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# PROSODIC DISAMBIGUATION AND THE SCOPE AMBIGUITY OF SENTENCES WITH NEGATION AND DISJUNCTION IN DUTCH

Angeliek van Hout<sup>1</sup>, Jelle Kisjes<sup>1,2</sup>, Antoine Cochard<sup>1,3</sup>, Máté Gulás<sup>4,5</sup>, Jack Hoeksema<sup>1</sup>, Elena Pagliarini<sup>6</sup>, Mieke Sarah Slim<sup>7</sup>, Annika van Wijk<sup>1</sup>, Balázs Surányi<sup>4,5</sup>

### Abstract

Work on the prosody-semantics interface has established that prosody can disambiguate sentences, including constructions with a scopal interaction of two logical connectives. Our study presents a novel case, investigating the effect of prosody on the interaction of sentences with negation and disjunction in Dutch. In a perception experiment 46 adult native speakers of Dutch took a forced-choice selection task for Dutch sentences similar to *Some children don't like red or blue*. They were given stories that focused on the OR narrow scope ('neither A nor B') or the OR wide scope reading ('not A or not B') and had to select one of two audio recordings of the same sentence that differed prosodically. For the OR narrow scope reading, participants strongly preferred a prosodic contour with neutral accent on OR, whereas for the OR wide scope reading they preferred a rise-fall contour with a pause before OR. These patterns show that prosody plays a role in distinguishing the two readings. This finding contributes new insights from prosody about the nature of a typological distinction between languages where some, like Dutch, prefer the OR narrow scope reading and others the OR wide scope reading.

1. Center for Language and Cognition Groningen, Rijksuniversiteit Groningen

2. Hanze University of Applied Sciences

3. Laboratoire de Linguistique de Nantes, Nantes Université

4. HUN-REN Hungarian Research Centre for Linguistics

5. Pázmány Péter Catholic University

6. Departament de Filologia Catalana, Centre de Lingüística Teòrica, Universitat Autònoma de Barcelona

7. Max Planck Institute for Psycholinguistics

Corresponding author: Angeliek van Hout, [a.m.h.van.hout@rug.nl](mailto:a.m.h.van.hout@rug.nl)

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## 1. Introduction<sup>1</sup>

There is a long standing tradition in the prosody-semantics interface of investigating how prosody can help disambiguate ambiguous sentences. It has been found that prosody plays a role with the ambiguity that arises with the scopal interaction of two logical connectives, for example, negation and universal quantification (Jackendoff, 1972; Syrett, Simon and Nisula, 2014a). The effect of prosody on the scope interaction of negation and disjunction has only been investigated in one recent study with French preschoolers (Larralde, Konradt & Szendrői, 2021) and another one with Hungarian adults (Surányi & Gulás, 2022). In Szabolcsi's (2002) typology of disjunction, French and Hungarian are both characterized as a language type that disprefers the narrow scope interpretation of disjunction in negative sentences. Here, we explore the issue experimentally in Dutch, a language that is assumed to belong to the other main class of languages in Szabolcsi's typology, characterized by the opposite scope preference.

Specifically, the aim of our study is to investigate the association between different prosodic contours and the two readings of negative sentences with disjunction. For example, for the sentence *Mary doesn't like coffee or tea*, the narrow scope of OR expresses a 'neither A nor B' reading (she likes 'neither coffee nor tea'). On the wide scope reading of OR the reading is disjunctive ('she doesn't like coffee, or she doesn't like tea, but I don't know which she doesn't like'). In a perception experiment with Dutch listeners we compared two different prosodic contours to probe people's preferred contour for each of these two readings. Our study contributes novel insights about the prosody-semantics interface, as we found strong associations between reading and prosodic contour. It furthermore speaks to the typological generalization that languages differ in their preferred reading of negated sentences with disjunction (Szabolcsi, 2002). This preference was indeed confirmed for the contour with neutral prosody. More importantly, the non-preferred reading became highly accessible for the rise-fall contour with a prosodic break before OR.

## 2. Background

### 2.1 Negative sentences with disjunction

Sentences with two logical operators pose a challenging puzzle for the relation between natural language and logic. Even though there are two possible ways in the logical representation in which the two operators interact, which means that such sentences are ambiguous, native speakers most often assign only one interpretation, and disprefer or even reject the other one. The puzzle is especially interesting because the interpretation patterns (which one is the acceptable, dispreferred or unacceptable reading) differ across languages. The current study focuses on sentences with two such operators: disjunction and negation. In the logical representation of such sentences there are two possible scopes: disjunction can either have narrow or wide scope, (1).<sup>2</sup>

- (1) a. Narrow scope interpretation of OR:  
       NEG > OR → ‘neither A nor B’  
        $\neg(A \vee B) = (\neg A \wedge \neg B)$
- b. Wide scope interpretation of OR:  
       OR > NEG → ‘not A or not B’  
        $(\neg A) \vee (\neg B)$

It has been shown that there are crosslinguistic differences with respect to the availability of one or both of these readings. It has been argued that there are two classes of languages (Szabolcsi, 2002). In one type of language both the narrow and wide scope reading for OR are available, whereas in another type only the wide scope reading is claimed to be available. English and Dutch are examples of the former type. In these languages a ‘neither A nor B’ reading for (2) is strongly preferred. Nevertheless, it is possible to access the ‘not A or not B’ reading given an appropriate discourse context. For example, (3) illustrates a context when the less preferred, wide scope reading of OR can be accessed easily (Verbuk, 2007). In Dutch, a context like (4) brings out the wide scope reading of OR (example provided by Jack Hoeksema, p.c.).

- (2) a. The cat does not like carrots or peppers. (English)  
 b. De kat houdt niet van wortels of paprika's. (Dutch)  
 'The cat doesn't like either vegetable.'
- (3) Speaker A: I know that Mary does not speak one of the languages that were in the job description. Do you remember which language she doesn't speak?  
 Speaker B: Mary does not speak Russian or German (but I don't remember which).  
 Verbuk (2007)
- (4) Context: John is holding up an adaptor and seems to be looking for his device.  
 Blijkbaar kan hij zijn telefoon of laptop niet vinden. (Dutch)  
 apparently can he his cell phone or laptop not find  
 'Apparently he cannot find his cell phone or laptop (but I don't know which).'
- Hoeksema (p.c)

Other languages have been argued to have the opposite interpretation preference, including Catalan (Pagliarini, Reyes, Guasti, Crain & Gavarró, 2021), French (Spector, 2014), Hungarian (Szabolcsi, 2002), Italian (Pagliarini, Crain & Guasti, 2018), Japanese (Goro & Akiba, 2004), Mandarin (Crain, 2012), Russian (Verbuk, 2007) and Turkish (Geçkin, Thornton & Crain, 2018). The preferred interpretation of sentences with negated disjunction in these languages is the OR wide scope reading ('not A or not B'). This is illustrated in (5) (examples are taken from a crosslinguistic study by Pagliarini et al., 2022).

- (5) a. Le chat n'a pas mangé la carotte ou le poivron. (French)  
 the cat CL has NEG eaten the carrot or the pepper
- b. A cica nem ette meg a répát vagy a paprikát. (Hungarian)  
 the cat not ate PRT the carrot or the pepper
- c. Il gatto non ha mangiato la carota o il peperone. (Italian)  
 the cat NEG has eaten the carrot or the pepper  
 'The cat does not like the carrot or she doesn't like the pepper (but I don't know which veggie she does not like)'
- Pagliarini et al. (2022)

The division between the two types of languages has been taken to reflect an underlying lexical parameter that characterizes disjunction words as a positive polarity item or not, i.e. the parameter is set as +PPI or -PPI (Crain, 2012). A +PPI disjunction word cannot appear inside the scope of negation. Instead, it must take wide scope, hence the availability of only one reading ('not A or not B',  $\forall b$ ). In languages where OR is -PPI, there is no similar restriction. As a result, both scope orders are possible, and both readings are in principle acceptable.

However, it has recently turned out that both narrow and wide scope interpretations are accessible after all, not only in -PPI languages such as English and Dutch, but also to some extent in +PPI languages (Lungu, Fălăuș & Panzeri, 2021). Collecting native speakers' judgements in an online questionnaire, Lungu and colleagues presented participants with negative sentences with disjunction followed by a short discourse which brought out either the narrow or the wide scope reading of OR. Native speakers of English and Romanian (two -PPI type languages) and French and Italian (two +PPI languages) assessed the felicity of these brief stories with a graded acceptability task (using a scale of 1 to 7). Surprisingly, in the +PPI languages, the narrow scope reading of OR was accepted, even more or less to the same extent as the wide scope reading, contrary to expectations from theories that link scopal interactions tightly to a PPI parameter. Lungu and colleagues conclude that the acceptance patterns do not support a clear-cut distinction between two types of languages, and, moreover, that the PPI nature of the disjunction element in a language does not seem to play a deciding role in restricting the scopal interaction possibilities. This means that an explanation of the crosslinguistic distribution of preferred interpretations in terms of a parameterized characterization of OR may be on the wrong track. Nevertheless, there were also some differences across the four languages, relating to the different degrees to which the narrow scope reading of OR is dispreferred. Lungu and colleagues raise a question for further research: given crosslinguistic differences in preferences for one reading over the other, why is the narrow scope reading of OR more strongly dispreferred in certain languages than in others? They point out briefly, citing a suggestion by Jing (2008) for English, that prosody may play a crucial role. The aim of our study is to investigate the role of prosody for scope preferences in sentences with negation and disjunction.

