

UTRECHT UNIVERSITY

MASTER'S THESIS FOR COGNITIVE ARTIFICIAL INTELLIGENCE

The role of intonation in the use of double negatives in Dutch

June 26, 2013

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Acknowledgements

This graduation project has been the most profound research I have been able to perform during my time as a CAI student. Needless to say I have learned a lot from immersing myself in such an extensive project and I have gained a lot of experience in performing theoretical and experimental research and making the connection between those types of research in writing a thesis like this. One of my personal highlights has been the privilege of starting this entire graduation project by participating in a LOT summer school 2012 course led by Laurence Horn, who wrote the book *among books* when it comes to negation. And a second highlight has been the performance of the production experiment of this project, which has comprised most of my time but luckily has been a very enjoyable and instructive experience.

I believe I could not have asked for a better supervisor for such a comprehensive graduation project than Henriëtte. Starting off this year I was a bit hesitant, knowing I would have to perform independent research for an entire year, which has proven to be quite a challenging task for CAI students. But Henriëtte guided me through by providing lots of useful input, by keeping me critical, and most importantly by keeping me motivated with her catching enthusiasm for the research field; for that I would like to thank her very much.

Additional input for this graduation project has come from Maartje Schulpen and Aaju Chen. Maartje helped me get started methodologically with experimenting and Aaju, as an expert phonologist, helped me make sense of the data it delivered. I would like to thank them both for their help in improving my experimental skills in setting up as well as analyzing. And I would also like to thank Stefan van der Stigchel and Janneke van Lith for reviewing this thesis in its final stage.

I am very grateful to all the participants of my experiments, especially the participants of the production experiment, who all voluntarily sacrificed some of their time to help me in the course of my graduation project.

Last but not least I thank my sister and my parents for their never-ending show of interest and support, and I thank Onno for always being there.

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1 Introduction and research question

This thesis comprises an extensive report on a graduation project for the Master's (MSc) program in Cognitive Artificial Intelligence (CAI). The next sections will form an introduction to the graduation project by explaining how research in CAI can lead to a graduation project like this, and by presenting the research question and the structure of this thesis.

1.1 CAI research

Research in CAI revolves around the study of human cognition, and how to possibly formalize this. Since this is quite a broad subject, this research is done within CAI by taking on a number of different perspectives. These perspectives include philosophy of mind, psychology, and linguistics to study human cognition, and logic, algorithms, and computer programming to attempt to formalize theories about human cognition. In order to study all aspects of human cognition in all these different areas, CAI students get acquainted with various research methods. These methods include literature research, experimental research, formulating theories, and formal theorem proving.

Since CAI is such a broad and interdisciplinary program it should not come as a surprise that each CAI student develops their own fascination for one or more topics within the CAI realm, while still maintaining their interdisciplinary background. As for me, while studying CAI I developed a specific interest for language as a part of human cognition. In particular, my focus turned to how we use and interpret language, which is basically the semantics and pragmatics. That is why for this graduation project I chose to explore one of the many possible topics in this linguistic area: double negatives in the Dutch language. In general substantial theoretical and experimental research has already been done in the field of the double negatives. But what makes this particular topic interesting is that so far not much research, especially experimental research, has been done on the behavior of double negatives in Dutch.

My CAI background contributes to the research of this graduation project in different ways. Both the linguistic insights and the philosophical and logical aspects of this background are useful in studying theories on negation or double negatives. And the knowledge of psychological methods as well as programming skills aid in performing the experimental part of this graduation project.

Vice versa, the research in this graduation project can contribute to CAI research in general. Language is seen as an important and definitely complex part of human cognition, and there-

fore of CAI. The research performed throughout this thesis on double negatives will create a better understanding of the semantic and especially pragmatic aspects of this subject. Generally speaking, this provides us once again with a bit more knowledge of human cognition. But more concretely, this understanding could for instance contribute to development in speech synthesis, aiding so-called text-to-speech systems in gaining a better performance that is one step closer to that of humans.

In the next section the research question of this thesis will be specified, after which the approach to answering this question will be explained by presenting the structure of this thesis.

1.2 Research question

As explained before, the topic of this thesis is double negatives in the Dutch language, and it lies in the fields of semantics and pragmatics. The central research question which motivates everything that will be discussed further in this thesis is the following:

What is the role of intonation in the use of double negatives in Dutch?

This question emerged from studying recent research developments in the field of double negatives and the interaction with intonation in a few other languages than Dutch. These languages also differ from Dutch with respect to how they handle double negatives, which had provided all the more motivation to study this phenomenon now in Dutch, especially since this type of research on the interaction between double negatives and intonation has not yet been performed for the Dutch language. The expectation with respect to the research question guiding this thesis is that intonation can to a certain extent act as a tool in conveying and interpreting different meanings of double negatives. This could work both for speakers using intonation to convey a certain meaning of double negatives rather than the other, and for hearers using intonation as a cue to interpret the meaning of an utterance containing double negatives without context.

In chapter 2 the topic of this thesis is introduced in depth, after which the relevant literature for the research in this thesis, both theoretical and experimental, is discussed. This should provide a solid background for carrying out the research that aims to answer the central research question. Chapter 3 describes the first part of this research. As from an experimental point of view we have to start from scratch in investigating double negatives in Dutch, this first part consists of a corpus study followed by a small pilot study on production. The corpus study aims to get a grasp of how double negatives are used in Dutch in spontaneous speech,

whereas the small production experiment (Experiment 1) is performed to get an initial idea of which intonation patterns are produced in an experimental set-up.

The second part of the research contributing to answering the central research question is described in chapter 4 and comprises an extensive production experiment (Experiment 2). This experiment uses the findings from the corpus study and the initial production experiment to elaborately explore the intonation patterns participants produce when confronted with double negatives in different disambiguating contexts. The results from Experiment 2 are then used in a follow-up perception experiment (Experiment 3). Experiment 3 forms the third and final part of the research in this thesis and its methods and results are described in chapter 5. This experiment aims to determine how participants interpret utterances containing double negatives when produced with certain intonation patterns.

Finally, chapter 6 forms the main conclusion of this thesis. It consists first of a general discussion of the results from the experimental studies described throughout this thesis and their implications for the central research question. Afterwards suggestions for further research based on the findings from the research in this thesis are discussed.

2 Theoretical background

This chapter forms a theoretical background for the experimental research that will be described in the following chapters. This theoretical background is needed to fully comprehend the current status of research into the phenomenon of double negation, and what the experimental studies described in this thesis can contribute to that research. First a general background in double negation and negative concord will be given, after which two specific research contributions in this area will be discussed. The first is an experimental contribution pertaining to Afrikaans; the second is a theoretical contribution pertaining to Dutch.

2.1 Double negation and negative concord

Can you remember the lyrics to Pink Floyd’s ‘Another Brick in the Wall’? Roger Waters wrote “We don’t need no education”, but what did he mean? Is he saying that we do *not* need education? Or that we do *not* need *no* education, hence we actually do need education? The latter is a form of semantic composition by which two negative terms negate each other’s meaning; this way they cancel each other out, and this mutual cancellation of negatives in fact yields a positive interpretation. In general, this concept is called the Law of Double Negation (Horn, 1989), and it is something we also see in propositional logic. In linguistics, this is simply called double negation (DN), and it is the expected interpretation of sentences containing two negative terms in so-called DN languages such as English and Dutch.

On the other hand we have so-called negative concord (NC) languages such as Spanish, Italian, and Romanian. In NC languages, the expected interpretation of sentences containing two negative terms is for them to express a single negation with no cancellation. In (1) examples of the behavior of double negatives in the DN languages Dutch and Standard English are shown, while in (2) there are examples of the behavior of double negatives in the NC languages Spanish and Italian.

- (1) a. *Ik heb niet niemand gezien.*
 I have not nobody seen
 ‘I have not seen nobody.’ (‘I have seen at least somebody.’)
- b. *Nobody has seen nothing.*
 ‘Everybody has seen something.’
- (2) a. *No he visto a nadie.*
 not have seen nobody
 ‘I have not seen anybody.’

- b. *Nessuno ha visto niente.*
nobody has seen nothing
'Nobody has seen anything.'

Even though there is this distinction between DN languages and NC languages based on the expected meaning for double negatives in those languages, it seems that this does not mean we will not find instances of DN meaning in NC languages or instances of NC meaning in DN languages. The question is how these unexpected instances are used and how we can distinguish them from the expected meaning in a language. Obviously context will always provide for disambiguation between the two possible meanings, but what if there is no disambiguating context and we only have a simple sentence containing two negatives? A possible influence here could be the use of intonation. The effects of prosody and gesture have already been explored for the interpretation of DN in the NC languages Catalan (Espinal & Prieto, 2011) and both Catalan and Spanish (Prieto et al., 2013). However, these studies focused on question-answer dialogues with isolated negative terms being the answers. By using this method they only looked at the intonation on single isolated negatives, not at the intonation pattern on a combination of two negatives. An extensive study that did look at intonation patterns on complete negative combinations was done by Huddleston (2010) for the NC language Afrikaans. This study will be discussed further in the next section.

2.2 Huddleston (2010)

In her dissertation, Huddleston (2010) aimed at providing an analysis of negative indefinites in Afrikaans, which is generally characterized as an NC language. As part of this analysis, Huddleston performed a corpus study, a perception experiment, and a production experiment. For the corpus study, Huddleston used the Pharos corpus of written Afrikaans, in which she looked for negative combinations. Of the 2,800 negative combinations she found in this corpus, 96% had an NC interpretation and only 4% had a DN interpretation, which is to be expected for an NC language. However, as this corpus study only involved written samples of the language, Huddleston felt it needed to be followed by a perception experiment involving native speaker judgements of auditory stimuli.

2.2.1 Perception experiment

The aim of Huddleston's perception experiment was to acquire both acceptability judgements and meaning judgements of auditory stimuli containing negative combinations. In

what follows the part of the experiment involving the acceptability judgements will not be discussed, since that part is not relevant for this thesis. The part of the experiment involving the meaning judgements aimed to test whether participants were able to distinguish between different prosodic contours by attributing either an NC or a DN meaning to them.

In order to create the items for this experiment, Huddleston determined which prosodic contours were needed to elicit an NC meaning and a DN meaning. For conveying an NC meaning she used the so-called “declarative contour” (Beckman & Elam, 1997), which consists of one or more H* pitch accents and ends in an L- phrase accent and L% boundary tone. For conveying a DN meaning she turned to the contradiction contour, which consists of a prenuclear H* pitch accent on the first negative, a nuclear L* pitch accent on the second negative, and an L- phrase accent and H% boundary tone. These two intonation patterns were then used to produce 14 sentences containing negative combinations; each of those sentences was produced with both patterns. In (3) we see an example of a sentence from the experiment.

- (3) *Daar is g'n niks kos in die yskas nie.*
 there is no nothing food in the fridge SN
 ‘There is no food in the fridge.’

Huddleston administered the questionnaire she had created with these items and fillers via the internet. Via this questionnaire, participants were presented with the sentences as auditory stimuli and, among other things, had to indicate the meaning they thought they conveyed. Since the accuracy of the speaker’s prosodic contour when uttering the items was questioned, Huddleston repeated the experiment with a different, and presumably more accurate, speaker. Thus she ended up with data from two versions of the same experiment. The first experiment had 16 participants, while the second experiment had 24 participants.

Huddleston indeed found that participants in the second version of the experiment were more accurate in interpreting utterances produced with a DN contour as conveying a DN meaning. This improvement can be seen by comparing Figure 1 to Figure 2, where for the first experiment there is a 60/40 split in favor of DN interpretations for the DN contour, while for the second experiment there is almost a 70/30 split in favor of DN interpretations. For utterances produced with an NC contour the split between DN and NC interpretations is merely the same for both versions of the experiment: 83/17 split in favor of NC interpretations in the first version and 80/20 split in favor of NC interpretations in the second version.

From these results Huddleston inferred that participants had a definite preference for NC

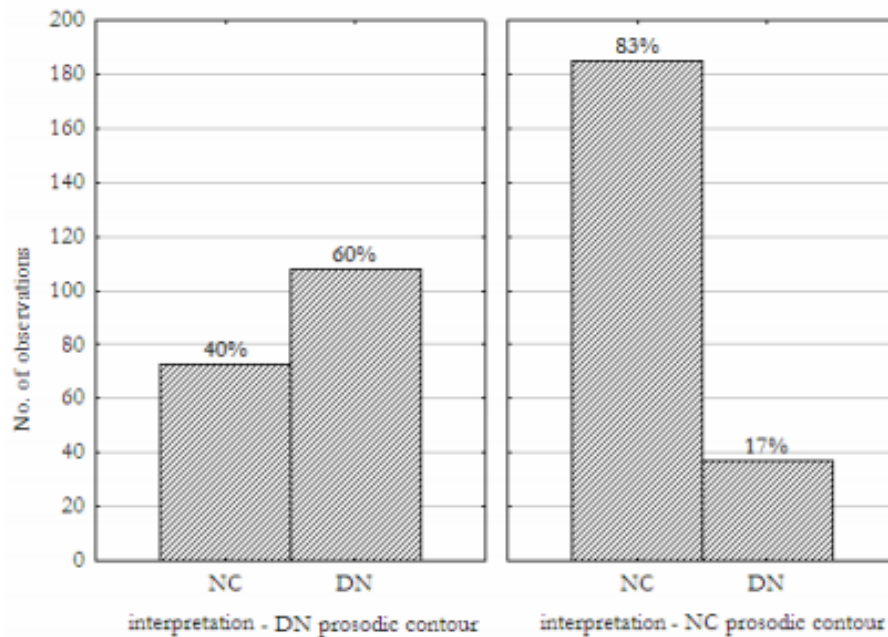


Figure 1: Meaning judgements of negative combinations 1st experiment (Huddleston, 2010, p. 177)

interpretations of negative combinations if they are produced with an NC contour. On the other hand, the results showed that it is also possible to elicit DN interpretations if negative combinations are produced with a DN contour, provided that this DN contour is precise and accurate. However, neither the NC contour nor the DN contour was always correctly identified. So even if prosodic cues are available, listeners were not always able to correctly identify the meaning of an utterance with double negatives out of context. This led Huddleston to follow the perception experiment by a production experiment, in order to explore whether speakers do themselves produce disambiguating prosodic contours for negative combinations.

2.2.2 Production experiment

After the perception experiment Huddleston performed a production experiment, which was aimed at determining to what extent Afrikaans native speakers produce disambiguating prosodic contours for sentences containing negative combinations. For this experiment, Huddleston created 38 paragraphs containing sentences with negative combinations. Due to the disambiguating contexts in these paragraphs, half of them contained negative combinations with an NC interpretation and half with a DN interpretation. Participants had to read

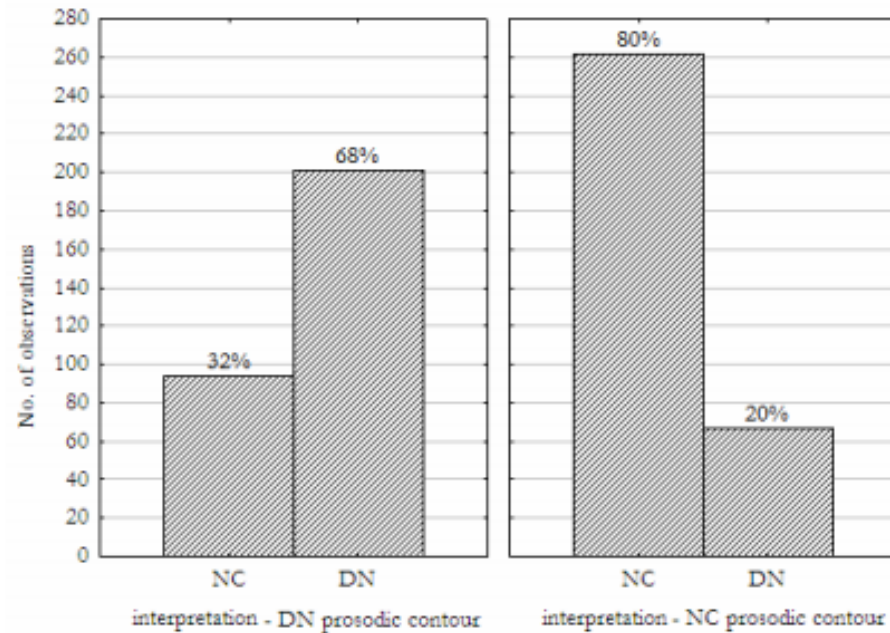


Figure 2: Meaning judgements of negative combinations 2nd experiment (Huddleston, 2010, p. 179)

these paragraphs, of which recordings were made. In (4) and (5) examples are shown of such paragraphs with an NC context and a DN context, respectively.

- (4) *Rassie Erasmus, kaptein van die Katte, het op 'n vraag oor die voorval geantwoord dat niemand niks oor die voorval sou gesê het nie indien Mulder in 'n Springbok-trui was. Maar provinsialisme vloei dik in SA rugby en die Kapenaars is nou ontsteld omdat hul pak gekry het.*

'Rassie Erasmus, captain of the Cats, answered a question about the incident, saying that nobody would have said anything about the incident if Mulder had been in a Springbok jersey. But provincialism runs deep in SA rugby and the Capetonians are now upset because they were given a hiding.'

- (5) *Ek het nog nooit niks gesien nie. Selfs nie in die Kalahari ná n verwoestende veldbrand waar die laaste grasspriet en rosyntjiesbos afgebrand het nie. Selfs dan, my liewe mens, is daar iets.*

'I have never seen nothing. Not even in the Kalahari after a destructive bush fire has burnt up the last blade of grass and little raisin bush. Even then, my dear, there is something.'

After completing the recording sessions, Huddleston extracted the sentences containing the negative combinations from their respective contexts and analyzed them using *Praat* (Boersma & Weenink, 2012), following the ToBI guidelines (Beckman & Elam, 1997), to determine the intonation patterns used by the speakers. To establish the accuracy of participants in disambiguating between NC and DN readings, Huddleston compared the intonation patterns they had produced to the typical NC and DN prosodic contours she had previously used in the perception experiment. For NC this contour consisted of one or more H* pitch accents and ends in an L- phrase accent and L% boundary tone, and for DN this contour consisted of a prenuclear H* pitch accent on the first negative, a nuclear L* pitch accent on the second negative, and an L- phrase accent and H% boundary tone.

Huddleston found that for negative combinations in NC contexts, 99% of participants produced a contour that was the same as the typical NC contour. For negative combinations in DN contexts, on the other hand, she found that only 30% of participants produced a contour that was the same as the typical DN contour. From these numbers Huddleston concluded that native speakers of Afrikaans do not reliably produce disambiguating prosodic contours for negative combinations.

2.2.3 Concluding remarks

The type of research that Huddleston has performed for Afrikaans constitutes the main inspiration for the research described further on in this thesis, which revolves around Dutch instead of Afrikaans. In chapter 3 a corpus study for spoken Dutch is discussed, and chapters 4 and 5 describe the methods and results of a production experiment and a perception experiment, respectively.

For this thesis, a different order of performing experiments was chosen, which meant that after the corpus study first a production experiment was performed which was followed by a perception experiment. As of yet not much experimental research has been performed in the field of double negatives in Dutch. Because of this, there were no reasons to assume certain prosodic contours for conveying either a DN or an NC meaning. Therefore, the best way to carry out this type of research for Dutch was to first perform a production experiment to explore the intonation patterns used in Dutch for double negatives, and then perform a perception experiment using the intonation patterns found in the production experiment.

2.3 Zeijlstra (2010)

Even though not much experimental research has been performed in the field of double negatives in Dutch, there does exist some theoretical literature on this topic. An interesting contribution to the literature has come from Zeijlstra (2010), who focused in his article *Emphatic multiple negative expressions in Dutch* on NC constructions in the DN language Dutch.

2.3.1 EMNEs

Zeijlstra points out that in DN languages such as Dutch, we still may find combinations of negatives which yield a single semantic negation, i.e. NC constructions. He lists a few examples to support this observation, which are shown in (6).

- (6)
- a. *Zij heeft nergens geen zin in.*
she has nowhere no lust in
'She doesn't feel like anything at all.'
 - b. *Hij gaat nooit niet naar school.*
he goes never not to school
'He never ever goes to school.'
 - c. *Zij hebben nooit geen geld.*
they have never no money
'They never have any money.'

Zeijlstra claims that since these constructions carry an emphatic reading, they should be called *Emphatic Multiple Negative Expressions* (EMNEs). He attributes the fact that they yield a single negation instead of the expected negation cancellation to the disappearance of NC in Dutch. Middle Dutch, the predecessor of Modern Dutch, was an NC language, but over time NC expressions have disappeared from Dutch. This resulted in Modern Dutch no longer being eligible to qualify as an NC language. However, since this is the case, according to Zeijlstra Dutch speakers can no longer interpret constructions as seen in (6) as NC constructions: "The death of Dutch NC, so to speak, led to the birth of EMNEs" (Zeijlstra, 2010, p. 37).

2.3.2 Differences between EMNEs and NC

To illustrate why EMNEs should not be considered as instances of NC, Zeijlstra lists four aspects in which EMNEs differ from NC constructions. These differences are listed in (7).

- (7) Differences between EMNEs and NC expressions:
- a. EMNEs always have an emphatic reading; NC constructions usually do not;
 - b. The formation of EMNEs is not productive; speakers generally differ with respect to which EMNE they accept and which they do not accept;
 - c. EMNEs are subject to strict adjacency conditions, contrary to NC constructions;
 - d. Only the first element of the EMNE may carry stress, whereas in NC constructions all elements may do so.

(Zeijlstra, 2010, p. 40)

As can be seen in (7a), Zeijlstra claims that EMNEs always give rise to emphatic negative readings, while NC constructions yield plain negative readings. He does however not explain why this difference should be the case. The difference mentioned in (7b) is actually not clearly stated as a difference, but what Zeijlstra means to say is that NC constructions are hardly ever subject to this variation in acceptance by speakers. To illustrate this point, he insists that, as opposed to the EMNEs seen in (6), only a minority of his informants accepts the EMNEs in (8).

- (8) a. *Ik heb niemand niets gegeven.*
 I have nobody nothing given
 ‘I didn’t give anything to anybody at all.’
- b. *Ik heb nergens niet gezocht.*
 I have nowhere not looked
 ‘I didn’t look (for it) anywhere.’

This is also where Zeijlstra notes that not all adjacent combinations of negatives are able to be an EMNE. Negative combinations containing either *niet* (not) or *geen* (no) as the first element are not possible as EMNEs. The third difference, seen in (7c), poses a restriction as well on which combinations can be EMNEs: in order to be an EMNE, the two negatives in a combination have to be strictly adjacent. Zeijlstra also states that if the two negatives of a combination are not adjacent, they can only yield a DN reading and not an NC reading. He does, however, also mention that sometimes double negative expressions where a single particular element intervenes are also accepted as EMNEs. To illustrate, he provides us with the examples in (9), where the single particular elements *op* (on) and *meer* (more) intervene.

- (9) a. *Ik heb nooit op geen paard gereden.*
 I have never on no horse ridden
 ‘I never ever rode a horse.’
- b. *Hij zal nooit meer geen klant zien.*
 he will never more no client see
 ‘He will never ever see a client anymore.’

