

Interpreting French Negative Sequences: The Role of Context and Intonation

Jeremy Yeaton, Viviane Déprez, PhD
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Negation ain't no problem

There are two possible interpretations to this sentence:

- (a) Negation is not a problem, or
- (b) Negation is a problem, because it is *not* no problem

Interpretation (a) would be the Negative Concord (NC) interpretation. Even though there are multiple negative words (ain't, no) it is interpreted as only one negative. Interpretation (b) above would be Double Negation (DN) where the two negatives cancel each other out, resulting in an overall positive sentence. Standard French allows both of these and this study sought to explore this ambiguity.

Background

There are three main theories concerning sequences of negative expressions. The first is that Negative Concord Items (NCIs) are non-negative (Zeijlstra, 2004; Biberauer and Zeijlstra, 2012) and that negation only comes from co-presence of sentence negation. The second is that NCIs are inherently negative (May, 1989; de Swart, 2010; de Swart & Sag, 2002; Déprez, 1997, 2000) and that they act as quantifiers that range over two variables instead of just one through resumptive quantification. The third builds on resumptive quantification and states that the interpretation is dependent on the internal structure of the NCIs (Deprez, 2011). A previous study (Deprez, forthcoming) investigated how syntactic structure and positioning of the NCIs could influence interpretations in French. The present study focused only on pronominal NCIs, shown to have the greatest amount of ambiguity. These issues have been investigated in Afrikaans (Huddleston, 2010), Dutch (Fonville, 2013), Catalan & Spanish (Prieto et al., 2013), and Catalan (Tubau et al., 2015). Intonation was shown to play a role in Afrikaans, Spanish and Catalan but produced unclear results in Dutch. The Dutch study did not control for meaning and cannot be sure that subjects responded with the interpretation intended by the context.

Research Questions

1. Does **context** succeed in influencing/determining NC/DN interpretation in French?
2. What is the role of **prosody**? Does French manifest a particular mapping between prosody and interpretation in NCI sequences? If so which one?

References

¹Corblin, F. (1996) "Multiple negation processing in natural language", in Theoria. A Swedish Journal of Philosophy, pp. 214-260. ²Déprez, V., Tubau, S., Cheylus, A., & Espinal, M. T. (2015). Double Negation in a Negative Concord Language: An Experimental Investigation. *Lingua: International Review Of General Linguistics*, 16375-107. ³Deprez V. (2000) "Parallel (A)symmetries and the Internal Structure of Negative Expressions" *Nat Lang Linguist Theory* 18.2: 253-342, ⁴De Swart, H.E. (2010). Expression and interpretation of negation: an OT typology. Dordrecht: Springer. ⁵Fonville, R. (2013) The role of intonation in the use of double negatives in Dutch. Master's thesis, Utrecht University, Utrecht, Netherlands. ⁶Prieto, P., Borràs-Comes, J., Tubau, S., Espinal, M.T., 2013. Prosody and gesture constrain the interpretation of double negation. *Lingua* 131, 136--150. ⁷Xu, Y. (2013). ProsodyPro — A Tool for Large-scale Systematic Prosody Analysis. In *Proceedings of Tools and Resources for the Analysis of Speech Prosody (TRASP 2013)*, Aix-en-Provence, France. 7-10. ⁸Zeijlstra, H. (2004). Sentential Negation and Negative Concord. PhD Thesis. University of Amsterdam.

Procedure and Participants

- 28 native speakers of French (18F, 10M, age 18-45)
- Recorded at the L2C2 Lab in Bron, France
- Production experiment with confirmation of interpretation
- Presented simple ambiguous transitive sentences with two NCIs in context
- Participants read the contexts and sentences silently (fig.1), then aloud to be recorded (fig. 2)
- Recording followed by verification question (T/F) (fig. 3)
- Given 2 practice items prior to the experiment
- Total experimental time was about 20 minutes per participant
- Used an Asus Orion PRO gaming headset with filtering microphone

Example item:

Figure 1: Example stimuli for silent reading

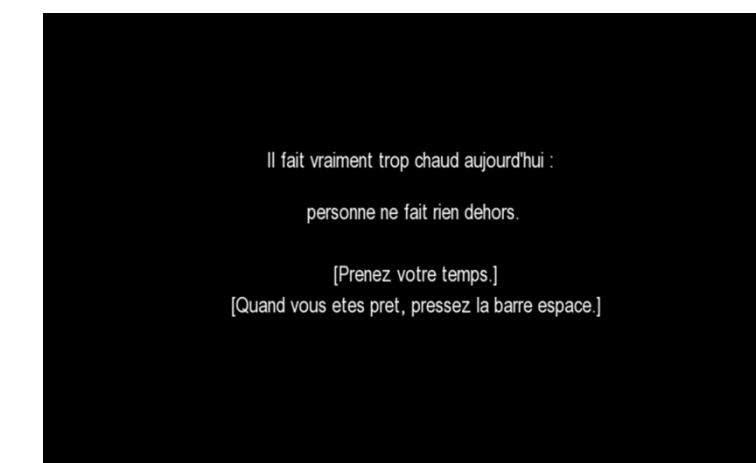


Figure 3: Example verification question

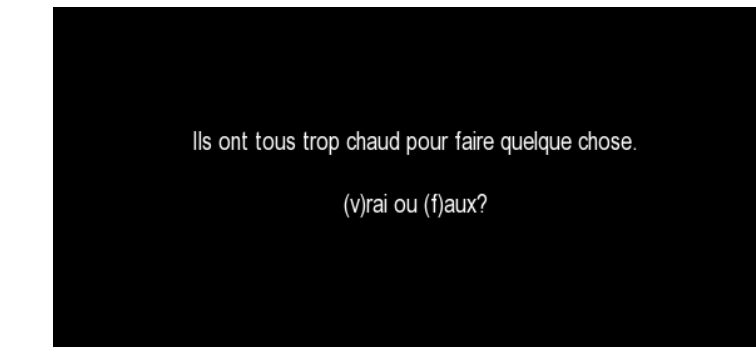
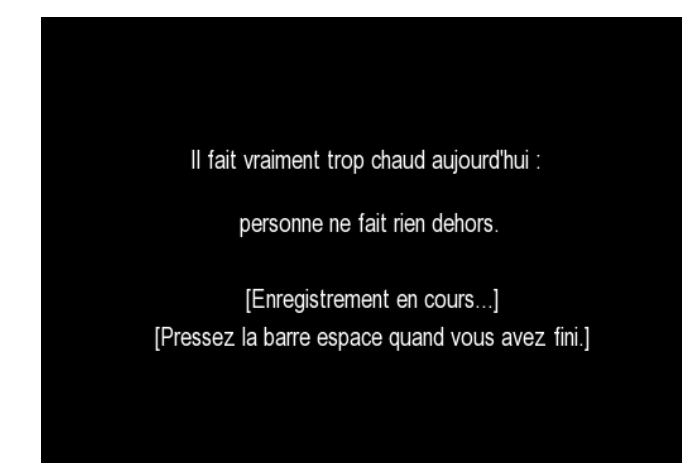