## 2.2 Prosody and scope ambiguity

The effect of prosody on the interpretation of ambiguous sentences has been widely studied in work on the prosody-semantics interface, which has shown that prosody is essential in listeners'

interpretations (Gussenhoven, 2006). As for logical connectives, the disambiguating role of prosody on the scope interaction of negation and universal quantifiers was first discussed by Jackendoff (1972), developing work by Bolinger (1965). For an ambiguous sentence such as (6), Jackendoff claims that a sentence-final fall contour gives a narrow scope reading of negation, whereas a fall-rise contour gives a wide scope reading (Bolinger’s A and B accent, respectively). A similar connection between prosody and scope inversion has also been established for German (Bühning, 1997; Krifka, 1998).

(6) All the men didn’t go. Jackendoff (1972)

a. Negation narrow scope: “As for all of the men, they didn’t go”.

ALL the men didn’t go



b. Negation wide scope: “It is not the case that all of the men went, only some of them did”.

ALL the men didn’t go



Jackendoff’s work spurred much subsequent research on the interface of prosody with semantics and pragmatics (e.g., Kadmon & Roberts, 1986; Ladd, 1980; Ward & Hirschberg, 1985), as well as in psycholinguistics (Fodor, 2002). There are several psycholinguistic experiments testing constructions with scope ambiguity, for example, focus particles *even* and *only* and the interaction of negation and sentence connective *because* (Hirschberg & Avesani, 2000).

Despite the straightforward predictions that follow from Jackendoff’s (1972) claim about prosody and scopal ambiguity, only few studies have systematically examined to what extent prosody indeed affects listeners’ interpretation of scopally ambiguous sentences, and which aspects of prosody are crucial. In two perception studies, Syrett et al. (2014a) compared two different prosodic contours (Jackendoff’s sentence-final fall versus rise-fall) for sentences with negation and a universal quantifier to see if English listeners would be sensitive to prosody, and, if so, if they would show a preference for the narrow or wide scope reading of negation given the prosodic cue. Experiment 1 used minimal pairs of prosodically different sentences that had a falling or a non-falling contour, (6). Participants heard only one of the sentences of these pairs. Their task was to first listen to the sentence and then choose which one of two

follow-up sentences made most sense in a story. These were formulated so that a particular continuation targeted one or the other reading, illustrated in (7).

- (7) All moms did not allow eyeliner. Syrett et al. (2014a)
- a. They were all in agreement. (Targeting negation narrow scope)
  - b. Only the moms of the older girls let their daughters wear it. (Targeting negation wide scope)

In Experiment 2, the task was to read a story, then listen to two recordings of the same sentence with a different prosodic contour (falling and non-falling), and finally choose the most appropriate one given the preceding discourse. An example of a context that favored the narrow scope reading of negation is illustrated in (8).

- (8) Several young girls wanted to have a make-up party together. Some of them thought their mothers wouldn't let them use eyeliner. In fact, the moms were all on the same page. *All the moms didn't allow eyeliner.* The girls were limited to mascara and blush. Syrett et al. (2014a)

In both experiments, participants were able to identify the matching follow-up sentence (Exp. 1) or prosodic contour (Exp 2). The falling contour was related to the negation narrow scope reading and the non-falling contour to the negation wide scope reading. Syrett and colleagues concluded that listeners indeed make use of prosodic cues to disambiguate scope ambiguities in sentences with negation and a universal quantifier. Their findings thus support Jackendoff's (1972) original hypothesis about the association of specific prosodic contours with certain interpretations of scopally ambiguous sentences.

Prosody has also been found to play a role for sentences with another logical operator, namely, disjunction. In a perception experiment with native speakers of English, Pruitt and Roelofsen (2013) tested if prosody disambiguates questions with English *or* which can either be interpreted as alternative questions or as simple yes/no-questions, (9).

- (9) Did Sally bring wine or bake a dessert? Pruitt & Roelofsen (2013)
- a. Alternative-question reading:  
 "Which of these two things did Sally do: bring wine or bake a dessert?"

## b. Yes/no-question reading:

“Did Sally do any of these things: bring wine or bake a dessert?”

The experiment compared contours with a sentence-final rise, which is canonically associated with a yes/no-question-interpretation, to contours with a fall, which is associated with an alternative-question interpretation.<sup>3</sup> The task for participants was to choose one of two paraphrases for the questions they listened to. The results showed that for disjunctive questions with a rise, listeners indeed selected the yes/no-question interpretation, whereas for those with a fall, they chose the alternative-question interpretation. Pruitt and Roelofsen conclude that the sentence-final part of the contour offers an important prosodic cue for the interpretation of disjunctive questions.

A recent acquisition study is highly relevant for the current work as it investigated the role of prosody for negative sentences with disjunction (Larralde et al., 2021). In a perception experiment, Larralde and colleagues investigated if French preschool children were sensitive to prosody when interpreting negative sentences with disjunction, such as (10).

(10) Le dinosaure a mangé le bonbon, mais n’ a pas mangé la pomme ou l’ orange.

‘The dino ate the candy, but did not eat the apple or the orange’. (French)

Larralde et al. (2021)

One group of participants heard sentences with neutral intonation on the disjunction word *ou* ‘or’ and another group heard sentences with prosodic stress on it. It was predicted that neutral intonation on OR would yield a narrow scope reading of disjunction, whereas prosodic stress on OR would yield a wide scope interpretation. In a truth-value judgment task, participants had to assess the critical sentences for two different types of situations: the dino had not eaten either piece of fruit (‘neither A nor B’), which is true on the narrow scope reading of disjunction, or the dino had eaten one, but not the other fruit (‘not A or not B’), which is true on the wide scope reading of disjunction.

In a pre-test of the experiment with neutral intonation on OR, a control group of French adult listeners unanimously preferred the ‘neither A nor B’ reading, and rejected the ‘not A or not B’ reading. Surprisingly, this finding reveals the opposite interpretation pattern of what has been claimed as default reading in semantic analyses of French OR in negative sentences (Spector, 2014). Furthermore, in the questionnaire study of Lungu and colleagues (2021), no default interpretation could be established, as both readings were accepted (on an acceptability



scale up to 6, the mean acceptability for OR narrow scope was 5.47 and for OR wide scope was 5.2). Lungu and colleagues used a questionnaire with a written task though, so their study does not speak to the role of prosody (absence or presence of stress on OR). Crucially, Larralde and colleagues' findings also do not align with two other, recent experimental studies with adult French participants (Cochard, Demirdache & van Hout, 2023; Pagliarini et al., 2022). These studies also tested negative sentences with disjunction with a truth-value judgment task, and the critical sentences were spoken with neutral intonation on OR. The first study found the opposite interpretation pattern from Larralde and colleagues, namely, acceptance of 'not A or not B' and rejection of 'neither A nor B' (Pagliarini et al., 2022). The second study found two subgroups among the French adults with one group consistently interpreting French OR in negative sentences as 'neither A nor B', and the other group interpreting it as 'not A or not B' (Cochard et al., 2023). It is not clear what can explain the differences between all these studies on French.

Coming back to Larralde and colleagues' (2021) main experiment comparing neutral prosody versus prosodic stress on the disjunction word, this was only conducted with preschoolers (mean age of 5;3). There was indeed a significant effect of prosody across the two child groups: the greater part of the difference came from a higher rate of acceptance of the 'not A or not B' reading in the group who heard prosodic stress on OR (37%) than in the group who heard neutral prosody on OR (7%). In addition, both groups of children overwhelmingly accepted the 'neither A nor B' reading (85% in the group with prosodic stress on OR and 96% in the group with neutral intonation on OR). The 'neither A nor B' interpretation clearly was the preferred reading for both prosodic contours. This is unsurprising, as this has been found as the initial interpretation of learners across many child languages, including languages in which 'not A or not B' is the preferred reading for adults (Crain, 2012; Geçkin et al. 2018; Goro & Akiba, 2004; Pagliarini et al., 2018, 2021, 2022). Unfortunately, Larralde and colleagues' experiment investigating the effect of stress on French OR did not include adult listeners. This makes it difficult to generalize the finding that "prosodic focus on the disjunctive is a successful cue to induce the marked scope reading" (Larralde et al., 2021: 8) to adult language processing.

Note that in Larralde and colleagues' (2021) study with French children, the effect of prosodic stress on the disjunction word did not actually switch the interpretation pattern in the two child groups. Rather, it merely led to somewhat higher acceptance of the 'not A or not B' reading. In a recent study with Hungarian adults, the effect of prosodic structure similarly affected the acceptance rates of the 'not A or not B' and the 'neither A nor B' reading of sentences with negated disjunction in Hungarian, without reversing the direction of the

acceptability difference between the two interpretations (Surányi & Gulás, 2022). In Surányi and Gulás' (2022) perception study, adult participants assessed the acceptability of negated disjunctive sentences such as (11) for situations corresponding to a 'neither A nor B' reading or a 'not A or not B' reading. The prosodic realization of the critical sentences was varied. One realization included the negation word and the rest of the sentence, containing both disjuncts, in a single intonational phrase, with negation bearing an accent, Figure 1. The other prosody, which is closer to the neutral realization of such sentences, split the same prosodic material into two intonational phrases, with an intonational phrase break, also marked by a pause, positioned between the two disjuncts, before OR. The two disjuncts were accented and carried a rise-fall contour, Figure 2.

- (11) A malac nem ette meg a répát vagy a paprikát. (Hungarian)  
 The piglet not eat.PAST PRT the carrot.ACC or the pepper.ACC  
 'The piglet didn't eat the carrot or the pepper.'

