

Nobody Say Nothing!

- 1 Negative Concord (NC): A single negation reading of a sequence of Negative Concord Items (NCI)
Nobody say anything
- 2 Double negation (DN):
Nobody say nothing → *Everybody say something*

French, while assumed to favor NC, permits both:
Personne ne dit rien.

Theoretical models of NC

Three main families of theory:

- 1 NC = NPI dependencies ($\neg\exists x, y$ or $\forall x, y \neg[x \text{ said } y]$)
(Laka 1990, Giannakidou 1998)
 - NCI = NPI = non-negative indefinite expression
 - SNEG = semantically negative

Prediction: No DN readings in NC dependencies as in NPI dependencies (But see Nicolae & Falaus 2016 for Romanian)

Theoretical models of NC

② NC = Agree dependency ($\neg \exists x, y[x \text{ said } y]$) (Zeijlstra 2004, Biberauer & Zeijlstra 2012)

- NCI = non-negative indefinite expression with a grammatical feature [INEG] or [UNEG]
- The [INEG] vs [UNEG] distinction is parametric:
DN languages: NCI = [INEG], SNEG = [INEG]
NC languages: NCI always [UNEG], SNEG = [INEG] in non-strict NC (e.g.: Italian), but [UNEG] for strict NC languages (Haitian Creole)

Prediction: DN in DN languages, NC in NC languages, no ambiguity, except for historically shifting languages

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Theoretical models of NC

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③ NC = Resumptive Quantification (NO < x, y > [x said y]) (De Swart 2010)

- NCI = negative quantifiers
- SNEG = semantically inert
- Possible DN readings

Prediction: Possible DN readings in all NC languages

A dual approach: Déprez (1997, 2000, 2011)

Two core types of NC relations by the nature of the NCI:

- ① Resumptive Quantification with NCI = Negative Q
- ② NPI-like dependencies with NCI = non-quantificational indefinite expressions

FR-NCI: NCI high within DP/XP structure

(1) [DP/XP **NCI** D ... [NP/FP 0]]

- Are like bare Negative Quantifiers
- NC = Resumptive Quantification, allows for DN readings

HC-NCI: NCI low within DP/XP structure

(2) [DP/XP 0 ... [NP/FP **NCI**]]

- Are like bare nominals with a null D: indefinite expressions that must be bound by a NEG operator (pa) = NPI

A dual approach: Déprez (1997, 2000, 2011)

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- Micro-parametric proposal
- NCIs do not need to all be identical in a given language, even if languages tend to have NCI paradigms
- Differences in NCIs are **not** subordinate to the nature of sentential negation

A more generalized approach: Déprez (2011)

Negative interpretability at the edge

- Neg features are “interpretable” for computation at phase edge
- Otherwise, NEGF = “uninterpretable” & needs licensing (derivational time bombs, cf. Preminger 2011, Kalin 2016)
- NEGF at DP edge = interpretable = Negative quantifier
[DP personne [D de [.autre...]]]
Grammaticalized DP internal focus position
- NEGF within DP = uninterpretable & needs licensing
[DP 0... [FP... [nP pèsonn]]]
- NEGF at vP edge = visible at sentential level (NegF inside vP needs licensing–PIC)
[TP J'ai [vP rien [vP fait [vP]]] Demotic French (Massot 2013), Norwegian V-move (Svenonius 2002)

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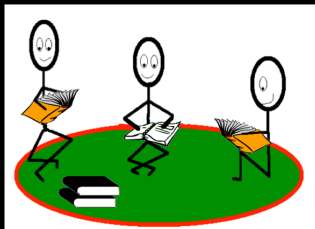
- ① In the absence of context, is NC the preferred interpretation in French?
Prediction: Yes, according to the literature.
- ② To what extent does the nature of the NCIs play a role in predicting interpretations?
 - Syntactic position
 - Parallelism
 - Structure of the NCIs themselves

The Task

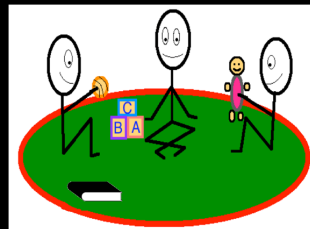
Binary choice between pictures

- Pictures represent possible NC/DN reading for an ambiguous French sentence with 2 negative expressions
- Preference task: speakers freely chose which reading was most salient
 - Avoids normativity issues that may arise from a judgment task
- Trial format:
 - 1 Presentation of sentence
 - 2 Read sentence and click to reveal pictures
 - 3 Click to select image corresponding to interpretation (RT)
 - 4 Required to provide justification on some items
- Pseudo-randomized to avoid ordering effects and left/right preference

Aucun élève ne lit aucun livre.



