What are the factors influencing the ordering of verbal complements in French?

Evidence from corpus data, questionnaires and psycholinguistic experiments

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Part of this work has been done in collaboration with
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Benoît Crabbé & Anne Abeillé (Université Paris Diderot)
In French, postverbal constituents are rather freely ordered (Blinkenberg, 1928; Abeillé and Godard, 2000)

**Verbal complements**

(1)  
<table>
<thead>
<tr>
<th></th>
<th>a. Paul a donné [une fleur] [à Marie]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b. Paul a donné [à Marie] [une fleur]</td>
</tr>
</tbody>
</table>

*Paul gave a flower to Marie*

(2)  
<table>
<thead>
<tr>
<th></th>
<th>a. Paul dit [qu’il fait beau] [à sa fille]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b. Paul dit [à sa fille] [qu’il fait beau]</td>
</tr>
</tbody>
</table>

*Paul tells his daughter that it is nice weather*

(3)  
<table>
<thead>
<tr>
<th></th>
<th>a. Cette musique rend [mon fils] [fou de joie]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b. Cette musique rend [fou de joie] [mon fils]</td>
</tr>
</tbody>
</table>

*This music makes my son really happy (lit. : crazy of joy)*
Introduction

In French, postverbal constituents are rather freely ordered (Blinkenberg, 1928; Abeillé and Godard, 2000)

<table>
<thead>
<tr>
<th>Verbal complement and modifier</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4) a. Paul parlera [à son frère] [un jour]</td>
</tr>
<tr>
<td>b. Paul parlera [un jour] [à son frère]</td>
</tr>
<tr>
<td><em>Paul will speak to his brother one day</em></td>
</tr>
<tr>
<td>(5) a. Paul verra [son petit frère] [à la plage]</td>
</tr>
<tr>
<td>b. Paul verra [à la plage] [son petit frère]</td>
</tr>
<tr>
<td><em>Paul will see his little brother on the beach</em></td>
</tr>
</tbody>
</table>

⇒ What are the factors influencing the postverbal ordering?
⇒ Focus on the case of 2 verbal complements: V NP PP or V PP NP
Previous work on French

1. General preference for *Direct Object before Indirect Object* (Blinkenberg, 1928; Berrendonner, 1987)

2. Length (Blinkenberg, 1928; Berrendonner, 1987): *short before long*

(6) Paul a donné [à Marie]PP [le merveilleux livre sur les papillons dont je t’ai parlé la semaine dernière]NP

*Paul gave to Marie the wonderful book on butterflies I told you about last week*
3 Lightness (Abeillé and Godard, 2004, 2006) : bare common nouns must occur immediately after the verb

(7) a. La course donne [soif] [à Paul]
    b. ? ? La course donne [à Paul] [soif]

    *The race makes Paul thirsty (lit. : gives thirst to Paul)*

(8) a. Ce livre fait [plaisir] [à Marie]
    b. ? ?Ce livre fait [à Marie] [plaisir]

    *This book gives pleasure to Marie (lit. : makes pleasure to Marie)*

4 Verb meaning (Schmitt, 1987a,b) : for a subset of verbs, the order of the complements is determined by the semantics of the verb

(9) rem江acer NP1 par NP2, troquer NP1 contre NP2, lier NP1 à NP2

    *to replace NP1 by NP2, to swap NP1 for NP2, to tie NP1 to NP2*

(10) faire de NP1 NP2

    *to make out-of NP1 NP2*
Previous work on French (3)

5 Definiteness: *definite before indefinite* (Berrendonner, 1987)

(11) Le gouvernement a envoyé [aux rebelles] [un message de soutien]

(12) Le gouvernement a envoyé [un message de soutien] [aux rebelles]

*The government sent a message of support to the rebels*

6 Status of the referent: *given before new* (Blinkenberg, 1928; Berrendonner, 1987)

(13) (Qu’est-ce que le gouvernement a envoyé aux partenaires sociaux ?)