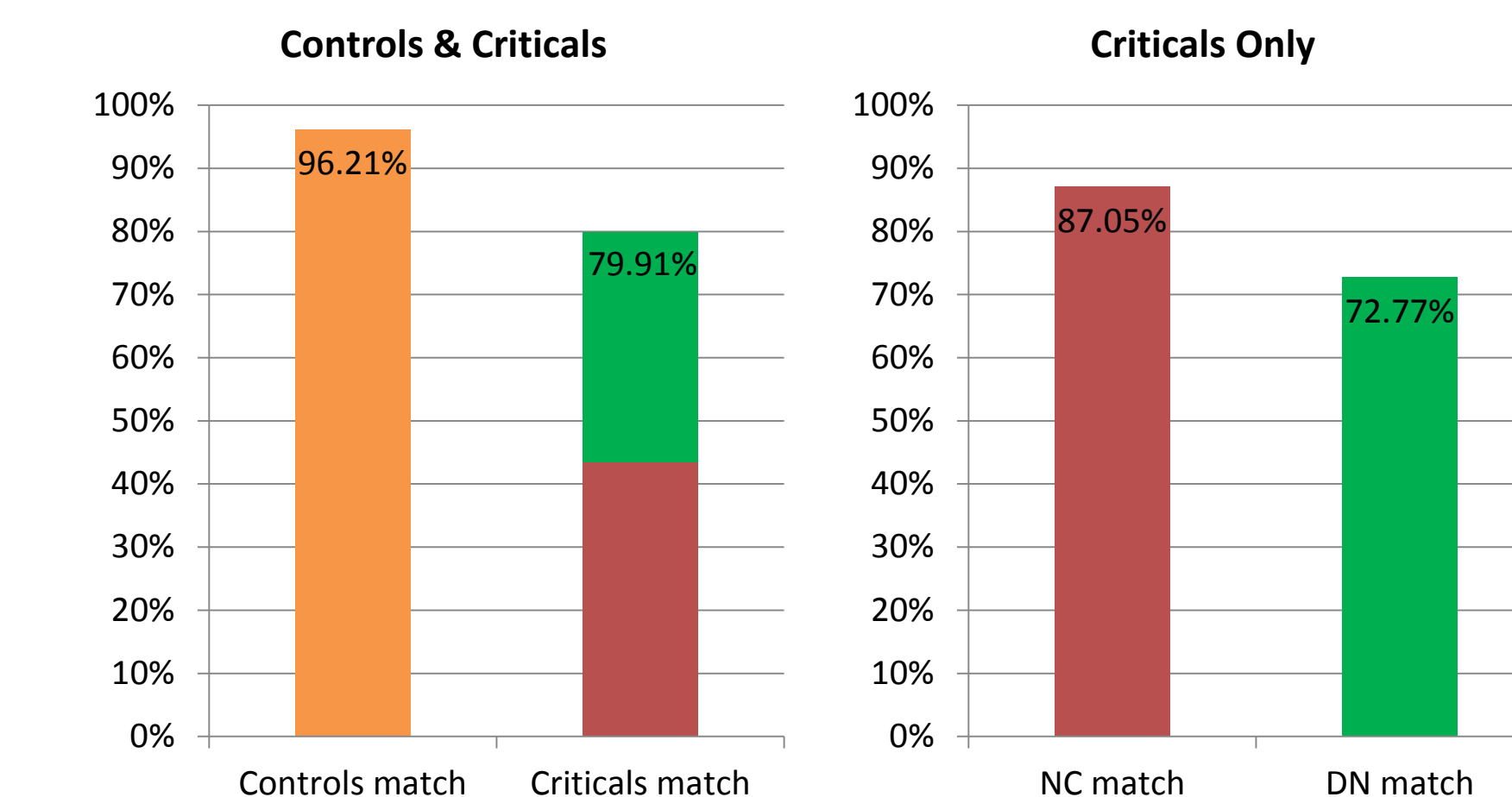
Figure 2: Example stimuli for recording



Results: Context Influence

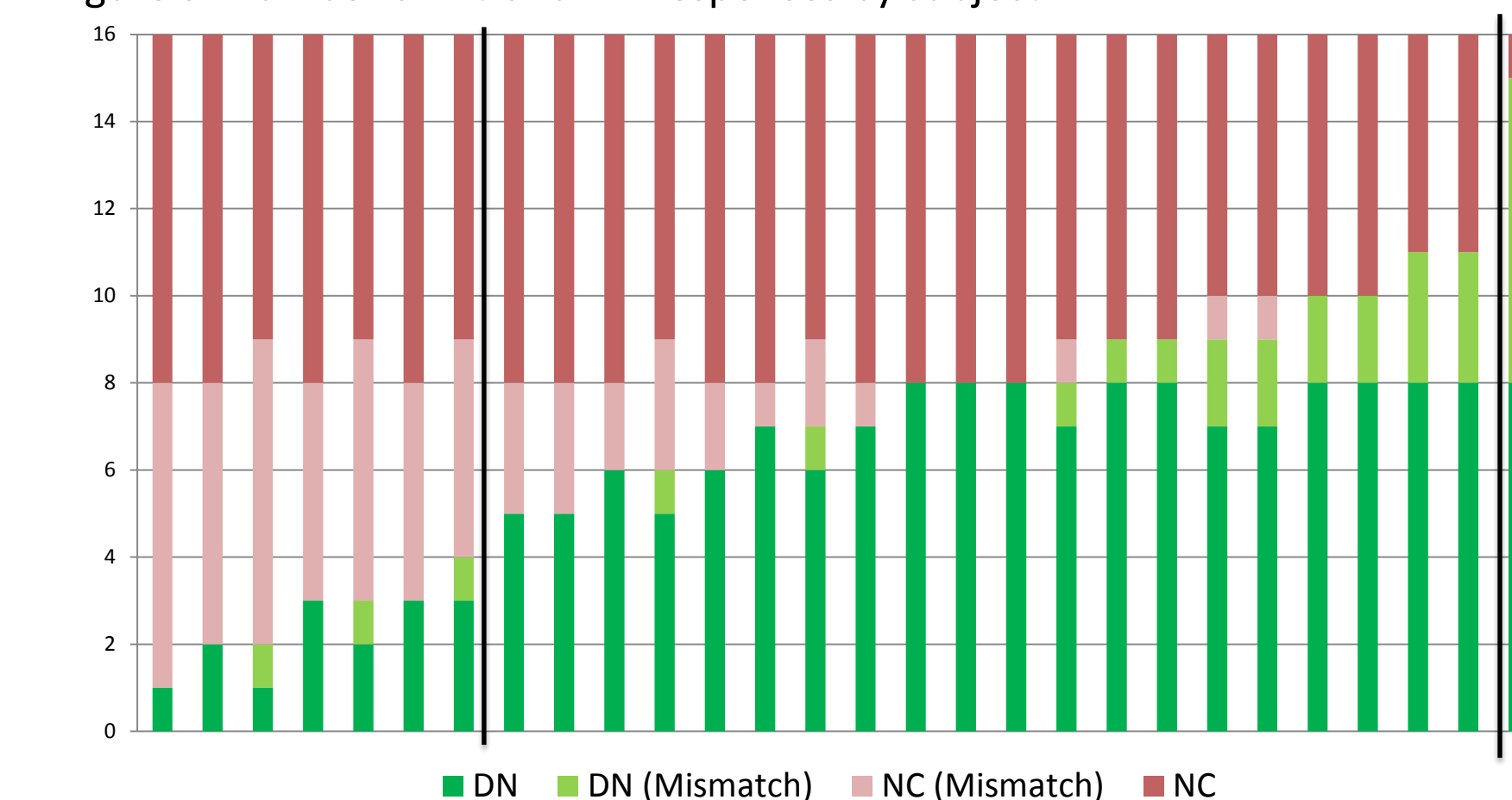
- Context played a significant role in determining meaning (fig. 4)