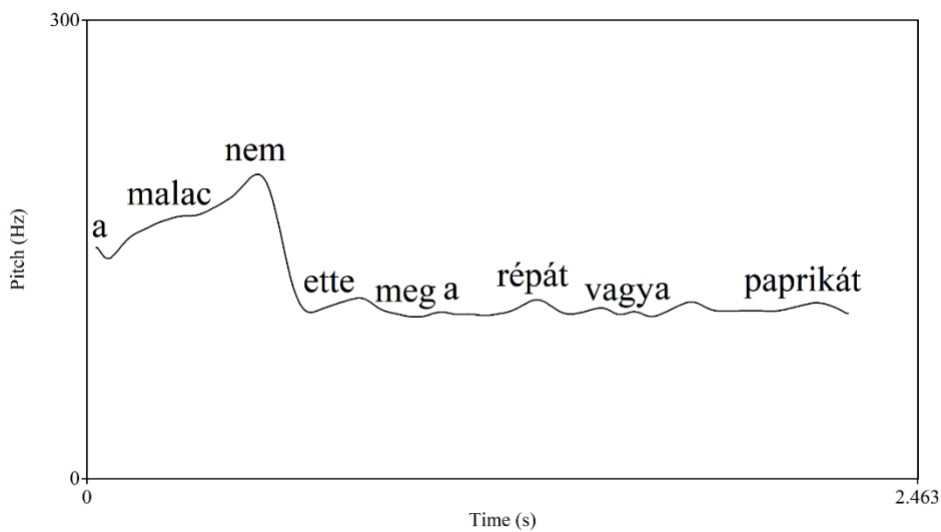


Figure 1: Single intonational phrase prosodic realization of a critical sentence in Surányi & Gulás (2022)

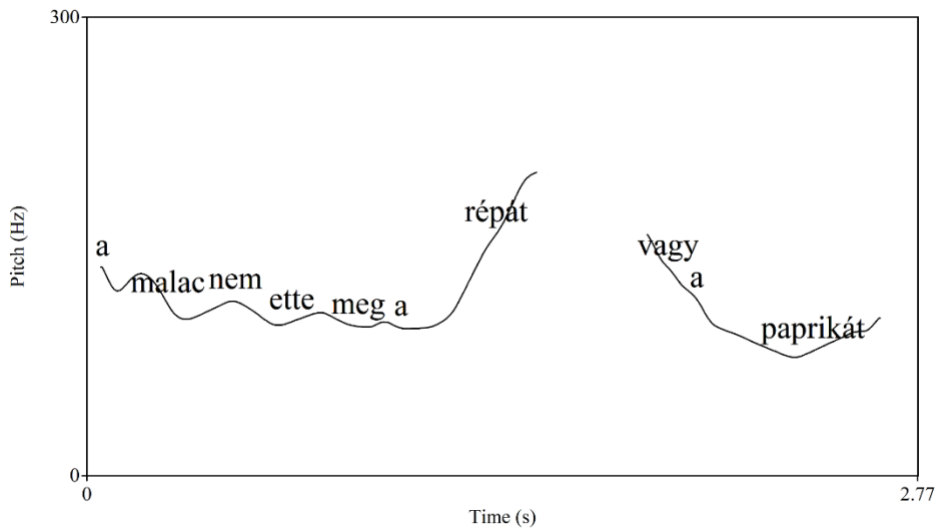


Figure 2: Double intonational phrase prosodic realization of a critical sentence in Surányi & Gulás (2022)

The results of revealed that the ‘not A or not B’ reading was significantly more often accepted than the ‘neither A nor B’ reading in both prosodic conditions, Nevertheless, the difference between the acceptability of the two readings was greatly reduced in the single intonational phrase realization as compared to the double intonational phrase realization. Thus, the acceptance rate of the ‘not A or not B’ reading was 92% in the double intonational phrase prosody, and dropped to 66% in the single intonational phrase realization, Moreover, the acceptance rate of the ‘neither A nor B’ interpretation was only 22% in the double intonational phrase contour, and increased to 45% in the single intonational phrase condition. Surányi and Gulás (2022) conclude that despite the overall higher acceptability of the ‘not A or not B’ reading, which is the expected pattern in a +PPI language like Hungarian, prosody played a significant role in shaping the availability of the other scope interpretation.

Summarizing, the work on prosodic disambiguation of sentences with negation and universal quantifiers (Jackendoff, 1972; Syrett et al., 2014a) and on disjunctive questions (Pruitt & Roelofsen, 2013) offers a promising perspective to investigate the role of prosody in sentences with negation and disjunction. Two recent studies on French (Larralde et al., 2021) and Hungarian (Surányi & Gulás, 2022) show how prosody can raise acceptance of the non-preferred reading. Both French and Hungarian are categorized in Szabolcsi’s (2002) typology as languages in which disjunction is a PPI. No study has investigated the effect of prosody on scope assignment in sentences with negation and disjunction in a language such as Dutch in which disjunction is not categorized as a PPI, and in which the ‘neither A nor B’ reading is

preferred by default. More generally, no study has directly tested the strength of the actual preference of one prosodic realization over another in negated disjunctive sentences in any language. These are the gaps that the current study aims to fill.

### 2.3 Negated disjunction in Dutch

In Dutch sentences with negation and disjunction, the negating element can take one of two forms: adverb *niet* ‘not’ or quantifier *geen* ‘no’. These give the same meaning, (12). In sentences with a verb that subcategorizes for a prepositional complement such as *houden van NP* ‘like’ in (12a), negation is expressed by the adverb *niet* ‘not’. In transitive sentences with a verb and direct object, on the other hand, sentence negation is typically expressed by quantifier *geen* ‘no’ in the object NP, which is illustrated for *lusten* ‘like’ in (12b).

- (12) a. De beer houdt **niet** van wortels of paprika’s. (Dutch)  
the bear likes **not** of carrots or peppers  
‘The bear does not like carrots or peppers.’
- b. De beer lust **geen** wortels of paprika’s. (Dutch)  
the bear likes **no** carrots or peppers  
‘The bear does not like carrots or peppers.’

In (12b), there is no ambiguity; negated disjunction with quantifier *geen* ‘no’ necessarily gives the ‘neither A nor B’ reading. Negated disjunction with *niet* ‘not’ allows both interpretations. While the ‘neither A nor B’ reading (12a) is the preferred one (Pagliarini et al., 2022), context can override this, as illustrated in (4) above.

Following Szabolcsi (2002), Van Wijk, Slim, Hoeksema and Van Hout (2019) suggest that prosody plays a role in triggering one of the two possible readings of negated disjunction with *niet* ‘not’, (12a). Whereas Szabolcsi points out that stress on OR can give rise to the narrow scope reading of OR, Van Wijk and colleagues argue the opposite for Dutch: while neutral prosody on OR gives the narrow scope reading of OR in (12a) (‘neither A nor B’), a prosodic contour with non-neutral stress on OR can give access to the wide scope reading of OR (‘not A or not B’). According to their native speakers’ intuition, stress on OR even seems necessary to access the wide scope reading.

## 2.4 Present Study

Framed against a long line of research on the prosody-semantics interface (Gussenhoven, 2006; Kadmon & Roberts, 1986; Ladd, 1980; Ward & Hirschberg, 1985), our study develops an old idea about the disambiguating role of prosody for the scope interaction of logical connectives (Jackendoff, 1972) by applying it to a novel pair of operators, negation and disjunction. It furthermore contributes to theories about crosslinguistic variation in the interpretation of negative sentences with disjunction (Szabolcsi, 2002), by developing an experimental approach to test recent ideas about the role of prosody and the preferred interpretation of such sentences (Lungu et al., 2021; van Wijk, 2019; Jing 2008). Thus, our study aimed to establish whether prosody has an effect on the interpretation of such sentences. Comparing neutral and marked prosodic contours, we wanted to see if there are different prosodic preferences for the OR narrow scope reading ('neither A nor B') and OR wide scope reading ('not A or not B, but I don't know which'). To find out, we designed a web-based perception study with a forced-choice task with adult Dutch native speakers. Their task was to select one of two prosodic contours as the preferred description of a short story. If prosody plays a role, it was expected that the neutral contour would be selected for stories that established a 'neither A nor B' reading, whereas the non-neutral contour would be selected for stories that established a 'not A or not B' reading.

## 3. Method

### 3.1 Participants

45 Adult native speakers of Dutch participated in a web-based study (mean age 21.4, range 15-51). Many of the participants were recruited in one of Jack Hoeksema's courses for first year students of Dutch. Participants had little to no background in formal semantics. They were not compensated for their time, but they were invited to join a raffle for a voucher for a large online store.

### 3.2 Design and Materials

We used a forced-choice preference task to see which of two prosodic contours was preferred for each of the two possible interpretations of disjunction in negative sentences (OR narrow scope and OR wide scope). Participants read a brief story, which brought out one of the two interpretations of the critical sentence, and then listened to two pre-recorded audios of the same sentence. Their task was to choose which of the two recordings matched best with the story. This task was similar to the one used by Syrrett and colleagues (2014a) in their second perception experiment.

We only varied story context: one type of story targeted a ‘neither A nor B’ interpretation (OR narrow scope) and the other an ‘not A or not B (but I don’t know which)’ interpretation (OR wide scope). For each critical sentence we created two stories. The stories started with the same sentence. For each story of a minimal pair the topic differed in such a way that only one of the two readings would fit logically. Sample stories and accompanying critical sentences are illustrated in (13)-(14). The stories were distributed across two lists, so that participants would get only one story of a given pair and hear the two recordings of the accompanying test sentence only once. Appendix 1 lists the story pairs for all critical items.

(13) Sample story and critical sentence for OR narrow scope (‘neither A nor B’):

- a. Op de verjaardag van mijn zoon kregen de kinderen allemaal een zakje met snoepjes mee als afscheidscadeau. Eerst hadden we ze alleen in rode en blauwe zakjes gestopt, maar ik heb ook maar een paar groene zakjes gevuld. Kinderen zijn namelijk erg kieskeurig.  
 ‘At my son’s birthday party, all the kids got a party bag with sweets at the end. Initially we had only used red and blue bags, but then I made sure to also get some green bags, because children can be very picky.’
- b. Sommige kinderen houden niet van rood of van blauw.  
 some children like not of red or of blue  
 ‘Some children don’t like red or blue’.
- c. Target reading:  
 “Some children like neither blue nor red (so they want a different color).”