Le gouvernement a envoyé aux partenaires sociaux *un message de soutien*

*(What did the government send to the social partners?)*

*The government sent a message of support to the social partners.*

⇒ To our knowledge, neither corpus studies nor experimental works
Previous work on other languages

- There are general patterns in the alignment of verbal arguments across languages: *animate and definite constituents tend to precede inanimate and indefinite ones*

**Animacy**: *animate before inanimate*

1. Corpus studies

- Dative alternation in English (Bresnan et al., 2007; Bresnan and Hay, 2008; Bresnan and Ford, 2010): inanimate recipient favors prepositional dative construction
  
  \[(14) \quad \text{theme} \prec \text{recipient}_{\text{inanimate}} \quad \text{prepositional construction} \]
  
  \[(14) \quad \text{recipient}_{\text{animate}} \prec \text{theme} \quad \text{double-object construction} \]

- Subject and Object ordering in German subordinate clauses (Kempen and Harbusch, 2004): for instance, in their data,
  
  \[(15) \quad \text{SUJ} \prec \text{IO}_{\text{inanimate}} (93\%) \]
  
  \[(15) \quad \text{SUJ} \prec \text{IO}_{\text{animate}} (54\%) \]
Animacy: *animate before inanimate*

- Experimental work: convergent results for several languages
  - Greek: Subject-DO (Branigan and Feleki, 1999)
  - Japanese: Subject-DO (Tanaka et al., 2011)
  - Spanish: Subject-DO (Prat-Sala and Branigan, 2000)

Definiteness: *definite before indefinite*

- English dative alternation (Collins, 1995; Bresnan et al., 2007)
  - indefinite recipients favor prepositional construction
  - indefinite themes favor double-object construction
  
  $\text{theme} \prec \text{recipient}_{\text{indefinite}}$
  $\text{recipient} \prec \text{theme}_{\text{indefinite}}$

  prepositional construction
  double-object construction
Previous work on other languages (3)

Definiteness: \textit{definite before indefinite}

2 Subject and Indirect Object ordering in German
   (Bader and Häussler, 2010)
   - in the \textit{Middlefield}, indefinite subjects tend to follow definite IOs
     
     \begin{align*}
     \text{IO}_{\text{definite}} & \prec \text{SUJ}_{\text{indefinite}} \quad (83\%) \\
     \text{IO}_{\text{definite}} & \prec \text{SUJ}_{\text{definite}} \quad (44\%)
     \end{align*}

3 \textit{Given referent before new referent}
   - Dative alternation and Heavy NP Shift in English (Arnold et al., 2000)
     * HNPS: besides weight, newness of the NP favors the HNPS
       
       \begin{align*}
       \text{PP} & \prec \text{NP}_{\text{new}} \quad (*) \\
       \text{DA: constituents of equal length}
       \end{align*}
       
     \begin{align*}
     \text{recipient}_{\text{new}} & \prec \text{theme}_{\text{given}} \quad (around 15\%) \\
     \text{recipient}_{\text{given}} & \prec \text{theme}_{\text{new}} \quad (around 60\%)
     \end{align*}
     
   - Preference for given-new ordering hypothesized to be a language universal
     (Clark and Clark, 1978)
Previous work on other languages (4)

Semantic connectedness

« what belongs close together conceptually also gets placed close together » (Behaghel, 1932)

NP and PP ordering in English (Wasow, 2002)

- observations in corpus: more PP NP orderings when the PP forms a collocation with the verb

(19) John took [into account] [his personal acquaintances]
What are the factors influencing the postverbal complement ordering in French?

