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When and How is Concord preferred ?
An Experimental approach

oral presentation in workshop: 120 Negation and polarity:
interfaces and cognition (Pierre LARRIVÉE & Chungmin
LEE)

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When and How is Concord preferred? An Experimental approach

Introduction

- In ambiguous sequences of Negative Expressions, **Negative Concord** is generally assumed to be the **default** or **preferred** reading.

- This is especially true for so-called **Negative Concord** languages (French Spanish, Italian) (Corblin & Tovena 2001 : 98, De Swart 2010: 3-4) where the choice is considered to be parametric ("The difference between DN and NC languages seems to be an instance of parametric variation." Zeijlstra 2010)

- **Double Negation,** in contrast, is universally regarded as **marked**, even in so-called Double Negative languages like English, German and Dutch (Horn 2001, Zeijlstra 2004: 58, Huddlestone 2010: 8, Espinal & Prieto 2011: 2404, Puskas 2012 : 612).

Introduction

- However common, these assumptions have never been tested experimentally, and in fact little is known about how speakers resolve these ambiguities, or about the factors that influence the choice of one reading over the other.

- Is NC really always a default, and if so, what does this mean?

- Are there characteristic triggers for DN and if so what are they?

DN Triggering Factors in the literature

- **Prosodic Factors :**

Corblin 1996, Espinal & Prieto 2011, Huddlestone 2010, Prieto *et alii* under review, Puskas 2006, 2009, 2012

- **Semantic factors:**

Scope: May 1989, Déprez 2000, De Swart 2010, Larrivée 2004

Parallelism: May 1989, Déprez 2000

- **Morphosyntactic factors:**

Internal DP structure, parallelism, syntactic complexity: Déprez 2000

- **Discourse Factors:**

Context: negative questions, Espinal & Prieto 2011, Puskas

- **Processing factors:**

Corblin & Derzhanski 1997

- **Sociolinguistic factors:**

Norm, dialectal variation, Larrivée 2004

Central Goals of The Study

- To explore reading preferences in **French** ambiguous sequences of negative expressions experimentally

- To establish a base line for further experimental manipulations that will serve to test potential factors influencing reading choice, one by one and separately.

Why an Experimental Approach ?

"when the data is murky, the relevant judgments consistently hard to make by introspective methods or informal testing, experimental methods are needed."

(Chemla, Homer & Rothschild 2012: 10)

Research questions for this presentation

1). Preference

In the absence of any context, is **NC** the **preferred interpretation** for ambiguous French sequences with two negative expressions?

2) Morphosyntactic factors

1. Is NC/DN interpretation influenced by morpho-syntaxic **parallelism** in NE? Pro Pro & NP NP vs Pro NP & NP Pro
2. Is NC/DN interpretation influenced by the **syntactic complexity** of NE?
3. Is NC/DN interpretation influenced by the **syntactic position** of NE?

3) Processing

  Is the **processing** of NC **faster** than that of DN ?

Road map of the talk

- Experimental design
- Results
- Discussion
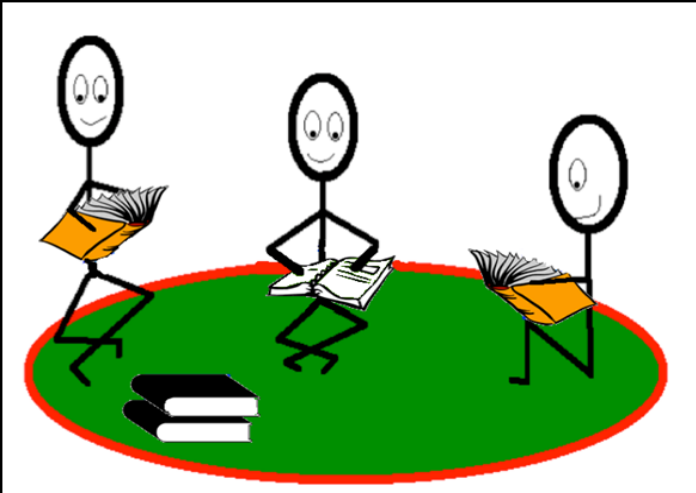- Significance
- Issues for future research
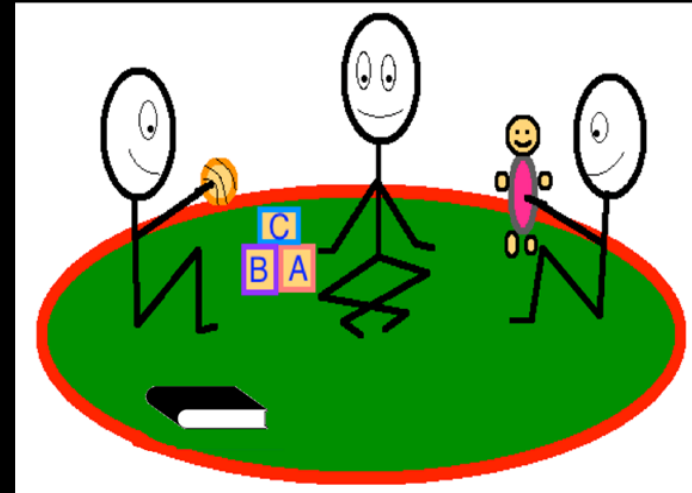
Experimental Design