- (14) Sample story and critical sentence for OR wide scope ('not A or not B, but I don't know which'):
- a. Op de verjaardag van mijn zoon kregen de kinderen allemaal een zakje met snoepjes mee als afscheidscadeau. Deze had mijn vrouw in rode en blauwe zakjes gestopt, precies genoeg voor iedereen. Ik heb van beide maar wat extra zakjes gevuld. Kinderen zijn namelijk erg kieskeurig.  
At my son's birthday party, all the kids got a party bag with sweets at the end. My wife had put the sweets in red and blue bags, just enough for everyone. I filled a couple more bags of each color, because children can be very picky.
  - b. Sommige kinderen houden niet van rood of van blauw.  
some children like not of red or of blue  
'Some children don't like red or blue'.
  - c. Target reading:  
"Some children don't like blue or they don't like red (so they want the other color)."

For each story we recorded a pair of test sentences, one with neutral prosody and the other with non-neutral prosody.<sup>4</sup> Using the native-speaker intuitions of the five Dutch members among our team of authors, we decided to use the following prosodic characteristics. In the audio with neutral prosody, a neutral sentence accent fell on *niet* 'not' and there was a sentence-final fall. There was no distinct pitch on *of* 'or' or on either disjunct, no pause between the disjuncts and no pitch accents (neither on the first disjunct nor on the second). It was expected that this prosodic contour would be associated with the narrow scope reading of OR in (13b) ('neither A nor B'), because this reading is the default one for Dutch. In contrast, in the audio with non-neutral prosody, the contour involved a combination of several prosodic features: a rise on the first disjunct, a pause of 300 msec. before OR, a high pitch on OR and a fall on the second disjunct. It was expected that this contour facilitates access to the wide scope reading of OR in (14b) ('not A or not B'). As this is the non-preferred reading, we hypothesized that a special intonation can help bring out this reading. Some of these features were similar to those used in Pruitt and Roelofsen's (2013) study on disjunctive questions presented above who used an accent on each disjunct and a prosodic phrase boundary between the two disjuncts in their multiple-accent contour.<sup>5</sup> Figures 3 and 4 illustrate the two prosodic contours for the critical sentences in (13)-(14).

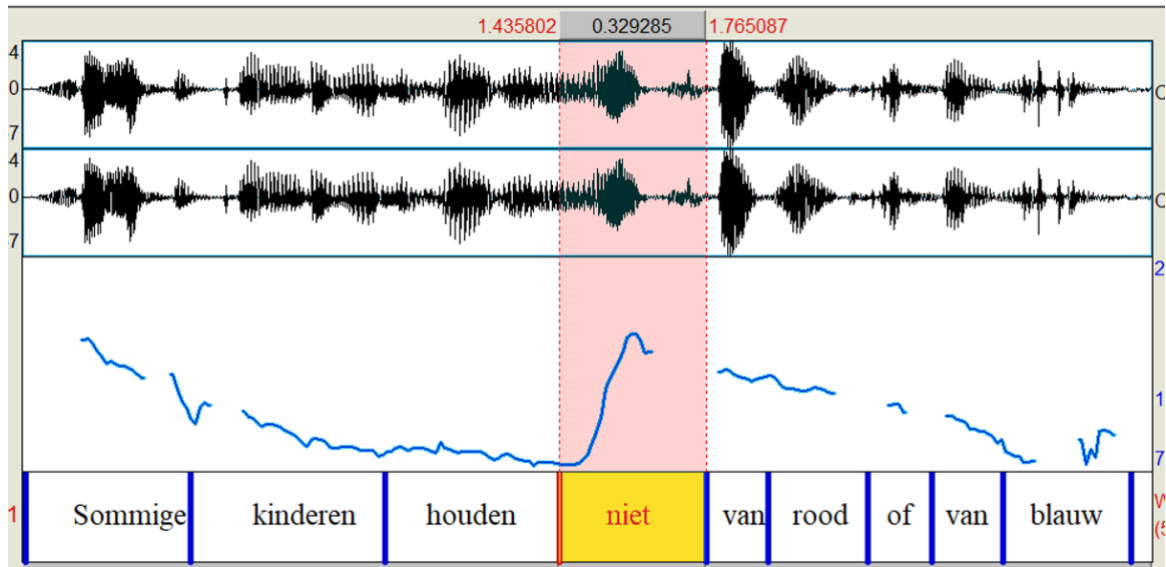


Figure 3: Contour with neutral prosody

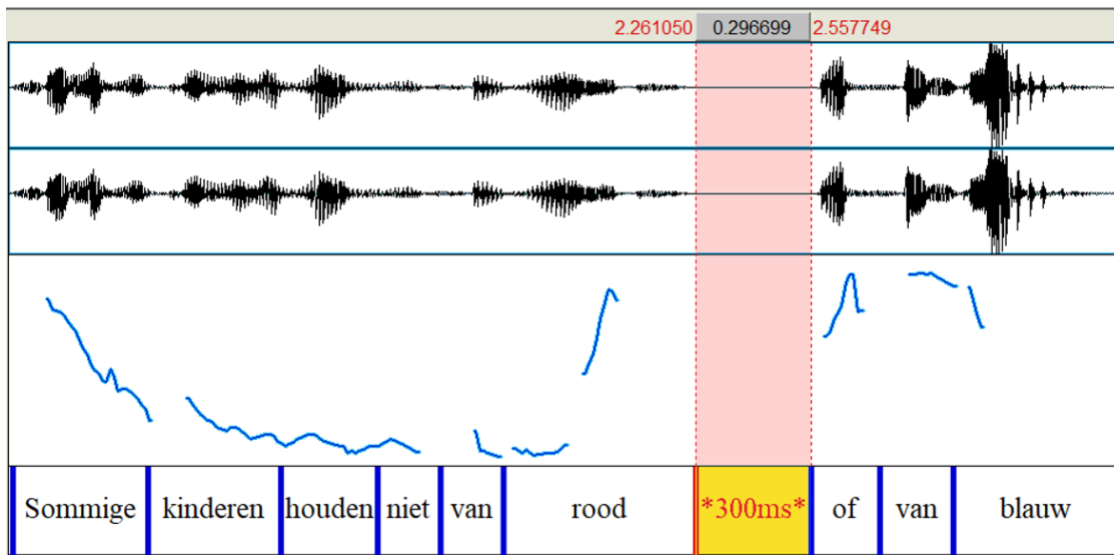


Figure 4: Contour with non-neutral prosody

The sentence pairs were recorded by a native Dutch male (the second author) in a soundproof studio and edited using Adobe Audition. Participants saw six items for each condition, 12 critical items in total.

In addition to the critical items, there were 12 filler items for which we also created brief stories. Filler sentences introduced a contrast to a story presented in prior discourse. For half of the fillers the contrast was related to the subject of the filler sentence, and for the other half to the verb phrase. For each story we created pairs of prosodically different sentences, with the location of focal stress either on the subject noun or on the verb phrase, resulting in a



continuation with a matching intonation (in the filler sentence stress appeared on the new noun or verb that contrasted with the noun or verb in the preceding story) and a mismatching one (stress appeared on the maintained noun or verb). A pair of filler items is illustrated in (15)-(16), with focal stress indicated in capitals. Appendix 2 lists all filler items.

(15) Sample filler item with contrast on the agent noun:

- a. In de advertentie van het circus stond dat hun chimpansee trompet ging spelen tijdens het optreden. Maar het bleek dat dit niet helemaal klopte.  
‘The ad from the circus said that their chimpanzee would play the trumpet during the show. But this turned out to be not quite right.’
- b. Focus stress match: De GORILLA speelde trompet tijdens de show.  
‘The GORILLA played the trumpet during the show.’
- c. Focus stress mismatch: De gorilla speelde TROMPET tijdens de show.  
‘The gorilla played the TRUMPET during the show.’

(16) Sample filler item with VP contrast:

- a. In de advertentie van het circus stond dat hun chimpansee trompet ging spelen tijdens het optreden. Maar het bleek dat dit niet helemaal klopte.  
‘The ad from the circus said that their chimpanzee would play the trumpet during the show. But this turned out to be not quite right.’
- b. Focus stress match: De chimpansee speelde juist PIANO tijdens de show  
‘The chimpanzee played the PIANO during the show.’
- c. Focus stress mismatch: De CHIMPANSEE speelde juist piano tijdens de show  
‘The CHIMPANZEE played the piano during the show.’

For filler items where the contrast concerned the agent participant in the story (for example, contrasting chimpanzee to gorilla in (15)), preference was expected for the audio with stress on the new subject. Conversely, for items where the contrast concerned the kind of action (for example, contrasting playing the trumpet to playing the piano in (16)), preference was expected for the audio with the new element in the VP stressed (verb or direct object). The filler items were distributed across two lists, so that participants would see only one version of the story with a given pair of audios. The filler items served two purposes: i) filter out any participants who were not paying attention, and ii) disguise the purpose of the task for the critical items.

In addition to critical and filler items, there were three practice items before participants started the experiment. For each practice item, a target sentence was pronounced with a neutral declarative intonation (sentence-final fall) and with a question intonation (sentence-final rise). The practice stories immediately preceding these two prosodic realizations of the target sentence were designed so that two of them required the following sentence to have declarative intonation and one called for question intonation. The aim of the training was to familiarize participants with the structure of the test items and the nature of the audio-selection task.

In total, there were 27 items (3 practice, 12 critical, 12 filler). The order of critical items and fillers was pseudorandomized, making sure that at most two consecutive critical items were of the same type (stories with OR wide scope versus OR narrow scope), regardless of how many filler items came in between.

### 3.3 Procedure

The experiment was created in OpenSesame (Mathôt & March, 2022) and the data was collected in a web-based protocol. The link to the experiment was distributed via a course link for first-year majors of Dutch at the University of Groningen in one of Jack Hoeksema's courses as well as via the second author's personal network.<sup>6</sup> The data was stored on a university server. Participants took the test on a pc or laptop. They were advised to wear headphones while taking the test, and to make sure they were in a quiet space where they would not be disturbed. They were also asked to check the sound level before starting the test by listening to a mock sentence.