- **Corpus study:**
  - multifactorial statistical modeling

- **Questionnaires:**
  - elicitation of acceptability judgements

- **Psycholinguistic experiments:**
  - sentence recall
1 Corpus study
   - Data and studied variables
   - Statistical modeling

2 Questionnaires
   - Animacy
   - The status of the referent

3 Sentence recall tasks
   - Animacy and sentence production
   - Postverbal complement order experiment
   - More about the role of animacy

4 Conclusion and discussion
Corpus study

The datatable

1434 sentences containing a verb followed by two subcategorized complements \((V \ NP \ PP \ or \ V \ PP \ NP)\)

extracted from

- two newspaper corpora (French Treebank and Est-Républicain)
- two speech corpora: public radio corpus (ESTER) and spontaneous speech (C-ORAL-ROM)

182 verbal lemmas

Average 70.4% preference for NP-PP order
## Corpus study

### Studied variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Examples</th>
<th>Distribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 DEFNP</strong></td>
<td>definiteness of the NP</td>
<td>definite NP vs indefinite NP</td>
<td>NP-PP: 72% vs 67%</td>
</tr>
<tr>
<td><strong>2 DEFPP</strong></td>
<td>definiteness of the PP</td>
<td>definite PP vs indefinite PP</td>
<td>NP-PP: 71% vs 68%</td>
</tr>
<tr>
<td><strong>3 ANIMNP</strong></td>
<td>animacy of the NP</td>
<td>animate NP vs inanimate NP</td>
<td>NP-PP: 79% vs 69%</td>
</tr>
<tr>
<td><strong>4 ANIMPP</strong></td>
<td>animacy of the PP</td>
<td>animate PP vs inanimate PP</td>
<td>NP-PP: 66% vs 74%</td>
</tr>
<tr>
<td><strong>5 PRONP</strong></td>
<td>pronominality of the NP (pronoun vs non-pronoun)</td>
<td>Only 9 NPs concerned by this variable</td>
<td></td>
</tr>
</tbody>
</table>

- **J. Thuilier (Rennes 2)**
- Postverbal complement order
- Feb. 10 2014
### Studied variables (2)

1. **PROPP**: pronominality of the PP
   - Only 14 PPs concerned by this variable

2. **NP-PPLEN**: relative length
   - (number of words of NP − number of words of PP)

3. **V-PPCOLLOC**: V-PP collocation as
   - *mettre en relief* (to bring out)
   - *mettre en lumière* (to highlight)
   - *prendre en compte* (to take into account)
   - Only 26 (1.8%) sentences concerned by this variable

4. **VERB+SEM**: Verbal lemma + its semantic class in context
   - (annotated according to dictionary of Dubois and Dubois-Charlier (1997))

5. **CORPUS**: corpus (FTB, ER, ESTER or CORAL)
Statistical modeling

**Logistic regression** (Agresti, 2007)

- Modeling the behavior of a binary variable as a function of several predictive variables
- Complement ordering = binary variable
  - NP-PP order = 0
  - PP-NP order = 1

**Logistic function**

Function for which values can be interpreted as conditional probabilities

\[ \pi_{\text{PPNP}} = \frac{e^{\beta X}}{1 + e^{\beta X}} \quad (1) \]

where

- \( \pi_{\text{PPNP}} \) = probability for the order PP-NP
- \( \beta \) = regression coefficients \( \alpha, \beta_0 \ldots \beta_n \)
- \( X \) = predictive variables \( X_0 \ldots X_n \)
Corpora and verbal lemma as sources of variation in the data

**Corpus**

<table>
<thead>
<tr>
<th></th>
<th>Datatable</th>
<th>FTB</th>
<th>ER</th>
<th>CORAL</th>
<th>ESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP-PP order</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>70.4%</td>
<td>67.8%</td>
<td>69.1%</td>
<td>73.6%</td>
<td>76.4%</td>
</tr>
</tbody>
</table>

**Verb + semantic class (cf. Schmitt, 1987a,b)**

<table>
<thead>
<tr>
<th></th>
<th>Datatable</th>
<th>ajouter</th>
<th>vendre</th>
<th>donner</th>
<th>mettre</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><em>U</em></td>
<td><em>D</em></td>
<td><em>D</em></td>
<td><em>L</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>to add</em></td>
<td><em>to sell</em></td>
<td><em>to give</em></td>
<td><em>to put</em></td>
</tr>
<tr>
<td>NP-PP order</td>
<td>70.4%</td>
<td>22.2%</td>
<td>36.7%</td>
<td>73.6%</td>
<td>88.2%</td>
</tr>
</tbody>
</table>

How to capture the characteristics of each group of data?