The fourth difference in (7d) concerns stress and is therefore the most relevant to the experiments later on in this thesis. Zeijlstra claims that only the first element of an EMNE may carry stress, and moreover that if the second element carries stress only the DN reading is yielded. To emphasize the difference in this case, he states in addition that stress patterns do not change the semantics in NC languages like they do for EMNEs.

2.3.3 Concluding remarks

Many of the claims Zeijlstra makes within his theory about the existence of EMNEs and their difference from NC constructions seem rather assumed and could be turned around in favor of NC constructions as well. The difference mentioned in (7b), for example, could just as well be non-existent if we assume that in a DN language, NC constructions can be subject to variation in acceptance. He has also not performed any empirical research besides consulting a few informants, which means he has no data to support his theory.

Since Zeijlstra himself has not provided actual experimental data to support his hypotheses, the research further on in this thesis provides an excellent opportunity to do so after all. Thus a few points from Zeijlstra’s theory about EMNEs will be coming back later in this thesis. First the results from the corpus study in chapter 3 will be compared to this theory to see whether the corpus could support the existence of EMNEs. Afterwards the results from both the production experiment (Experiment 2) in chapter 4 and the perception experiment (Experiment 3) in chapter 5 will be compared to Zeijlstra’s hypothesis about stress patterns for EMNEs.

3 Pilot: corpus and experimental study

This chapter describes the methods and results of a small pilot study, which consisted of two parts: a corpus study and a production experiment. The aim of this pilot study was to investigate to what extent Dutch native speakers use two negative terms in one simple clause and how they use this phenomenon.

3.1 Corpus study

The first part of the pilot was a corpus study. The aim was, first, to get an idea of how frequent Dutch native speakers actually use multiple negative terms in simple clauses, and second, to assess whether they use those multiple negatives with a DN meaning or an NC meaning. Regarding the latter question the hypothesis would be that Dutch speakers use multiple negative terms predominantly with a DN meaning, since Dutch is a DN language.

3.1.1 Methods

The corpus used for this study is the *Corpus Gesproken Nederlands* (Spoken Dutch Corpus), which is an annotated corpus consisting of 900 hours of spontaneous speech (Boves & Oostdijk, 2003). Within this corpus it is possible to perform a content search (e.g. to search for occurrences of a word), and also to put certain constraints on such a content search. These features enabled for a search for occurrences of two different negative indefinites near each other in the corpus.

Within the corpus searches were performed for all possible combinations of two negatives out of the following Dutch negative terms:

- (10) a. *niemand* (nobody)
- b. *niets/niks* (nothing)
- c. *nooit* (never)
- d. *nergens* (nowhere)
- e. *niet* (not)
- f. *geen* (no)

This was initially done by ensuring that the two negatives were within a five-word distance from each other. However, this type of search also gave many results that concerned complex sentences such as (11).

- (11) *Ik zie 't nooit dat 't niet vermeld is.*
 I see it never that it not mentioned is
 'I never see that it is not mentioned.'

In this thesis DN readings are being compared to NC readings, but Zeijlstra (2004, p. 64) already noted that NC readings only arise within a single clause; whenever negatives are in different clauses, like in (11), they will yield only a DN reading. Therefore complex sentences, where one negative is in the main clause and the other is in the subordinate clause, are unfit to use for the research in this thesis. Ultimately the search was done by looking at two negatives that are maximally within a two-word distance from each other (i.e. there is maximally one word between the two negatives). And for the sake of comparison, searches were also performed for two negatives within a one-word distance from each other and within a three-word distance from each other.

The Spoken Dutch Corpus consists of Dutch speech spoken in many different regions, but mainly in either Dutch or Flemish regions. Initially the searches were performed for the whole corpus as well as only for the Dutch regions, but since Dutch spoken in Flemish regions can behave quite differently from Dutch spoken in Dutch regions searches were continued only for the Dutch regions. Finally, the results of all searches were examined more closely and judged by their contexts to assess whether they yielded a DN reading or an NC reading.

3.1.2 Results

The total numbers of the negative terms listed previously in (10), are shown in Figure 3. The negatives *niets* and *niks* are taken together since they both have the same meaning (i.e. in English: 'nothing') and can be used interchangeably. From the results in Figure 3 we can immediately see that in the corpus (the whole corpus as well as only the Dutch regions) *niet* is by far the most used negative term. This is followed by *geen*, which, even though it occurs less than one fifth of the number of times *niet* occurs, still is used about double the number of times that any of the other negatives are used. The most striking result we see in this plot is the huge difference between the most-used negative *niet*, occurring as much as 113,020 times, and the least-used negative *nergens*, occurring only 690 times. However, *niet* (not) is a very general negative which can negate many different concepts, just like the second most-used

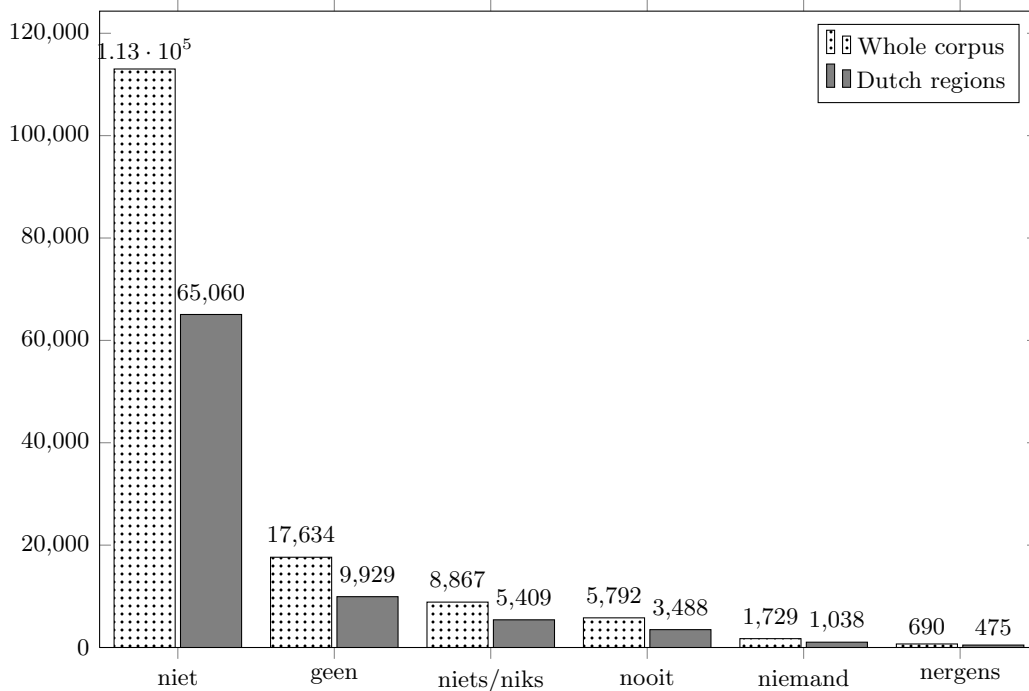
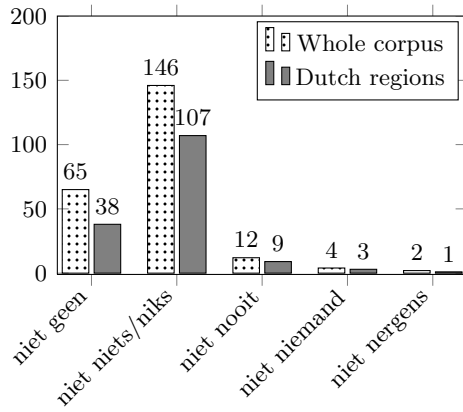


Figure 3: No. of negative terms in the corpus

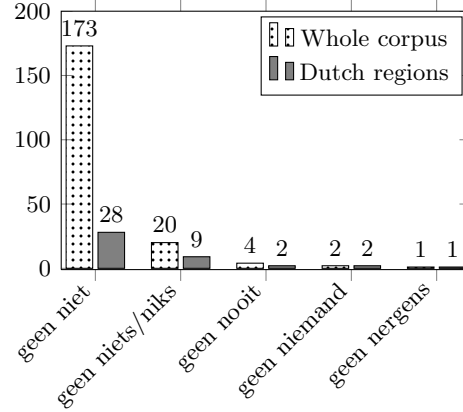
negative *geen* (no), while the remaining negatives can only be used to negate specific concepts such as time and space. But even within these four negatives the difference between them is remarkable: *niets/niks* occurs 8,867 times and *nooit* occurs 5,792 times, while *niemand* and *nergens* occur only 1,729 and 690 times respectively.

The total numbers of combinations of negative terms that are maximally within a two-word distance from each other are shown in Figure 4 on page 19. They are split into six separate plots according to the six different negatives investigated in this pilot. The first thing to notice is that the ratio between the whole corpus and only the Dutch regions differs extremely per combination. While some combinations have (nearly) the same number, like the combinations *niet/niks niemand* or *nergens niets/niks*, for other combinations the number drops heavily for Dutch regions, like *geen niet* or *niets/niks niet*. This big drop in the number of combinations between the whole corpus and the Dutch regions occurs mostly for combinations ending with *niet*. After close inspection of these combinations in the corpus this turned out to be not so surprising, since in the recordings from Flemish regions the negative *niet* was used a lot to strengthen the previous negative term, yielding an NC reading.

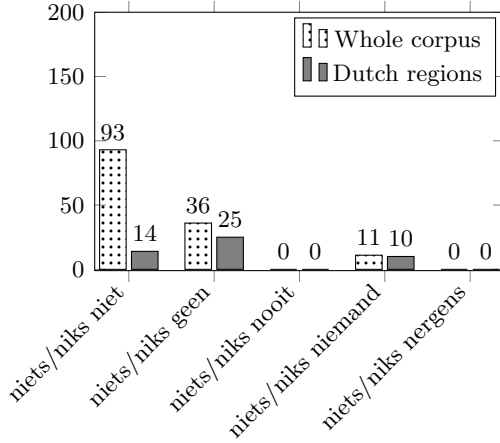
What we also see is that some combinations occurred only once or twice in the corpus, and some even never occurred. Especially combinations starting with either *niemand* or *nergens*



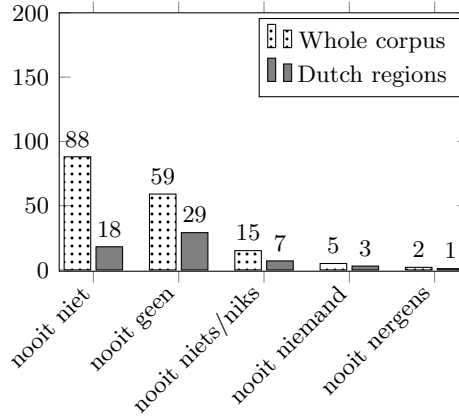
(a) No. of combinations starting with *niet*



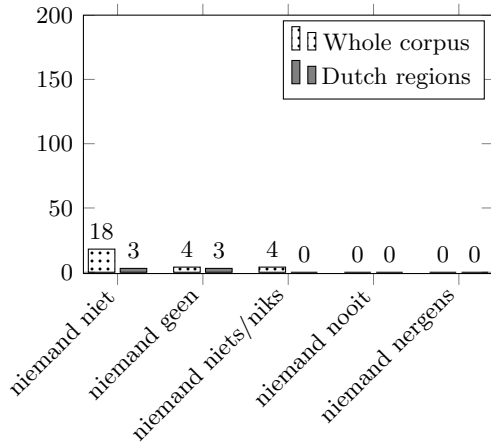
(b) No. of combinations starting with *geen*



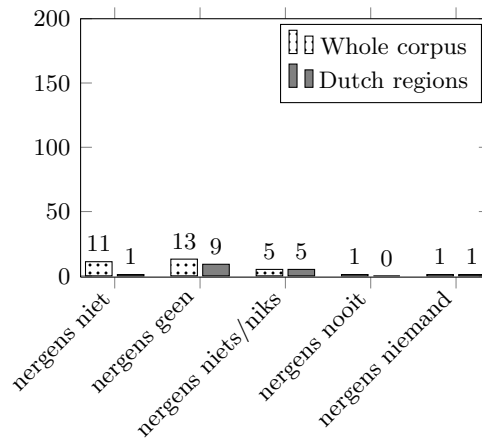
(c) No. of combinations starting with *niets/niks*



(d) No. of combinations starting with *nooit*



(e) No. of combinations starting with *niemand*



(f) No. of combinations starting with *nergens*

Figure 4: No. of negative combinations in the corpus

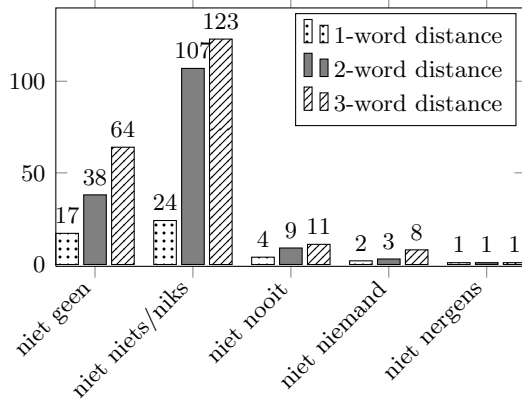
show a very low overall frequency, as can be seen in Figure 4(e) and 4(f). When we look only at the Dutch regions, we can find the highest frequency in Figure 4(a) for the combination *niet niets/niks*. This is probably due to the fact that in Dutch regions both “*niet niks*” (or “*niet niets*”) and “*niet voor niks*” (or “*niet voor niets*”) are common expressions, most often used as in (12). As we can see, both expressions generally yield a DN reading.

- (12) a. *Dat is niet niks.*
 that is not nothing
 ‘That’s really something.’
- b. *Ik heb niet voor niets mijn kamer opgeruimd.*
 I have not for nothing my room cleaned
 ‘I cleaned my room for a reason.’

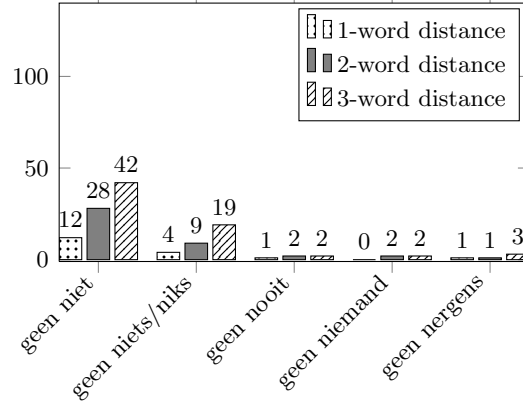
If we look back at the total numbers of negative terms in the corpus in Figure 3 and compare those to the numbers for the combinations we see in Figure 4, we might say that the latter are quite low. For example, the total number of combinations with *geen* (either as the first or the second negative) in the whole corpus amounts to 377, which is still only 2.1% of the total number of occurrences of *geen*.

In Figure 5 on page 21 we see the cumulative numbers for negative combinations within a 1-word, 2-word, or 3-word distance occurring in Dutch regions only. These numbers were fetched to help establish whether it is indeed suitable to draw the line at a 2-word distance, as was done for the previous results in Figure 4. But since these numbers do not show any abnormalities, such as a sudden rise in number between 2-word and 3-word distances, they cannot be decisive in this matter. What is important now is to look at the usability of these combinations at different distances, i.e., whether they are ‘valid’ combinations for this thesis in the sense that they can provide us with a DN or NC reading.

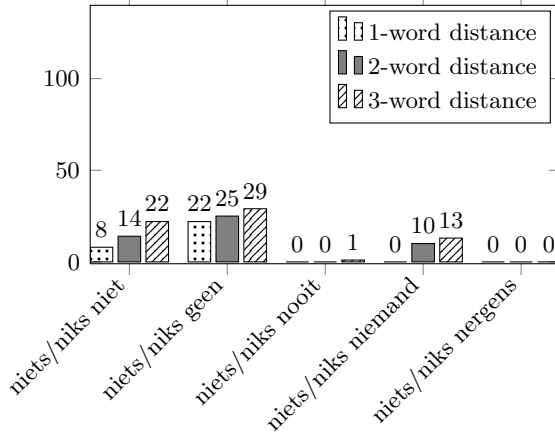
Thus, we will turn to the question whether the occurrences of combinations of negative terms in the corpus yield a DN reading or an NC reading. All results examined hailing from Flemish regions yielded NC readings (as mentioned before, by using *niet* a lot to strengthen the previous negative), which is why it is interesting primarily to look at results hailing from only Dutch regions. The interpretations of negative combinations from Dutch regions are shown in Table 1 on page 22. After inspecting their contexts in the corpus, the combinations of negative terms were sorted into three categories: ‘DN’ for those where context yielded a DN reading, ‘NC’ for those where context yielded an NC reading, and ‘Other’ for those that could not be assigned to ‘DN’ or ‘NC’. This last category mainly concerned phenomena like correcting oneself while speaking or the two negatives not being in the same single clause,



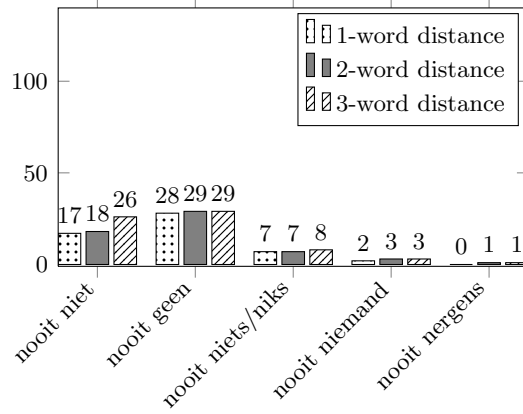
(a) No. of combinations starting with *niet*



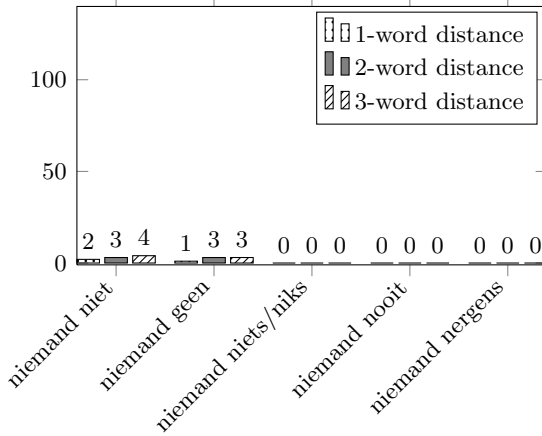
(b) No. of combinations starting with *geen*



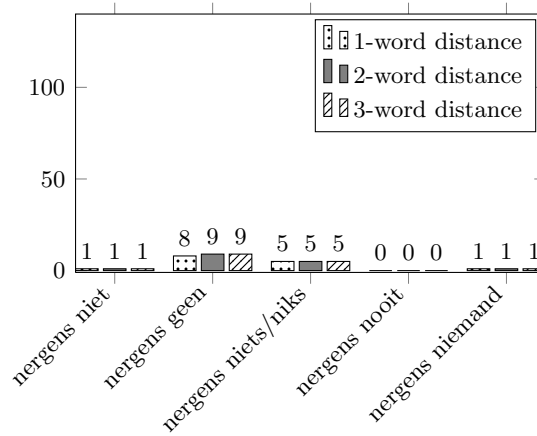
(c) No. of combinations starting with *niets/niks*



(d) No. of combinations starting with *nooit*



(e) No. of combinations starting with *niemand*



(f) No. of combinations starting with *nergens*

Figure 5: No. of negative combinations in the corpus (Dutch regions only)

<i>Distance:</i>	<i>1-word</i>	<i>2-word</i>	<i>3-word</i>
DN	14	78	2
NC	125	12	5
Other	29	71	94
Total	168	161	101

Table 1: Interpretations of negative combinations in Dutch regions

all of which were unusable for research on DN and NC. In (13) are some examples of two negatives at a 1-word, 2-word, or 3-word distance in the corpus which do not yield a DN or NC reading. In (13a) there is a clause boundary between *niet* and *geen*, which means they do not form a combination and cannot yield a DN or NC reading. In (13b) the speaker is correcting themselves while speaking, deciding to use *niemand* instead of *geen*. And in (13c) we have a complex sentence (like in (11) earlier) where the negative *niets* is in the main clause and *niet* is in the subordinate clause. Like mentioned before this does yield a DN reading, but since this always yields a DN reading complex sentences are not very useful for this research.

- (13) a. *dat weet ik niet weet ik niet geen idee*
 that know I not know I not no idea
 ‘that I don’t know I don’t know no idea’
- b. *ook geen ook niemand die we kennen?*
 also no also nobody who we know
 ‘also no also nobody we know?’
- c. *er was daar niets wat er niet hoorde en niets ontbrak*
 there was there nothing that there not belonged and nothing lacked
 ‘there was nothing that didn’t belong there and nothing was missing’

What we see in Table 1 is that for negative combinations at a 1-word distance (i.e. occurring next to each other) NC readings are found much more than DN readings, while for negative combinations at a 2-word distance DN readings are found more. When we look at the negative combinations at a 3-word distance it is obvious that these are better not used for this research, since only 7 out of 101 combinations yield a DN or NC reading; the other 94 combinations turned out to be unusable. This means that if we take the negative combinations at a 1-word distance and at a 2-word distance together, we have a total of 329 combinations, of which 229 are usable. Of those 229 negative combinations 92 (40.2%) yield a DN reading, and 137 (59.8%) yield an NC reading. This is a striking result, since Dutch is a DN language, yet we find that approximately 60% of combinations of negative terms yield an NC reading. In (14a)

we have an example of one of those DN readings from the corpus, and in (14b) an example of an NC reading from the corpus. All 228 negative combinations yielding a DN reading or an NC reading are included in Appendix A.1.

- (14) a. *we worden niet voor niets weggestuurd*
 we are not for nothing sent away
 ‘we are being sent away for a reason’
- b. *waarom mocht ik net niet geen vraag dan?*
 why might I just not no question then
 ‘then why couldn’t I get a question just now?’

In Figure 6 on page 24 an overview is shown of which combinations (at 1- and 2-word distances) yield the 91 DN readings and the 137 NC readings. What is immediately obvious is that all 91 DN readings were found for the combination *niet niets/niks*; nearly all of them concerned the use of this combination as exemplified previously in (12), and also seen in (14a). The 137 NC readings, on the other hand, are more spread out between the different combinations, but most are found for the combinations *nooit geen* (28), *niets/niks geen* (21), and *nooit niet* (17). Zeijlstra (2010) would object here that many of the NC readings found for combinations at a 1-word distance are probably not instances of NC, but so-called EMNEs. In chapter 2.3 it was discussed how he claims that constructions like *niemand niet* (nobody not) or *nooit geen* (never no), what he calls EMNEs, are what the disappearance of NC in Dutch has left behind, yet they are fundamentally different from NC constructions. He therefore infers that the occurrence of EMNEs “should not be taken to be instances of NC in DN languages” (Zeijlstra, 2010, p. 70). Now, of the 125 NC readings found for combinations at a 1-word distance, 97 could fall under Zeijlstra’s EMNE category since they do not start with either *niet* or *geen*. In (15) and (16) we see examples of combinations with an NC reading found in the corpus, that could possibly be EMNEs.