Participants were instructed to carefully read each short story that appeared on the screen, and click the speaker symbol on the screen when they were ready. Subsequently, two recordings of the same sentence were played which sounded slightly different from each other, the second one directly following the first. While each of the recordings was playing, a speaker symbol lit up on the right or left-hand side of the screen; these symbols were numbered 1) and 2). Next, participants saw a screen with a question in the middle (*Welke versie heeft jouw voorkeur?* 'Which version do you prefer?') and the numbers 1 and 2 on each side of the screen. Figure 5 shows the structure of a sample item.

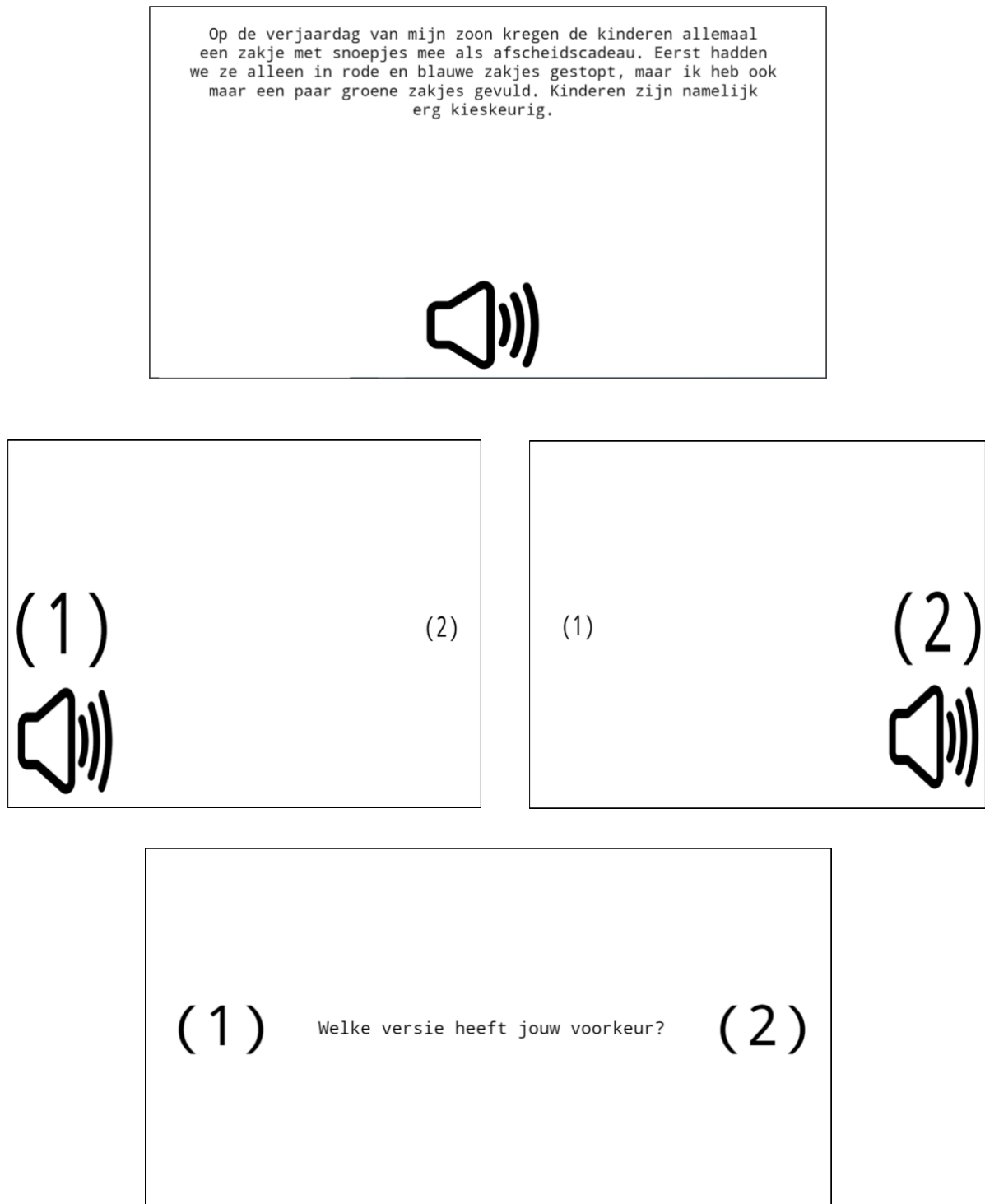


Figure 5: Item structure illustrated for critical sentences (13)-(14)

The task was to click as quickly as possible on the number of the audio that sounded best. Reaction times were automatically recorded from the offset of the audio that was played last. During the training, participants were informed that there were no right or wrong answers, and that they should simply follow their intuition.

Before starting the experiment, participants filled out a brief questionnaire asking their gender, age and profession or studies, and were asked to give permission to use their data. The experiment was approved by the ethical committee of the Faculty of Arts, University of Groningen.<sup>7</sup>

#### 4. Results

All participants passed the inclusion criterion for the fillers (10, 11 or 12 correct out of 12). The analyses below present the data of the 45 participants. Figure 6 shows how often each of the prosodic contours was selected for the two types of story contexts. Despite a slight overall preference for neutral prosody (57%), the results clearly show different preferences for the two readings of negative sentences with disjunction. For the OR narrow scope reading ('neither A nor B'), the Dutch listeners mostly selected the recording with neutral prosody (85%), and for the OR wide scope reading ('not A or not B'), they chose the recording with non-neutral prosody more often (70%).

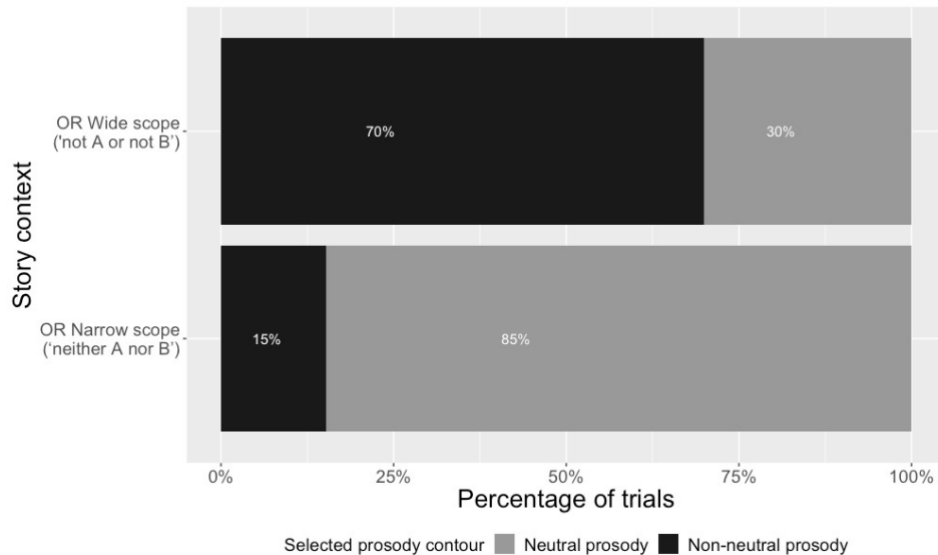


Figure 6: Choice of preferred contour for OR narrow scope and OR wide scope contexts

We used R (R Core Team, 2022) and lme4 (Bates, Maechler & Bolker, 2015) to perform a linear mixed effects analysis of the relationship between context and preference for prosodic contour. As fixed effects, we entered context into the model. As random effects, we had intercepts for subjects and items, as well as by-subject and by-item random slopes for the effect

of context. Visual inspection of residual plots did not reveal any obvious deviations from homoscedasticity or normality. P-values were obtained by likelihood ratio tests of the full model with the effect in question against the model without the effect in question. The model reveals a significant effect of context on prosody preference ( $\beta = 2.970$ ,  $p < .001$ ).

Looking at the individual patterns in prosody preference, we counted for each participant how often they selected the contour with non-neutral prosody in each condition. Figures 7 and 8 present these counts for the OR narrow scope and OR wide scope reading, respectively. The two figures are each other's mirror image. For the OR narrow scope 'neither A nor B' reading in Figure 7, most participants ( $n=36$ ) consistently selected the contour with neutral prosody 5 or 6 times out of 6 (there were 6 items in each condition). There was no one who preferred the non-neutral prosody for the 'neither A nor B' reading. For the OR wide scope 'not A or not B' reading in Figure 8, half of the participants ( $n=24$ ) always or almost always chose the contour with non-neutral prosody (5 or 6 times out of 6), and another 10 chose it most of the time (4 times out of 6). Note that some people preferred the audios with neutral prosody for the 'not A or not B' reading. In other words, they did not modulate their prosodic preference across the two readings.