Task

- Forced choice between 2 pictures

- Each picture is representing a possible NC/DN reading for an ambiguous French sentence with 2 negative expressions

Experimental Design: visual stimuli

Aucun éleve ne lit aucun livre.

DN reading

NC Reading

Experimental Design: verbal stimuli

- **96 test sentences**

- **32 critical conditions**
- **8 Pro-Pro: Simple Parallel**
  - ***Personne ne mange rien***
  - 'Nobody is eating nothing'
- **8 NP-NP : Complex Parallel**
  - ***Aucun élève ne lit aucun livre***
  - 'No student is reading no book'
- **8 Pro-NP: Simple Subject Non-Parallel**
  - ***Personne ne chante aucune chanson***
  - 'Nobody is singing no song'
- **8 NP-Pro : Complex Subject Non-parallel**
  - ***Aucun enfant ne boit rien***
  - 'No child is drinking nothing'

Experimental Design: verbal stimuli

- **32 controls to ensure good understanding of the task**

- **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 quelquechose***
  'Everyone is reading something'

32 additional fillers

Experimental design

Procedure

Participants read aloud a sentence presented on a computer screen, then, after bar pressing, saw two images and chose one by mouse clicking.

Slide order was pseudo-randomized (to avoid ordering effects); left-right picture order was also pseudo-randomized (to avoid side preference)

Reading was recorded for intonation analysis (not this talk)

Picture choice was recorded with several measures;
Mouse tracking (trajectory) from center point (not this talk)
Mouse clicking (final choice)

Time was recorded between picture appearance (bar-pressing) and picture choice (final mouse click)

Experimental design: measures

The design produced experimental data on the relation between NC/DN and:

1) Parallelism
2) Structural complexity
3) Syntactic position
4) Processing time
5) Choice trajectory (not in this talk)
6) Intonation contours paired to readings (not in this talk)