- (15) *d’r is nooit geen plek voor je jas als je daarheen gaat*
 there is never no place for your coat if you there go
 ‘there’s never any place for your coat when you go there’
- (16) *we hoorden nergens niks meer van*
 we heard nowhere nothing more from
 ‘we didn’t hear anything from anywhere anymore’

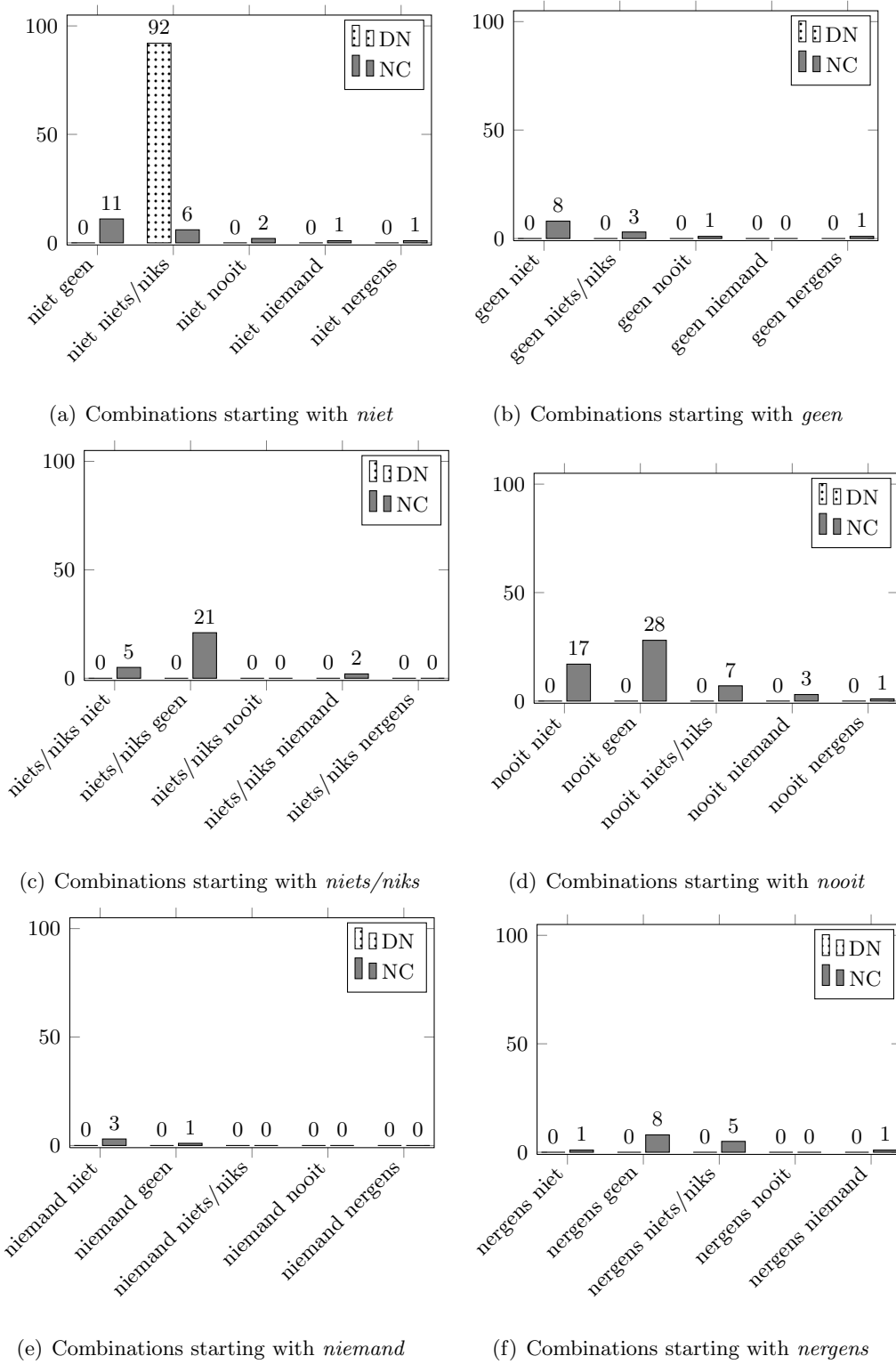


Figure 6: No. of DN and NC interpretations in the corpus (Dutch regions only)

If we would follow Zeijlstra’s argumentation and apply it to the results from Table 1, the number of NC readings found would decrease rapidly, which in turn would mean that the results would comply better with the idea of Dutch being a DN language. However, even then we are still left with 12 NC readings at a 2-word distance, and 28 NC readings at a 1-word distance that Zeijlstra cannot account for. In (17) we see an example of an NC reading at a 2-word distance from the corpus.

- (17) *'k wil helemaal niks van niemand meer*
 I want totally nothing from nobody more
 ‘I don’t want anything from anybody anymore.’

The 28 NC readings at a 1-word distance that Zeijlstra could not account for, are negative combinations of a form which he explicitly classifies as not being EMNEs. We see an example of such an NC reading from the corpus in (18).

- (18) *en nu we niet niks beloven wil ze natuurlijk wel*
 and now we not nothing promise wants she of course well
 ‘and now that we do not promise her anything she does of course want to’

According to Zeijlstra, *niet niks* cannot be an EMNE, since the first negative element is *niet*. The same holds for negative combinations starting with *geen*, of which an example NC reading from the corpus is shown in (19).

- (19) *omdat je geen nergens twee straten hebt*
 because you no nowhere two streets have
 ‘because you haven’t got two streets anywhere’

So even if we follow Zeijlstra, we end up with a considerable amount of NC readings (40 in total for combinations at a 1- and 2-word distance) found in the corpus, which are all not expected since we are talking about the DN language Dutch.

3.2 Production experiment (Experiment 1)

The corpus study was followed by a production experiment (Experiment 1), which was similar to the production experiment Huddleston (2010, ch. 5) did for Afrikaans. The aim of this small experiment was to get an idea of how Dutch native speakers would use intonation to try to convey either a DN meaning or an NC meaning.

3.2.1 Methods

The participants in the production experiment were eight graduate and undergraduate students who were enrolled in the MSc or the BSc program in Artificial Intelligence at Utrecht University. All participants were native speakers of Dutch and ranged in age from 20 to 24 years old. The materials for the production experiment were five short sentences containing two negatives, i.e. *niemand* combined with each of *nooit*, *niet*, *niets*, *nergens*, and *geen*. Each short sentence was then set in two different contexts providing for either a DN reading or an NC reading, thus resulting in ten discourse fragments. All ten items are included in Appendix A.2, but in (20) we see an example of the sentence ‘*Niemand heeft nooit gelogen*’ set in two different contexts, as used in the experiment. In (20a) the context is supposed to yield a DN reading, while in (20b) the context is supposed to yield an NC reading.

- (20) a. *Niemand heeft nooit gelogen; iedereen verzint wel eens een leugentje om
nobody has never lied everyone makes up some time a lie for
eigen bestwil.
own sake
‘Nobody has never lied; everyone makes up a lie for their own good some time.’*
- b. *Die film gaat over een wereld waar mensen niet kunnen liegen, dus
that movie is about a world where people not can lie so
niemand heeft nooit gelogen.
nobody has never lied
‘That movie is about a world where people cannot lie, so nobody has ever lied.’*

All participants were presented with all ten items, which were randomly ordered. They were instructed to first read each discourse fragment to themselves, and then to read them out loud as if they were telling someone about the events from the discourse fragment. While the participants read the discourse fragments out loud, they were being recorded.

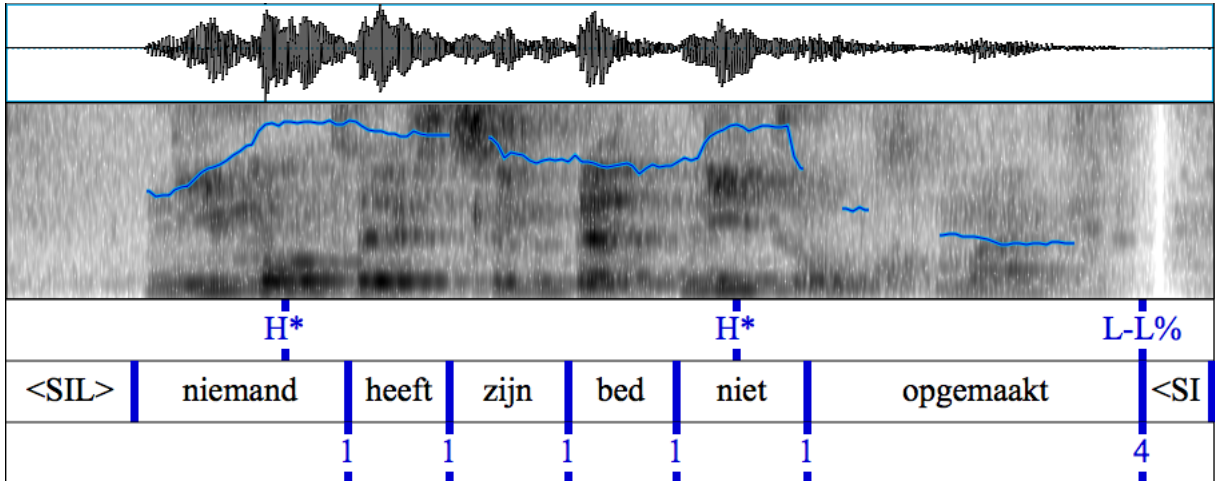
After completion of the recording sessions the original sentences containing the combinations of negative terms were extracted from the recordings without their respective contexts, to be used for the analysis. In total there were 40 utterances with a DN reading and 40 utterances with an NC reading (5 sentences * 8 participants). However, due to poor sound quality, a total of 4 utterances was removed, resulting in 38 utterances with a DN reading and 38 utterances with an NC reading. To analyze these utterances the program *Praat* (Boersma & Weenink, 2012) was used. In *Praat*, the prosodic annotation of the contours was made with the support of the ‘Guidelines for ToBI labelling’ (Beckman & Elam, 1997).

3.2.2 Results

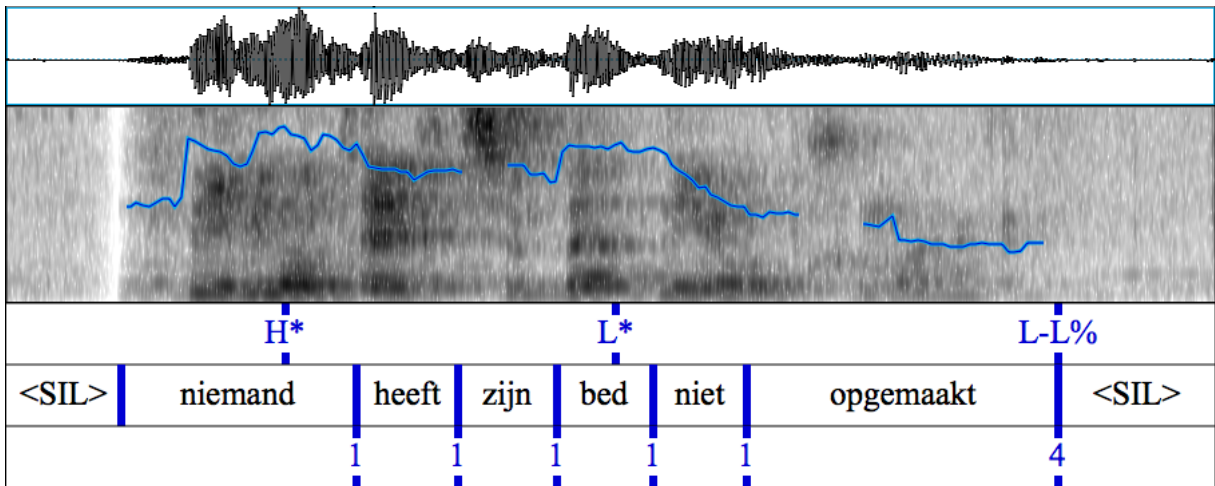
When looking at the sentences presented in a DN context, it was found that 31 out of 38 utterances yielded a considerably similar prosodic contour. The most important similarity in the contours of these utterances is the fact that they all contain a pitch accent, whether it is high (H) or low (L), on the second negative term. To be more precise, in these contours there is always an H* pitch accent on the first negative term, followed by either an L* pitch accent (16 out of 31) or another H* pitch accent (15 out of 31) on the second negative term, and ending in an L- phrase accent (28 out of 31) or an H- phrase accent (3 out of 31) and always an L% boundary tone. In Figure 7(a) on page 28 an example of such a contour is shown. The contours of the remaining 7 utterances either lack the pitch accent on the second negative term or have a pitch accent on a word right before or after the second negative term. In the discussion of the more elaborate production experiment (Experiment 2) in chapter 4 we will see that the results of Experiment 2 confirm these preliminary findings for intonation patterns in DN contexts, finding mostly what will then be called the H*L* pattern and the H*H* pattern for utterances in DN contexts.

The sentences presented in an NC context, on the other hand, showed more diverse prosodic contours. Still, there are some interesting results to consider. First, it was found that 17 out of 38 utterances yielded the same type of contour as most utterances in DN context did. Notably, 11 of those 17 utterances concerned the combinations *niemand niets* and *niemand nergens*. All other 21 utterances in NC contexts showed contours that later on in the discussion of Experiment 2 in chapter 4 will fall under what will then be called the H*- pattern. Out of these 21 utterances, all 7 concerning the combination *niemand niet* showed the same contour, which is illustrated in Figure 7(b) on page 28. In this contour there is an H* pitch accent on the first negative term, followed by an L* pitch accent on the word before the second negative term, and ending in an L- phrase accent with an L% boundary tone. As for the 14 remaining utterances, their contours either lacked a second pitch accent or had a pitch accent on a word right after the second negative term. The prosodic annotations for all 76 utterances (38 DN and 38 NC) are included in Appendix A.3.

While these results actually seem to show a few patterns in prosodic contours for both DN readings and NC readings, it has to be taken into account that they are based on very few data. In addition to this, most participants of the production experiment expressed serious confusion when confronted with the sentences in NC context, doubting the validity of the assertions. Some participants also complained afterwards about the bothersome level of the sentences with multiple negative terms in general, implying that they would rather not use



(a) Prosodic contour for a DN interpretation



(b) Prosodic contour for an NC interpretation

Figure 7: Prosodic contours for *niemand heeft zijn bed niet opgemaakt*

that type of sentences. All in all these factors make the results of the production experiment, though interesting, quite unreliable.

The sentences that were used for this experiment actually contained combinations of negative terms that occurred the least of all combinations in the corpus, which could in part explain the complaints of the participants, so a follow-up experiment should use combinations of negative terms that have a higher occurrence in the corpus. Also, three of the five sentences were composed in a ‘simple’ form: starting with the first negative, followed by a word, then the second negative, followed by a final word. Noticeably it were mostly those simple sentences where the prosodic contour for the NC interpretation was either similar to DN or just flat (lacking a pitch accent). It seemed that the other two sentences, which were one or two words longer, allowed the participants to make more use of prosody and put pitch accents on other words than the second negative, instead of resorting to the same contour as for DN or keeping it flat. Thus it would be good to use less simple sentences in a follow-up experiment to allow participants to be more creative with prosody, especially in NC contexts.

3.3 Discussion

Overall, the results from the pilot study are somewhat surprising. Since Dutch is a DN language we would expect to find mostly DN readings when multiple negative terms are used in Dutch. However, the results from the corpus study indicated that the opposite seems to be the case, finding more NC readings than DN readings for the occurrences of multiple negative terms in the Spoken Dutch Corpus. This could, however, be influenced by regional differences within Dutch regions. Just like Dutch spoken in Flemish regions behaves different from Dutch spoken in Dutch regions when it comes to double negatives, there could be regional differences in the behavior of double negatives within Dutch regions, e.g. between southern regions and northern regions. But during this corpus study there has not been kept track of the origins of the occurrences of negative combinations.

Even though in the corpus more NC readings were found, the reactions from the participants of the production experiment to the sentences in NC contexts are completely contrary to the results from the corpus study, and in accordance with Dutch being a DN language. They clearly showed a preference for multiple negative terms in DN contexts and seemed confused by those in NC contexts. But their complaints about the pesky sentences did comply with the low number of negative combinations found in the corpus study, indicating that multiple negative terms preferably are not used in Dutch. Also, like already mentioned, the negative combinations used in this pilot production experiment had the lowest number of occurrences

in the corpus, which can also have contributed to the resistance towards the use of negative combinations. So the following production experiment (Experiment 2) should control for this by using negative combinations with higher numbers of occurrences in the corpus.

The fact that most participants in the production experiment were not at ease with the negative combinations in NC contexts could be due to them all being students in Artificial Intelligence (AI). Within this program, students attend a number of courses in various types of logic. Through this education AI students develop a strong logical sense, which means that a DN meaning should indeed seem much more familiar to them than an NC meaning. This possible bias for AI students is something to keep in mind for further research.

3.4 Conclusion

The results from the corpus study showed which type of negative combinations are used and with which readings. The latter turned out to be mostly NC readings, which is surprising since Dutch is actually a DN language. However, these results clearly indicate that even though Dutch is a DN language, this does not mean that negative combinations will only be found within DN contexts. Instead, it is definitely possible to find NC readings in this DN language.

The participants from the production experiment, on the other hand, showed a preference for DN readings. This is to be expected from Dutch native speakers, but is contrastive with the results from the corpus study. This contrast between preferences for either DN readings or NC readings is something that will be explored further in Experiment 2.

The results from the corpus study and Experiment 1 have provided a good basis for conducting further experiments to learn more about the use of intonation with double negatives. The next chapter describes another production experiment (Experiment 2), for which sentences and contexts from the corpus will be used.

4 Production experiment (Experiment 2)

This chapter describes the methods and results of a production experiment. The aim of this experiment was to determine to what extent native speakers of Dutch produce disambiguating prosodic contours for sentences containing two negative terms, when those sentences are set in two different contexts. The hypothesis for the outcome of this experiment is that negative combinations will be produced with different intonation patterns if intended to convey a DN meaning, than if intended to convey an NC meaning. The question as to what these intonation patterns look like lies open, and is to be answered by the data gathered by performing this experiment.

4.1 Methods

4.1.1 Participants

For this production experiment, 31 participants were recruited through personal networks. All participants were native speakers of Dutch and ranged in age from 18 to 67 years old (with an average age of 30.9 years). Gender was fairly balanced among the participants: 58% male, 42% female.

4.1.2 Materials

The materials for the experiment were 20 sentences, each containing a combination of two negatives. All combinations consisted of two negatives from the following: *niet* (not), *geen* (no), *niks* (nothing), *nooit* (never), *niemand* (nobody), and *nergens* (nowhere). These were the same negatives that were examined in the corpus research during the pilot phase. The 20 sentences containing negative combinations were constructed through four categories, each comprising five sentences.

Two categories emerged from the corpus research which was done during the pilot: category 1 contained negative combinations with a tendency towards a DN interpretation, category 3 contained negative combinations with a tendency towards an NC interpretation. These tendencies were based on the findings from the corpus research. All ten sentences in categories 1 and 3 were taken directly from the corpus, and where possible together with their contexts from the corpus. In some cases contexts were too elaborate or too complicated to include directly into the materials for this experiment. In those cases the contexts were either simplified or completely changed in order to be fit as materials. Every sentence in category

1 contained the negative combination *niet niks*, as this was the only combination from the corpus that carried a DN meaning. The combination *niet niks* was the negative combination that occurred the most in the corpus. The negative combinations in category 3 were all different from each other; two of them occurred substantially in the corpus, and the other three had only a few occurrences.

Category 2 emerged from the results of the small production experiment that was done during the pilot. The results led to the hypothesis that a greater distance between two negatives within a sentence increased the possibilities for using intonation to disambiguate between a DN meaning and an NC meaning. Consequently, category 2 contained negative combinations with at least three words between them. As during the corpus study searches were only performed for combinations up to a distance of two words between them, there is no clear connection to be made between the negative combinations in this category and their possible occurrences in the corpus.

Finally, category 4 contained negative combinations that were Dutch translations of some of the Afrikaans negative combinations used for the production experiment from Huddleston (2010) as described in chapter 2, in which she found participants to have a clear preference for NC readings. All these negative combinations were different from each other, and they all had low numbers of occurrences in the corpus.

Each of those 20 sentences was set in two different contexts providing for either a DN reading or an NC reading, which resulted in a total of 40 discourse fragments to be used as items in the experiment. In Appendix B.1 these 40 discourse fragments are listed. All items were divided between two lists, while ensuring to keep the balance between items with DN reading and items with NC reading, as well as the balance between items from the four different categories mentioned before. Naturally, neither of the lists contained the same sentence both in a DN context and an NC context. Ultimately both lists contained 20 items and 20 fillers (fillers were the same for both lists). All fillers are listed in Appendix B.2. The order of a list was randomly generated for each participant. In (21)-(24) four examples are shown of sentences with two negatives put in two different contexts; (21) is an example from category 1, (22) is an example from category 2, (23) is an example from category 3, and (24) is an example from category 4.

- (21) a. DN: *Thomas heeft de organisatie van het hele feest gedaan. Hij heeft de zaal en de drank geregeld, de band en de DJ ingehuurd, de uitnodigingen verstuurd, noem maar op. Dat is niet niks natuurlijk, dus daar verdient hij wel een bedankje voor.*
 ‘Thomas organized the entire party. He arranged the venue and the drinks, hired

the band and the DJ, sent out invitations, you name it. That is not nothing, of course, so he really earns it to be thanked.’

- b. NC: *Wat betreft de organisatie van het feest heeft Thomas niet zo veel gedaan hoor. Het meeste werk, zoals de zaal, de drank, de band en de DJ regelen, is gedaan door Jeroen; ik geloof dat Thomas alleen een paar slingers heeft gekocht. Dat is niet niks natuurlijk, dus je hoeft voor hem geen bedankje te regelen.*

‘As far as organizing the party goes, Thomas hardly did anything. Most of the work, like arranging the venue, the drinks, the band, and the DJ, was done by Jeroen; I believe Thomas only bought a few garlands. That is not nothing, of course, so you don’t need to thank him.’

- (22) a. DN: *Ik had jullie de opdracht gegeven om moeilijke sommen voor elkaar te bedenken. Bij het nakijken zag ik dat iedereen goed zijn best heeft gedaan om de sommen lastig te maken. Mooi, niemand heeft de opdracht niet begrepen.*

‘I gave you an assignment to come up with difficult math problems for each other. While revising I noticed that everybody really made an effort in producing difficult math problems. That’s good, nobody did not understand the assignment.’

- b. NC: *Ik had jullie de opdracht gegeven om moeilijke sommen voor elkaar te bedenken. Maar bij het nakijken zag ik dat jullie alleen maar makkelijke sommen hebben opgeschreven. Dat was niet de bedoeling; niemand heeft de opdracht niet begrepen.*

‘I gave you an assignment to come up with difficult math problems for each other. But while revising I noticed that you had only written down easy math problems. That was not the idea of the assignment; nobody did not understand the assignment.’

- (23) a. DN: *Vroeger heb ik een aantal jaren bij de gemeente gewerkt. Maar toen ik kinderen kreeg ben ik gestopt met werken om zelf met de kinderen thuis te kunnen zijn. Ik werd daar eigenlijk best ongelukkig van en ik denk nu dat het de verkeerde keuze is geweest, want ik heb er nooit geen spijt van gehad.*

‘Previously I worked a few years in the municipality. But when I had my children I quit my job to be able to be at home with the kids. But I became quite unhappy because of that, and now I believe I made the wrong choice, because I never had no regrets.’