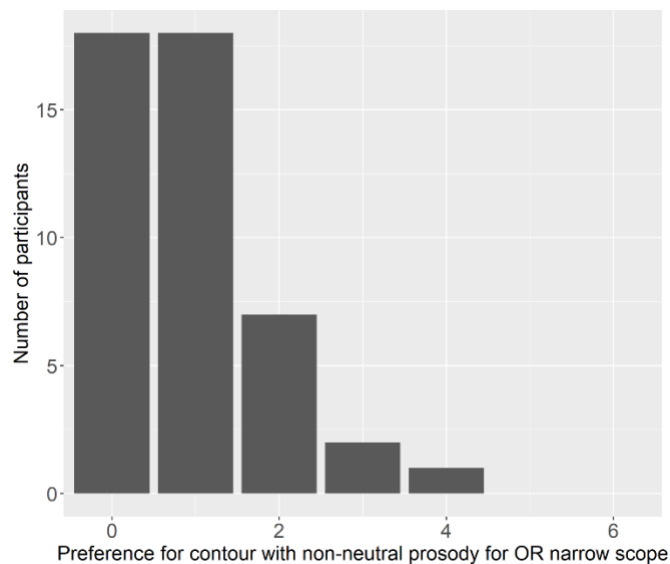


Figure 7: Number of participants and the number of times (between 0 to 6) they selected the contour with non-neutral prosody for the OR narrow scope context ('neither A nor B')

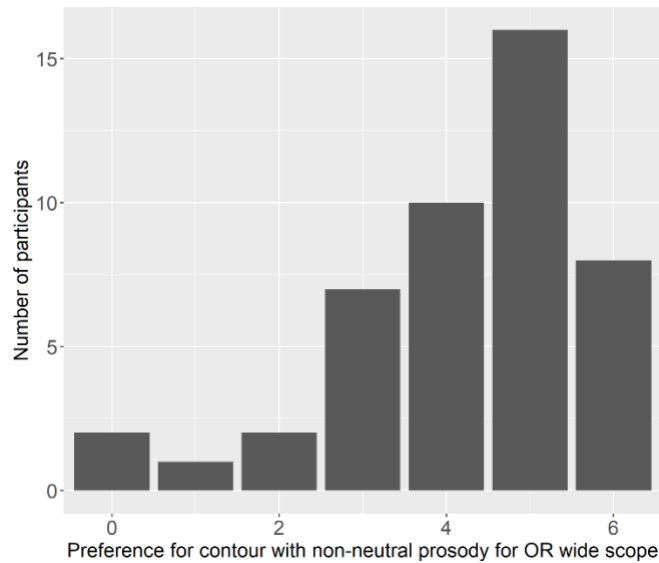


Figure 8: Number of participants and the number of times (between 0 to 6) they selected the contour with non-neutral prosody for the OR wide scope context ('not A or not B')

Next, looking more closely at the individual patterns for both of the readings in tandem, Figure 9 plots the distribution of participants' preferences for each contour by context type ('neither A nor B' reading on the X-axis and 'not A or not B' reading on the Y-axis). Most participants appear in the bottom-right corner of the plot. These people favored the contour with neutral prosody for the 'neither A nor B' reading, and, moreover, (almost) always preferred the contour with non-neutral prosody for the 'not A or not B' reading. Other people only occasionally preferred the contour with non-neutral prosody for the 'not A or not B' reading (middle area at the bottom), and consistently preferred the contour with neutral prosody for the 'neither A nor B' reading. And less than a handful of people had a mostly consistent preference for the contour with neutral prosody (bottom-left corner), regardless of the reading. Note that there was one outlier in the set of 45 participants who accepted the prosody with non-neutral prosody more frequently for the OR narrow scope reading than for the OR wide scope reading (the one in the middle above the diagonal line).<sup>8</sup>

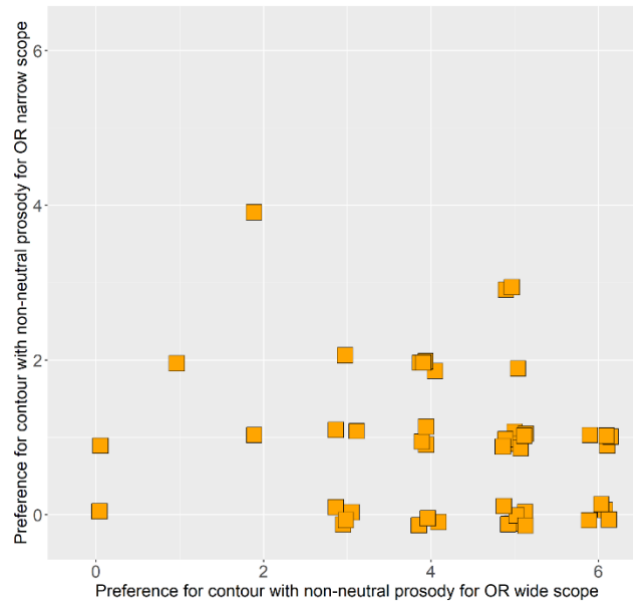


Figure 9: Distribution of participants as to how often they selected the non-neutral contour for the OR wide scope context (on the X-axis) and for the OR narrow scope context (on the Y-axis) (maximum number is 6)

In summary, the two different meanings ‘neither A nor B’ and ‘not A or not B’, as brought out by the story context, clearly affected people’s individual prosody preferences. Most participants favored the contour with neutral prosody for the ‘neither A nor B’ reading, and the contour with non-neutral prosody for the ‘not A or not B’ reading.

## 5. Discussion

Sentences with two logical operators are often ambiguous. Yet, native speakers most often have a clear interpretation preference for one or the other reading. For sentences with negation and disjunction, this preference varies crosslinguistically (Szabolcsi, 2002). An explanation for this difference has been offered, proposing a parametric difference of the positive polarity status of disjunction words across languages as +PPI or -PPI (Crain, 2012; Szabolcsi, 2002), although this parameterized explanation has recently been empirically challenged (Lungu et al., 2021). At present, it is not clear what can explain the different preferences across and within languages. For other types of sentences with two logical operators, it has been argued that prosody plays an important role in disambiguation (Jackendoff, 1972), and several experimental studies offer support for this claim (Pruitt & Roelofsen, 2013; Syrett et al., 2014a). The idea that prosody

plays a role in determining scope interaction has also been suggested for sentences with negation and disjunction (Han & Romero 2004; Jing 2008; Lungu et al., 2021; van Wijk et al., 2019). A recent acquisition study tested this idea in French children (Larralde et al., 2021), and another study explored the issue in Hungarian adults (Surányi & Gulás, 2022), both of which are +PPI languages where OR wide scope ‘not A or not B’ is the preferred reading. Our study is the first to investigate the effect of prosody in a language in which disjunction is not categorized as +PPI, and in which the ‘neither A nor B’ reading is the preferred one. As far as we know, testing preference of one prosodic realization over another in negated disjunctive sentences has not been done directly in any language.

Dutch sentences with negated disjunction are ambiguous between an OR narrow scope reading (‘neither A nor B’) and an OR wide scope reading (‘not A or not B, but I don’t know which’). The narrow scope reading is the preferred one in Dutch (as established in Pagliarini et al., 2022). Inspired by Jackendoff’s (1972) idea about another type of scope ambiguity (i.e., negation vis-à-vis universal quantification), we hypothesized that a special prosodic contour can facilitate access to the OR wide scope reading. The results showed a clear effect of interpretation on prosodic preference. For the OR narrow scope reading, participants strongly preferred a contour with a neutral sentence accent on the disjunction word *of* ‘or’, and no pauses or rises. In contrast, for the OR wide scope reading, they mostly preferred the contour with a high pitch on the first disjunct, a pause, high pitch on OR and a fall on the second disjunct. These findings show how the two different scope readings are associated to two different prosodic contours, suggesting that a special intonation can help bring out a non-preferred reading.

Our results are in line with several other experimental studies on prosody and the interpretation of scope ambiguity. The role of prosody was first pointed out for the scope interaction of negation and universal quantifiers for sentences such as (6) (Jackendoff, 1972). This was confirmed experimentally many years later (Syrett et al., 2014a). Our experiment used the same forced-choice selection method as the second experiment in Syrett and colleagues’ perception study. Similar to their study, we also found that when the scope of the two logical operators is unambiguous in a given context, listeners preferred different prosodic contours for different interpretations.

There are three prior studies that have also looked at the interpretation of disjunction related to different prosodic contours. There, the task was to choose a particular interpretation given a certain prosodic contour. Pruitt and Roelofsen (2013) found that in English the most dominant property cueing the interpretation of interrogatives with disjunction is the sentence-



final contour. When such questions were pronounced with a final fall, they were interpreted as alternative questions, (9a). Conversely, when they were pronounced with a final rise, which is the canonical contour for interrogatives, they were interpreted as yes/no-questions, (9b). Their conclusion that the sentence-final part of a prosodic contour provides the best clue for disambiguation raises an interesting question for our findings. While the two contours that were contrasted in our study also differed at the end of the sentence (a fall for the neutral prosody and a rise-and-fall for the non-neutral prosody), the contour with non-neutral prosody involved several other prosodic elements as well (a high pitch on the first disjunct and on the negation word, a pause after the first disjunct). It might be interesting to investigate which (combination) of elements affects interpretation most robustly in negative sentences with disjunction.

In the French acquisition study of Larralde and colleagues (2021), the prosodic element that was investigated was presence or absence of prosodic stress on OR in the same ambiguous construction as ours, negative sentences with disjunction. They compared how French children interpreted different prosodic contours for sentences like (10), and found a difference between the group who heard these sentences with neutral prosody on OR and the group who heard them with prosodic stress on OR. They only collected data from children though, not adults, which makes a comparison between their findings and ours uneven. Nevertheless, the results from their study and ours point in the same direction, namely, prosody plays an important role in the disambiguation of scope interaction.

The same conclusion is reached in Surányi and Gulás' (2022) experiment on Hungarian, another language in which, like French, disjunction is categorized in Szabolcsi's (2002) typology as +PPI. Although no direct comparison with the outcomes of the current experiment is possible due to differences in methodology, the results from the Hungarian adults converge with ours in that they also suggest that the two readings, 'not A or not B' and the 'neither A nor B', may favor different prosodic realizations. As Surányi and Gulás did not directly test speakers' preferences for one prosody over the other, the strength of such preferences, and the extent to which they hold in PPI languages, remains an open question.