DN reading



NC reading

No student reads no book.

Stimulus

4 conditions \times 8 tokens each = 32 critical conditions items:

- 8 Pro-Pro: Simple Parallel

Personne ne mange rien

“Nobody is eating nothing”

- 8 DP-DP : Complex Parallel

Aucun élève ne lit aucun livre

“No student is reading no book”

- 8 Pro-DP: Simple Subject Non-Parallel

Personne ne chante aucune chanson

“Nobody is singing no song”

- 8 DP-Pro : Complex Subject Non-parallel

Aucun enfant ne boit rien

“No child is drinking nothing”

Stimulus

4 control conditions to ensure availability of single negation and DN readings:

- 8 Double Negative: *Pas un enfant ne lit rien*
“No child is reading nothing”
- 8 Negative polarity: *Personne ne lit quoique ce soit*
“No one reads anything”
- 8 Negative quantifiers: *Les enfants ne lisent rien*
“The children are reading nothing”
- 8 universal readings: *Tout le monde lit quelque chose*
“Everyone is reading something”

32 additional fillers (96 total items)

Justification for picture choice every 10 items

Participants

French

- 38 native speakers of French
 - Collected from the Universities of Caen & Lyon
 - Aged 18-26

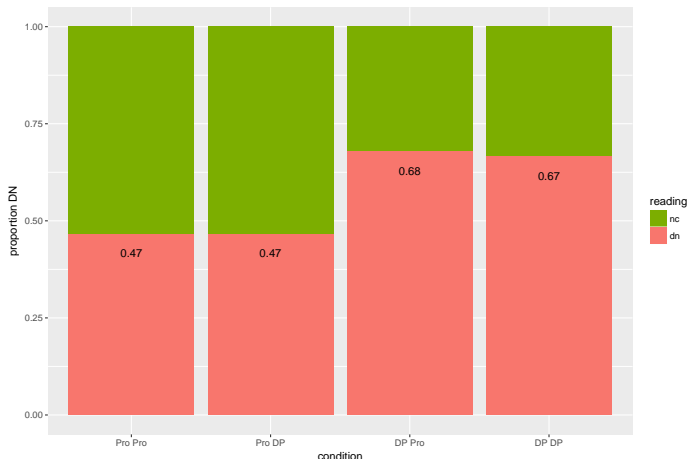
Conducted in parallel with the same experiment in English:

English

Presumed DN language (but see Blanchette 2013)

- 22 native speakers of English
 - Undergraduates at Rutgers University in New Jersey

French Results by Condition



- No major **NC** preference: **DN** dominates in 2 conditions
- DPs trigger slightly more **DN** overall ($p=0.02$), especially in subject position ($p=0.003$)

How Ambiguous are French Double Negative Sequences?