- b. NC: *Vroeger heb ik een aantal jaren bij de gemeente gewerkt. Maar toen ik*

kinderen kreeg ben ik gestopt met werken om zelf met de kinderen thuis te kunnen zijn. Sommige mensen begrijpen zon keuze niet, maar ik heb er nooit geen spijt van gehad.

‘Previously I worked a few years in the municipality. But when I had my children I quit my job to be able to be at home with the kids. Some people don’t understand such a choice, but I never had no regrets’

- (24) a. DN: *Toen we in Rotterdam woonden had onze buurman vaak verdacht uitziende personen over de vloer. Of er ook echt verdachte zaken plaatsvonden bij onze toenmalige buurman weet ik natuurlijk niet, maar altijd als ik thuis was zag ik wel van die criminele types op straat of bij hem voor het raam; ik heb nooit niks gezien. En niet alleen ik, maar ook mijn toenmalige huisgenoot zag altijd wel wat verdachts.*

‘When we lived in Rotterdam, our neighbor often had suspicious persons over at his house. I don’t know whether suspicious affairs really took place at our former neighbor’s house, but every time I was at home I saw those criminal types in the street or at his window; I have never seen nothing. And not only me, but also my flatmate always saw something suspicious.’

- b. NC: *Toen we in Rotterdam woonden had onze buurman vaak verdacht uitziende personen over de vloer. Tenminste, dat is wat mijn toenmalige huisgenoot altijd zegt, want ik heb nooit niks gezien. Ik weet dus achteraf niet of ik hem moet geloven of dat hij het allemaal wat overdreef.*

‘When we lived in Rotterdam, our neighbor often had suspicious persons over at his house. At least that’s what my former flatmate always says, because I have never seen nothing. So in hindsight I don’t know whether I should believe him or he was just exaggerating it all.’

4.1.3 Experimental design

The experiment was performed in the university phonetics lab in a sound-treated cabin with decent audio equipment. Each participant was scheduled for a half hour, during which the recordings were made. Participants were seated in front of a computer screen on which the experiment was administered using a PDF slideshow. Each item or filler was presented on an individual slide and participants could use the keyboard to go through the experiment at their own pace. Participants were instructed to read each slide to themselves before reading it out loud, and imagine the recordings to be used in an audio test for people learning Dutch

	DN context	NC context
Wrong order	5	0
Missing N1	1	5
Missing N2	0	2
Replaced N2 by \exists	2	13
Poorly pronounced	0	1
Total	8	21

Table 2: Reasons for excluding utterances from analysis

as a second language. The complete instructions given to participants in this experiment are included in Appendix B.3.

After completion of the recording sessions, the initial 20 sentences containing negative combinations were extracted from their contexts. This resulted in (31 participants * 20 utterances =) 620 utterances to be analyzed, of which 310 were originally presented in a DN context and another 310 in an NC context. To analyze the utterances the program *Praat* (Boersma & Weenink, 2012) was used. In *Praat*, the prosodic annotation of the contours was made with the support of the ‘Guidelines for ToBI labelling’ (Beckman & Elam, 1997).

4.2 Results

A total of 29 utterances was excluded from the analysis; 8 of those were presented in a DN context, the other 21 in an NC context. Reasons for exclusion ranged from uttering the words in a sentence in a wrong order, to failing to pronounce either the first or the second negative in a sentence or even replacing the second negative by the corresponding existential (e.g. *iemand* -somebody- instead of *niemand* -nobody-). Table 2 sums up all reasons for excluding the 29 utterances from the analysis.

While these utterances were excluded from the actual analysis, it is worthwhile noting that apparently for 20 utterances in an NC context participants chose a different strategy than intonation to convey the correct meaning of the sentence. For 13 utterances this was done subtly by replacing the second negative by its corresponding existential, which for all cases meant that only the initial ‘*n*’ of the negative had to be omitted. For 7 utterances this was done more rigorously by simply omitting one of the negatives.

With 29 utterances excluded there were 591 utterances left to be analyzed for prosodic patterns; 302 from a DN context and 289 from an NC context. The main focus of the analysis of

these utterances was whether or not pitch accents were placed on the two negatives in each utterance, and if so, whether these pitch accents were high or low. Boundary tones are not included in this analysis, since they were very dependent on whether the end of an intonational phrase was also the end of an entire sentence or not. The following sections will present the data grouped in a number of different configurations, in order to reveal some different aspects of the results. We will start by looking at all data together and the data grouped according to the four categories the items were originally constructed through.

4.2.1 All data

Figure 8 shows the frequency in percentages of the main intonation patterns found for all 591 utterances. Both H* and L* signify pitch accents (high or low) on either the first or the second negative in a sentence, and the - signifies no pitch accent on the second negative. All negative combinations that were produced with one of the pitch combinations shown in the figure are grouped in the corresponding bar, even if additional pitch accents were present in the same sentence. Additional pitch accents can be on words occurring before, in between, or after the two negatives in that sentence. All intonation patterns that include pitch combinations on the two negatives that are not explicitly shown in the figure belong to OTHER.

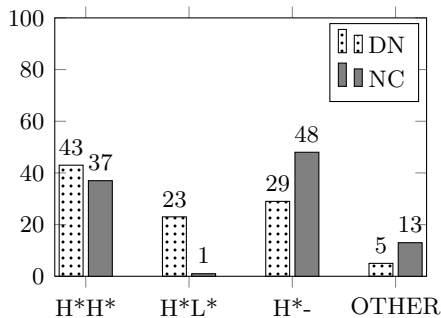


Figure 8: Pitch accents on negatives for all data

Statistical tests ($p = 0.01$) show that the distributions over different intonations patterns for both DN contexts ($\chi^2 = 89.97; df = 3; p < 0.00001$) and NC contexts ($\chi^2 = 162.89; df = 3; p < 0.00001$) differ significantly from a null hypothesis. This means that in both contexts the use of different intonation patterns is not equal, but certain intonation patterns shown in Figure 8 are used rather than other patterns shown. Concerning these differences in frequencies of intonation patterns, what becomes apparent in Figure 8 is that the H*L* pattern (H* pitch accent on the first negative and L* pitch accent on the second negative) is almost never produced by participants in an NC context, while it is produced for 23% of the

utterances in a DN context. The H*- pattern (H* pitch accent on the first negative and no pitch accent on the second negative), on the other hand, is produced more in an NC context (48%) than in a DN context (29%), though for this pattern the difference between contexts is not as striking as it is for the H*L* pattern. The H*H* pattern (H* pitch accent on both negatives) is produced for 43% of the utterances in a DN context, and for 37% of the utterances in an NC context, which is quite a small difference. Statistical tests comparing either the observed distribution for DN contexts to the distribution for NC contexts ($\chi^2 = 356.81; df = 3; p < 0.00001$) or the observed distribution for NC contexts to the distribution for DN contexts ($\chi^2 = 46.99; df = 3; p < 0.0001$) show that these distributions differ significantly from each other. Furthermore, in both tests the standardized residual shows us that the major contributors to this significant difference are mostly the H*L* pattern and to a lesser extent the H*- pattern. So based on Figure 8 we can say that if the H*L* pattern is used, it is used to convey a DN meaning. The H*- pattern is preferably used to convey an NC meaning, but is still quite frequent for conveying a DN meaning. And the H*H* pattern remains ambiguous between a DN meaning and an NC meaning. As for OTHER, in NC contexts most of those utterances (9%) were produced with an intonation pattern that lacked a pitch accent on the first negative, which for DN contexts was less than 1%. This means that overall the first negative in a combination always carries a pitch accent in DN contexts, and in 91% of the cases it carries a pitch accent in NC contexts.

4.2.2 Four categories

Figure 9 shows the data from Figure 8, but now ordered by category. In Figure 8 we saw that overall the H*- pattern is produced more within an NC context. In Figure 9 we can see that this is still the case for all four categories individually, though the extent differs a bit per category; Figure 9(a) shows that the H*- pattern is only found in NC contexts for category 1 (DN tendency), while Figure 9(c) shows that the preference for the H*- pattern in NC contexts is barely present in category 3 (NC tendency). It could be that this difference between categories 1 and 3 relates to the nature of those categories. Category 1 contained negative combinations with a tendency towards a DN interpretation, which possibly made it much easier to produce combinations in DN contexts with a typical DN pattern like H*L* or the ambiguous pattern H*H*. Category 3, on the other hand, contained negative combinations with a tendency towards an NC interpretation, which could have led participants to produce combinations in DN contexts with the H*- pattern more easily, even though this pattern is produced preferably for combinations in NC contexts. However, statistical tests show that both for DN contexts ($\chi^2 = 6.61; df = 3; p = 0.0854$) and NC contexts ($\chi^2 = 1.11; df = 3; p =$

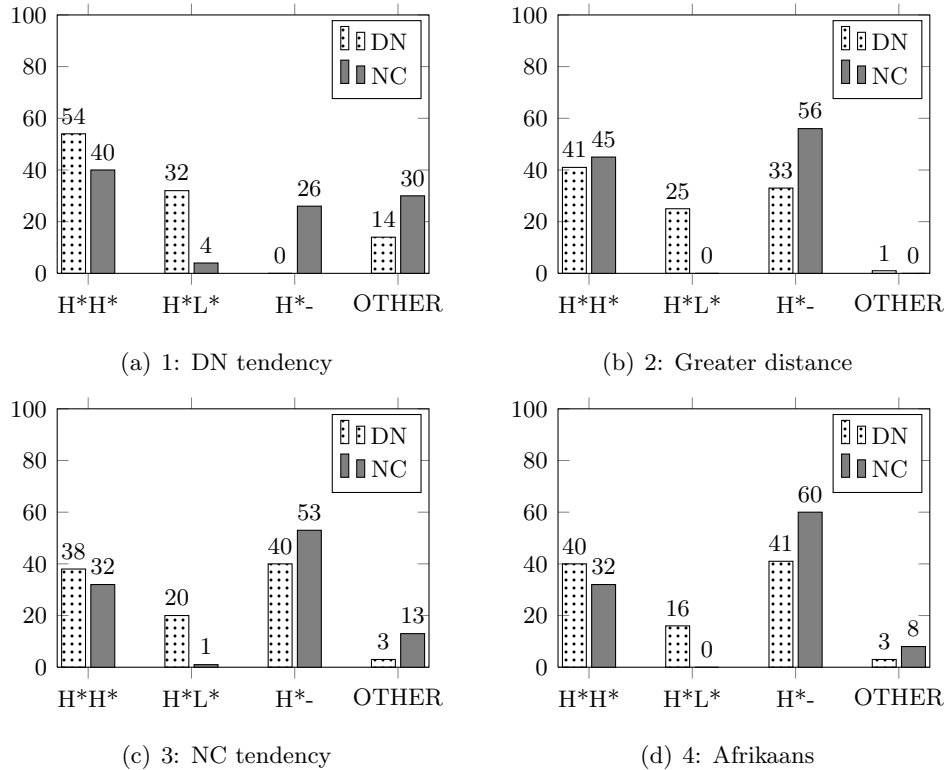


Figure 9: Pitch accents on negatives per category

0.7747) the distributions in Figure 9(c) do not differ significantly from the distributions for all data in Figure 8. The distributions in Figure 9(a), on the other hand, do differ significantly from the distributions for all data, both for DN contexts ($\chi^2 = 50.02; df = 3; p < 0.0001$) and NC contexts ($\chi^2 = 39.36; df = 3; p < 0.0001$). The standardized residual shows that the major contributors to this significant difference are the H*- pattern and OTHER.

As suggested by the statistical tests, we should notice the relatively high percentages for OTHER in Figure 9(a): 14% in DN contexts and 30% in NC contexts. After close inspection of the intonation patterns belonging to OTHER it turned out that the variability for OTHER in category 1 is very low; almost all utterances (both DN and NC) were produced with an L*H* pattern. In contrast, this pattern hardly occurred in categories 2, 3 and 4. Since all sentences in category 1 contained the combination ‘*niet niks*’ (for an example look back at (21)), which is a frequently used expression in Dutch, it could be that the L*H* pattern is related to this negative combination in some way. However, it remains unclear why this intonation pattern occurred approximately twice as much in NC contexts as it did in DN contexts.

Figure 9(b) shows the lowest frequency for OTHER (DN: 1%, NC: 0%), which means that for category 2 (greater distance) nearly all uttered negative combinations were produced with

one of the patterns H^*H^* , H^*L^* , or H^*- . The distribution between these three patterns for category 2 resembles the distribution seen for all data in Figure 8 very much. This is confirmed by statistical tests, which show that the distribution for DN contexts in Figure 9(b) is not significantly different from the distribution for DN contexts in Figure 8 ($\chi^2 = 3.6; df = 3; p = 0.308$). The distribution for NC contexts does exhibit a significant difference from the corresponding distribution for all data ($\chi^2 = 16.6; df = 3; p = 0.0009$), but the standardized residual shows that the only contributor to this significant difference is OTHER. This similarity to the distribution for all data also applies to category 4 in Figure 9(d). Both for DN contexts ($\chi^2 = 8.95; df = 3; p = 0.03$) and NC contexts ($\chi^2 = 6.36; df = 3; p = 0.0954$), statistical tests show that their distributions in Figure 9(d) are not significantly different from the corresponding distributions for all data in Figure 8.

We have now looked at the results from all data together and the effects of grouping the data according to the four categories the items were ordered by. This has already given us some insight into the intonation patterns used in either DN or NC contexts. But in order to obtain more information from these data, the next sections will present them in other configurations than just the separation in four categories. These new configurations are derived from different properties of the negative combinations.

4.2.3 EMNEs

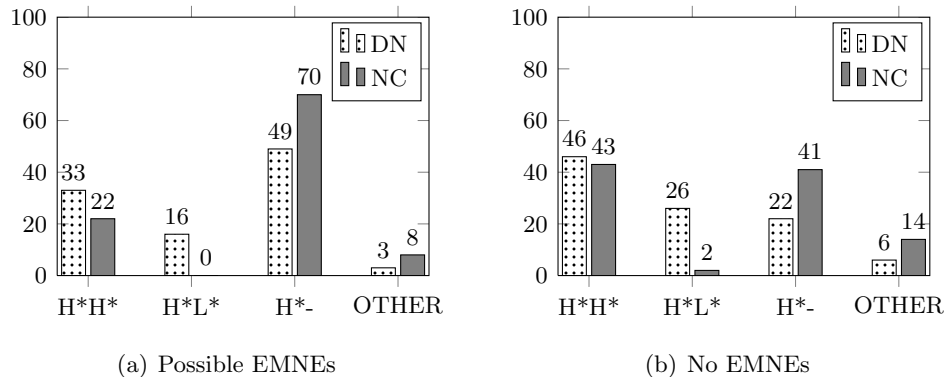


Figure 10: Pitch accents on negatives for possible EMNEs and other combinations

Figure 10 shows all data again, now split into two groups according to whether the negative combination in the sentence could be an EMNE like Zeijlstra (2010) described. In chapter 2.3 Zeijlstra's ideas on negative concord and EMNEs were discussed. Now remember that he claims that constructions like *niemand niet* (nobody not) or *nooit geen* (never no) are not to be taken as instances of NC in a DN language. Instead Zeijlstra thinks they should be

viewed as EMNEs. Out of the 20 negative combinations used in this experiment 5 could be EMNEs, which means that the negatives in those combinations directly follow each other and that they do not contain *niet* (not) or *geen* (no) as the first negative. Of those 5 possible EMNEs, 4 belonged to category 4 (Afrikaans) and 1 belonged to category 3 (NC tendency). Two examples of an item from this experiment that is a possible EMNE are shown in (23) and (24) on page 33. The other 15 negative combinations could not be EMNEs.

Figure 10(a) shows the distribution over different intonation patterns for the negative combinations used in this experiment that Zeijlstra would call EMNEs, while Figure 10(b) shows this distribution for all other negative combinations. These two figures seem to show a slightly different distribution; for the possible EMNEs in Figure 10(a) we see the highest frequency in DN and NC contexts for the H*- pattern (DN: 49%, NC: 70%), while for all other combinations in Figure 10(b) the highest frequency is seen for the H*H* pattern (DN: 46%, NC: 43%). What is interesting here is that statistical tests show that the distributions for possible EMNEs in Figure 10(a) are significantly different from the distributions for all data in Figure 8, both in DN contexts ($\chi^2 = 20.87; df = 3; p = 0.0001$) and NC contexts ($\chi^2 = 18.89; df = 3; p = 0.0003$). The standardized residual shows that the major contributor to this significant difference is the H*- pattern in both contexts, and also the H*H* pattern in NC contexts. The distributions for all other combinations in Figure 10(b), on the other hand, are not significantly different from the distributions for all data in Figure 8, both in DN contexts ($\chi^2 = 2.44; df = 3; p = 0.4862$) and NC contexts ($\chi^2 = 2.16; df = 3; p = 0.5399$).

This asymmetry between Figure 10(a) and Figure 10(b) is somewhat in accordance with Zeijlstra's view on intonation for EMNEs, since he claims that "for EMNEs the stress must fall on the first element". However, Figure 10 still is not supporting Zeijlstra's idea convincingly due to a few issues. First, we have already seen that for negative combinations the first element almost always carries a pitch accent, irrespective of whether we are talking about possible EMNEs or DN versus NC contexts. This makes his statement about the obligation for the first element of an EMNE to carry stress rather meaningless, since this is already almost always the case for double negatives. And second, in addition to his first claim about stress for EMNEs, there is a second restriction he poses on stress for EMNEs: he claims that if the second element carries stress, only the DN reading is yielded. So for EMNEs the second element may not carry stress. This means that the H*H* pattern is not suitable for EMNEs. And even though the H*H* pattern is less frequent than the H*- pattern for possible EMNEs it is still found for a third of all utterances in DN contexts and nearly a quarter of all utterances in NC contexts, which is not to be dismissed.

4.2.4 Negation and n-words

Figure 11 shows nearly all data split into three groups: negative combinations consisting of two n-words (i.e. *niets/niks, nooit, niemand, nergens*), and negative combinations consisting of an n-word and a negation (i.e. *niet, geen*) in both orders. Out of the 20 negative combinations used in this experiment 9 are combinations of two n-words, 4 are combinations of an n-word followed by a negation, and 6 are combinations of a negation followed by an n-word. One combination consisted of two negations and is not included in Figure 11. Out of the 9 combinations of two n-words 2 belonged to category 2 (greater distance), 2 belonged to category 3 (NC tendency), and 5 belonged to category 4 (Afrikaans). Out of the 4 combinations of n-word + negation 3 belonged to category 2 (greater distance), and 1 belonged to category 3 (NC tendency). Out of the 6 combinations of negation + n-word 5 belonged to category 1 (DN tendency), and 1 belonged to category 3 (NC tendency). An example of an item from this experiment that contained two n-words is shown in (24) on page 34, two examples of an item that contained a combination of an n-word followed by a negation are shown in (22) and (23) on page 33, and an example of an item that contained a combination of a negation followed by an n-word is shown in (21) on page 32.

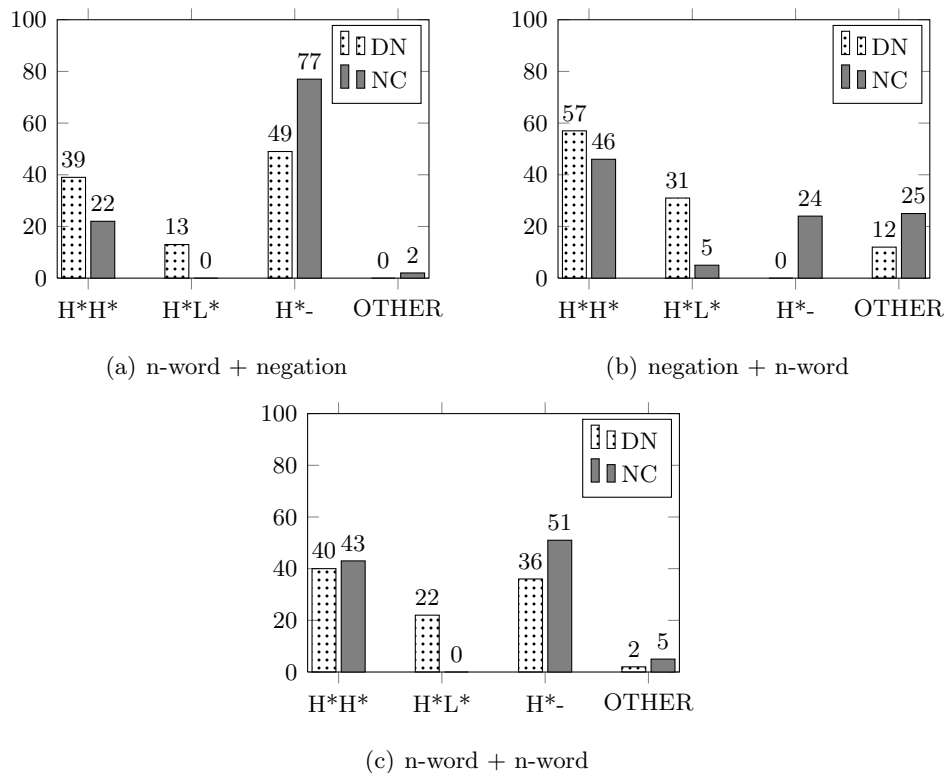


Figure 11: Pitch accents on n-words and negations

While the distribution seen in Figure 11(c) for combinations of only n-words is very similar to the distribution for all data in Figure 8, the distributions in Figures 11(a) and 11(b) for an n-word followed by a negation and a negation followed by an n-word, respectively, are rather different. These observations are confirmed by statistical tests. The distributions for combinations of two n-words in Figure 11(c) are not significantly different from the distributions for all data in Figure 8, both in DN contexts ($\chi^2 = 3.66; df = 3; p = 0.3006$) and NC contexts ($\chi^2 = 7.69; df = 3; p = 0.0529$). But the distributions for combinations containing an n-word followed by a negation in Figure 11(a) do differ significantly from the distributions for all data, both in DN contexts ($\chi^2 = 23.27; df = 3; p < 0.0001$) and NC contexts ($\chi^2 = 34.11; df = 3; p < 0.0001$), the major contributor being the H*- pattern. And the distributions for combinations containing a negation followed by an n-word in Figure 11(b) differ significantly as well from the distributions for all data, both in DN contexts ($\chi^2 = 46.78; df = 3; p < 0.0001$) and NC contexts ($\chi^2 = 33.81; df = 3; p < 0.0001$), the major contributor again being the H*- pattern as well as OTHER. For the order negation + n-word in Figure 11(b) we indeed see high percentages for the H*H* pattern (DN: 57%, NC: 46%), quite low percentages for the H*- pattern (DN: 0%, NC: 24%), and a considerably high frequency for OTHER (DN: 12%, NC: 25%). For the order n-word + negation in Figure 11(a), on the other hand, the distribution is more or less the other way around. Here we see very high percentages for the H*- pattern (DN: 49%, NC: 77%), and a moderate frequency for the H*H* pattern (DN: 39%, NC: 22%).

The rather high percentages for the H*- pattern if an n-word precedes a negation could be explained by the fact that in an intonational phrase it is easy to not put a pitch accent on a negation when it is already preceded by an accented n-word. The n-word, expressing a more complex meaning than a negation, tends to be a more prominent feature of an intonational phrase. This could also explain why if an n-word follows an accented negation in an intonational phrase, it almost always carries a pitch accent in DN contexts (a total of 88%) and half of the time in NC contexts (a total of 51%), as we can see in Figure 11(b). The so-called strategy of participants in this case might have been to, after having already put a pitch accent on the first negation (which simply happens almost always, as we saw earlier on), also put a pitch accent on the n-word that follows it to emphasize this more prominent aspect of the intonational phrase as well.