Dutch is one of the languages for which it has been claimed in the literature that both readings are available, even though the OR narrow scope reading is the preferred one. As shown by Surányi & Gulás' (2022) results, prosody may also play a role in the other type of languages (French, Hungarian, Italian, etc.) for which it has been claimed that the OR wide scope reading is the preferred one, and even the only possible one. The claim that these languages allow only one reading has been put forward in a theory about how the lexical characterization of the disjunction word in a language as +PPI or -PPI determines the typological distinction (Crain,

2012). However, it has recently been found that this generalization is incorrect, and that the other, OR narrow scope reading is accessible also in +PPI languages when given a proper context (Lungu et al., 2021). Lungu and colleagues suggest that further research should look at the role of prosody. If prosody also plays a role in this type of languages, making the OR narrow scope reading more accessible, similar to the relation we found between interpretation and preferred prosody in Dutch, it will constitute another argument against a parameterized account of the crosslinguistic difference.

## **6. Conclusions**

Framed within research on the prosody-semantics interface (Gussenhoven, 2006; Jackendoff, 1972; Kadmon & Roberts, 1986; Ladd, 1980; Ward & Hirschberg, 1985), this study has contributed novel prosodic insights for the crosslinguistic puzzle about the skewed relation between natural language and logic for sentences with two logical operators, negation and disjunction. Logical representations with these two operators are principally ambiguous: OR can take narrow or wide scope (and negation wide or narrow scope, respectively). Yet, speakers tend to strongly favor only one of the two readings. This preference varies across languages (Szabolcsi, 2002). While our study does not speak to the question of why there is crosslinguistic variation, it does address the issue of switching readings. It was pointed out that context can make the not-so-obvious reading accessible (Lungu et al., 2021; Verbuk, 2007). Related to this, and in line with Surányi & Gulás's (2022) conclusions about Hungarian, a +PPI language, our findings suggest that the two interpretations may each come with their own prosodic contour in Dutch, a -PPI language. Participants strongly associated the OR narrow scope reading with a contour with neutral prosody (85%) and the OR wide scope reading with non-neutral prosody that involved a rise-fall contour on the disjuncts and a prosodic break between the first disjunct and the disjunction word (70%). These findings confirm not just that both interpretations are available to native speakers of Dutch, but also that many speakers prefer a specific prosodic contour for each of the interpretations.

In summary, sentences with negation and disjunction are ambiguous, because either one of the two logical connectives can take wide scope. Our study is the first to have investigated adult native speakers of a language whose disjunction is not categorized as +PPI in Szabolcsi's (2002) typology, and the first that directly tested speaker's prosodic preferences in this sentence type. Our approach was to see if a particular interpretation would be associated with a particular

contour, and it was. A next step would be to investigate if prosodic cues can disambiguate sentences with disjunction and negation, by presenting listeners with a particular prosodic contour, and see which interpretation they assign to it, similar to the approach taken in other studies with scope ambiguity (Larralde et al., 2021; Pruitt & Roelofsen, 2013; Syrett et al., 2014a). If prosody can disambiguate scopal ambiguity, another question could be to test if children are as sensitive to prosody as adults, like Larralde and colleagues asked. Furthermore, it might be interesting to see if native speakers systematically use prosodic cues in their own speech when they have to disambiguate sentences with negation and disjunction, as did the participants to some extent in Syrett and colleagues' (2014a,b) production study for sentences with negation and a universal quantifier.

The challenge remains, though, as to why a contour with neutral prosody associates with one reading in one set of languages, and another reading in the other set of languages. One possibility to pursue this question would be to ask if crosslinguistic differences as to what qualifies as neutral prosody can explain these differences in crosslinguistic preferences, or even accessibility of readings.

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## Endnotes

<sup>1</sup> We are very pleased to present Jack Hoeksema our first paper on disjunction and negation, including him as an author. Given his expertise on negation, Angeliek van Hout approached Jack back in 2018 to be consultant on a crosslinguistic L1 acquisition project led by Elena Pagliarini (see Pagliarini et al., 2022). Three others from the current team of authors participated in that project: Balázs Surányi, Annika van Wijk and Mieke Slim (the latter two being Bachelor students at the time). Jack's enthusiasm about the topic subsequently led to the research that is reported in the current paper: the role of prosody for Dutch sentences with negation and disjunction. The second author, Jelle Kisjes (a Master student at the time), set up the experiment and analyzed the data. In addition, Balázs Surányi and Máté Gulás, who started pursuing the topic of prosody independently for Hungarian in 2019 (in a paper written for a Master students' competition, later developed into Surányi & Gulás, 2022), also joined our team of authors. Finally, at some point, yet another author, and language, was added to the mix: Antoine Cochard, who was working on the L1 acquisition of negated disjunction in French (Cochard et al., 2023). At the moment of writing, all authors are involved in an ongoing collaboration where we are experimentally investigating the role of prosodic contour for the interpretation of sentences with negation and disjunction across Dutch, French, Hungarian and Italian. We are looking forward to Jack's continued participation on the team, even if he has now retired.

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<sup>2</sup> Note that an unembedded disjunction 'A or B' is routinely interpreted as exclusive ("either A, or B, but not both"). This strengthening of the interpretation of disjunction is not reflected in the logical representation in (1b), but is commonly taken to arise via pragmatic reasoning.

<sup>3</sup> In addition, the design included pitch accent as a second variable, comparing a single-accent contour, which typically gives rise to a yes/no-question interpretation, to a multiple-accent contour (an accent on each disjunct and a prosodic phrase boundary between the two), which is associated with an alternative-question interpretation. This variable indeed contributed to the alternative-question interpretation, but played a much smaller role.

<sup>4</sup> Note that the critical sentences repeat the preposition in the second disjunct, which was different from the critical sentences that were used in Pagliarini et al. (2022). With the extra preposition, it turned out to be easier to produce the contour with a break before OR and prosodic accent on it. A reviewer asked if the preferred interpretation differs for a disjunction with two NPs or two PPs. As the results below show, this was not the case. For a contour with neutral accent on OR, the ‘neither A nor B’ reading was preferred, both for a disjunction with two NPs in Pagliarini et al. (2022) as well as in the current study with two PPs.

<sup>5</sup> Following up on Pruitt and Roelofsen’s (2013) experiment, O’Mahoney (2014) manipulated the prosodic contour of disjunctive questions in English in two additional ways, adding an accent on the first disjunct and a pause after it (and before OR). The prosodic contour of our non-neutral condition included both of these prosodic characteristics.

<sup>6</sup> A demo version of the Dutch experiment can be found [here](#).

<sup>7</sup> CETO approval was registered under nr. 73698870.

<sup>8</sup> For exploratory purposes we also analyzed the reaction times of the critical and filler items. Interestingly, there was a significant difference, as participants took much longer to respond to the critical items (1735 ms) than to the filler items (1100 ms). There was no significant difference between the two critical conditions, OR narrow scope (1673 ms) and OR wide scope (1797 ms).

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## Appendix 1: Critical items

- 1A OR narrow Ik wilde vorige week al een afspraak met Marie maken, maar ik heb haar niet meteen gebeld. Ondertussen kan ik nog maar op dinsdag en donderdag. Maar toen ik haar net belde bleek dat het niet meer gaat lukken deze week.  
*Marie kon niet op dinsdag of op donderdag.*
- 1B OR wide Ik heb vorige week een afspraak met Marie gemaakt maar ik heb het niet meteen in mijn agenda geschreven. Nu weet ik niet meer precies op welke dag we uitgekomen waren. Ik kon dinsdag en donderdag, maar Marie kon niet op één van die dagen. Ik weet alleen niet meer welke.  
*Marie kon niet op dinsdag of op donderdag.*
- 2A OR narrow Voor lage rugpijn raden dokters aan om regelmatig tenminste één sport te doen die de rugspieren versterkt, zoals yoga en zwemmen. Maar deze sporten zijn niet erg populair onder veel oudere patiënten. Het zou daarom handig zijn als dokters nog een derde sport zouden voorstellen ter behandeling van rugpijn.  
*Veel patiënten houden niet van yoga of van zwemmen.*
- 2B OR wide Voor lage rugpijn raden dokters aan om regelmatig yoga te doen en te zwemmen. Deze twee sporten versterken namelijk de rugspieren. Maar zwemmen en yoga worden meestal door nogal verschillende type mensen gedaan. Ik vraag me af hoe dat gaat als deze twee sporten allebei samen voorgeschreven worden ter behandeling van rugpijn.  
*Veel patiënten houden niet van yoga of van zwemmen.*
- 3A OR narrow Op de verjaardag van mijn zoon kregen de kinderen allemaal een zakje met snoepjes mee als afscheidscadeau. Eerst hadden we ze alleen in rode en blauwe zakjes gestopt, maar ik heb ook maar een paar groene zakjes gevuld. Kinderen zijn namelijk erg kieskeurig.  
*Sommige kinderen houden niet van rood of van blauw.*

- 3B OR wide Op de verjaardag van mijn zoon kregen de kinderen allemaal een zakje met snoepjes mee als afscheidscadeau. Deze had mijn vrouw in rode en blauwe zakjes gestopt, precies genoeg voor iedereen. Ik heb van beide maar wat extra zakjes gevuld. Kinderen zijn namelijk erg kieskeurig.  
*Sommige kinderen houden niet van rood of van blauw.*
- 4A OR narrow In dat café krijg je altijd een potje thee bij je stukje taart, waarbij je de keuze hebt tussen zwarte thee en groene thee. De ober vraagt tegenwoordig echter standaard of iemand liever koffie heeft, of wat anders.  
*Sommige gasten houden niet van zwarte thee of van groene thee.*
- 4B OR wide In dat café krijg je altijd een potje thee bij je stukje taart, waar je mag kiezen tussen twee soorten: zwarte thee en groene thee. De eigenaar zorgt er altijd voor dat er genoeg voorraad van beide soorten thee is, zodat iedereen de soort thee kan krijgen die ze besteld hebben.  
*Sommige gasten houden niet van zwarte thee of van groene thee.*
- 5A OR narrow Jan is in de supermarkt voor zijn wekelijkse boodschappen. Zijn schoonzus komt dit weekend logeren, dus hij koopt wat meer boodschappen dan normaal. Jan koopt gewoonlijk altijd appels en bananen, maar hij weet dat zijn schoonzus een dubbele fruitallergie heeft.  
*Ze kan niet tegen appels of tegen bananen.*
- 5B OR wide Jan is in de supermarkt voor zijn wekelijkse boodschappen. Zijn schoonzus komt dit weekend logeren, dus hij koopt wat meer boodschappen dan normaal. Wanneer hij bij de fruitafdeling komt, moet hij even hard nadenken, want er is één soort fruit waar zijn schoonzus allergisch voor is. Jan koopt gewoonlijk altijd appels en bananen. Maar nu twijfelt hij.  
*Ze kan niet tegen appels of tegen bananen.*