Participants

20 Native French speakers (14 F, 6 M)
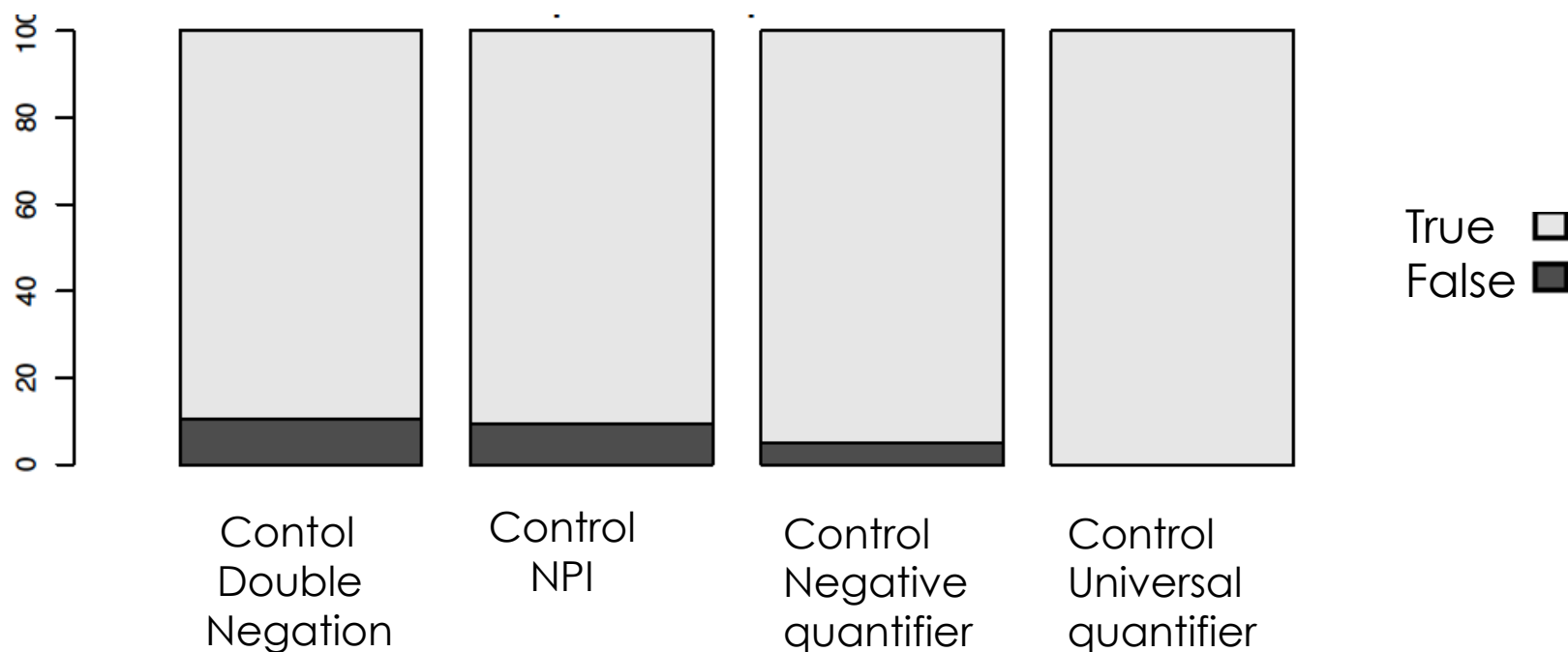All students at the University of Caen
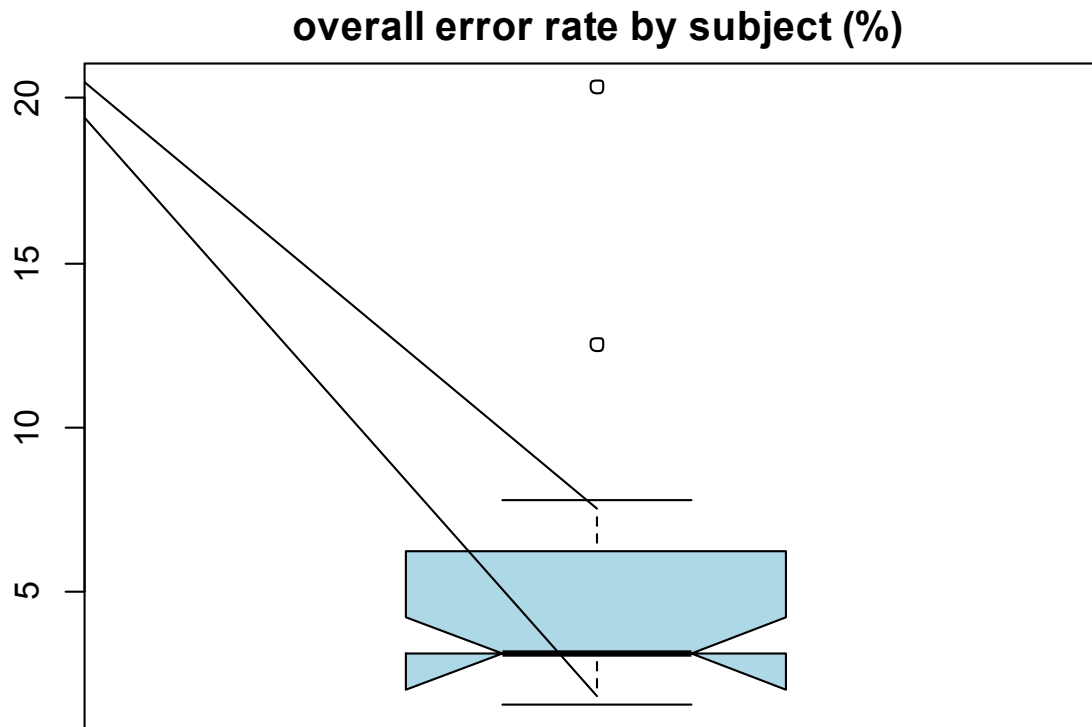
8 L2 speakers (not discussed here)