If we look back at the very high frequency of the H*- pattern for an n-word preceding a negation in Figure 11(a), we can see that this is especially high in NC contexts (DN: 49%, NC: 77%). In order to learn more about the cause of this peak, Figure 12 shows a more fine-grained distribution of the intonation patterns for combinations of an n-word followed by

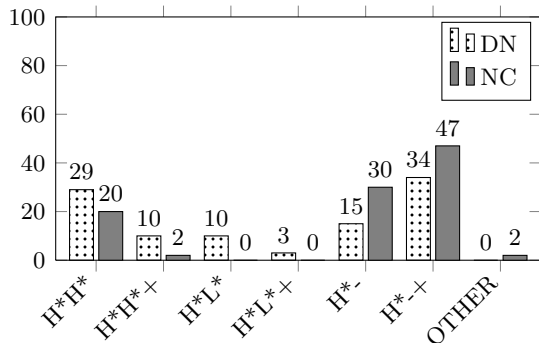


Figure 12: Pitch accents for n-word + negation

a negation. All three intonation patterns we have seen already in previous figures are now split into patterns with solely pitch accents on the two negatives (i.e. H*H*, H*L*, H*-), and patterns with pitch accents on the two negatives as well as additional pitch accents on other words in the intonational phrase (i.e. H*H*+, H*L*+, H*+-). What we see in Figure 12 is a rather high frequency of the H*+- pattern (DN: 34%, NC: 47%), which is higher than the frequency of the H*- pattern (DN: 15%, NC: 30%). For the patterns H*H* and H*L*, on the other hand, this is not the case. After close inspection of the utterances produced with the H*+- pattern it was clear that all of them contained the negation ‘*geen*’ (English: ‘no’) as the second negative. Moreover, for almost all of those utterances the + actually turned out to signify a pitch accent on the noun immediately following *geen*, so the noun this negation modifies. Apparently, if *geen* is the second negative in a combination, the preferred strategy is to shift the pitch accent from this negative to the immediately following noun. However, this strategy does not seem to be used specifically in either DN or NC contexts, since for both contexts this pattern was produced for almost all utterances included in the H*+- pattern in Figure 12.

4.3 Discussion

The results for all data as presented in Figure 8 showed a trend that complies with the results previously found in Experiment 1 in chapter 3. In that pilot experiment for DN contexts mostly what we called here the H*L* pattern and the H*H* pattern were found, and for NC contexts mostly what we call now the H*- pattern. This trend indeed came back in the results for all data from this more elaborate Experiment 2, finding the H*L* pattern to be used only in DN contexts, the H*- pattern to be used more in NC contexts, and the H*H* pattern to be used in both contexts.

In the design of this production experiment (Experiment 2), the items with negative combinations were divided between four categories based on findings from the corpus research and a production experiment (Experiment 1) performed during the pilot phase. However, these different categories do not deliver remarkably different results in the distributions of intonation patterns, as we have seen in Figure 9. The only category that shows a significantly different distribution is category 1 (DN tendency), which is also the only category for which all five intonational phrases contain the exact same negative combination (i.e. *niet niks*).

So to find other informative configurations we have also looked at a division between possible EMNEs and no EMNEs, and a division based on whether the negative combinations contain n-words or simple negations. In Figure 10 we have seen that separating the data into negative combinations which Zeijlstra (2010) would label EMNEs, and negative combinations which are not EMNEs, does indeed leave us with two slightly different distributions of intonation patterns. However, Figure 10(a), which shows the frequency of intonation patterns for possible EMNEs, does not confirm Zeijlstra’s hypothesis on the existence of EMNEs. His claim about the obligation of stress falling on the first element of an EMNE implies that the second element is not allowed to carry stress. But Figure 10(a) shows that for at least 22% of possible EMNEs in NC contexts the second element still carries stress, which is simply not acceptable if you claim that this is not possible for a negative combination that is an EMNE. Therefore, it seems more likely that the difference between Figure 10(a) (possible EMNEs) and Figure 10(b) (no EMNEs) is related to the proximity of the two negatives in a combination.

In Figure 11 we have seen that separating the data based on whether we are dealing with n-words or negation, and in which configuration, also leaves us with different distributions. Especially combining an n-word and a negation, as seen in Figure 11(a) and Figure 11(b), has helped in getting a better grasp of the behavior of intonation when using double negatives. Based on all the different configurations of the data we have seen in the previous section, it is possible to formulate the following prosodic rules for double negation in an intonational phrase:

1. The first negative expression of a negative combination always carries a pitch accent.
2. (a) If the second negative expression of a negative combination is a negation (i.e. *niet*, *geen*), it will most likely not attract a pitch accent.
 - (b) If the second negative expression of a negative combination is an n-word (i.e. *niks*, *nooit*, *niemand*, *nergens*), it will most likely attract a pitch accent as well.
3. If the second negative expression of a negative combination is *geen* (no), the pitch accent will most likely shift to the following noun.

It should be clear that these rules in general are independent of the DN/NC distinction. However, in rule 2 we see the formulation ‘most likely’, which in fact can be subscribed to a DN/NC distinction. To see how this is, here are the prosodic rules reformulated:

1. The first negative expression of a negative combination always carries a pitch accent.
2. (a) If the second negative expression of a negative combination is a negation (i.e. *niet*, *geen*), it will most likely not attract a pitch accent. *If it does attract a pitch accent, the negative combination is probably set in a DN context.*
- (b) If the second negative expression of a negative combination is an n-word (i.e. *niks*, *nooit*, *niemand*, *nergens*), it will most likely attract a pitch accent as well. *If it does not attract a pitch accent, the negative combination is probably set in an NC context.*
3. If the second negative expression of a negative combination is *geen* (no), the pitch accent will most likely shift to the following noun.

4.4 Conclusion

This chapter described the methods and results of an elaborate production experiment (Experiment 2) that emerged from the results of the corpus study and a small production experiment (Experiment 1), which were performed in the pilot phase. The aim was to determine to what extent Dutch speakers would produce disambiguating intonation patterns for negative combinations set in both DN contexts and NC contexts.

We have looked at the data from this experiment from different angles, such as the different categories the sentences belonged to, whether the combinations could be EMNEs or not, and whether the combinations consisted of n-words or plain negation. These different angles gave us some interesting views on the data and the possible strategies being used by participants. However, those views pertained more to general trends in prosody for double negatives; they did not add more insight to the DN/NC contrast besides the trend we already saw in Figure 8, which showed the intonation patterns found for all data together in one figure. Thus, going back to the aim of this experiment, in line with the analysis of the results we can conclude the following about possible disambiguation between DN and NC interpretations using intonation:

1. The H*L* pattern is almost always used to convey a DN meaning.
2. The H*- pattern is preferably used to convey an NC meaning.

3. The H*H* pattern remains ambiguous between a DN meaning and an NC meaning.

So following the results from this production experiment, there is indeed a difference to be found in prosodic contours for negative combinations between DN and NC, but this difference is not clear-cut.

A possibility for further research could be to re-analyze the recorded data with ToDI (Transcription of Dutch Intonation) instead of ToBI (Tones and Break Indices), since the former system was created specifically for Dutch intonation (Gussenhoven, 2005). Another option would be to perform a phonetic analysis (as opposed to the current phonological analysis) on the negative combinations that were produced with the H*H* pattern, to see whether under such analysis this pattern stays ambiguous between DN and NC or not.

But what is now very interesting is the question whether the findings from this production experiment can be confirmed by results from a perception experiment. Performing a perception experiment could provide us with more insight as to whether it is indeed the case that Dutch speakers will judge negative combinations produced with an H*L* pattern as conveying a DN meaning and sentences produced with an H*- pattern as conveying an NC meaning. And an even more interesting question, of course, is how they would judge negative combinations produced with the so far ambiguous H*H* pattern. Therefore the next chapter will present the methods and results of a follow-up perception experiment (Experiment 3).

5 Perception experiment (Experiment 3)

This chapter describes the methods and results of a perception experiment. The aim of this experiment was to explore to what extent intonation can influence the interpretation of a sentence containing a negative combination. This was essentially done by testing the findings from Experiment 2. From the results of Experiment 2 the following guidelines pertaining to prosodic disambiguation between DN and NC were extracted:

1. The H*L* pattern is almost always used to convey a DN meaning.
2. The H*- pattern is preferably used to convey an NC meaning.
3. The H*H* pattern is ambiguous between a DN meaning and an NC meaning.

These guidelines will serve as the hypothesis for this experiment. The first question is whether rules 1 and 2 will be confirmed, meaning that a produced H*L* pattern and H*- pattern will in general indeed be perceived as conveying a DN meaning and NC meaning respectively. The second question is whether rule 3 will remain like this or will be defeated by finding the H*H* pattern to be chosen more for either DN or NC readings.

5.1 Methods

5.1.1 Participants

For this perception experiment, 75 participants were recruited via both personal and social networks. All participants were native speakers of Dutch and ranged in age from 16 to 69 years old (with an average age of 38.6 years). Gender was fairly balanced among the participants: 47% male, 53% female.

5.1.2 Materials

The materials for this experiment consisted of 6 simple sentences containing a negative combination. All 6 sentences were previously used in Experiment 2 as well, and are shown in (25).

- (25) a. *er was niet niks te doen daar*
 ‘there was not nothing to do there’
- b. *niks van dat alles is nergens te vinden*
 ‘nothing from all of that is nowhere to be found’

- c. *niemand heeft de opdracht niet begrepen*
'nobody did not understand the assignment'
- d. *dan heb je nooit meer nergens last van*
'then you will never have problems nowhere anymore'
- e. *je kunt niet met niemand afspreken*
'you cannot meet with nobody'
- f. *ik heb er nooit geen spijt van gehad*
'I never had no regrets'

Out of the 6 negative combinations, 2 are combinations of two n-words (see (25b) and (25d)), 2 are combinations of a negation followed by an n-word (see (25a) and (25e)), and 2 are combinations of an n-word followed by a negation (see (25c) and (25f)). The negative combination in (25a) is the commonly used combination *niet niks* (not nothing), which is normally used with a DN meaning. The negative combination in (25f) is what Zeijlstra (2010) would call an EMNE. In chapter 2.3 Zeijlstra's ideas on negative concord and EMNEs were discussed. Now remember that he claims that constructions like *niemand niet* (nobody not) or *nooit geen* (never no) are not to be taken as instances of NC in a DN language. Instead Zeijlstra thinks they should be viewed as EMNEs. But irrespective of whether we call the combination in (25f) an EMNE or not, this combination tends to be used with an NC meaning. The other four combinations have not been proven to show a particular preference for either DN or NC.

The 6 sentences shown in (25) were recorded by a Dutch native speaker in a sound-treated cabin. All 6 sentences were recorded with 3 different intonation patterns on the two negatives in the sentence: H*L*, H*-, and H*H*. Remaining words in the sentences were not accented. In the experiment, the recordings of the sentences were combined with a pair of written follow-up sentences, each ensuring either a DN or NC meaning for the spoken sentence in the recording. For each of the 6 spoken sentences, every recording (H*H*, H*-, and H*L*) was combined with the same pair of written follow-up sentences. In (26) a complete item is shown.

- (26) Recorded: *niemand heeft de opdracht niet begrepen*
- a. Written DN follow-up:
Iedereen heeft netjes gedaan wat er gevraagd was.
'Everybody has neatly done what was asked.'

- b. Written NC follow-up:

Iedereen heeft iets anders gedaan dan de bedoeling was.

‘Everybody has done something different from what was intended.’

The 18 items (6 sentences * 3 recordings) were divided between 3 lists, each list containing one of the three different recordings from each of the 6 sentences. Thus, different recordings of the same sentence never occurred together in one list. The 6 items in each list were then supplemented by 7 fillers. Just like the items, the 7 sentences for the fillers were the same for each list, but the recordings were different. The order of each list was randomly generated, but was the same for each participant. All 6 complete items are included in Appendix C.1 and all 7 complete fillers are included in Appendix C.2.

5.1.3 Experimental design

The experiment was conducted via the internet. Each participant could access the experiment by going to the via email or social network provided web page, and was then randomly assigned to a list. As there were 3 lists and 75 participants, ultimately 25 participants performed the experiment for each list. Participants were able to perform the experiment on any computer with an internet connection and speakers or headphones on. On the web page, the participant was instructed to listen to each audio fragment one by one and indicate which of the two written sentences would best follow the sentence the participant had just heard. The exact instructions for participants as formulated on the web page are included in Appendix C.3.

5.2 Results

In this section first an overall analysis for all gathered data will be given. Subsequently we will look at the data for each individual sentence.

5.2.1 Overall analysis

Figure 13 shows the results for all data of this perception experiment together. For each condition (i.e. each intonation pattern) we see the distribution between DN and NC interpretations in percentages, as indicated by the participants. If we assume a null hypothesis, statistical tests ($p < 0.01$) show that for utterances produced with the H*L* pattern, the occurrence of DN interpretations versus NC interpretations differs significantly ($\chi^2 = 44.83$;

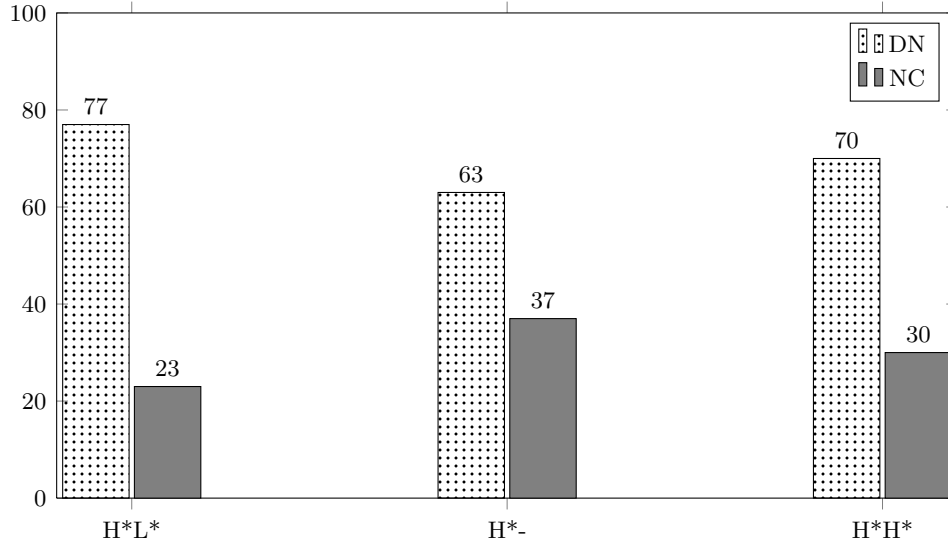


Figure 13: Interpretation in % of all 6 utterances in all 3 conditions

$df = 1$; $p < 0.0001$). For utterances produced with the H*- pattern, the occurrence of DN versus NC interpretations differs significantly as well ($\chi^2 = 9.63$; $df = 1$; $p = 0.0019$). And finally, there is also a significant difference between DN and NC interpretations for the H*H* pattern ($\chi^2 = 24$; $df = 1$; $p < 0.0001$). The significant differences for all 3 conditions are in favor of DN interpretations. We see the greatest difference between DN and NC interpretations for the H*L* pattern: 77% DN and 23% NC. This is followed by the numbers for the H*H* pattern (70% DN; 30% NC), and finally the H*- pattern (63% DN; 37% NC).

While the differences between DN and NC interpretations for each condition in Figure 13 are significant, this does not yet say something about the hypotheses gained from the previous production experiment (Experiment 2). This is why statistical tests were run again, this time, instead of null hypotheses, assuming the following hypotheses based on the results from Experiment 2:

	DN	NC
1. H*L*	95.80%	4.20%
2. H*-	37.70%	62.30%
3. H*H*	53.75%	46.25%

Again, for all conditions the observed frequencies of DN and NC interpretations differ significantly from the hypotheses¹, which was clearly expected just by looking at the observed

H*L* : $\chi^2 = 136.11$; $df = 1$; $p < 0.00001$

¹ H*- : $\chi^2 = 39.95$; $df = 1$; $p < 0.0001$

H*H* : $\chi^2 = 15.93$; $df = 1$; $p < 0.0001$

frequencies in Figure 13. This means that in this sense the observed frequencies of DN and NC interpretations in this perception experiment do not confirm the hypotheses extracted from the results of the production experiment. However, if we look back at Figure 13 we can see that the conclusions from the production experiment still make at least some sense. Indeed we see that for each intonation pattern the preference is in favor of DN interpretations, instead of in favor of NC interpretations for the H*- pattern and more or less equal for the H*H* pattern. But we can also see that for DN interpretations only we find the highest frequency for the H*L* pattern (77%) and the lowest frequency for the H*- pattern (63%), and likewise for NC interpretations we find the highest frequency for the H*- pattern (37%) and the lowest frequency for the H*L* pattern (23%). So even though it is not immediately obvious, Figure 13 does slightly show an expected trend for DN and NC interpretations.

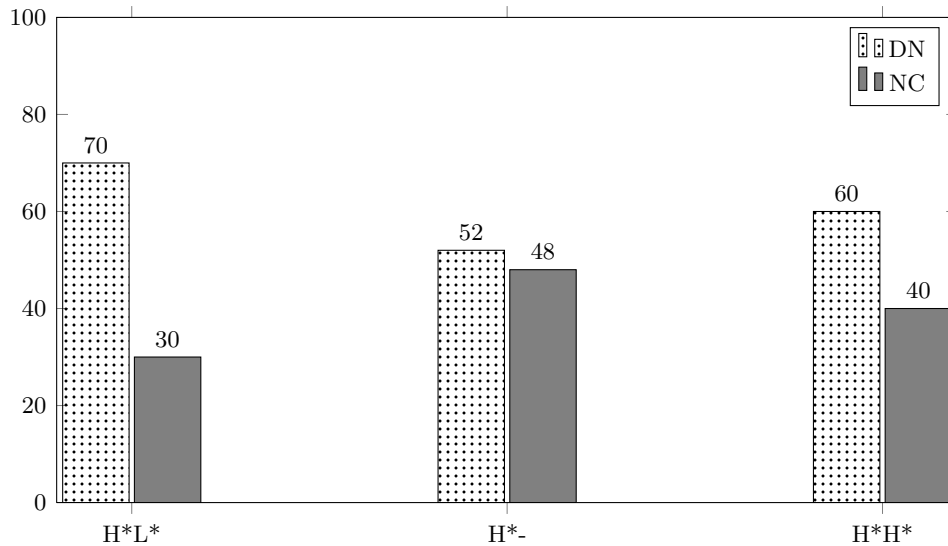


Figure 14: Interpretation in % of only 4 utterances in all 3 conditions

In the next section, where a sentence by sentence analysis will be explored, it will become clear that there are two sentences used in this experiment that seem to have an overall preference for a DN interpretation. Both sentences in all three conditions have a frequency for DN interpretations that is 80% or higher (see also items 1 and 3 in Tables 3, 4, and 5 on page 53). Therefore in Figure 14 results are shown again, now excluding the data from the two sentences (items 1 and 3) with a clear bias towards DN. If we assume a null hypothesis, statistical tests now show that for utterances produced with the H*L* pattern, the occurrence of DN interpretations versus NC interpretations still differs significantly ($\chi^2 = 16$; $df = 1$; $p < 0.0001$). For utterances produced with the H*- pattern, on the other hand, the occurrence of DN versus NC interpretations now does not differ significantly ($\chi^2 = 0.16$;

$df = 1; p = 0.6892$). And there is also no significant difference anymore between DN and NC interpretations for the H*H* pattern ($\chi^2 = 4; df = 1; p = 0.0455$). This means that, if two sentences with a clear DN bias are excluded, while the H*L* pattern does elicit a significant preference for DN interpretations, both the H*- pattern and the H*H* pattern elicit no such preference for either interpretation.

5.2.2 Sentence by sentence analysis

If we explore the data sentence by sentence we can learn more about how the ratios between DN and NC interpretations for all data as seen in Figure 13 come about. In Tables 3, 4, and 5 the ratios for all 6 sentences individually are shown for the H*L* pattern, the H*- pattern and the H*H* pattern, respectively. As mentioned already in the previous section, there are two sentences, items 1 and 3, which in all three conditions have a frequency for DN interpretations that is 80% or higher. For item 1 this behavior was expected, since it contains the more frequently used negative combination *niet niks* (not nothing) which is used by default with a DN meaning. For item 3, however, such an obvious bias towards DN was not immediately expected; for the H*H* pattern there were even no NC interpretations at all. Remember that the expectation in the production experiment (Experiment 2) for the type of negative combination we see in item 3, where the two negatives are at a greater distance from each other, was that it would provide for more opportunities in using intonation to disambiguate. But since in the results from this perception experiment we see a DN bias in item 3 for all three intonation patterns, we should conclude that this negative combination is not susceptible to meaning influence by intonation. It could be that precisely the fact that the second negative *niet* (no), which is a plain negation, is at a greater distance from the first negative makes it harder for hearers of the utterance to ignore its presence. And if they cannot ignore its presence they will have to compose the meaning like is expected in Dutch, so they end up with a DN interpretation.

Now let us consider item 5 which, just like item 1, contains a negative combination of a negation followed by an n-word. It is, however, not a familiar combination like item 1 is, and we can see in Tables 3, 4, and 5 it does also not at all behave like item 1 either. For the H*L* pattern in Table 3 we see a frequency for DN interpretations of only 64%. As the H*L* pattern was expected to convey only DN readings, this is a rather low number. Moreover, for the H*- pattern in Table 4, which was expected to convey mostly NC readings, we actually see a higher frequency for DN interpretations of 72%. For the H*H* pattern in Table 5 we see the highest frequency for DN interpretations for item 5, which is 92%. Why the sentence from item 5 behaves this strangely in the 3 different conditions is rather unclear. A very

Item no.	Utterance	DN	NC
1	<i>er was niet niks te doen daar</i>	88%	12%
2	<i>niks van dat alles is nergens te vinden</i>	72%	28%
3	<i>niemand heeft de opdracht niet begrepen</i>	96%	4%
4	<i>dan heb je nooit meer nergens last van</i>	88%	12%
5	<i>je kunt niet met niemand afspreken</i>	64%	36%
6	<i>ik heb er nooit geen spijt van gehad</i>	56%	44%

Table 3: Interpretation of utterances produced with the H*L* pattern

Item no.	Utterance	DN	NC
1	<i>er was niet niks te doen daar</i>	88%	12%
2	<i>niks van dat alles is nergens te vinden</i>	48%	52%
3	<i>niemand heeft de opdracht niet begrepen</i>	80%	20%
4	<i>dan heb je nooit meer nergens last van</i>	52%	48%
5	<i>je kunt niet met niemand afspreken</i>	72%	28%
6	<i>ik heb er nooit geen spijt van gehad</i>	36%	64%

Table 4: Interpretation of utterances produced with the H*- pattern

Item no.	Utterance	DN	NC
1	<i>er was niet niks te doen daar</i>	80%	20%
2	<i>niks van dat alles is nergens te vinden</i>	56%	44%
3	<i>niemand heeft de opdracht niet begrepen</i>	100%	0%
4	<i>dan heb je nooit meer nergens last van</i>	60%	40%
5	<i>je kunt niet met niemand afspreken</i>	92%	8%
6	<i>ik heb er nooit geen spijt van gehad</i>	32%	68%

Table 5: Interpretation of utterances produced with the H*H* pattern

speculative explanation could be that the two written follow-up sentences accompanying this item were not convincingly disambiguating between DN and NC meaning after all.