Viviane
Déprez
Jeremy
Yeaton

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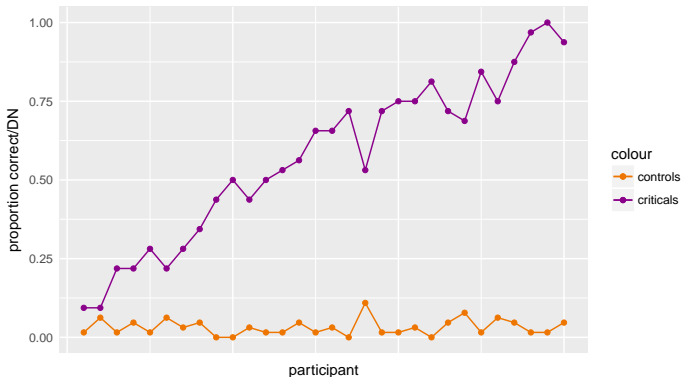
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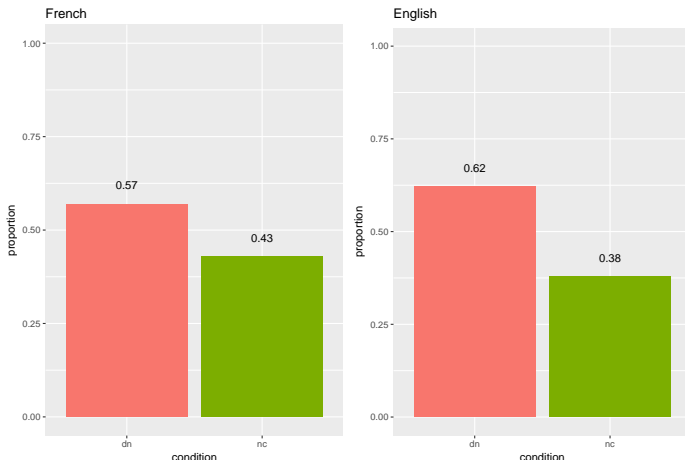
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French Results by Participant



- Participants were consistently good on controls
- Varying levels of **DN** preference through conditions

Overall French & English



- DN/NC preference in French closely resembles that of English (presumed DN language)
- **DN** preference with all conditions together ($p < 0.001$)

Back to the research questions

① Is NC a default choice in French?

- NC does not appear to be the default reading in French—there is no overall preference for NC
- Seems to be an overall preference for DN, taking all critical conditions together (thought both are hard, per RTs)

② How does the nature of NCI affect interpretation?

- **Structural Parallelism** does not appear to impact reading choice, contrary to May (1989) and Déprez (2000) conjecture.
- **DP Structure** matters. Significant distinction between Pro-Pro and DP-DP sequences, with DP-DP and DP-Pro favoring DN.
- **Syntactic Position** matters. DP in preverbal subject position (at TP edge) significantly favors DN, as opposed to Pro subject.

Theoretical Significance

- DN is not as marked as expected from the literature and can sometimes be preferred. This suggests that there are languages where DN is no more marked than NC.
- Neg relations are not homogenously interpreted even within a single language; they depend on the nature of the NCI and position in sentence.
- Calls into question the macroparametric approach:
 - Does not make sense to classify French as a DN or NC language, since the DN/NC preference varies across conditions
 - Both interpretations remain readily available.
 - Macro-parameter accounts for neither the strong presence of both NC and DN in French, nor the distinctions observed in the different conditions

Experiment 2a: Context Influence

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Research Question:

- 1 Does context succeed in influencing/ determining NC or DN interpretations in French?

Prediction: Yes, if NC/DN is a matter of ambiguity influenced by pragmatics, and not a syntactic parameter.

The Task

- Native French speakers were presented with simple, ambiguous transitive sentences with one (Control) or two (Critical) NCI in context
- They were then asked to (at their own pace)
 - ① Read the entirety silently for comprehension
 - ② Read it aloud (as though to a child)
 - ③ Respond to T/F question
- Responses were recorded on an Asus Orion PRO gaming headset with a noise filtering microphone
- Recording took place at the *Laboratoire sur le Langage, le Cerveau, et la Cognition (L2C2)* in Bron, France
- Total experimental time \leq 20 minutes

Some Examples

NC Context

- ① *Dans notre famille, on est tous allergique à l'alcool :*
(In our family, we are all allergic to alcohol)

DN Context

- ② *Chez les jeunes, la consommation d'alcool est effrayante :*
(Among the youth, the rate of alcohol consumption is frightening)

Ambiguous Critical Item

- ③ **Personne ne boit rien dans les soirées.**
(Nobody drinks nothing/ anything at parties)

