, there is a mismatch between syntax and pragmatics, because the object appears in the focus sensitive adverb's c-command domain, but is not selected as the focus in discourse. The data in Section 3 prove that this reading is a genuine option for the surface sequence in (16), albeit a marked one. I submit that this reading can be derived by a pragmatic equivalent of Quantifier Raising (Fox 2000). Specifically, the object DP *de kok* 'the cook' in (16) covertly migrates to a higher position outside of the scope of the focus sensitive adverb to resolve the syntax–pragmatics mismatch, as in (17). This "anti-focus" process yields the inverse discourse reading, as the object is now interpreted in a position different from where it is phonetically realized. I will refer to this process as *Pragmatic Raising*.

(17)

Phonetic Form:					[$_{vP}$	vaak … [$_{VP}$	de kok	beledigen]]]		
Functional Form:	[$_{vP}$	de	kok	[$_{vP}$	vaak … [$_{VP}$	~~de kok~~	beledigen]]]			
		the	cook		often			insult		

Pragmatic Raising is subject to the same economy conditions as Quantifier Raising and only applies when the appropriate discourse interpretation cannot otherwise be derived. I take the cognitive effort associated with Pragmatic Raising to be reflected in the experimental data as increased reaction times and decreased judgment scores (see Section 3.1.5). Participants accepted a sentence less often and took longer to respond to a sentence when it contained a non-focal object in unscrambled position, as compared to a focal object in the same position, but such syntax–pragmatics mismatches are nonetheless fully acceptable.

Now consider the structure in (18). The object DP in this example is assigned the [+Σ] feature and consequently moves to (at least) the outer edge of *v*P (Chomsky 2001).[7] In this configuration, the object is not located within the focus sensitive adverb's c-command domain and therefore does not normally receive a focal (discourse-new) reading.

(18) [$_{vP}$ de kok$_{[+\Sigma]}$ [$_{vP}$ vaak … [$_{VP}$ ~~de kok~~ beledigen]]
the cook often insult

However, the experimental data indicate that a focal reading is in fact possible for scrambled objects. Once again, the situation leads to a mismatch between syntax and pragmatics, which can be accounted for if scope reconstruction is taken to apply at the syntax-pragmatics interface. The object DP can be interpreted at its base position inside the focus sensitive adverb's c-command domain (i.e. at the site of its lower copy in (18)), or at its landing site outside of the focus sensitive adverb's c-command domain (i.e. at the site of its higher copy in (18)). To paraphrase Fox (1999), the discourse-semantic effect of the movement can be "undone". This is demonstrated in (19).

(19) Phonetic Form: [$_{vP}$ de kok [$_{vP}$ vaak … [$_{VP}$ ~~de kok~~ beledigen]]]
Functional Form: [$_{vP}$ vaak … [$_{VP}$ de kok beledigen]]]
often the cook insult

Like Pragmatic Raising, reconstruction incurs additional processing difficulty. Mismatches between syntax and pragmatics are acceptable, but participants took longer to respond to sentences with a focal object in scrambled position than to sentences with a non-focal object in this position. The mismatching conditions were hardly ever rejected, but did receive lower judgment scores than the matching conditions. I take these differences to reflect the cognitive effort associated with reconstruction.

Note that the scope-shifting operations illustrated in (17) and (19) are each other's mirror image. An analysis that takes scope-shifting operations to apply at the pragmatics interface goes a long way in explaining the experimental data. Syntax–pragmatics mismatches yield acceptable but marked structures, which in the experiment led to a decrease in judgment scores and an increase in reaction times. This section argued that these effects result from cognitively costly scope-shifting operations; Pragmatic Raising and reconstruction. I conclude that scrambling is an optional movement that sometimes can be invisible to phonetics (Pragmatic Raising) or to discourse-interpretation (reconstruction).

5 Conclusion

The central claim of this article is that definite object scrambling in Dutch is not as restricted as commonly claimed in the literature. Sentences in which surface order and discourse structure do not match are perfectly acceptable by virtue of the parser's ability to shift

[7] Alternatively, it can be assumed that the Dutch middle-field has a designated position for (contrastively) focalized material (e.g. Neeleman 1994; Barbiers 2002; Broekhuis & Corver 2016: Section 13.3.2). However, these analyses cannot explain the discrepancy in the reaction time data between sentences with focus sensitive and time-point adverbs without additional stipulations.

scope relations. These scope-shifting operations, reconstruction and Pragmatic Raising, are cognitively costly and induce additional processing difficulty. Hence, scrambling is informed but not determined by discourse conditions.

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Competing Interests

The author has no competing interests to declare.

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