Next we have item 6, which contains a possible EMNE consisting of an n-word immediately followed by the negation *geen* (no). This item shows quite low frequencies for DN interpretations in all 3 conditions. We see the lowest DN frequencies for the H*H* pattern in Table 5 and the H*- pattern in Table 4 with 32% and 36%, respectively, while for the H*L* pattern in Table 3 the portion of DN interpretations is about half: 56%. This means that for item 6, both the H*- pattern and the H*H* pattern have led to a slight preference for NC interpretations, while the H*L* pattern has led to no preference either way. In the production experiment (Experiment 2) we already saw that combinations with *geen* as the second negative were often produced with no pitch accent on *geen*, i.e. with the H*- pattern. This happened both in DN and NC contexts, even though the H*- pattern was preferably used in NC contexts. What the results from this perception experiment now show is that the negative combination in item 6 seems to have a preference for NC interpretations, even if produced with the supposedly ambiguous H*H* pattern. Only the H*L* pattern, which should only convey DN readings, is able to cancel this preference and keep it somewhat equal between DN and NC.

And finally let us consider items 2 and 4, which both contain a negative combination that consists of two n-words. If we look again at the frequencies for these two items in Tables 3, 4, and 5, we see that the frequencies for these items are very much alike in each condition. They both exhibit a clear preference for DN interpretations for the H*L* pattern in Table 3, with a frequency of 72% for item 2, and even 88% for item 4. For the H*H* pattern they both lean only slightly towards DN interpretations, with 56% for item 2 and 60% for item 4. And for the H*- pattern we see they are both more or less equal between DN and NC interpretations, with 48% DN interpretations for item 2, and 52% DN interpretations for item 4. Even though these two items still do not exhibit a preference for NC interpretations for the H*- pattern as expected, they do seem to be the items that in general best meet the hypotheses for the different intonation patterns. They are the only items that show a clear DN preference for the H*L* pattern, hardly any preference for the H*H* pattern, and at least not a DN preference for the H*- pattern.

5.3 Discussion

The overall results from this perception experiment, as presented in Figure 13 on page 50, seem to show only a small influence of intonation on the interpretations. This influence is definitely not as great as was hypothesized, especially since for no intonation pattern a majority of

NC interpretations is observed. But we do see a noticeable difference in frequency of NC interpretations between the H*L* pattern (which was expected to elicit DN interpretations) and the H*- pattern (which was expected to elicit NC interpretations) in favor of the H*- pattern. Moreover, once two items with a bias towards DN are excluded (see Figure 14 on page 51), the interpretations for the H*- pattern do not show a significant difference from a null hypothesis anymore.

When looking at the 6 sentences used in this experiment individually, we see that the negative combination *niet niks* in item 1 behaves as expected by receiving in each condition only a few NC interpretations. This is also the case for the negative combination in item 3, though for this item this behavior was not necessarily expected. However, like already mentioned in the results section, it could be explained by the isolated position the negation *niet* takes relative to the first negative in the sentence. This could make it difficult for hearers to not apply its meaning to the previous part of the sentence and thereby compute a DN interpretation for the entire negative combination. Ultimately, both item 1 and item 3 appear to be unsusceptible to intonation when interpreting their meaning, and instead display a bias towards DN readings in general.

On the other hand there is item 6, a possible EMNE, which does not display a preference for DN interpretations for any of the intonation patterns. Instead it shows a slight preference towards NC interpretations for the H*H* pattern and the H*- pattern, and no preference either way for the H*L* pattern. These observations are not compatible with what Zeijlstra (2010) claims about intonation on EMNEs. According to his theory, if the second negative of an EMNE carries stress we should only be able to obtain a DN interpretation. But the results from this experiment show us that for the possible EMNE in item 6, 44% of participants obtained an NC interpretation for the H*L* pattern (see Table 3 on page 53) and as much as 68% obtained an NC interpretation for the H*H* pattern (see Table 5 on page 53). Therefore these observations clearly reject Zeijlstra's hypothesis on intonation patterns for EMNEs.

Finally, item 4 also shows incompatibility with Zeijlstra's theory on EMNEs. Even though the two negatives from the negative combination in this item are not directly adjacent, remember that combined with the single particular element that in this case intervenes, according to Zeijlstra it could still be considered an EMNE. However, as observed in the results section, in this experiment item 4 is displaying the same behavior throughout the different conditions as item 2, which is definitely not an EMNE. This should of course not have been the case if we assume Zeijlstra's theory on EMNEs, since then an EMNE could not be displaying the same behavior for interpretation under different conditions as a negative combination that is

clearly not an EMNE. Therefore this observation also rejects Zeijlstra's theory on the distinct status of EMNEs.

5.4 Conclusion

This chapter described the methods and results of an initial perception experiment (Experiment 3) that followed an elaborate production experiment (Experiment 2). The aim of this experiment was to explore to what extent intonation can influence the interpretation of sentences containing negative combinations. This was done by using the results from Experiment 2 as the following hypotheses for this perception experiment:

1. The H*L* pattern is almost always used to convey a DN meaning.
2. The H*- pattern is preferably used to convey an NC meaning.
3. The H*H* pattern is ambiguous between a DN meaning and an NC meaning.

It was found that overall it was not possible to use intonation in the DN language Dutch to elicit an NC interpretation of a negative combination; whatever intonation pattern was used, overall the preference for DN interpretations was either kept intact or reduced to be equal to NC interpretations. However, intonation did seem to be able to reduce the portion of DN interpretations a bit when using the H*H* pattern, and even more when using the H*- pattern. As for the hypotheses for this experiment, they were clearly rejected by the observed data. But as already mentioned in the results section, they did make some sense. They were too strong for the influence intonation actually turns out to possess, but when expressed a bit more nuanced they are in fact applicable to the results from this experiment. To sum up, in nuanced form they constitute the following conclusions:

1. The H*L* pattern elicits mostly DN interpretations.
2. The H*- pattern elicits the least DN interpretations, though still as many as NC interpretations.
3. The H*H* pattern elicits less DN interpretations than the H*L* pattern, but still favors DN interpretations.

This perception experiment was still rather limited in terms of the materials used. There were only 6 items, which did not give much space for interpreting or comparing the data. So this experiment should be considered more of a pilot and has merely provided good grounds for a more extensive perception experiment. That experiment should mainly involve a more elaborate collection of items, which vary in both the kind of negatives used in the combinations

and the distance between those negatives. Such a collection of items should provide more space to interpret the behavior of the items under different conditions and to compare the results for the items based on shared properties.

Additionally, in the discussion of the corpus study in chapter 3 it was mentioned that there could be regional differences in the ease of speakers or hearers in dealing with NC readings. If that would indeed be the case, it would also be interesting to control for the origins of participants of a follow-up experiment. For this experiment there has been no such control, but since participants were gathered through personal and social networks most of them probably hail from central and western Dutch regions. This means that there is a possibility that the clear overall DN preference that was found in this experiment could be different if participants hailed from other Dutch regions.

6 Discussion and further research

This final chapter provides a general discussion of the results from the experimental studies described throughout this thesis and brings us back to their implications for the central research question as well as the research field this thesis is a part of. And finally, suggestions for further research based on the findings from the research in this thesis are discussed.

6.1 Overall discussion

In this overall discussion we will first go back to the central research question, after which we will discuss other contributions and implications of the research in this thesis.

6.1.1 Answering the research question

After having discussed the relevant literature as well as the methods and results from a corpus study and three different experiments, it is now time to come back to the central research question as stated in the introduction to this thesis:

What is the role of intonation in the use of double negatives in Dutch?

In order to answer this question a corpus study was conducted, which was followed by a small pilot study on production and two main experiments: a production experiment and a perception experiment. In chapter 3, the corpus study gave us insight into how double negatives are used in spontaneous Dutch speech, both in frequency and interpretation. It was found that double negatives are used very little, and surprisingly, if they are used, about 60% of the time they are used with an NC reading. On the other hand, participants in Experiment 1, the small pilot study on production, clearly expressed resistance towards double negatives in NC contexts, which complies with Dutch being a DN language.

What followed was an elaborate production experiment (Experiment 2), described in chapter 4, where speakers were recorded while uttering sentences containing double negatives set in either DN or NC contexts. The hypothesis of this experiment was that speakers would use different intonation patterns to disambiguate between DN and NC readings of double negatives. This turned out to be not that clear-cut, but it was still possible to make some sense out of the data by extracting from them the following general prosodic rules for double negatives in an intonational phrase:

1. The first negative expression of a negative combination always carries a pitch accent.

2. (a) If the second negative expression of a negative combination is a negation (i.e. *niet*, *geen*), it will most likely not attract a pitch accent. If it does attract a pitch accent, the negative combination is probably set in a DN context.
- (b) If the second negative expression of a negative combination is an n-word (i.e. *niks*, *nooit*, *niemand*, *nergens*), it will most likely attract a pitch accent as well. If it does not attract a pitch accent, the negative combination is probably set in an NC context.
3. If the second negative expression of a negative combination is *geen* (no), the pitch accent will most likely shift to the following noun.

But in addition to these general prosodic rules for double negatives it also seemed possible to use the data from Experiment 2 to formulate the following hypotheses for Experiment 3 (the perception experiment):

1. The H*L* pattern is almost always used to convey a DN meaning.
2. The H*- pattern is preferably used to convey an NC meaning.
3. The H*H* pattern is ambiguous between a DN meaning and an NC meaning.

What we saw in chapter 5, however, was that strictly speaking the results from Experiment 3 clearly defeated these hypotheses, showing a preference for DN interpretations for each intonation pattern. But after excluding sentences used in the experiment that exhibited an obvious bias towards DN interpretations, this clear overall DN preference was nuanced a bit. This led to the following conclusions for Experiment 3:

1. The H*L* pattern elicits mostly DN interpretations.
2. The H*- pattern elicits the least DN interpretations, though still as many as NC interpretations.
3. The H*H* pattern elicits less DN interpretations than the H*L* pattern, but still favors DN interpretations.

Going back to the central research question of this thesis, we can see that Experiments 2 and 3 have provided some answers to this question. The results from Experiment 2 have shown that Dutch speakers, though it is not a clear-cut difference, do tend to use different intonation patterns for conveying different meanings of double negatives, whether they do this consciously or unconsciously. It seems, however, that these prosodic cues provided by speakers are not as much picked up on by listeners. The results from Experiment 3 have shown that Dutch listeners have the tendency to stick to the expectation of their DN language, and

in general have a preference for DN when interpreting utterances produced with different intonation patterns. But their tendency towards DN does seem to be weakened for some intonation patterns, which provide cues that make it slightly easier for listeners to also get an NC interpretation.

6.1.2 Implications and contribution

First it is possible to make some connections between the similar research by Huddleston (2010) on Afrikaans as discussed in chapter 2 and the research on Dutch as described throughout this thesis. Recall that for her production experiment, Huddleston found 30% of speakers to be accurate in producing a typical DN contour, and as much as 99% of speakers to be accurate in producing the intonation pattern she hypothesized to be used for NC meanings. In this thesis in chapter 4, however, for Dutch no such consensus on any intonation pattern for either type of meaning was found. Additionally, the results of Huddleston's perception experiment showed that for double negatives in Afrikaans it is indeed possible to use intonation to perceive a certain meaning, which worked best for NC meanings but certainly also for DN meanings. But the results from Experiment 3 in chapter 5 showed that in Dutch the use of intonation was not capable of actually forcing to perceive a different meaning than the expected one. So when we compare Huddleston's results for Afrikaans to the results in this thesis for Dutch it becomes clear that, even though Dutch and Afrikaans are perceived as quite similar languages, they behave rather differently when it comes to double negatives.

Some specific implications of the research in this thesis apply to the theoretical work of Zeijlstra (2010) on EMNEs. In chapter 2 his point of view on the occurrence of NC in the DN language Dutch was explained. Zeijlstra believes we should not mistake EMNEs for instances of NC. But on various occasions throughout this thesis we were able to connect the results of the experiments to his claims about EMNEs, and conclude that those claims were not solid.

First it was found in the corpus study in chapter 3 that a considerable amount of NC readings of double negatives occurred in the corpus which could definitely not qualify as EMNEs. In chapter 4, the results of Experiment 2 proved Zeijlstra's claim about stress patterns for EMNEs to be wrong. They showed that the first negative of a combination always carries a pitch accent irrespective of the context or meaning, which means it is not specific to EMNEs. And they also showed that there were too many NC readings with a pitch accent on the second negative to be able to say that if the second negative carries stress only a DN reading can be obtained. And finally in chapter 5, the results of Experiment 3 showed that for possible

EMNEs still about half elicited NC interpretations for intonation patterns containing a pitch accent on the second negative, which again defeated the claim that in such cases only a DN reading can be obtained. All these asymmetries between Zeijlstra's theoretical claims and the observed data gathered throughout this thesis indicate that indeed empirical research has shown that Zeijlstra's theory on EMNEs is not solid.

The research in this thesis on double negatives in Dutch and their interaction with intonation contributes an initial understanding of this topic to the general field of double negatives, as up until now there has been no experimental research on double negatives in Dutch combined with intonation. The research described in this thesis has therefore provided a first basis for performing further experimental research and formulating new theories on the behavior of double negatives in Dutch.

As explained in the introduction in chapter 1, the research in this thesis on double negatives in Dutch and their interaction with intonation also contributes to the interdisciplinary field of CAI. The topic that has been studied here is a linguistic and logical topic, which are both subfields of CAI research. More importantly, language, of which double negatives are a complex phenomenon, is seen as an important part of human cognition. The more theories and experimental evidence we gain on its behavior, the more opportunities we have to in turn formalize and test these theories to ultimately gain a better understanding. This is all important within the CAI research framework as well as concrete CAI applications such as speech synthesis. The research in this thesis on double negatives and intonation has thus contributed to that framework as well.

6.2 Further research

Throughout this thesis a few suggestions for further research have already been made. In this section they will all be discussed. This discussion of further research will thereby constitute the final part of this thesis.

Even though Dutch is a DN language, contrary to our expectation in chapter 3 in the corpus more NC readings were found than DN readings. While this first of all indicates that indeed it is possible to find NC readings in a DN language, it also begs the question whether this is the case in all Dutch regions. It could be that NC readings are found more easily in certain Dutch regions rather than others. To account for this it would be interesting to go back to the corpus and find out for all occurrences of negative combinations from which region the speaker comes. If that research would indeed yield that most or all NC readings hail only from certain regions, it could be followed by a new perception experiment which controls for

the origin of its participants.

The data gathered in Experiment 2 in chapter 4 were very coarse-grained. For the research in this thesis one approach to analyzing those data was chosen, but there are more options. The approach chosen for the analysis of Experiment 2 was to use the general ToBI (Tones and Break Indices) system for annotating the intonational phrases. But there also exists a system, the ToDI (Transcription of Dutch Intonation) system, which was created specifically for annotating Dutch intonation (Gussenhoven, 2005). Obviously an annotating system does not change the intonation pattern of an intonational phrase as we perceive it, but since the ToDI system was created specifically for Dutch it is constructed in such a way that it highlights aspects in an intonation pattern that are specific for Dutch intonation.

Another option for the analysis of the data from Experiment 2 would be to perform a phonetic analysis instead of the current phonological analysis. A phonetic analysis focuses on the realization of pitch accents in terms of their pitch and duration, instead of simply on the actual pitch accents and their relative height, like in a phonological analysis. And the last option for the analysis of the data from Experiment 2 is to have a second phonologist re-analyze the data. Since annotating prosodic data ultimately still relies on someone's own perception and experience, having a second person re-analyzing the data can provide new results to control for the reliability of the current results.

The performance of Experiment 3 in chapter 5 has also left some suggestions for further research behind. The scope of this experiment was still rather small, as there were only six items used. By having just 6 items, there are not many possibilities within the analysis to compare their data with each other or to explain the behavior of their data. It is therefore better to consider this experiment as a pilot study for a more elaborate perception experiment on double negatives and intonation. The most important thing for the follow-up to Experiment 3 is to have a more extensive set of items. These items should cover all the different aspects of double negatives encountered in this thesis, such as different combinations of n-words and negation, different distances between the two negatives, and as much variation as possible in the actual negatives used in the combinations. Such an extensive set of items will provide a better basis for analyzing the data thoroughly and acquiring an understanding of their behavior through mutual comparison based on shared properties.

Ultimately, my hope is that the research and findings of this graduation project, which forms a fairly new contribution to research on double negatives, have indeed provided the basis and the insights needed for the suggestions for further research made in this final section.

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Appendices

A Pilot

A.1 DN and NC readings found in the corpus

DN readings at a 1-word distance:

1. die zeshonderd miljoen is uh is niet niets integendeel is een groot bedrag maar toch blijft het een druppel op een gloeiende plaat dus welke mogelijkheden ziet de staatssecretaris om daar nog meer aan te doen?
2. wat nou niet niets?
3. ja dat vind ik toch niet niks
4. 't was toch ook niet niks
5. dat is natuurlijk niet niks
6. nou is niet niks
7. d'r is natuurlijk niet niks n niet niks aan de hand
8. d'r is natuurlijk niet niks n niet niks aan de hand
9. ja 't is ook niet niks wat er was gebeurd he
10. 't is echt niet niks
11. nou da's ook niet niks natuurlijk
12. want ja he 't is toch niet niks he
13. ja is ook niet niks
14. dat is niet niks natuurlijk

DN readings at a 2-word distance:

1. de belangrijkste overweging die 'k nu hoor van de heer Van O ook voor 't uh 't voorstel voor deze tijdelijke zeg maar vervolgcommissie of tijdelijke taak voor deze commissie uh is dat het toch ook niet voor niets was dat er een commissie Kalsbeek was die zoveel belangrijk materiaal op tafel heeft gekregen

2. ik heb net niet voor niets gerefereerd aan de vragen die uh uh een aantal van u gesteld hebben
3. nou ik vraag de staatssecretaris niet voor niets om uh daa daar daar t toch nog eens met wat meer activiteit als het gaat om de algemene verantwoordelijkheid die de overheid heeft om het uh uh maatschappelijk verantwoord ondernemen te bevorderen om daar toch de nodige activiteiten in uh te ontplooiën de komende tijd
4. en dat is niet uh niet voor niets
5. die heb je toch niet voor niets neergelegd?
6. niet voor niets twee weken naar Delft heen en weer gereisd
7. nee ja ik heb er niet voor niets een radio met een koptelefoon staan want dan zet ik gewoon m'n uh koptelefoon op en dan ga ik uh xxx draaien
8. niet voor niets had ik naar onzichtbaar Italië zitten turen
9. en daar is niet alleen niets aan te doen het is bovendien en ik beseft dat dit een schok zal zijn altijd zo geweest
10. ze vormden een heilige cirkel het was niet voor niets dat het gewone stervelingen verboden was er binnen te gaan
11. Sovjetpedagogen schreven niet voor niets
12. we heten niet voor niets de Martin Luther Kingschool
13. ze zat toch verdomme niet voor niets al zeventien jaar bij de politie?
14. niet voor niets willen veel mensen in hun eigen vertrouwde omgeving sterven in plaats van in een steriel eenpersoonskamertje aan het eind van een gang in het ziekenhuis of verpleeginrichting
15. we worden niet voor niets weggestuurd
16. ik ben niet voor niets spits
17. niet voor niets riep ze in haar eerste toespraak op tot nationale eenheid
18. we spreken niet voor niets over een veiligheidsketen
19. die muur is niet voor niets gevallen
20. ja ja ja ik heb niet voor niets aan de overkant alles uit de kast gehaald nietwaar?