Interpretation Verification

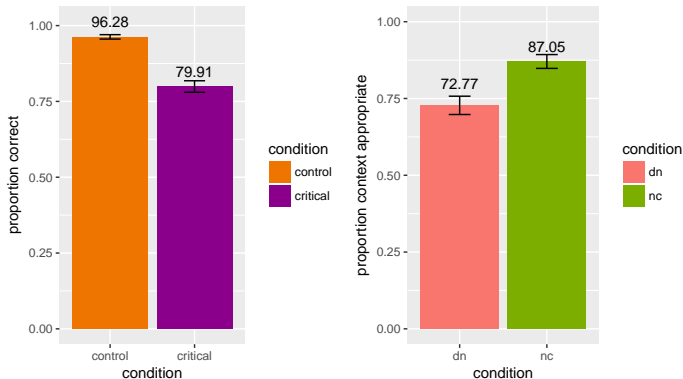
- ④ *Ils ne boivent pas d'alcool.*
(They don't drink alcohol)
= **T** for **NC** interpretation
= **F** or **DN** interpretation

- 40 total context/sentence pairs (8 items \times 5 conditions):
 - ① 8 \times **Double Negative:** *Personne ne boit rien ici*
 - ② 8 \times **Negative Concord:** *Personne ne boit rien ici*
 - ③ 8 \times **Negative Object:** *Marie ne boit rien ici*
 - ④ 8 \times **Negative Subject:** *Personne ne boit d'eau ici*
 - ⑤ 8 \times **Fillers**
- Pseudorandomized
- DN contexts did not resort to contradictions

Participants

- 28 native French speakers ($M=10$)
- Age 18-45 (mostly students at University of Lyon)
- Representative of diverse regions of France
- All had a minimum of a university degree

Results: Controls and Criticals



- Participants were overall good at the task/ obedient to context
- Overall slight preference for **NC**, but **DN** still frequent

Back to the research question

- 1 Does context succeed in influencing/ determining NC or DN interpretations in French?
 - Yes it does, pointing to ambiguity, not syntactic parameter.
 - NC and DN are still both quite available in French (neither an NC nor DN language)
 - Does not fit macro-parametric approach
 - Could fit either resumptive quantification or micro-parametric approaches
 - Context generally allows for disambiguation, but not universally across speakers: some are all NC and rarely all DN
 - Further research is needed investigating the nature of the contexts

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Experiment 2b: Prosody

Research Questions:

- 1 Is prosody used in disambiguating French transitive sentences with two NCIs?
Prediction: Yes (cf. Spanish, Catalan–Espinal et al 2011, 2016—and English–Blanchette et al 2018).
- 2 What are the prosodic indicators which are employed by speakers to mark these differences?
Prediction: Speakers will use a high pitch accent and extended duration to mark DN readings (Féry 2000, Avanzi et al 2014)

Stimuli & Participants

The same experiment as 2a.

Stimuli specifications:

- Same 8 frequent monosyllabic verbs
- Same number of syllables in target sentence
- Final PP to avoid sentence boundary L tone on object NCI
- Maximized use of sonorants where possible

Participants:

- 20 native French speakers (M=4)
- Age 18-45 (mostly students at University of Lyon)
- Representative of diverse regions of France

Condition	Structure	Abbreviation	n
Double Negation	NCI-NCI	DN	137
Negative Concord	NCI-NCI	NC	140
Subtotal Criticals			277
Single Negative Object	DP-NCI	NegOb	149
Single Negative Subject	NCI-DP	NegSub	149
Total			575

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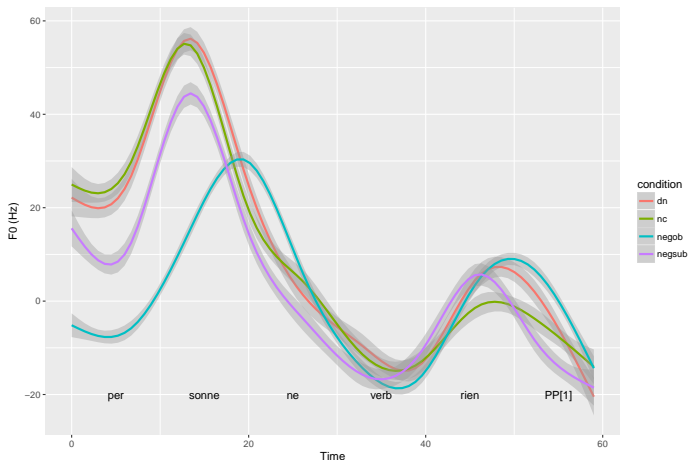
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Analysis