Predictions

- If NC is a favored reading,
  - It should be chosen more often than DN overall, or a least in some conditions (parallel, simple)
  - Response choice should be faster for NC than for DN choice

- If syntactic parallelism (Pro-Pro & NP-NP vs. mixed) is a significant factor
  - Following May's 1989 parallelism constraint on Resumptive quantification formation, Pro-Pro should be easier to process than NP-NP

- If syntactic simplicity (Pro vs. NP) impacts on reading choice
  - Following Déprez's 2000 assumption that simplicity may ease the formation of a Resumptive Quantifier, Pro should favor NC over DN and NP favor DN

Controls and Fillers: the task was well understood

3.7 % errors on controls + fillers items; 96.03 % responses as expected
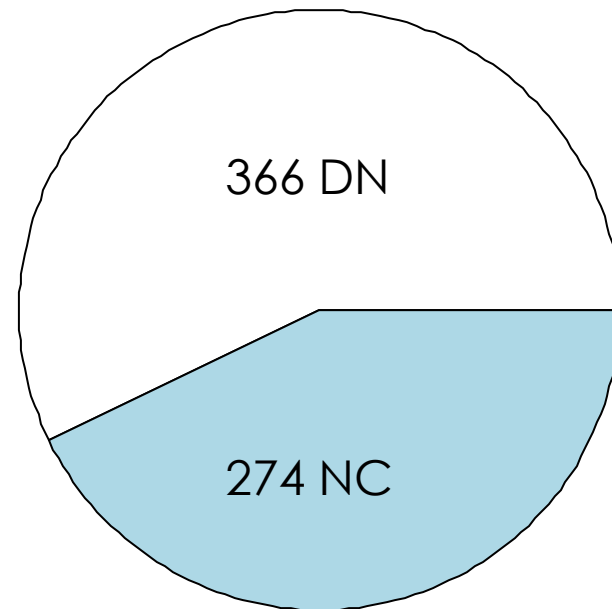
Controls and fillers

overall error rate by subject (%)

Results: NC Prefered?

Is NC a preferred interpretation? Not in French.