⇒ **mixed-effects model**:

- the idea: besides the general model (fixed-effects), each group of data receives its own coefficient (random-effects)
- each corpus and each verb has a coefficient capturing its individual behavior
Multifactorial statistical modeling

**Random effects**

<table>
<thead>
<tr>
<th></th>
<th>Variance</th>
<th>Std.Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CORPUS</strong></td>
<td>0.24245</td>
<td>0.49239</td>
</tr>
<tr>
<td><strong>VERB+SEM</strong></td>
<td>1.24298</td>
<td>1.11489</td>
</tr>
</tbody>
</table>

Number of obs : 1434, groups : **VERB+SEM**, 253; corpus, 4

**Fixed effects**

|          | Estimate | Std. Error | Std. Error | P(>|z|)         |
|----------|----------|------------|------------|----------------|
| Intercept| -1.4269  | 0.2879     | -4.955     | 7.22e-07 ***   |
| **NP−PPLEN** | +2.6891  | 0.1565     | 17.183     | <2e−16 ***     |

- the other variables do not have a significant effect on the probability of PP-NP ordering ($\chi^2(7) = 8.44$, p = 0.30)

⇒ the corpora study suggests that **animacy** and **definiteness** do not affect the relative ordering of verbal complements in French
Given vs. new in a subset of data

- Sample of 166 sentences with $-2 < \text{NP-PPLEN} < 2$ (in order to minimize the effect of length)
- 79.5% of NP-PP order
- Annotation of the referents of NP and PP according to the categories of Prince (1981)
  - new: when a speaker first introduces an entity into the discourse [...] we may say that it is NEW (Prince, 1981, p 235)
  - evoked (=given): if some NP is uttered whose entity is already in the discourse model [...] it represents an EVOKED entity (Prince, 1981, p 236)
- 2 variables:
  - NPSTATUS: the referent of the NP is new or given
  - PPSTATUS: the referent of the NP that is complement of the preposition is new or given
Observations

- **NP STATUS**
  - NP[new] 95 NP-PP (77%) 29 PP-NP (23%)
  - NP[given] 37 NP-PP (88%) 5 PP-NP (12%)

- **PP STATUS**
  - PP[given] 46 NP-PP (78%) 13 PP-NP (22%)
  - PP[new] 86 NP-PP (80%) 21 PP-NP (20%)

- Data with different status for each constituent

Statistical modeling of NP-PP order using mixed-effects logistic regression: STATUSNP and STATUSPP do not have a significant effect on the probability of PP-NP ordering

⇒ **given vs. new** opposition does not affect the relative ordering of verbal complements in corpus data
Results of the corpus study

Factors significantly influencing the complement ordering
  ▶ Length: 82.5% of the data respect the *short before long* principle
  ▶ Verbal lemma: each disambiguated verb has an influence on the proportion of PP-NP order

Corpus data failed to show:
  ▶ an effect of animacy
  ▶ an effect of definiteness
  ▶ an effect of the status of the referent (new vs. given)

The lack of effect could be due to uncontrolled correlation between the factors and other variables (length and verbal lemma)

⇒ Questionnaires set up in order to control correlations
1. Corpus study
   - Data and studied variables
   - Statistical modeling

2. Questionnaires
   - Animacy
   - The status of the referent

3. Sentence recall tasks
   - Animacy and sentence production
   - Postverbal complement order experiment
   - More about the role of animacy

4. Conclusion and discussion
# Questionnaire 1: Animacy

Joint work with Anne Abeillé & Benoît Crabbé (Université Paris Diderot)

## Hypothesis

Speakers tend to prefer *animate before inanimate* ordering

## Method

### Participants
- 38 native speakers of French, recruited at Paris Diderot University

### Items
- 16 sentences containing ditransitive verbs
- NP and PP: same length, and both definite
- sample of verbs with different preferences estimated in the corpus
- inanimate NP
- equal number of items with animate and inanimate PP
Method