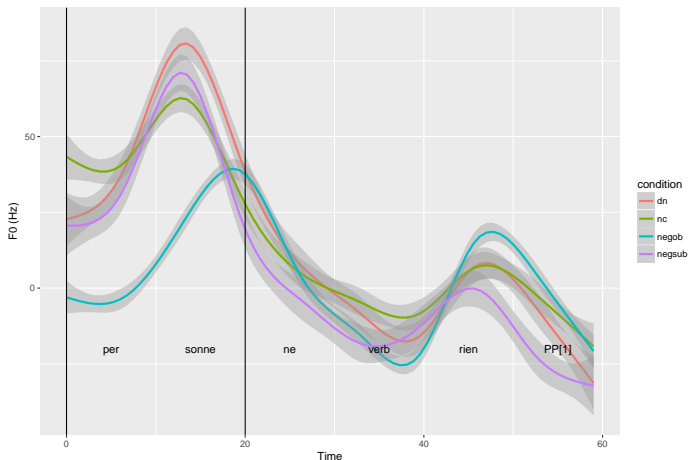
- Utterances were excised from context and text-aligned using **EasyAlign** (*J.-Ph. Goldman, 2011*) in **Praat** (*Boersma & Weenink, 2015*)
- Extracted for each syllable using **ProsodyPro** (*Xu, 2013*):
 - Duration
 - 10 time-normalized F0 measurements
- Only the first 6 syllables are included:
per sonne ne [verb] rien PP[1]
- F0 values were de-meanned
- Analysis: LM, LMEM
- Removed 1,136/33,790 (3.4%) data points
 $\geq 3\sigma$ from μ

Aggregated Pitch Contours



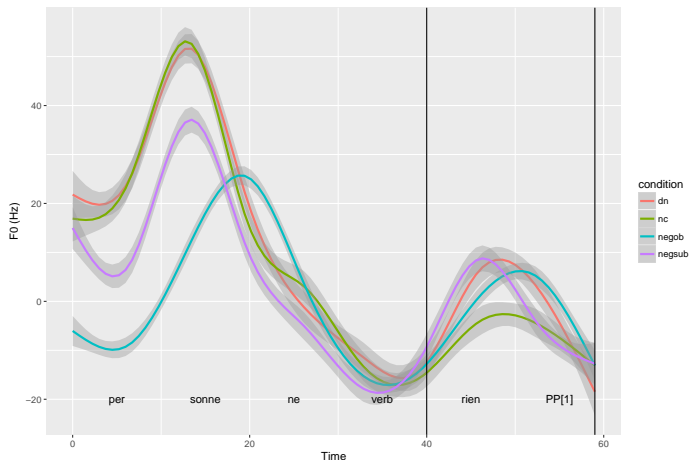
- Differences seen on subject and object between conditions (n=20)

Group 1: Subject NCI



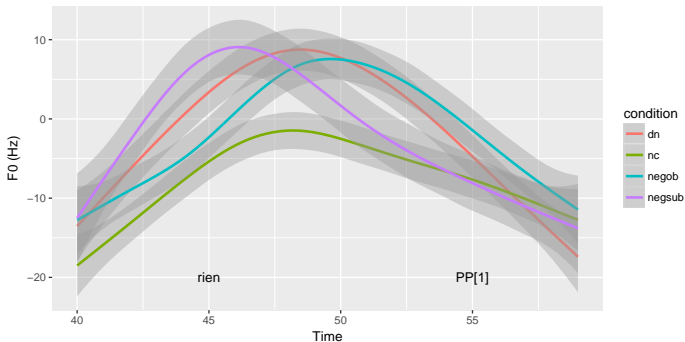
- High pitch accent on subject NCI in **DN**, no difference on object NCI (n=4)