Figure 4: Percent context-matching responses



- For the majority of speakers (n=20) these sentences were entirely ambiguous
- Some subjects had a strong preference for a given interpretation (n=8) regardless of context (fig. 5)

Figure 5: Number of NC and DN responses by subject



NB: The 8 subjects who had strong preferences were not included in the prosodic analysis

Materials and Method

Experimental Stimuli:

NC Context

(a) *Dans notre famille, on est tous allergique à l'alcool:*

(In our family, we are all allergic to alcohol)

DN Context

(b) *Chez les jeunes, la consommation d'alcool est effrayante:*

(In the youth population, alcohol consumption is frightening)

Ambiguous Critical item

(c) *personne ne boit rien dans les soirées.*

(nobody drinks anything/nothing at parties)

Interpretation verification

(d) *Ils ne boivent pas d'alcool.*

(They don't drink alcohol)

=T for NC interpretation

=F for DN interpretation

- 5 categories x 8 items per category x 28 participants (1,020 total items), pseudo-randomized in blocks

Prosodic controls:

- Same number of syllables in all target sentences
- Maximized sonorant use
- Final prepositional phrase to avoid sentence boundary L tone on object NCI
- Same frequent 8 monosyllabic verbs

Analysis of Contextual Interpretation:

- T/F responses coded as +/-context matching & as NC/DN

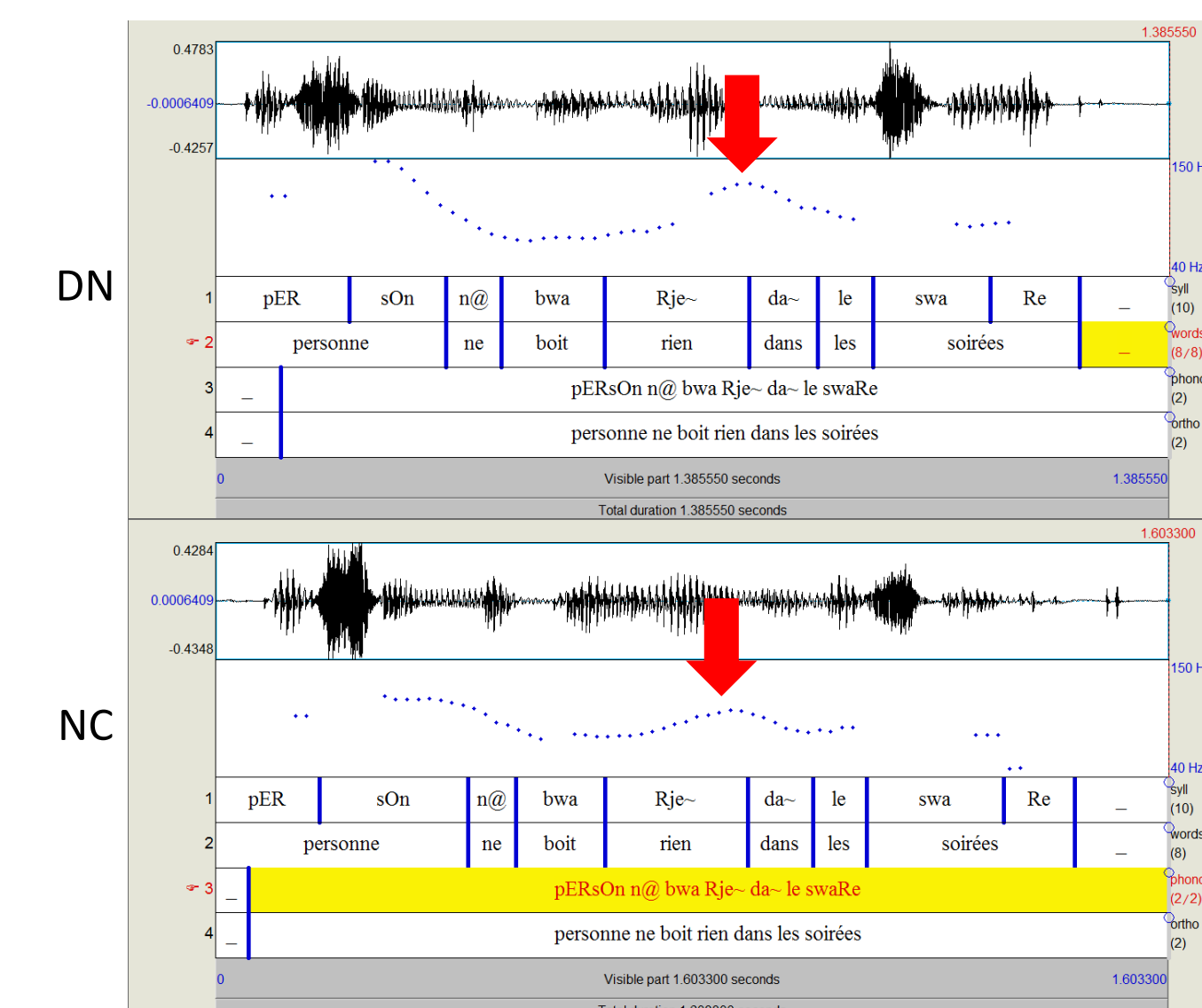
Analysis of Prosody:

- Critical sentence (personne ne [verb] rien [PP]) excised from context (Audacity 2.0.6)
- Time aligned, matching phonemes & syllables to waveform in Praat (Boersma & Weenink, 2015) using EasyAlign (J.-Ph. Goldman, 2011) (see fig. 6)
- Praat script ProsodyPro (Xu, 2013) was used to extract F0 values
- For each syllable in the critical sentence ProsodyPro extracted 10 time-normalized F0 values (as well as highest and lowest F0 for each syllable)
- These 10 values were aligned and averaged for the same syllables across all 8 items, in each condition, by participant.
- Further averaged overall all participants to create an "average contour" for each condition
- 278 total sentences: 138 DN & 140 NC

Results: Prosody

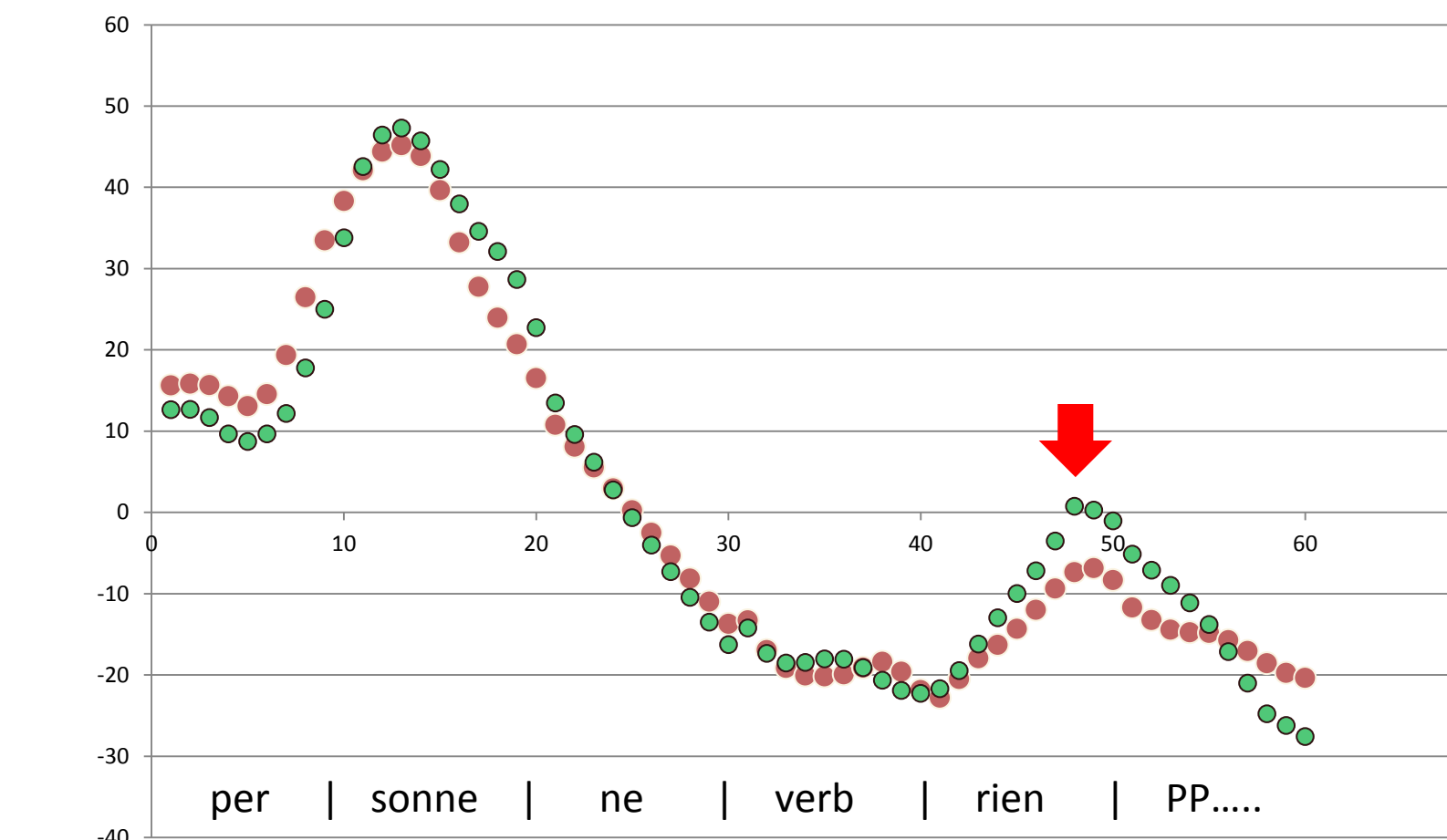
- Subjects realized a higher pitch accent on the second NCI in the DN contexts (fig. 6)