NC   42.81 %

DN   57. 18 %

Binomial test (366 vs 274)
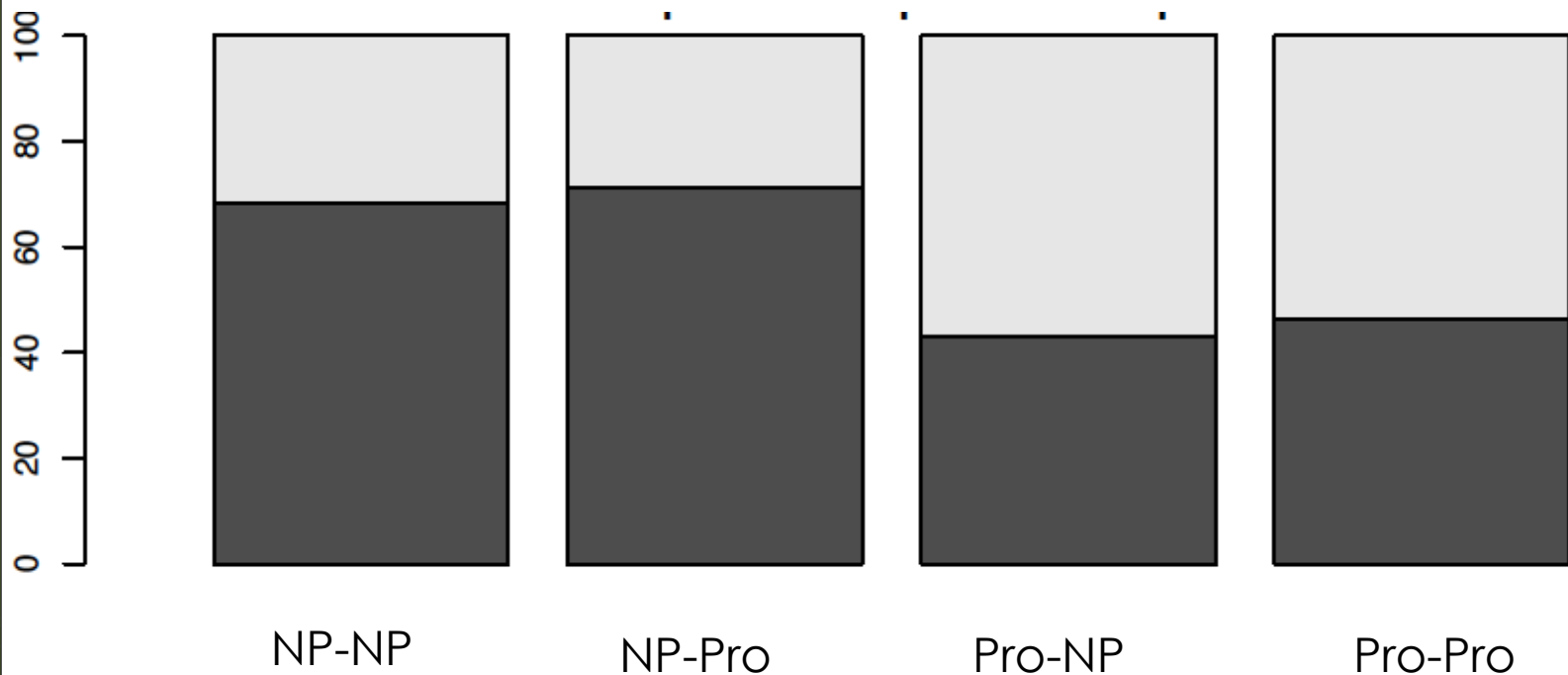
p < 0.001

Collapsing all conditions and subjects, there is in fact a significant preference for **DN readings**

366 DN

274 NC

No Preference for NC

In two conditions out of 4, DN preferred
In the other two, about equal

No preference for NC

In 2 conditions out of 4 DN is chosen significantly more often than NC;

In the other 2 conditions, there is no preference: NC and DN are both chosen about equally. No significant distinction
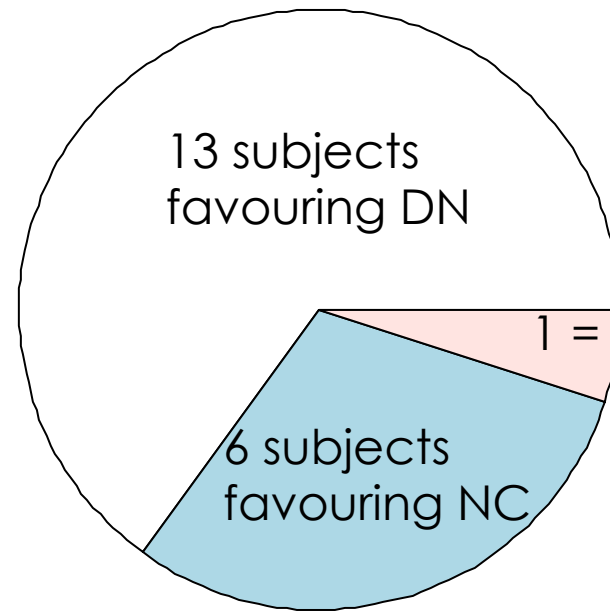
(160 items)	NP NP	NP Pro	Pro NP	Pro Pro
NC	31,875 %	28.75 %	56.87 %	53.75 %
DN	68,125 %	71.25 %	43.12 %	46.25 %
Binomial test p	< 0.001	< 0.001	0.0966	0.3846

Preference for DN ?