Group2: Object NCI



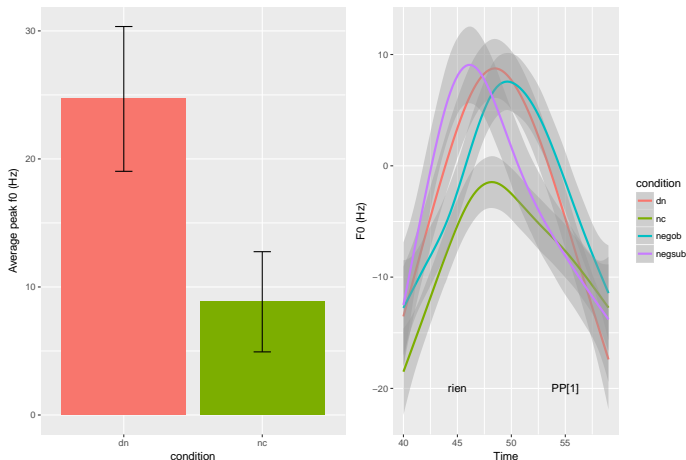
- High pitch accent on object NCI in **DN**, no difference on subject NCI (n=14)

A Closer Look: Group 2



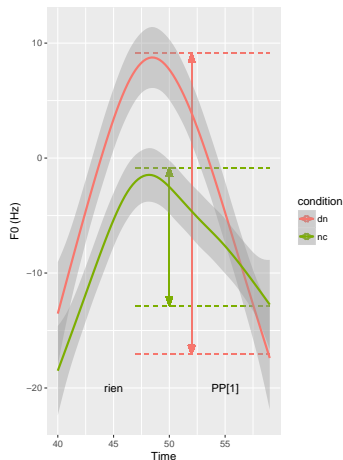
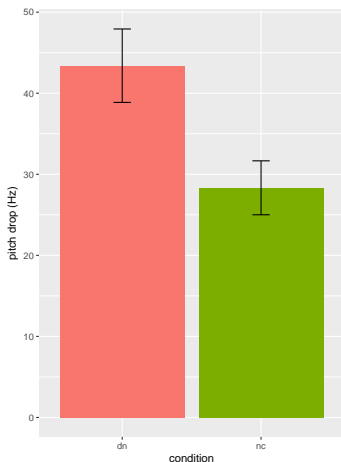
- Group 2 only (n=14)
- Three other conditions (including non-NCI object) appear very similar, while **NC** is much flatter

A Closer Look: *rien* peak



- Group 2 only (n=14)
- Peak on **NC** much lower than on **DN**

A Closer Look: *rien* drop



- Group 2 only (n=14)
- **NC** has much lower slope into the following syllable

NC Flattening

Linear Model:

$$F0 \sim \text{timeseries} + \text{condition} + \text{time} \times \text{condition}$$

- ① Interaction effect of *timeseries* \times *condition*:

NC ($t = -4.558, p = 5.25e - 06$)***

NegSub ($t = 4.011, p = 6.11e - 05$)***

NegOb ($t = 2.549, p = 0.0108$)*

- ② Main effect of *condition*:

NC ($t = -5.077, p = 3.93e - 07$)***

NegSub ($t = -4.771, p = 1.87e - 06$)***

NegOb ($t = -2.006, p = 0.0449$)*

- ③ Significant effect of *timeseries* across conditions

LM

LMEM

ANOVA

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Back to the research questions

- ① Is prosody used in disambiguating French transitive sentences with two NCIs?
 - Yes, with significant differences shown between DN and NC conditions in both f_0 and duration.
- ② What are the prosodic indicators employed by speakers to mark these differences?
 - NC seems to be marked by a flattening of pitch.

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Discussion: f0

The f0 distinctions we see on the second NCI are realizations of phrasing and tone:

NC

- Focus on *personne*
 - *rien* is phrased as part of VP
- L* H- L* H-/L- L%
- ((([_{DP}**Personne**]_{AP})([_{VP}ne V **rien**]_{AP})...([_{PP}...PP...]_{AP})_{IP})

DN

- Focus on *personne*
 - VP is “dephrased” (Féry 2010)
 - Focus on *rien*, which forms its own phrase
- L* H- L* LH- L%
- ((([_{DP}**Personne**]_{AP}) ne V ([_{DP}**rien**]_{AP})...([_{PP}...PP...]_{AP})_{IP})