Items

- both orders presented to the participants
- 22 fillers
- the 38 items were randomly ordered in each questionnaire

Procedure

- Acceptability judgment task
- Each continuation has been judged using a scale ranging from 1 to 5 (1 = not acceptable; 5 = fully acceptable)
- Paper and pencil questionnaire
- Each participant has a different questionnaire (ordered differently)

Il faut que les Israéliens maintenant, dans les prochaines semaines, dans les prochains mois

A. donnent les réponses précises à ces questions.

B. donnent à ces questions les réponses précises.

literally: It is necessary that the Israelis now, in the next few weeks, in the next few months give [the precise answers] [to these questions]
Results

- Expected result: preference for PP[animate]-NP[inanimate] ordering
- Participant’s judgments show an overall preference for NP-PP order (Mean = 4.06, standard error = 1.07) (Figure 1)
- Participants slightly prefer items where PP is animate, but not significantly (Figure 2)
- Interaction between order and animacy: participants tend to prefer PP-NP ordering, when PP is animate (Figure 3)
Results

- Acceptability judgments modeled using mixed-effects linear regression:
  - subjects and items as random effects
  - order, animacy of PP and interaction between both variables as fixed effects
- Both random effects are significant (for subject $\chi^2(1) = 88.703, p < 0.0001$, for items $\chi^2(1) = 11.265, p < 0.001$)
- One fixed effect is significant: order
- Neither animacy nor its interaction with order are significant factors for predicting the judgment made by the participants ($\chi^2(2) = 3.95, p = 0.14$)

⇒ Initial hypothesis not confirmed, no conclusion possible
⇒ Neither corpus study nor questionnaire show an effect of animacy on postverbal constituent ordering
# Questionnaire 2: The status of the referent

## Hypothesis
Speakers tend to prefer *given before new* ordering.

## Method

### Participants
- 28 native speakers of French, recruited at Paris Sorbonne University.

### Items
- 16 sentences containing ditransitive verbs.
- NP and PP: same length, and both inanimate.
- Indefinite and new NP.
- Equal number of items with given and new PP.
- 8 verbs with different preferences estimated in the corpus.
- For each verb, one context with given PP, and another with new PP.
Method

Items
- both orders presented to the participants
- 17 fillers
- the 33 items were randomly ordered in each questionnaire

Procedure
- Acceptability judgment task
- Each continuation has been judged using a scale ranging from 1 to 10 (1 = not acceptable; 10 = fully acceptable)
- Each participant has a different questionnaire (ordered differently)
**Example of given PP**

*De nombreuses questions* se posent à propos de la situation économique du pays. Il faut que les candidats maintenant
donnent à ces questions des réponses appropriées.
donnent des réponses appropriées à ces questions.

literally: *Numerous questions* arise about the economic situation of the country. Now the candidates have to give suited answers to these questions.

**Example of new PP**

*En Camargue, seuls les flamants roses peuvent*
donner à un paysage monotone une pointe de relief.
donner une pointe de relief à un paysage monotone.

literally: In the Camargue, only the pink flamingos can give a bit of relief to a monotonous landscape.
Results

- Expected result: preference for PP[given]-NP[new] ordering
- Participant’s judgments show an overall preference for NP-PP order (Figure 1)
- No preference between given and new referent (Figure 2)
- Interaction between the order and the status of the referent: no effect of the interaction on judgment (Figure 3)
Results

- Observations confirmed by the modeling of acceptability judgments
- Acceptability judgments modeled using mixed-effects linear regression:
  - subjects and items as random effects
  - order, status of the PP and interaction between both variables as fixed effects
- Only one random effect is significant: Subject (Items not significant $\chi^2(1) = 0.70, p = 0.38$)
- One fixed effect is significant: order
- Neither the status of the referent nor its interaction with order are significant factors for predicting the judgment made by the participants ($\chi^2(2) = 0.40, p = 0.82$)