Taking into account subject, individual preferences, although the same trend remains, we do not have enough subjects to reach significance

NC   30 %
DN   65 %
NC=DN   5 %

Binomial test (14 vs 6)
p = 0.1153

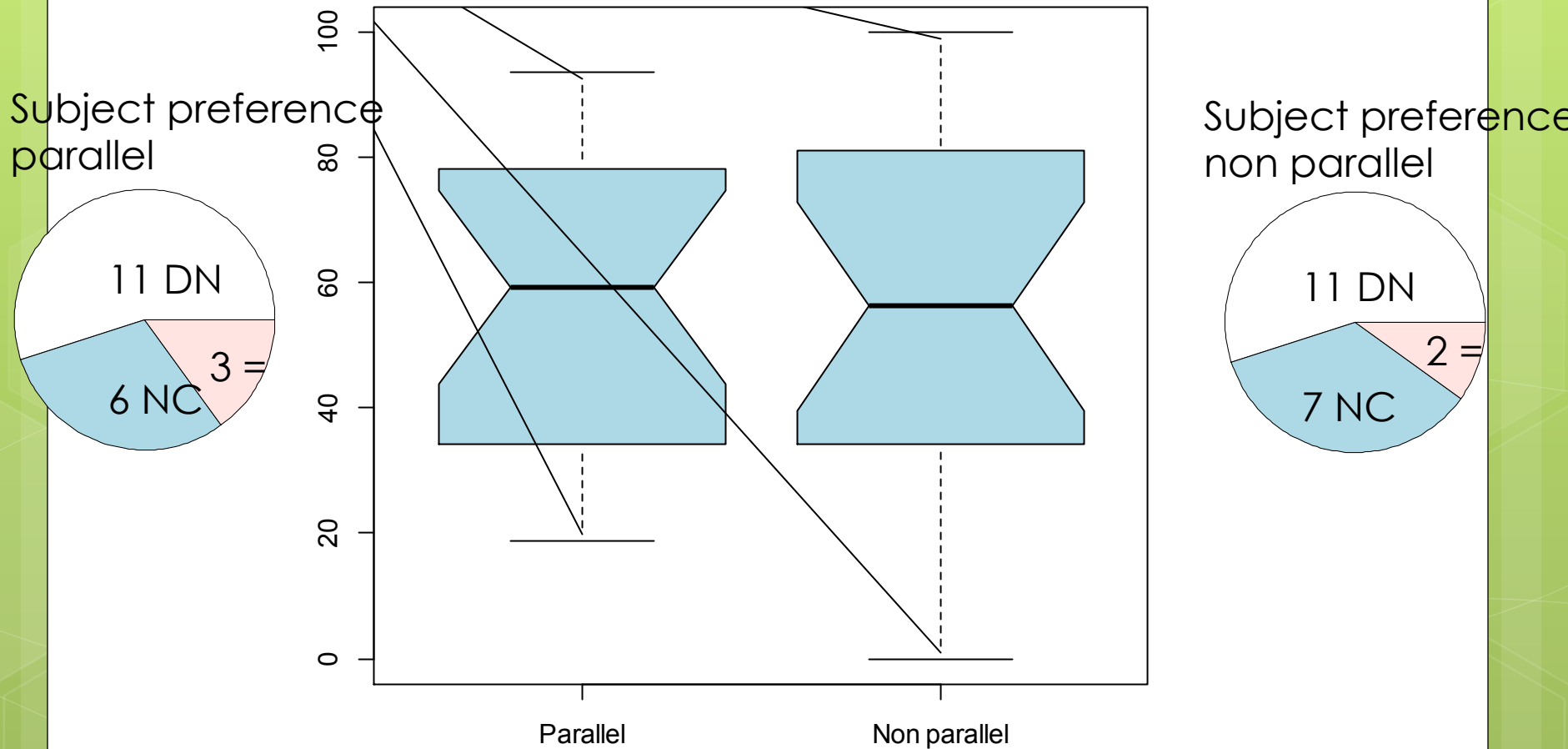13 subjects favouring DN

1 =

6 subjects favouring NC

Results: Parallelism factor

Parallel form (Pro Pro + NP NP) vs. non-parallel form (Pro NP + NP Pro) is not found to induce a preference for NC

	Parallel	Non parallel
NC	42.8125 %	42.8125 %
DN	57.1875 %	57.1875 %

Even taking into account subject preference, no distinction

% DN by subject

Subject preference parallel

11 DN

3 =

6 NC

Subject preference non parallel

11 DN

2 =

7 NC

Parallel   Non parallel

Results: Complexity factor

Complexity defined in morphosyntactic terms (Pro Pro being less complex than NP NP) is found to induce a significant difference in favor of DN choice.