21. dat is de man met vier goals achter z'n naam tijdens dit EK de topscorer en dat zal die zeker niet voor niets zijn spits van Real Zaragoza
22. beter spelend gevaarlijker spelend maar aan de andere kant loert natuurlijk altijd 't raffinement van de Fransen niet voor niets een Frans woord
23. maar die buizerd die zit er tuurlijk niet voor niets die wacht op verkeersslachtoffers
24. en die torenvalken zitten d'r ook niet voor niets
25. 't is ook geen aanval op die persoon want hij werkt daar niet voor niets
26. ja en je hebt natuurlijk ook niet voor niets je begeleider
27. niet voor niets werd zij Diana genoemd en dat was dus eigenlijk heel frappant dat zij zo opgejaagd werd door de paparazzi
28. niet Charon van Israel nu maar Charon dat was een veerman en die zette je over maar die deed dat niet voor niets
29. ja maar die Veiligheidsraad is er toch niet voor niets?
30. nee die is er niet voor niets
31. want uh ja omdat dat wonen 't is ook niet voor niets dat heel veel nieuwe collega's helemaal uit 't westen komen daar uh en hier komen want ja uh de omstandigheden zijn hier toch anders
32. die zat daar xxx natuurlijk ook niet voor niks
33. ze hebben natuurlijk in de meeste gevallen veel problemen achter de rug ze zijn niet voor niks gevluht
34. het was niet voor niks dat de commissie zelf ook zei we moeten dit nog nader onder onderzoeken
35. nou ik vind dat we daarvoor alle begrip moet hebben we hebben als Kamer een aantal jaren terug ook niet voor niks de overheid op afstand gezet van een bedrijf als KPN
36. had ik 't thuis pas in de gaten dat dat niet voor niks was omdat dat uh in Etretard de plek was
37. ja een uurtje vliegen is niet voor niks waarschijnlijk
38. ik bedoel uh en alles wat verder ondersteunend kan zijn en waar je anders ook n niet voor niks geschikt raakt ik raak nergens nergens voor in

39. dus we kunnen kijken of we in de sfeer van het belastingplan de vijf miljard we praten niet over niks er ruimte is om dat probleem op te lossen
40. uh we hebben onszelf die mogelijkheid niet voor niks gegeven een twee uhm als je als de Kamer het zelf doet en daarom ben ik blij als het verspreid wordt zo meteen dan hebben we als Kamer ook de mogelijkheden om te zeggen dit willen we gevraagd hebben dat willen we gevraagd hebben dan zijn we heer en meester over onze eigen adviesaanvragen
41. o we hebben toch de korte broek niet voor niks meegenomen
42. he 'k bedoel 't is niet voor niks dat een bedrijf die wordt overgenomen de dag voordat 't gebeurt beginnen mensen al te kopen
43. we hebben niet voor niks van die mooie roerstaafjes
44. je hebt toch niet voor niks pinautomaten?
45. Fortuna Sittard heet ie ook niet voor niks
46. niet voor niks
47. ja je hebt niet voor niks twee uur gezegd en dacht daar begint ie wel over xxx 'k zet 'm zo dat ie dat ziet en dan begint ie d'rover
48. ja je bent niet voor niks Spaans aan 't leren natuurlijk
49. ja bedoel zij komt toch niet voor niks hierheen dus als ze dat kan combineren vind ik dat niet erg
50. en die deed 't niet voor niks
51. en die borden staan daar toch niet voor niks
52. die man die zit er niet voor niks
53. maar dat je wel laat zien aan de leerlingen die wel zijn geweest van je doet 't niet voor niks
54. daar betalen ze niet voor niks zoveel voor he
55. maar 'k doe niet voor niks mee
56. want ik heb niet voor niks dat beestje
57. he joh je belt toch niet voor niks
58. nou ja kijk in de eerste plaats heb n hebben we natuurlijk geprobeerd om uh een een zo goed mogelijk uh voorstel op tafel te leggen in deze miljoenennota uh maar die algemene politieke beschouwingen zijn d'r ook niet voor niks

59. en 't was ook niet voor niks
60. want het is niet voor niks dat we zo'n klein kikkertje genomen hebben want als je een mens wil nemen dan uh dan heb je dus een veel groter volume nodig
61. 'k bedoel 't gaat uiteindelijk niet om niks
62. zij doen dat niet voor niks omdat zij uh toch van mening zijn dat de besluitvorming een een onjuiste besluitvorming is voor 't GVB
63. dan uh dan heb je niet voor niks geleefd
64. da's toch niet voor niks?
65. xxx dus ja maar ik dacht ja 't pistool heb je niet voor niks
66. ja hij zat natuurlijk niet voor niks bij de fysiotherapeut dus uh
67. toen zei d hij zegt toch niet voor niks dat je de helpdesk moet bellen
68. kijk 't is niet voor niks dat ik daar uh daar weg wou
69. ik bedoel 'k ga daar niet voor niks elke ochtend om zeven uur naartoe
70. Jan Pieter is ook niet voor niks gestopt met uh bestuur van uh de muziekvereniging
71. die heeft ook niet voor niks zijn ontslag gehad
72. want ja dat hij zal wel niet voor niks die cursus krijgen maar dan moet ie dus verstand gaan krijgen van al die apparaten
73. nou ja misschien dat ze niet voor niks vertalen maar dan onder de markt gaan werken zeg maar uh
74. ja die pastoor wist dat ook die kwam doen niet voor niks he
75. ja ik bedoel ggg hij heet niet voor niks Arjan Poep
76. rood dat is ook weer niet voor niks rood
77. die heeft dat inderdaad nou ja goed wij worden niet voor niks ingehuurd tot een bepaald zie je dat voor je voltrekken dan ben je d'r ook voor om dat gewoon te doorbreken
78. gevoelens staan d'r eigenlijk niet voor niks

NC readings at a 1-word distance:

1. maar als je dan niet geen les wil ja ja

2. en uh uh en dan sluit dat natuurlijk de bloedvaten af en dan krijg je geen geen zuurstof ook niet geen voeding
3. 't is niet geen project van m'n moeder om uh om van een psychiatrische inrichting om te kijken of ik dan echt gek ben?
4. hij is echt geen niet geen conservatief
5. dus uh dan kan ie hij kan nu al lekker zelf lopen dus dan hoeft ik niet geen dr niet twee kinderen te tillen dus ben 'k allang blij om
6. waarom mocht ik net niet geen vraag dan?
7. nee helemaal niet geen punt
8. 't is uh en soms ja op zondag hoeft je niet geen parkeergeld te betalen bij Jolijn dus dan is 't weer makkelijker ja
9. uh dan moet de uw eigen veel te veel aan regeltjes houden van uh dat zegeltje is niet zo gestempeld en uh dat is niet geen postaalstuk en
10. en uh niet geen uh middengroep zeg maar
11. maar goed wij zeiden altijd dat we dat konden en wat blijkt eigenlijk is dat als je dus gewoon genoeg vertrouwen hebt en je hebt een zekere deskundigheid in heel veel dingen dan kun je juist jouw ongedwongen niet niks weten van airconditioning kun je gebruiken juist om daar dingen mee doen waar specialisten niks mee niet niet op zouden komen
12. en nu we niet niks beloven wil ze natuurlijk wel
13. want nou d'r was niet niks te zwemmen d'r viel niks te zwemmen en uh en toen uh nou zit ik hier
14. en niet niks van als ie mank loopt nog een uh paar weken aankijken en dan die xxx maar bellen
15. ik heb dat nog eigenlijk niet niks veel doorgelezen
16. alleen we zijn d'r niet nooit 's winters geweest
17. ja precies maar wij praten wel heel veel maar we hebben dat ding niet nooit echt al aanstaan
18. die vermogensrendementsheffing is wel zo uniek dat 't nergens in Europa uh zelfs niet nergens in de wereld voorkomt

19. de de pastoor die kwam vroeger langs als je dus geen niet elk jaar een kind kreeg
20. dan ga je uh dan zit er geen niet echt veel stiltes tussen
21. ja maar ik zit niet op ik druk geen niet op een knopje want ik zit helemaal niet bij dat apparaat
22. en uh dat zijn ook geen niet van die kleine pietemeteuterige boompjes of zo
23. want ik wil toch niet zo ver en 't is geen niet echt mooi weer
24. ik ik heb ik heb nog helemaal geen niks van uh nog niks gedronken na die tijd weet je dat?
25. ja 'k ben 't nog niet helemaal mee eens eigenlijk maar ja was geen niks tegen in te brengen
26. ding heb je ook geen niks aan
27. ik had voor geschiedenis had ik geen nooit meer onvoldoendes
28. omdat je geen nergens twee straten hebt
29. ja dat is niets niet nee
30. nee ik kom nu niks niet meer
31. maar wij hadden helemaal geen geld of niks niet bij
32. ja maar ja je moet je voorstellen ik hoefde geen accommodatie of niks niet
33. niks niet ze hebben alles binnen handbereik
34. en niks geen pretenties en verwachtingen waarmaken
35. 'k heb d'r ook echt helemaal niks geen zin in om dat te volgen want
36. is ook helemaal geen niks geen uh
37. maar dat betekent dat ze dus niks geen uh geen houvast hebben
38. 't zijn echt meidjes van veertien soms en die die willen niks geen kritiek
39. niks geen verontschuldigende inleiding meer zoals langs deze mij onsympathieke weg of door omstandigheden verhinderd kennis te maken
40. niks geen nertsen dekentje of gouden muntstukken
41. anders hadden ze inderdaad helemaal niks geen uh geen problemen gehad

42. heb verder heb je niks geen nieuws?
43. ja echt hoor daar was helemaal niks geen land mee te beziel
44. niks uh weet je niks geen haasten en zo
45. en de andere dagen heb ik geloof 'k niks geen grootse dingen
46. in elke auto zat wel een sinterklaas xxx maar daar hadden ze niks geen erg in maar ggg
47. niks geen problemen mee
48. stond niks geen gereserveerd op en d'r was dicht bij de TV konden we voe voetbal kijken
want Teun wou voetbal kijken
49. ik had helemaal niks geen idee over 't krijgen van een ouwe ijskast
50. maar daar heb jij niks geen ggg niks geen verstand van
51. maar daar heb jij niks geen ggg niks geen verstand van
52. ik heb van de week ja haast niks geen uh
53. niks geen bruggen bouwen
54. niks geen Meccano doen
55. nee never nooit niet
56. echt nu niet nooit niet
57. dan kun je merken van ja Mia heeft gewoon voor zichzelf ook nooit niet zo'n haast van
uh ik moet ook naar huis
58. ik vind 't wel nooit niet echt prettig zo'n uh
59. dan uh zeg ik niet dat 'k dat nooit niet zal gaan zeggen als de gelegenheid zich voordoet
60. je zei d'r mening wel maar die hoor je nooit niet uh ergens over zeuren of doordrammen
of zo
61. hebben wij daar nooit niet heel veel mee gespeeld he want ze was toch wel iets jonger
62. je weet 't ooit nooit niet
63. dat weet ooit nooit niet
64. toen niet en nooit niet
65. want i ik heb 'm nooit niet uh

66. ge weet ooit nooit niet wanneer ge belt he?
67. ge weet ooit nooit niet
68. moeder dat weet u ooit nooit niet
69. dat weet u ooit nooit niet wanneer ge belt he?
70. ja dat weet ik niet maar uh ge weet ooit nooit niet he
71. he mensen die hebben nooit niet echt geleerd om knoerhard te werken want waarom zouden ze dat doen?
72. ik heb nog nooit geen sherry gehad maar lijkt me niks aan
73. heb ik ook nog nooit geen foto van gezien
74. heeft ze ook nog nooit bij stilgestaan geloof ik die heeft nog nooit geen Viva gelezen dus
75. nooit geen foto d'rop
76. maar die doen eigenlijk g nooit geen functioneringsgesprekken
77. ki ik heb ik heb nog nooit geen last van een kip gehad
78. want de mensen hadden nooit geen rust
79. twee zadeltassen en een grote baal op elk dier rondom ingesnoerd in dubbel diamantvorm en vastgezet met halve steken en hem vertelde bestel nooit geen soep
80. nee ken nooit geen kwaad
81. ja maar Sjors daar heb ik nooit geen last van gehad ik uh ben altijd al alleen geweest
82. en ja die at ook nooit geen groenten en zo
83. zij at eigenlijk nooit geen groenten
84. en dan nooit geen groenten d'rbij
85. want als 't regent dan kan 'k ook nooit geen paraplu meenemen
86. ja nou ja weet je ja ik hoor wel meer hoor dat ze nooit geen geld krijgen
87. o v vroeger ook je vader kreeg nooit geen aanstelling maar hij heeft overal mensen die overspannen waren op de school
88. nee maar je kent de mensen en dan weet je al van oh die rol is geschikt voor die en die rol is geschikt voor die maar soms moeten switchen maar dat uh dat is nooit geen

probleem

89. ja ik 'k heb nooit geen contact met Belgen he
90. maar 'k heb er toch nooit geen spijt van gehad
91. heeft zij nooit geen uh examen gedaan n voor de auto he in uh Eindhoven niet he?
92. heb ik nooit geen erg in gehad
93. nee jawel maar de eerste twee maanden van 't jaar was ik drieënvijftig en de laatste twee maanden van 't jaar was hij drieënvijftig want daar heb ik dus eigenlijk nog nooit geen erg in gehad
94. nou ja dat kan nooit geen kwaad he
95. want uh ik heb nooit geen bekeuringen maar nu achter mekaar
96. want hij wilde ook nooit geen mest in de tuin hebben
97. ja want dan heb je helemaal uh nooit geen garantie
98. en ik denk dat uh tennissen dan een uh hele goeie bezigheid want uh je hoeft nooit geen einden te lopen uh ja je moet proberen een beetje snel te zijn
99. d'r is nooit geen plek voor je jas als je daarheen gaat
100. och daar doet de ook nooit niks meer mee
101. ggg ja den vind nooit niks nodig
102. d'r wordt nooit niks nieuws geschreven
103. mmm nee dat volgens mij wordt dat nooit niks
104. ja als dat nog bestaat want xxx 'k heb daar ook nooit niks meer van gehoord eigenlijk en ja Dirk die als ie 't een keer lekker vindt daar uh gaat ie meestal toch wel uh paar keer naar terug he
105. ja ons vader ons moeder wel maar uh wij zagen d'r nooit niks van
106. en ge heeft nooit niks gezien?
107. d'r verderop en voor de rest hebben we d'r nooit niemand daar gezien
108. maar anders nooit niemand nog
109. als je als er twintig mensen binnen zijn dat er dan niemand niet meer

110. en uh Frank weet niet waar ie aan toe is de gemeente niet niemand niet
111. ik hoef met niemand geen rekening te houden
112. maar gewoon nergens niet?
113. nergens geen schuld aan hebt
114. ik zie nergens geen letter
115. ik doe nergens geen zout in dus dan heb ik die die smaak van die uh bouillon en die groenten allemaal
116. je hebt nergens geen idee van
117. nergens geen last van
118. en dat ik dat voelde denk ik gelijk Alex nergens geen last van nou ik heb gewoon
119. toch nergens geen smaak van
120. dat doe je toch nergens niks anders meer
121. en je hoort nergens niks meer van
122. we hoorden nergens niks meer van
123. uh uiteraard want toen uh de vrouw van Vogelaar plotseling stierf uh die wist ook geen raad met z'n eigen toen want die wist nergens niks van
124. maar goed toen heb ik uh die begrafenis voor 'm geregeld en toen heb ik zijn administratie gedaan en heb ik dus als die jaren heb ik dus een jaar of drie vier heb ik bij Vogelaar dus de boekhouding gedaan en al z'n zaken geregeld wat iets te regelen viel want die wist nou die wist nou totaal nergens niks van administratie af
125. nergens niemand thuis?

NC readings at a 2-word distance:

1. en ik zeg niet eens geen dank je wel
2. van die kleintjes daar hebben daar kunnen ze niet meer niks meer mee
3. ja en ik mag je mag niet met niemand afspreken
4. dus uh dan kan ie hij kan nu al lekker zelf lopen dus dan hoef ik niet geen dr niet twee kinderen te tillen dus ben 'k allang blij om
5. en daarom wou ie dus ook geen club niet

6. nee want dat er zijn geen volgende niet meer
7. 'k wil helemaal niks van niemand meer
8. niks voor niemand
9. Josie heeft zich in haar leven nog nooit door niemand laten inpalmen
10. en dan heb je nooit meer nergens last van?
11. wat de Sinti betreft heeft niemand nog niet in hun eigen taal opge opgeschreven
12. en ge hebt nergens ja geen verplichtingen aan

A.2 Items Experiment 1

- (1) a. *Niemand heeft nooit gelogen; iedereen verzint wel eens een leugentje om
nobody has never lied everyone makes up some time a lie for
eigen bestwil.
own sake
'Nobody has never lied; everyone makes up a lie for their own good some time.'*
 - b. *Die film gaat over een wereld waar mensen niet kunnen liegen, dus
that movie is about a world where people not can lie so
niemand heeft nooit gelogen.
nobody has never lied
'That movie is about a world where people cannot lie, so nobody has ever lied.'*
- (2) a. *Waarschijnlijk heeft de één meer gezien dan de ander, maar niemand heeft
probably has the one more seen than the other but nobody has
niets gezien. Iedereen zat er nota bene met zijn neus bovenop!
nothing seen everybody was there nota bene with his nose on top
'Most likely some have seen more than others, but nobody has seen nothing.
Everybody was right in front of it!'*
 - b. *Maak je niet druk, niemand heeft niets gezien. Je verrassing is
make yourself not busy nobody has nothing seen your surprise is
voorlopig nog een verrassing.
as yet still a surprise
'Don't worry, nobody has seen anything. Your surprise is as yet still a surprise.'*
- (3) a. *Er is altijd wel een uitgang in de buurt, dus niemand kan nergens heen.
there is always well an exit nearby so nobody can nowhere to
'There's always an exit nearby, so nobody can go nowhere.'*
 - b. *Het hele gebouw is afgesloten, dus niemand kan nergens heen!
the whole building is locked so nobody can nowhere to*

‘The whole building is locked, so nobody can go anywhere!’

- (4) a. *De bak met ijs is nog steeds niet leeg, maar niemand heeft geen toetje gegeten, dus daar ligt het niet aan.*
 the tray with ice cream is yet still not empty but nobody has no dessert eaten so there lies it not on
 ‘The tray of ice cream still isn’t empty, but nobody has eaten no dessert, so that’s not the problem.’
- b. *De bak met ijs is nog altijd onaangeraakt. Waarschijnlijk zat iedereen vol van het hoofdgerecht, want niemand heeft geen toetje gegeten.*
 the tray with ice cream is yet still untouched probably was everybody full from the main course because nobody has no dessert eaten
 ‘The tray of ice cream remains untouched. Probably everybody was full from the main course, because nobody has eaten any dessert.’
- (5) a. *Niemand heeft zijn bed niet opgemaakt, dus de slaapzaal ziet er best netjes uit.*
 nobody has his bed not made so the dorm looks there quite decent out
 ‘Nobody has not made his bed, so the dorm looks quite decent.’
- b. *De slaapzaal ziet er flink slordig uit, want niemand heeft zijn bed niet opgemaakt.*
 the dorm looks there quite messy out because nobody has his bed not made
 ‘The dorm looks quite messy, because nobody has made his bed.’

A.3 Prosodic analysis Experiment 1

(DN)				(NC)			
<i>Niemand</i>	<i>heeft</i>	<i>nooit</i>	<i>gelogen.</i>	<i>Niemand</i>	<i>heeft</i>	<i>nooit</i>	<i>gelogen.</i>
H*		L*	L-L%	H*			L-L%
H*		L*	L-L%	H*		L*	L-L%
H*		L*	L-L%				
H*		H*	L-L%	H*		L*	L-L%
H*			L-L%	H*		L*	L-L%
H*		H*	L-L%	H*			L-L%
				H*		L*	H-L%
H*		L*	L-L%	H*			L-L%

(DN)					(NC)				
<i>Niemand</i>	<i>heeft</i>	<i>niets</i>	<i>gezien.</i>		<i>Niemand</i>	<i>heeft</i>	<i>niets</i>	<i>gezien.</i>	
H*		L*		L-L%	H*			L*	L-L%
H*		L*		L-L%	H*		L*		H-L%
H*		L*		L-L%	H*		L*		L-L%
H*		L*		L-L%	H*		L*		L-L%
H*		H*		L-L%	H*				L-L%
H*		H*		L-L%	H*		H*		L-L%
H*		L*		L-L%	H*		H*		L-L%
H*		H*		L-L%	H*		L*		H-L%

(DN)					(NC)				
<i>Niemand</i>	<i>kan</i>	<i>nergens</i>	<i>heen.</i>		<i>Niemand</i>	<i>kan</i>	<i>nergens</i>	<i>heen.</i>	
					H*		H*		H-L%
H*		L*		L-L%	H*		H*		H-L%
H*		L*		L-L%	H*				L-L%
H*		L*		L-L%	H*		L*		L-L%
H*				L-L%	H*		L*		L-L%
H*		H*		L-L%	H*				H-L%
H*		L*		L-L%	H*		L*		L-L%
H*		L*		L-L%	H*				L-L%

(DN)					(NC)				
<i>Niemand</i>	<i>heeft</i>	<i>geen</i>	<i>toetje</i>	<i>gegeten.</i>	<i>Niemand</i>	<i>heeft</i>	<i>geen</i>	<i>toetje</i>	<i>gegeten.</i>
H*		H*		L-L%	H*		L*		L-L%
H*			L*	L-L%	H*			H*	L-L%
H*		H*		L-L%	H*		L*		L-L%
H*		L*		L-L%	H*			L*	L-L%
H*		L*		H-L%	H*		L*		L-L%
H*		H*		L-L%	H*			H*	L-L%
H*		H*		L-L%	H*			H*	L-L%
H*		H*		L-L%	H*				H* L-L%

(DN)

<i>Niemand</i>	<i>heeft</i>	<i>zijn</i>	<i>bed</i>	<i>niet</i>	<i>opgemaakt.</i>	
H*				H*		L-L%
H*						L-L%
H*					L*	L-L%
H*				H*		H-L%
H*			L*	L-H*		H-L%
H*				H*		L-L%
H*				H*		L-L%
H*			L*			L-L%

(NC)

<i>Niemand</i>	<i>heeft</i>	<i>zijn</i>	<i>bed</i>	<i>niet</i>	<i>opgemaakt.</i>	
H*			L*			L-L%
H*			L*			L-L%
H*			L*			L-L%
H*			L*			L-L%
H*			L*			L-L%
H*			H*			L-L%
H*			L*			L-L%

B Experiment 2 (production experiment)

B.1 Items

Category 1 - DN tendency

- (1) Sentence: *dat is niet niks natuurlijk*
 NC: *Wat betreft de organisatie van het feest heeft Thomas niet zo veel gedaan hoor. Het meeste werk, zoals de zaal, de drank, de band en de DJ regelen, is gedaan door Jeroen; ik geloof dat Thomas alleen een paar slingers heeft gekocht. Dat is niet niks natuurlijk, dus je hoeft voor hem geen bedankje te regelen.*
 DN: *Thomas heeft de organisatie van het hele feest gedaan. Hij heeft de zaal en de drank geregeld, de band en de DJ ingehuurd, de uitnodigingen verstuurd, noem maar op. Dat is niet niks natuurlijk, dus daar verdient hij wel een bedankje voor.*
- (2) Sentence: *er is niet niks aan de hand*
 NC: *Vorige maand is Ellen haar baan bijna kwijtgeraakt doordat haar zwager Hans haar per ongeluk in een kwaad daglicht had gesteld. Maar gelukkig is het allemaal goed gekomen en nu is iedereen dat incident allang weer vergeten. Dus maak je geen zorgen, er is niet niks aan de hand.*
 DN: *Vorige maand is Ellen haar baan bijna kwijtgeraakt doordat haar zwager Hans haar per ongeluk in een kwaad daglicht had gesteld. Met die onhandige actie heeft Hans nog flink wat commotie doen ontstaan in de familie, dus er is niet niks aan de hand op dit moment.*
- (3) Sentence: *nu we niet niks beloven wil ze natuurlijk wel*
 NC: *Telkens als we begonnen over het idee om misschien op vakantie te gaan volgende maand leek onze dochter niet bepaald geïnteresseerd. Ondertussen lijkt de kans dat we nog zullen gaan steeds kleiner te worden, maar nu we niet niks beloven wil ze natuurlijk wel. Maar helaas lijkt er dus geen vakantie voor ons in te zitten voorlopig.*
 DN: *Toen we nog niks konden beloven aan onze dochter over een vakantie omdat we nog in de knoop zaten met werk, liet zij in al haar bescheidenheid weten dat zij ook niet per se op vakantie hoefde. Maar ondertussen is ons werk geen probleem meer en zijn we zelfs een zeer luxe vakantie aan het boeken, en nu we niet niks beloven wil ze natuurlijk toch wel. Dus nu gaan we lekker met zn drieën op vakantie.*
- (4) Sentence: *ik weet niet niks van voetbal*

NC: *Wat zeg je? Je vraagt je af waarom de scheidsrechter net floot? Tsjja, mij hoeft je echt niet te vragen waarom die scheidsrechter net floot, want ik weet niet niks van voetbal. Ik snap helemaal niks van dat spel.*

DN: *Lach je me nou uit omdat ik weet te vertellen waarom de scheidsrechter net floot? Zeg, ik ben misschien niet de grootste expert op het gebied van voetbal in dit gezelschap, maar ik weet niet niks van voetbal. Sterker nog, ik weet er nog altijd meer van dan de gemiddelde voetbalkijker.*

(5) Sentence: *er was niet niks te doen*

NC: *Afgelopen zomer zijn we met de tent achterin lekker naar het zonnige Frankrijk gereden. De camping waar we toen uiteindelijk stonden was alleen ontzettend saai, net als de omgeving, want er was niet niks te doen daar. We hebben bijna niks anders gedaan dan gewoon voor de tent zitten.*

DN: *Afgelopen zomer zijn we met de tent achterin lekker naar het zonnige Frankrijk gereden. De camping waar we toen uiteindelijk stonden was wel prima. Hij had leuker kunnen zijn met een uitgebreider animatieprogramma, maar er was niet niks te doen daar. We hebben ons nog prima kunnen vermaken in het zwembad en op de tennisbaan die daar allebei waren.*

Category 2 - Greater distance

(6) Sentence: *nog nooit is er in de Utrechtse binnenstad niks gedaan aan de fietswrakken*

NC: *Steeds vaker kom je in het centrum kapotte en verlaten fietsen tegen die allemaal plek innemen waar jouw eigen fiets anders zou kunnen staan, en de gemeente doet er nog altijd niks aan. Nog nooit is er in de Utrechtse binnenstad niks gedaan aan de fietswrakken.*

DN: *Vaak kom je in het centrum kapotte en verlaten fietsen tegen die allemaal plek innemen waar jouw eigen fiets anders zou kunnen staan, maar de gemeente probeert daar met opruimacties ieder jaar iets aan te doen. Nog nooit is er in de Utrechtse binnenstad niks gedaan aan de fietswrakken.*

(7) Sentence: *niemand heeft de opdracht niet begrepen*

NC: *Ik had jullie de opdracht gegeven om moeilijke sommen voor elkaar te bedenken. Maar bij het nakijken zag ik dat jullie alleen maar makkelijke sommen hebben opgeschreven. Dat was niet de bedoeling; niemand heeft de opdracht niet begrepen.*

DN: *Ik had jullie de opdracht gegeven om moeilijke sommen voor elkaar te bedenken. Bij het nakijken zag ik dat iedereen goed zijn best heeft gedaan om de sommen*

lastig te maken. Mooi, niemand heeft de opdracht niet begrepen.