⇒ Initial hypothesis not confirmed, no conclusion possible
⇒ Neither corpus study nor questionnaire show an effect of the status of the referent on postverbal constituent ordering
Results of the questionnaires

- Speaker judgments on complement ordering are not sensitive to
  - the animacy of the PP
  - the status of the PP referent

- The lack of an animacy effect or a given/new effect is surprising
  - French language seems to not follow cross-linguistic trends

- Methodological (possible) issues
  - **Noise**: the long contexts introducing the items and the varied lexicon used might introduce noise that hides the expected effects
  - **Number of participants**: we could possibly detect an effect by adding participants to our observations
  - **Weakness of the effect**: the effect may be very weak and the experimental protocol may not be sensitive enough to detect this effect

- Direct methods may have more chances to show up the expected effects

⇒ Sentence recall tasks set up in order to assess the role of animacy
Corpus study
- Data and studied variables
- Statistical modeling

Questionnaires
- Animacy
- The status of the referent

Sentence recall tasks
- Animacy and sentence production
- Postverbal complement order experiment
- More about the role of animacy

Conclusion and discussion
Animacy and sentence production

Joint work with Margaret Grant (McGill University)

- Previous studies showed that animate entities may preferentially be produced in early word order positions than inanimate entities.
- Sentence production in Greek (Branigan and Feleki, 1999)
  - Both SVO and OVS orders are licensed.
    
    (20)  
    a. Sta dimokratika politevmata, o politis sevete to sindagma in democratic regimes the citizen-NOM respects the law-ACC  
    b. Sta dimokratika politevmata, to sindagma sevete o politis in democratic regimes the law-ACC respects the citizen-NOM  

- Tendency to recall OVS sentences as SVO sentences with subject[anim] / object[inan]
- Tendency to recall SVO sentences as OVS sentences with subject[inan] / object[anim]

- If animacy plays a role in French sentence production, we expect
  - V PP[inan] NP[anim] order to be recalled as V NP[anim] PP[inan]
  - V NP[inan] PP[anim] order to be recalled as V PP[anim] NP[inan]
## Method

### Participants
- 38 native speakers of French, tested individually at Paris Diderot University

### Items
- 24 blocks containing 4 sentences each
- 1 experimental item and 3 fillers by block
- animate PP
- 12 animate NPs and 12 inanimate NPs
- 12 NP-PP orders and 12 PP-NP orders
- items controlled for length and definiteness

---

Le chef de projet a confié \{un agent commercial/un nouveau budget\} à un décorateur

The project manager assigned \{a commercial agent/ a new budget\} to a decorator
Method

Procedure

- a block consists of 3 successive phases
  1. **Reading**
     - subjects read the 4 sentences for 7000 ms each,
     - sentences separated by a fixation cross with 600 ms duration
  2. **Mental Arithmetic**
     - subjects are asked to respond out loud to a simple arithmetic question presented for 5000 ms
  3. **Repetition**
     - subjects are prompted with the initial portion of each of the 4 sentences from the Reading phase
     - they are asked to say the sentence out loud, as accurately as possible
     - each production had a time limit of 10 000 ms

- sentences presented in randomized order during the Reading phase and the Repetition phase
- subjects completed a total of 24 experimental blocks following 2 training blocks
Postverbal complement order experiment

Method

Data analysis
- responses were coded as
  - Correct Order
  - Reverse Order
  - Incomplete/other
- Subjects with fewer than 30% complete responses were excluded from analysis → 33 Subjects
- Reliability was assessed using mixed-effect logistic regression with
  - random intercepts for Subjects and Items
  - random slopes for Animacy and presented Complement Order
### Results

- **477 Correct Orders / 77 Reverse Orders (12.8%)**
- **Inversions from NP-PP to PP-NP**
  - animate NP: 11.9% (17/143)
  - inanimate NP: 4.2% (6/144)
- **Inversions from PP-NP to NP-PP**
  - animate NP: 14.7% (19/129)
  - inanimate NP: 21.3% (28/131)