- 6A OR narrow In de brugklas krijgen leerlingen nieuwe vakken: vreemde talen en exacte vakken. De middelbare school van mijn zoon wil een onderwijsvernieuwing invoeren waarbij er ook vakken als maatschappijleer en psychologie worden aangeboden. Dan hebben meer leerlingen kans van slagen.  
*Sommige leerlingen zijn niet goed in talen of in exacte vakken.*
- 6B OR wide In de onderbouw van de middelbare school volgen leerlingen allerlei nieuwe vakken: vreemde talen en exacte vakken. In de bovenbouw kiezen de leerlingen zelf hun vakkenpakket. Sommige profielen focussen op de exacte vakken, andere meer op talen en cultuur. Dit zorgt ervoor dat meer leerlingen zullen slagen.  
*Sommige leerlingen zijn niet goed in talen of in exacte vakken.*
- 7A OR narrow De juf van groep acht is het jaarlijkse klassenuitje aan het organiseren. Normaal gesproken gaan ze aan het einde van het schooljaar iets leuks doen, zoals naar de bioscoop en het zwembad. Nu wil de juf graag ergens anders naartoe, zodat iedereen kans krijgt om mee te gaan. Er is namelijk altijd wel gedoe geweest van ouders over het toezicht in zwembaden en de filmkeuze.  
*Sommige leerlingen mochten vorig jaar niet mee naar de bioscoop of naar het zwembad.*
- 7B OR wide De juf van groep acht is het jaarlijkse klassenuitje aan het organiseren om het einde van het schooljaar te vieren: eerst gaan ze naar de bioscoop en dan naar het zwembad. De kinderen moeten in ieder geval aan één activiteit meedoen, maar ze zijn niet verplicht om aan beide mee te doen. Er is al vaak gedoe van ouders geweest over het toezicht in zwembaden, of juist over de filmkeuze.  
*Sommige leerlingen mochten vorig jaar niet mee naar de bioscoop of naar het zwembad.*

- 8A OR narrow Op het scoutingkamp moeten de kinderen zelf de route van de wandeltocht vinden. Voorgaande jaren moest dit aan de hand van een kompas of een gps-apparaat. Nu mogen de kinderen ook hun mobiele telefoon mee onderweg.  
*Sommige kinderen kunnen niet omgaan met een kompas of met een gps apparaat.*
- 8B OR wide Op het scoutingkamp moeten de kinderen zelf de route van de wandeltocht vinden. Ze mogen geen mobiele telefoons mee, maar kunnen kiezen of ze een kompas of een gps-apparaat meenemen onderweg. We laten de kinderen dus zelf bepalen hoe ze de route gaan uitzoeken.  
*Sommige kinderen kunnen niet omgaan met een kompas of met een gps apparaat.*
- 9A OR narrow Sommige adoptiekinderen groeien op in een pleeggezin omdat allebei hun ouders in de gevangenis zitten. Psychologen zeggen dat het contact met de ouders belangrijk is voor de ontwikkeling van het kind. Gelukkig willen de meesten dat wel. Maar er zijn kinderen die al het contact afwijzen.  
*Ze willen niet op bezoek bij hun vader of bij hun moeder.*
- 9B OR wide Sommige adoptiekinderen groeien op in een pleeggezin omdat allebei hun ouders in de gevangenis zitten. Psychologen zeggen dat het contact met de ouders belangrijk is voor de ontwikkeling van het kind. Maar vaak geven kinderen één van de ouders de schuld voor de situatie en wijzen het contact met die ouder af.  
*Ze willen niet op bezoek bij hun vader of bij hun moeder.*
- 10A OR narrow Eva heeft een erg duur cadeau gekocht voor de verjaardag van haar vriend. Maar één cadeau vindt ze een beetje weinig, dus ze koopt er nog een kleinigheidje bij. Ze koopt een reep chocolade, en kiest er bewust voor om een witte reep te kopen.  
*Haar vriend houdt niet van melkchocolade of pure chocolade.*

- 10B OR wide Eva heeft een erg duur cadeau gekocht voor de verjaardag van haar vriend. Maar één cadeau vindt ze een beetje weinig, dus ze koopt er nog een kleinigheidje bij. Witte chocolade vindt hij sowieso niet lekker, maar welke bruine soort hij wel lust, weet ze even niet meer. Ze twijfelt.  
*Haar vriend houdt niet van melkchocolade of pure chocolade.*
- 11A OR narrow Tijdens de projectweek gaan leerlingen via school logeren bij een gastgezin in een ander land, zoals Frankrijk en Spanje. Maar niet iedereen heeft Frans en Spaans gehad. Dit jaar is daarom ook Engeland toegevoegd als alternatieve bestemming.  
*Sommige leerlingen willen niet logeren in Frankrijk of in Spanje.*
- 11B OR wide Tijdens de projectweken gaan leerlingen via school logeren bij gastgezinnen in twee verschillende landen, namelijk Frankrijk en Spanje. Leerlingen mogen zelf aangeven of ze inderdaad naar beide landen willen of juist de hele periode in hetzelfde land willen blijven.  
*Sommige leerlingen willen niet logeren in Frankrijk of in Spanje.*
- 12A OR narrow Op de meeste middelbare scholen krijgen leerlingen Engels plus twee vreemde talen. Op deze taaltalent school moeten leerlingen behalve de bekende schooltalen een extra vreemde taal kiezen, zoals Chinees en Russisch. Maar dat zijn heel moeilijke talen. Daarom biedt de school sinds kort ook Spaans aan. Een aantal kinderen is daar heel blij mee.  
*Zij willen niet kiezen voor Chinees of voor Russisch.*
- 24B OR wide Op de meeste middelbare scholen krijgen leerlingen Engels plus twee vreemde talen. Op deze taaltalent school worden leerlingen aangeraden naast de bekende schooltalen twee extra talen te kiezen, namelijk Chinees en Russisch. Dit is echter geen verplichting; het is ook toegestaan om maar één extra taal te nemen. Een aantal kinderen is daar heel blij mee.  
*Zij willen niet kiezen voor Chinees of voor Russisch.*

## Appendix 2: Filler items

- 1 De docente had een tijdje geleden gehoord dat één van haar leerlingen harddrugs had gebruikt. Maar toen ze het laatste nieuws hoorde, was ze stomverbaasd.  
*Het bleek dat haar collega drugs gebruikt.*
- 2 Als de telefoon van mijn vrouw 's avonds gaat, is het altijd familie die belt.  
*Maar gisteravond werd ze door haar baas gebeld*
- 3 Jan is erg lui en onverantwoordelijk: hij liet vroeger vaak zijn ouders bij hem thuis schoonmaken. Daar is hij eindelijk mee gestopt.  
*Tegenwoordig heeft hij een schoonmaker die schoon komt maken.*
- 4 Barbera dacht dat er bij de Aldi appels in de aanbieding waren. Normaal gesproken doet ze haar boodschappen bij de Jumbo, maar ze houdt erg van appels, dus ze besloot om deze keer naar de Aldi te gaan.  
*Maar toen ze daar aankwam, zag ze dat de sinaasappels in de aanbieding waren.*
- 5 Angela verwachtte dat ze een groot boeket met haar favoriete bloemen zou krijgen op Valentijnsdag. Ze houdt enorm van rode rozen, dus ze keek er erg naar uit.  
*Maar toen ze thuiskwam, kwam ze erachter dat haar man tulpen had gekocht.*
- 6 Toen ik vanochtend boodschappen deed, heb ik alle ingrediënten gekocht om een cake te bakken voor mijn verjaardag. Maar ik weet niet zeker of een cake wel goed genoeg zou zijn voor een verjaardagsfeest.  
*Dus ik heb besloten om een appeltaart te bakken.*
- 7 In de advertentie van het circus stond dat hun chimpansee trompet ging spelen tijdens het optreden. Maar het bleek dat dit niet helemaal klopte.  
*De chimpansee speelde piano tijdens de show.*
- 8 Een filmrecensent schreef dat de nieuwe film van Wes Anderson erg grappig is en vol zit met droge humor. Daarom had ik afgelopen weekend mijn zus naar de film meegenomen, want zij houdt van vrolijke films. Maar ik denk niet dat de recensent gelijk heeft.  
*Mijn zus moest ervan huilen.*

- 9 De weerman zei gisteren dat het vandaag veel warmer zou zijn dan gisteren. Ik had daarom juist een korte broek en een licht t-shirtje aangedaan.  
*Helaas was de temperatuur veel lager.*
- 10 Mijn zoon en neefjes gingen naar het meer voor een verfrissende duik.  
*Maar toen hij terugkwam, vertelde hij me dat de jongens hadden gevoetbald.*
- 11 Mijn ouders zijn met een gezelschap op vakantie geweest naar de bergen. Ik had gedacht dat ze elke dag zouden gaan wandelen.  
*Maar ze vertelden bij thuiskomst dat de groep juist veel gefietst had.*
- 12 Als gezin maken we elk jaar een fietstocht door Nederland in de zomervakantie. Maar deze zomer is het door corona helemaal anders.  
*Deze zomer blijft mijn gezin thuis.*