160 items	Pro Pro	NP NP
NC	53.75 %	31.87 %
DN	46.25 %	68.125 %

$P = 0.0001224$

Results

Does position matter?

NP in subject position favors a DN choice as compared to NP in object position

.

160 items	NP Pro	Pro NP
NC	28.75 %	56.87 %
DN	71.25 %	43.12 %

$P = 0.0000006$

Results

Does complexity with position matter?

NP as compared to Pro subject is found to significantly relate to DN

320 items	NP (NP Pro + NP NP)	Pro (Pro Pro + Pro NP)
NC	30.13 % (97)	55.31 % (177)
DN	69.69 % (223)	44.69 % (143)

p = 0.00000000002772
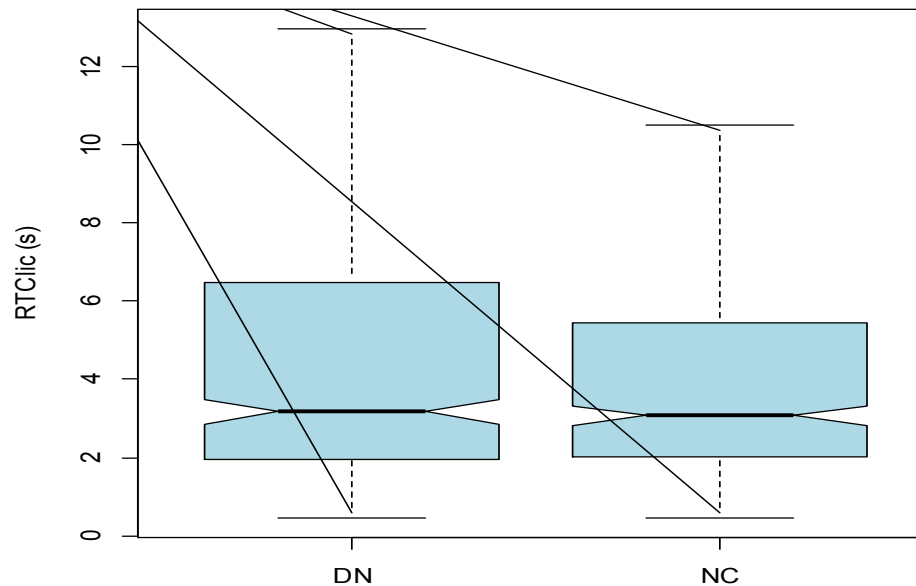
Results

Does position matter?

Probably, however when taking into account subject preferences, we do not reach significance yet (not enough subjects)

20 subjects	NP (NP Pro + NP NP)	Pro (Pro Pro + Pro NP)
NC	25 % (5)	45% (9)
DN	65% (13)	45% (9)
=	10 % (2)	10 % (2)

p = 0.32 (NC) or 0.3404 (DN)

Results: Processing Factor

Is NC processing time faster than DN? No.

No significant choice time difference is found (p=0.42)

NC average time : 4.599 s

DN average time : 5.064 s

Summary of results

No overall NC preference.

There even seems to be a DN preference.

Taking all critical conditions together, there is a significant preference for DN over NC

This however, needs to be nuanced in relation to the number of subjects tested.

No evidence of processing time difference

NC vs DN choice take about as much time

Summary of results

On morphosyntactic triggers

- Parallel vs. non-parallel structures do not significantly impact reading choice
- Morphosyntactic complexity appears to matter. There is a significant distinction between Pro-Pro vs. NP-NP
- *Aucun+ NP* in preverbal subject position significantly relates to DN
- But these results need to be confirmed with a larger set of subjects

Theoretical Significance

- Preference for NC not supported, in a supposed NC language

- Notion of a NC macro-parameter/language is not supported at all.
- In French NE sequences are highly ambiguous with no preference for NC, nor a faster processing time for NC over DN

- DN is not marked with respect to NC

- Predictions of the resumptive quantification model (May, Deprez, De Swart) are supported in part: although parrallelism, as defined here, was not found to be significant, Complexity was.
- It may be that the parallelism tested is irrelevant but that other parallelisms still matter. We will be testing for partitive structure vs non-partitive

- These results need to be confirmed with a larger sample of subjects.

That's all folks!
Thanks for your attention !

Many Thanks to our collaborator Anne Cheylus

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Dowles