⇒ No preference for ordering animate complements before inanimates

- Surprisingly, there is a significant interaction (p < .01) such as inanimate NPs favor inversions from PP-NP to NP-PP

⇒ Experimental data show a preference for **inanimate before animate order**
Results

- Post-hoc analysis
  - Because of the free recall nature of the task, subjects were able to vary factors such as definiteness
  - Responses were coded for definiteness of the NP and the PP
  - Number of responses with
    - Indef-Def order: 88 with 19% of Reverse Order (17/88)
    - Def-Indef order: 70 with 17% of Reverse Order (12/70)

- No significant interaction between Definiteness and Order for predicting the Reverse Order
- Interaction between Animacy and Order still significant (p < 0.01)

⇒ By looking for an animate before inanimate effect, we found a reverse effect favoring inanimate before animate!
More about the role of animacy

- Was the surprising effect due to methodological issues?
- We studied the role of animacy for 2 other sentence types using the same experimental design
  - voice alternations

**Active**: Au bout de la ruelle, le policier a trouvé \{le voleur/le revolver\}

At the end of the alley, the policeman found \{the thief/the revolver\}

**Passive**: Au bout de la ruelle, \{le voleur/le revolver\} a été trouvé par le policier

At the end of the alley, \{the thief/the revolver\} was found by the policeman

- sentences with coordinated NPs

Ce jeune homme a toujours fui les traîtres et \{les lâches/les échecs\}

This young man has always avoided traitors and \{cowards/failures\}

Ce jeune homme a toujours fui \{les lâches/les échecs\} et les traîtres

This young man has always avoided \{cowards/failures\} and traitors
More about the role of animacy

Results

Voice alternations

- 39% of inversions from passive to active with inanimate patient
- 11.4% of inversions from passive to active with animate patient
- Statistically significant effect of animacy

Coordinations

- No significant differences for inversions based on animacy

⇒ Results in agreement with other studies (Bock and Warren, 1985; Tanaka et al., 2011)

⇒ Results supporting a role for animacy in grammatical role assignment but not for simple linear order
1. Corpus study
   - Data and studied variables
   - Statistical modeling

2. Questionnaires
   - Animacy
   - The status of the referent

3. Sentence recall tasks
   - Animacy and sentence production
   - Postverbal complement order experiment
   - More about the role of animacy

4. Conclusion and discussion
Conclusion and discussion

Factors playing a role
- Length of the NP and PP
- Verb lemma combined with its semantic class

Definiteness and the given/new opposition
- Quantitative study on corpus and acceptability judgment questionnaire

⇒ No evidence showing that French postverbal complement ordering is affected by these factors, contrary to other languages

Animacy
- Quantitative study on corpus and acceptability judgment questionnaire: no visible effect
- Sentence recall experiment: unexpected effect *inanimate before animate*
Conclusion and discussion

How to explain these observations?

Methodology

- Inanimate before animate tendency
  - Need to gain insight into the nature of this effect by studying for instance the effect of length
  - Recall sentence results not in line with other evidence (questionnaire and corpus)
  - Is the effect of animacy so weak that only sensitive experimental protocols as sentence recall can detect it?

- Definiteness and the given/new opposition
  - Need of other experimental tools in order to explore the effect of these factors (sentence recall, for instance)
How to explain these observations?

Linguistic characteristics

- One possible explanation for the animacy effect
  - tendency to put typical arguments (inanimate DO and animate IO) in their canonical positions (DO ≪OI in French)
- In other languages, most word order phenomena include the Subject
  - Subject is typically *animate* and *given*
- In English and German at least, verb complement ordering involves pronominal constituents
  - pronouns are prototypically *given* and can be *animate*
  - in French, most of the pronouns appear as clitics before the verb

⇒ These observations could explain the lack of effect/or the weak effect of animacy and the status of the referent in French postverbal complement ordering
Thank you for your attention!