Conclusions

- The availability of both readings is inconsistent with a Macro-Parametric approach
- Our results are consistent with a Resumptive Quantification and Micro-Parametric approach
- The acoustic cues that we see in French to mark phrasing might be clues to Syntax:
 - **NC:** NCl_2 is phrased within the VP & has H-
[_{TP}Personne [ne dit [_{VP}[_{VP}dit rien]]]]
 NCl_2 remains inside VP, so its NEG feature is not interpretable since it is not at an edge
 - **DN:** NCl_2 forms its own prosodic phrase with LH-
[_{TP}Personne [ne dit [_{VP}rien [_{VP}rien]]]]
 NCl_2 is at vP edge where its NEG feature is interpretable

- Are the prosodic differences actually perceptible to speakers? (Perception experiment ongoing.)
- Might speakers emphasize these features more in a situation with less clear context?
- Is all NC Resumptive Quantification? Presumably not:
 - Catalan and Spanish have a clear preference for NC (Déprez et al 2015)
 - Basque has no DN under essentially the same experimental conditions (Etxeberria et al 2018)
- How can we investigate the processing cost of these different readings? Does one have a higher cost?

Thank you for your attention!

Acknowledgements

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RUTGERS



PSL 

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R Output: Linear Model

```
Call:
lm(formula = demeaned_f0 ~ series * condition + series + condition,
    data = over46)
```

Residuals:

Min	1Q	Median	3Q	Max
-87.291	-12.271	0.894	11.842	97.834

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	128.7891	7.0734	18.207	< 2e-16 ***
series	-2.4613	0.1332	-18.483	< 2e-16 ***
conditionnc	-50.4014	9.9274	-5.077	3.93e-07 ***
conditionnegob	-19.6224	9.7837	-2.006	0.0449 *
conditionnegsub	-47.1537	9.8829	-4.771	1.87e-06 ***
series:conditionnc	0.8520	0.1869	4.558	5.25e-06 ***
series:conditionnegob	0.4695	0.1842	2.549	0.0108 *
series:conditionnegsub	0.7461	0.1860	4.011	6.11e-05 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 20.76 on 7267 degrees of freedom

Multiple R-squared: 0.1558, Adjusted R-squared: 0.155

F-statistic: 191.7 on 7 and 7267 DF, p-value: < 2.2e-16

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R Output: LMEM

```
Linear mixed model fit by REML ['lmerMod']
Formula: demeaned_f0 ~ series * condition + condition + series + (1 + condition | subj)
Data: over46

REML criterion at convergence: 63525.4

Scaled residuals:
    Min       1Q   Median       3Q      Max
-4.7017 -0.5404 -0.0309  0.4849  5.4231

Random effects:
 Groups   Name                Variance Std.Dev. Corr
 subj    (Intercept)          60.61    7.785
          conditionnc         59.59    7.719   -0.15
          conditionnegob      83.66    9.147   -0.38  0.59
          conditionnegsub     49.58    7.041   -0.31  0.18  0.54
Residual                353.04    18.789
Number of obs: 7275, groups: subj, 20

Fixed effects:
              Estimate Std. Error t value
(Intercept)    130.2274     6.6366  19.622
series          -2.4844     0.1206 -20.606
conditionnc     -52.0684     9.1518  -5.689
conditionnegob  -21.5778     9.0914  -2.373
conditionnegsub -46.9842     9.0858  -5.171
series:conditionnc    0.8770     0.1692   5.182
series:conditionnegob 0.4982     0.1668   2.987
series:conditionnegsub 0.7371     0.1684   4.376

Correlation of Fixed Effects:
              (Intr) series cndtnnc cndtnngb cndtnngs srs:cndtnnc srs:cndtnngb
series      -0.963
```

R Output: ANOVA

```
Data: over46
Models:
full.lm: demeaned_f0 ~ series * condition + condition + series
ser_cond_slope.lmer: demeaned_f0 ~ series * condition + condition + series + (1 +
ser_cond_slope.lmer:      condition | subj)
              Df    AIC    BIC logLik deviance  Chisq Chi Df Pr(>Chisq)
full.lm          9 64787 64849 -32385    64769
ser_cond_slope.lmer 19 63565 63696 -31763    63527 1242.2    10 < 2.2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

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