Figure 6: Praat screenshots of a contrastive DN/NC minimal pair



- Difference still visible when pitch values are averaged together (fig. 7)

Figure 7: Aggregate average DN and NC curves for all subjects



- Difference on the peak of *rien* (object NCI) statistically significant (fig. 8 & 9)

Figure 8: Average peak F0 NC vs DN

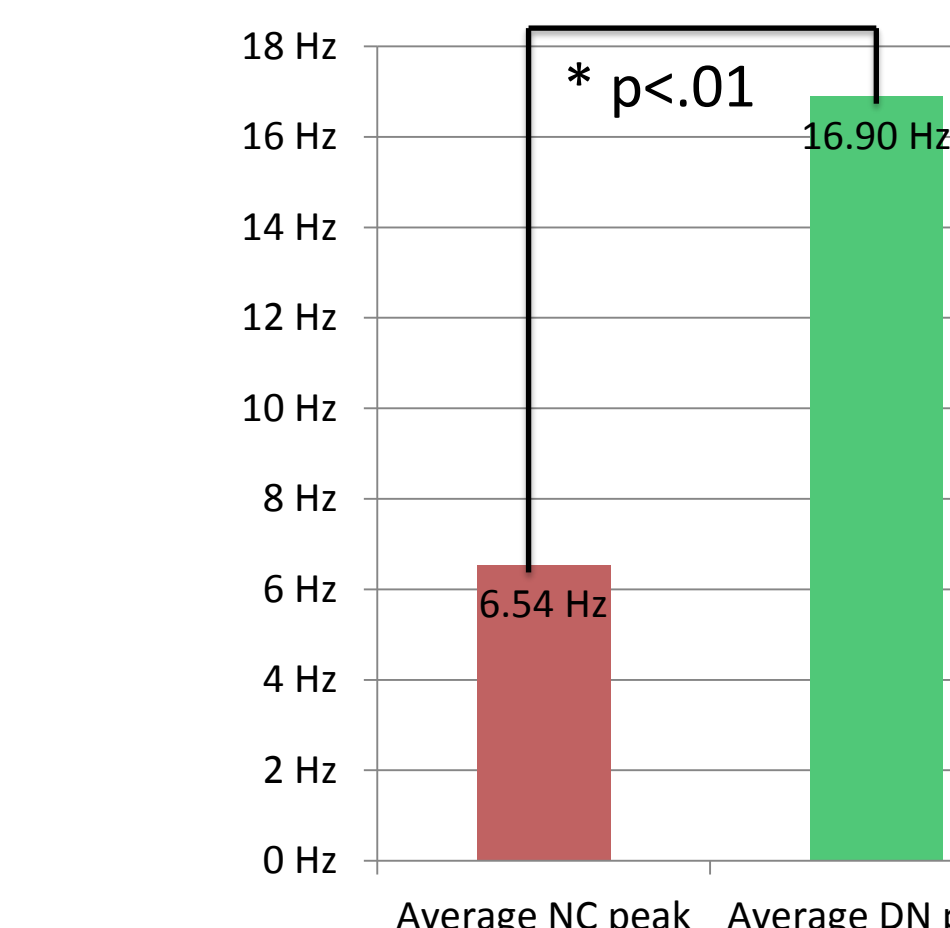
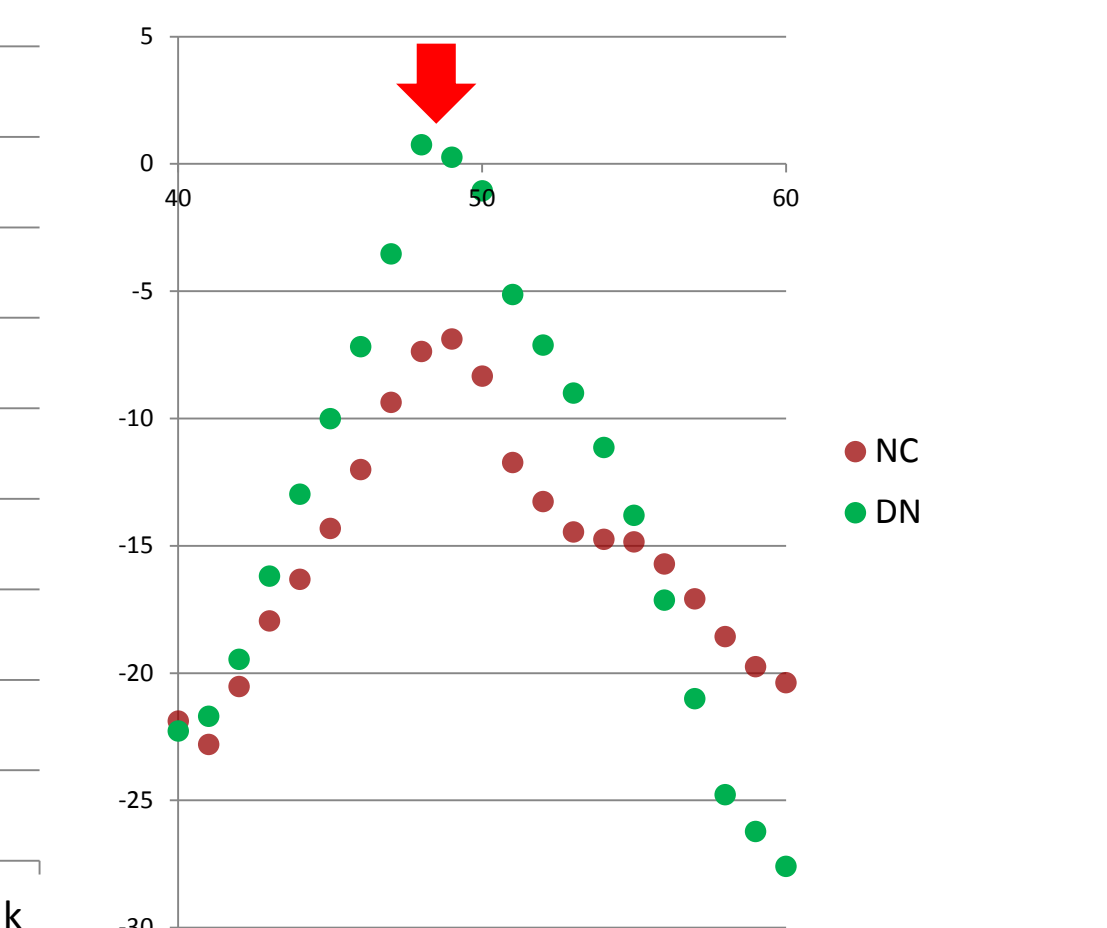
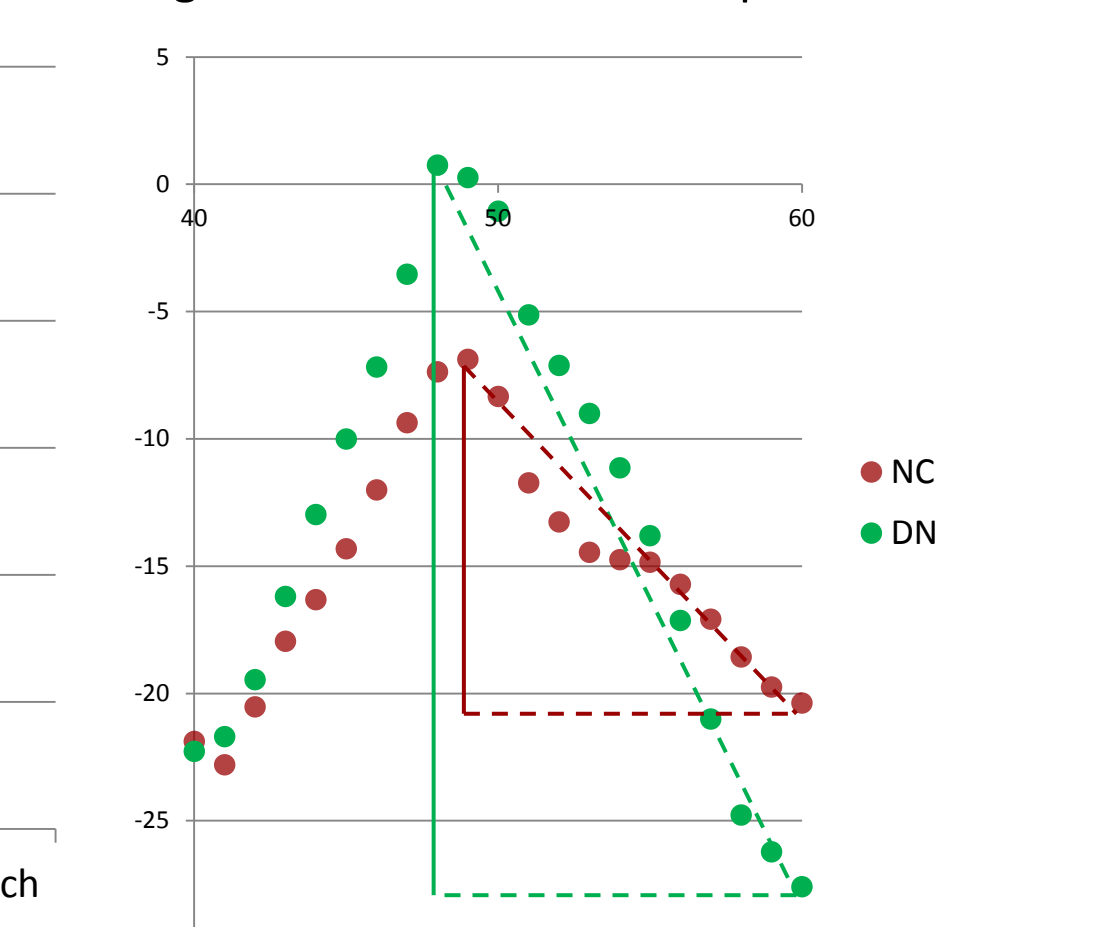
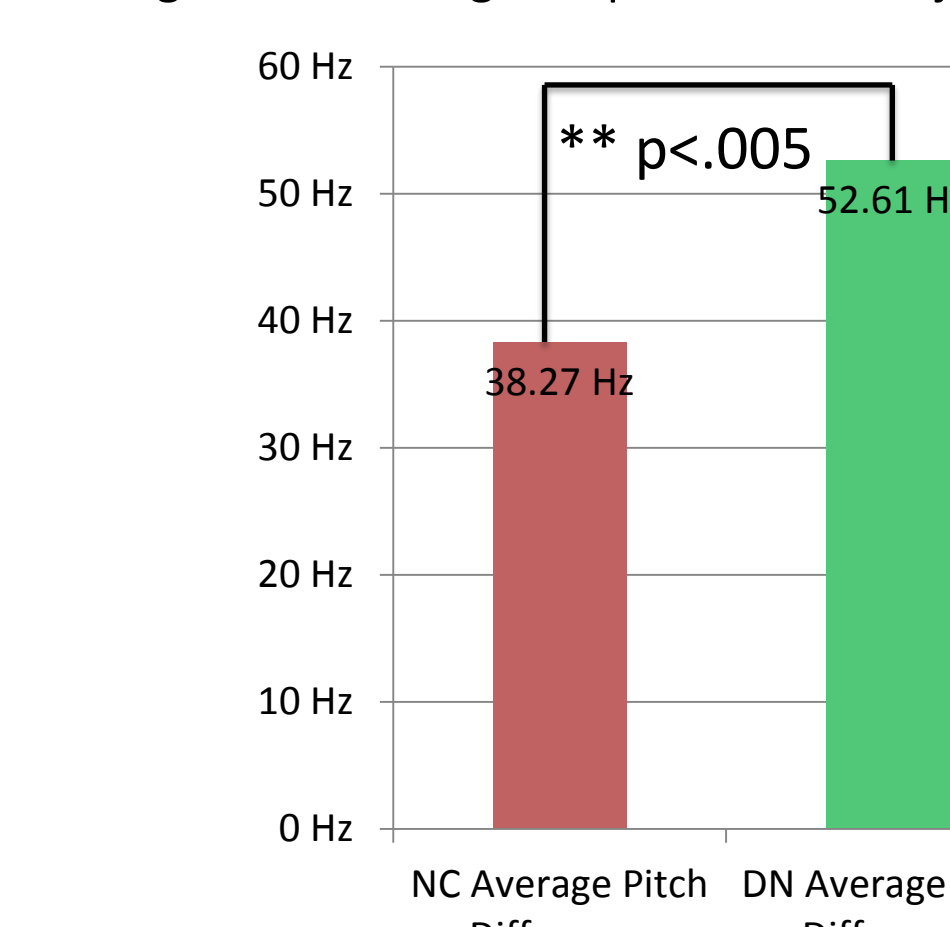


Figure 9: Zoom-in on *rien* in average contour



- Subjects also demonstrated a statistically significant steeper drop in pitch following the second NCI in the DN condition (fig. 10 & 11)

Figure 10: Average drop in F0 after object NCI



Acknowledgements

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