(8) Sentence: *niks van dat alles is nergens te vinden*

NC: *De regisseur heeft me een hele lijst meegegeven met dingen die we nodig hebben voor het decor van het toneelstuk. Ik heb de hele dag in de stad lopen zoeken, maar tevergeefs, want niks van dat alles is nergens te vinden. Nu hebben we dus nog steeds niks voor het decor en moet het opbouwen ervan weer uitgesteld worden.*

DN: *De regisseur heeft me een hele lijst meegegeven met dingen die we nodig hebben voor het decor van het toneelstuk. Ik moet naar de meest ongebruikelijke plekken om alle voorwerpen te vinden, maar uiteindelijk zal het wel lukken, want niks van dat alles is nergens te vinden. Dat betekent ook dat we snel alles voor het decor zullen hebben en kunnen beginnen met opbouwen.*

(9) Sentence: *nooit meer zal hij geen klant zien*

NC: *Onlangs is er een nieuwe groothandel geopend in de buurt. Ik zag dat daar alles veel goedkoper is dan bij de winkel van meneer Dekker. Die zal nu dus wel langzaamaan failliet gaan; nooit meer zal hij geen klant zien. Helaas voor hem zullen al zijn klanten voortaan liever naar de goedkope groothandel gaan.*

DN: *Onlangs is er een zeer goede recensie over de winkel van meneer Dekker verschenen in de regionale krant. Sindsdien lopen ze de deur plat bij hem; nooit meer zal hij geen klant zien. Iedereen wil voortaan naar meneer Dekker voor zijn uitmuntende service en expertise.*

(10) Sentence: *niemand weet zich al jaren geen raad met de toenemende werkloosheid*

NC: *De werkloosheid in Nederland neemt de laatste jaren steeds toe. Vele vooraanstaande economen hebben zich al gebogen over dit probleem, maar zonder succes. Niemand weet zich al jaren geen raad met de toenemende werkloosheid.*

DN: *Het is een lastig probleem, maar vele vooraanstaande economen hadden de afgelopen jaren goede ideeën en dragen zo met hun eigen inzichten een steentje bij aan de oplossing. We blijven de toekomst dus positief inzien, want niemand weet zich al jaren geen raad met de toenemende werkloosheid.*

Category 3 - NC tendency

(11) Sentence: *je mag niet met niemand afspreken*

NC: *Sorry Jessica, ik weet dat het je ook al niet lukte om met Dorien en Stefan af te spreken, maar ik ben volgende week op vakantie dus met mij kun je ook niet*

afspreken. Je kunt niet met niemand afspreken de komende tijd, ben ik bang. Maar misschien lukt het volgende maand wel weer.

DN: *Wat jammer, Jessica, dat het je niet lukte om met Dorien en Stefan af te spreken. Ik ben zelf ook redelijk druk komende week, maar ik zal kijken of ik nog ergens een gaatje heb. Je kunt niet met niemand afspreken, dat is ook zo ongezellig. En anders is Karin misschien nog wel beschikbaar.*

(12) Sentence: *dan heb je nooit meer nergens last van*

NC: *Je schouder gaat vaak uit de kom omdat je schouderbanden niet goed meer werken, en nu gaan de dokters deze bij een operatie weer vastzetten. En als die operatie goed verloopt, dan is je schouder weer helemaal in orde en dan heb je nooit meer nergens last van.*

DN: *Je schouder gaat vaak uit de kom omdat je schouderbanden niet goed meer werken, en nu kunnen de dokters daar met een operatie iets aan proberen te doen. Maar ze zullen het probleem nooit helemaal kunnen verhelpen. Na een operatie zal je schouder weer minder makkelijk uit de kom gaan, maar je schouder zal altijd een gevoelig punt blijven, dus ook dan heb je nooit meer nergens last van.*

(13) Sentence: *Josie heeft zich in haar leven nog nooit door niemand laten inpalmen*

NC: *Ik zal niet in de weg staan van jullie keuze om al zo snel te gaan trouwen, Michael. Ik heb er vertrouwen in dat mijn dochter weet waar ze aan begint en bewust voor jou gekozen heeft, want Josie heeft zich in haar leven nog nooit door niemand laten inpalmen.*

DN: *Ik zal eerlijk zijn, Michael, ik sta er niet echt achter dat jullie al zo snel gaan trouwen. Mijn dochter is nogal makkelijk over te halen; toen Josie nog jonger was heeft haar toenmalige vriend haar ervan overtuigd bij hem in te trekken zonder dat ze daar zelf goed over nadacht. Ik vrees dan ook dat zij ook nu hier niet goed zelf over heeft nagedacht, want Josie heeft zich in haar leven nog nooit door niemand laten inpalmen.*

(14) Sentence: *daarom wou hij dus geen fooi niet*

NC: *We wilden de ober na het betalen van de rekening nog een fooi geven. Hij liet ons echter beleefd weten dat de bediening bij dat restaurant al bij de prijzen was inbegrepen. Daarom wou hij dus geen fooi niet. In plaats van de fooi te geven hebben we hem toen nog maar nadrukkelijk bedankt voor de goede service.*

DN: *Hans werkte als ober in een restaurant voor minimumloon, waarmee hij nauwelijks de eindjes aan elkaar kon knopen. Daarom wou hij dus geen fooi niet, want*

alle financiële extraatjes kon hij dan ook goed gebruiken.

(15) Sentence: *ik heb er nooit geen spijt van gehad*

NC: *Vroeger heb ik een aantal jaren bij de gemeente gewerkt. Maar toen ik kinderen kreeg ben ik gestopt met werken om zelf met de kinderen thuis te kunnen zijn. Sommige mensen begrijpen zo'n keuze niet, maar ik heb er nooit geen spijt van gehad.*

DN: *Vroeger heb ik een aantal jaren bij de gemeente gewerkt. Maar toen ik kinderen kreeg ben ik gestopt met werken om zelf met de kinderen thuis te kunnen zijn. Ik werd daar eigenlijk best ongelukkig van en ik denk nu dat het de verkeerde keuze is geweest, want ik heb er nooit geen spijt van gehad.*

Category 4 - Afrikaans

(16) Sentence: *dat niemand niks over het incident gezegd zou hebben*

NC: *Na het incident heeft het bestuur van Feyenoord geëist dat Ajax-aanvaller Derk Boerrigter zo lang mogelijk geschorst wordt, omdat zijn tackle niets minder dan opzettelijk en schandalig zou zijn. Frank de Boer, trainer van Ajax, denkt dat niemand niks over het incident gezegd zou hebben als Boerrigter een Oranje-shirt aan had gehad. Maar het chauvinisme zit diep in de Eredivisie, en nu voelen de Rotterdammers zich gekrenkt.*

DN: *Na het incident heeft het bestuur van Feyenoord geëist dat Ajax-aanvaller Derk Boerrigter zo lang mogelijk geschorst wordt, omdat zijn tackle niets minder dan opzettelijk en schandalig zou zijn. Frank de Boer liet weten dat ze hier wel anders over gedacht zouden hebben als Boerrigter voor Nederland had gespeeld. Maar Ronald Koeman, trainer van Feyenoord, denkt zelfs als Boerrigter een Oranje-shirt aan had gehad, dat niemand niks over het incident gezegd zou hebben.*

(17) Sentence: *ik heb nooit niks gezien*

NC: *Toen we in Rotterdam woonden had onze buurman vaak verdacht uitziende personen over de vloer. Tenminste, dat is wat mijn toenmalige huisgenoot altijd zegt, want ik heb nooit niks gezien. Ik weet dus achteraf niet of ik hem moet geloven of dat hij het allemaal wat overdreef.*

DN: *Toen we in Rotterdam woonden had onze buurman vaak verdacht uitziende personen over de vloer. Of er ook echt verdachte zaken plaatsvonden bij onze toenmalige buurman weet ik natuurlijk niet, maar altijd als ik thuis was zag ik wel van die criminele types op straat of bij hem voor het raam; ik heb nooit niks*

gezien. En niet alleen ik, maar ook mijn toenmalige huisgenoot zag altijd wel wat verdachts.

(18) Sentence: *jij hebt nog nooit om niemand gegeven*

NC: *Jouw houding ten opzichte van andere mensen is onacceptabel, jij behandelt je vrienden en je familie echt niet zoals het hoort. Maar jij hebt nog nooit om niemand gegeven, dus het zou me ook niet moeten verbazen.*

DN: *Jij bent zo goed voor deze wereld en alle mensen die je tegenkomt. Eigenlijk kan iedereen wel op jouw liefde en steun rekenen. Sommige mensen vinden dat een beetje naïef, maar ik vind dat juist wel mooi aan jou; jij hebt nog nooit om niemand gegeven.*

(19) Sentence: *hij is nooit nergens naartoe gegaan*

NC: *Die oude meneer Jansen, van het huis op de hoek van de straat, is niet bepaald een globetrotter. Hij is in zijn hele leven dat dorp nooit uitgekomen; hij is nooit nergens naartoe gegaan. Maar waarom hij nooit op reis is geweest weet niemand.*

DN: *Die oude meneer Jansen, van het huis op de hoek van de straat, was een echte globetrotter. Hij heeft in zijn leven veel gereisd en leek eigenlijk altijd wel een nieuwe reisbestemming te hebben; hij is nooit nergens naartoe gegaan. Hij had dan ook een hekel aan thuis stilzitten.*

(20) Sentence: *ik heb niks nergens gekocht*

NC: *Ik heb tijdens de uitverkoop een keer de hele middag rondgelopen in de stad, van winkel naar winkel. Maar het zal je verbazen: ik ben toen met lege handen thuisgekomen, want ik heb niks nergens gekocht. De portemonnee is de hele middag de tas niet uitgekomen.*

DN: *Hoe denk je dat ik aan al die nieuwe kleren ben gekomen? Die komen toch zeker niet gratis en voor niks in mijn schoot vallen? Daarvoor moet je nog altijd gewoon langs de winkels hoor; ik heb niks nergens gekocht. Ik kan je zelfs nog vertellen uit welke winkel ieder kledingstuk komt.*

B.2 Fillers

(21) *Zodra Matthijs de menselijke omtrek op het water ziet drijven, zwemt hij ernaartoe. Boven water gekomen doet hij zijn duikbril af en bekijkt de drenkeling. Die drijft op zijn rug, de ogen wijd opengesperd. Hij heeft niet eens meer zijn mondstuk uit kunnen doen.*

- (22) *Voor de consument zal het nieuwe besturingssysteem Windows 8 weer heel wat nieuwe voordelen opleveren. Voor bedrijven biedt Windows 8 echter niet veel vooruitgang ten opzichte van Windows 7, dus in tegenstelling tot de consument zit het bedrijfsleven niet direct op Windows 8 te wachten.*
- (23) *Wielrenner Wout Poels herstelt momenteel van de vele verwondingen die hij heeft opgelopen tijdens zijn val bij de Tour de France. Hij vindt het met terugwerkende kracht niet heel slim van zichzelf dat hij na die val in eerste instantie probeerde door te fietsen. Dat heeft ervoor gezorgd dat zijn herstel nu veel langer zal duren.*
- (24) *Rutger Kappe onderzocht leerprestaties en persoonlijkheidskenmerken bij 148 studenten aan de hogeschool. Hiervoor volgde hij hen van het begin van hun studie tot aan het begin van hun carrière. Uit dit onderzoek concludeert hij dat niet intelligentie maar motivatie studiesucces bepaalt.*
- (25) *In het nieuwe seizoen komt Veronica met een nieuw spelprogramma dat die van het vorige seizoen moet vervangen. Ze hopen hiermee weer meer kijkers te trekken, want het vorige spelprogramma was nou niet bepaald een succes.*
- (26) *Lydia is vorige maand verhuisd naar het centrum van de stad. Daar huurt ze een appartement met twee slaapkamers, een balkon en een prachtig uitzicht. Dat heeft ze dus allemaal goed voor elkaar; ze woont daar zeker niet oncomfortabel. Je moet maar snel eens langgaan.*
- (27) *Tijdens de Nederlandse Kampioenschappen atletiek die afgelopen week plaatsvonden hebben vele atleten zich weer van hun beste kant laten zien. Ook de nieuwkomer Michel Butter is niet onopgemerkt gebleven dankzij de vele topprestaties die hij leverde.*
- (28) *Ook als spits van een voetbalteam moet je je op allerlei gebieden blijven ontwikkelen, zoals bijvoorbeeld verdediging en balbezit. Maar uiteindelijk blijft het voor een spits ook zeker niet onbelangrijk om gewoon goed te kunnen scoren. Daarvoor is hij natuurlijk een spits.*
- (29) *Tijdens zijn allereerste college als student in Amsterdam ontmoette Lars zijn huidige vrouw. Ze zat twee rijen voor hem en in de pauze raakten ze bij de koffiemachine aan de praat. Nooit meer zal hij dat moment vergeten. Hij vertelt er ook nog steeds graag over.*

- (30) *Het lijkt me duidelijk dat iemand van onze collegas afgelopen vrijdag geld heeft gestolen uit de kas. Maar ik durf niet zomaar te zeggen wie dat geweest moet zijn. Ik denk in ieder geval niet dat het Anne was; zij zou zoiets nooit doen. Bovendien werkte zij afgelopen vrijdag niet.*
- (31) *Toen gisteren de zon een beetje scheen ben ik lekker naar het meertje hier in de buurt gegaan. Ik had eigenlijk verwacht dat wel meer mensen op dat idee zouden zijn gekomen en dat het dus redelijk druk zou zijn. Maar dat was niet zo; ik heb zelfs helemaal niemand gezien daar.*
- (32) *Het vijfgangendiner dat Rob had bereid was echt om van te smullen. Iedereen heeft ook flink zijn best gedaan en alles, van de eerste tot de vijfde gang, helemaal opgegeten. Er was niemand die ook maar iets had laten liggen op zijn bord. Het diner was een groot succes.*
- (33) *Een tijdje terug heeft Tanja besloten dat ze rond wil reizen door Zuid-Amerika wanneer ze klaar is met haar studie. Ondertussen heeft ze alle nodige voorbereidingen al getroffen en ligt ze mooi op schema met afstuderen; er is niks meer wat haar nog kan tegenhouden.*
- (34) *Sommige mensen praten graag veel en hebben overal wel wat over te zeggen. Op die manier lijken ze meestal ook wel slim, maar niets is minder waar. Vaak zijn ze helemaal niet snugger, ookal denken ze zelf misschien dat ze dat wel zijn.*
- (35) *Afgelopen zondag vond de Klassieker weer plaats, ditmaal in de Amsterdamse Arena. Vele Feyenoordsupporters zaten voor de buis gekluisterd; ze wilden niets liever dan hun ploeg te zien winnen. Helaas voor hen gebeurde dit echter niet, want Ajax won de wedstrijd met drie tegen nul.*
- (36) *De nieuwste versie van de iPhone was alweer razendsnel uitverkocht. Op dit moment heeft het geen zin om ervoor naar de winkel te gaan, want ze zijn helemaal nergens meer te vinden. Afhankelijk van hoe snel ze geleverd worden kan men het komend weekend of volgende week weer proberen.*
- (37) *Kasper heeft de laatste tijd echt nergens meer zin in. Zelfs zijn volleybaltrainingen, die hij altijd zo leuk vond, gaat hij nu met tegenzin naartoe. Misschien moet hij maar eens met iemand gaan praten om erachter te komen wat er aan de hand is.*

- (38) *Toen ik vorige week jarig was heb ik een lekkere citroentaart gekocht en meegenomen naar mijn werk. Maar mijn collegas houden kennelijk niet van citroentaart; ze hebben geen van allen een stuk genomen. Dus toen heb ik hem maar weer mee naar huis genomen en met de kinderen opgegeten.*
- (39) *Na een week van bloedig geweld in Israël en de Gazastrook maken beide partijen de balans op. Onduidelijk is wie de voorlopige winnaar van deze confrontatie is en hoe het verder moet. Vooralsnog kunnen ze in ieder geval geen van beide de overwinning claimen.*
- (40) *Op korte termijn hard bezuinigen is wat de meeste politieke partijen voorstellen, of ze nu links of rechts zijn. Economisch gezien ligt dit helemaal niet voor de hand, gezien de schade hiervan op de korte termijn, stelt de Rotterdamse econoom Bas Jacobs. Geen enkele partij stelt een verstandig macro-economisch beleid voor.*

B.3 Instructions for participants

Instructions as given to each participant in Dutch:

“Je krijgt straks achtereenvolgens veertig korte stukjes tekst te zien. Ik wil graag dat je ieder stukje tekst eerst even voor jezelf leest zodat je weet wat er staat. Daarna mag je het hardop voorlezen en dat neem ik dan op via de microfoon. Bij het voorlezen wil ik graag dat je je inbeeldt dat deze opnames gebruikt zouden kunnen worden in een luistertoets voor mensen die Nederlands aan het leren zijn als tweede taal. Het is dus belangrijk om duidelijk te spreken en te zorgen dat de betekenis goed overkomt, want mensen die nog moeite hebben met de taal zouden het ook moeten kunnen volgen. Zodra ik straks de cabine heb verlaten en de opname heb gestart kun jij op je eigen tempo met behulp van de pijltjestoetsen door de slides heengaan, en deze dus één voor één eerst voor jezelf lezen en dan hardop voorlezen. Hier en daar een kleine verspreking is niet erg, maar als je er zelf door in de war raakt kun je beter dat stukje even opnieuw voorlezen.”

Translation of the instructions to English:

“In a moment you will see forty short pieces of text in succession. I would like you to first read each piece of text to yourself to make sure you know what it says. Then you can read it aloud, which I will be recording via the microphone. While reading aloud, I would like you to imagine that the recordings could be used in

an audio test for people learning Dutch as a second language. So it is important to speak clearly and to make sure the meaning comes across, since people who are still having trouble with the language should also be able to follow it. In a moment, once I have left the cabin and started recording, you will be able to use the arrows on the keyboard to go through the slides at your own pace, while first reading each slide to yourself and then reading it aloud. A slip of the tongue every now and then is not a problem, but if you get confused by it, it is better to read the piece aloud over again.”

C Experiment 3 (perception experiment)

C.1 Items

- (1) Recorded sentence: *er was niet niks te doen daar*
 DN: *Dankzij het zwembad hebben we ons niet de hele tijd hoeven vervelen.*
 NC: *We hebben ons alleen maar zitten vervelen; het was ontzettend saai.*
- (2) Recorded sentence: *niks van dat alles is nergens te vinden*
 DN: *Uiteindelijk heb ik alles van de lijst ergens vandaan weten te halen.*
 NC: *Ik heb naar alles van de lijst gezocht, maar tevergeefs.*
- (3) Recorded sentence: *niemand heeft de opdracht niet begrepen*
 DN: *Iedereen heeft netjes gedaan wat er gevraagd was.*
 NC: *Iedereen heeft iets anders gedaan dan de bedoeling was.*
- (4) Recorded sentence: *dan heb je nooit meer nergens last van*
 DN: *Je schouder zal dus altijd een gevoelig punt blijven.*
 NC: *Je schouder zal nooit meer problemen opleveren.*
- (5) Recorded sentence: *je kunt niet met niemand afspreken*
 DN: *Dan heb je een hartstikke saai pinksterweekend straks.*
 NC: *Helaas heeft iedereen al plannen voor het pinksterweekend.*
- (6) Recorded sentence: *ik heb er nooit geen spijt van gehad*
 DN: *Ik denk daarom ook dat ik echt de verkeerde keuze heb gemaakt.*
 NC: *Ik ben heel gelukkig met de keuze die ik heb gemaakt.*

C.2 Fillers

- (7) Recorded sentence: *ze woont daar zeker niet oncomfortabel*
 a. *Met dat prachtige appartement heeft ze het wel goed voor elkaar.*
 b. *Ze blijft dan ook voorlopig nog op zoek naar iets beters.*
- (8) Recorded sentence: *het is ook niet onbelangrijk om blij te zijn met je baan*
 a. *Dan ga je tenminste altijd met plezier naar je werk.*
 b. *Maar een goed salaris is ook zeker wel belangrijk.*

- (9) Recorded sentence: *hij lijkt misschien Italiaans, maar niets is minder waar*
- Hij is namelijk gewoon in Nederland geboren.*
 - Hij kan niet eens Italiaans spreken.*
- (10) Recorded sentence: *er was niemand die ook maar iets had laten liggen op zijn bord*
- Iedereen had zijn bord netjes leeggegeten.*
 - Er was niks meer over om te bewaren.*
- (11) Recorded sentence: *het vorige feest was nou niet bepaald een succes*
- Dus deze keer gaan we het helemaal anders aanpakken.*
 - Maar het was nou ook weer niet een compleet fiasco.*
- (12) Recorded sentence: *uit onderzoek blijkt dat niet intelligentie maar motivatie studiesucces bepaalt*
- Als je heel slim bent is dat dus nog niet genoeg.*
 - Als je heel slim bent kom je dus al een heel eind.*
- (13) Recorded sentence: *het bedrijfsleven zit niet direct op Windows 8 te wachten*
- Ten opzichte van Windows 7 biedt deze voor bedrijven niet veel vooruitgang.*
 - Windows 8 heeft veel nieuwe voordelen voor bedrijven.*

C.3 Instructions for participants

Instructions as given on the web page in Dutch:

“Tijdens dit experiment beluister je een aantal geluidsfragmenten en geef je vervolgens (meerkeuze) voor ieder fragment aan welke zin jij het beste vindt volgen op de zin die je in het geluidsfragment hoorde. Ik wil je vragen hierbij je intuïtie te gebruiken en hoe dan ook altijd aan te geven welke zin het beste past, ook als je eigenlijk van beide mogelijkheden niet helemaal overtuigd bent. Goede of foute antwoorden bestaan in dit experiment niet! Denk dus ook niet te lang na over je antwoorden; waar ik benieuwd naar ben is jouw intuïtie. Kom ook niet terug op eerder gegeven antwoorden.”

Translation of the instructions to English:

“During this experiment you will listen to some audio fragments, after which you will indicate (multiple choice) for each fragment which sentence you think follows

best the sentence you heard in the audio fragment. I would like you to use your intuition on this and always indicate which sentence fits best, even if you are actually not completely convinced by either possibility. There are no right or wrong answers in this experiment! So do not think too long about your answers; what I am curious about is your intuition. Also do not revisit answers you have already given earlier.”