Do animate arguments come first ?

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Animacy is known to play a role in postverbal argument ordering for various languages (W02, B08a, B08b). Together with definiteness, pronominality, and shortness, animacy favors positioning an argument first. Nevertheless, it is sometimes difficult to distinguish linear ordering from grammatical function or semantic role assignment, since those are also subject to various factors including animacy (K77). In order to investigate the role of animacy in French argument ordering, we limit ourselves to complements of ditransitive verbs with object and indirect object nominal complements. Using statistics on treebanks for language production and a questionnaire study for language perception, we show that animacy seems to play no role in the relative ordering.

Ordering of postverbal NP and PP complements in French is known to display a preference for NP PP (ex1, B28) and to be sensitive to different factors~: length (2), definiteness (3)… Given the lack of treebanks for spontaneous spoken French, we randomly extracted 982 sentences from two newspaper corpora (Le MondeA03, Est Républicain) and a radio corpus (ESTER). We observe an average 58% preference for NP PP, with some variation between corpora (46.4% for Est Républicain), between verbs (37.8% for *montrer* - 'to show') and between prepositions (28.4% for *de* - 'of'). We annotated the sentences for relative length of NP and PP (log number of words), V-PP collocation, and complement animacy, definiteness and pronominality. We annotate Animacy into a binary variable (with 'animate' for 'human', 'animal' and 'organization').

We built a logistic regression model predicting either ordering (NP-PP or PP-NP), with corpus and verb lemma as intercept random effects. We observe two significant effects : relative length (p-value < 2e-16) and collocation (p-value = 0.039). Differently from English and German complement ordering (B08a, B08b), animacy shows no reliable preference for early position (AnimacyPP p-value = 0.95, AnimacyNP p-value = 0.91) as illustrated on the following figure :
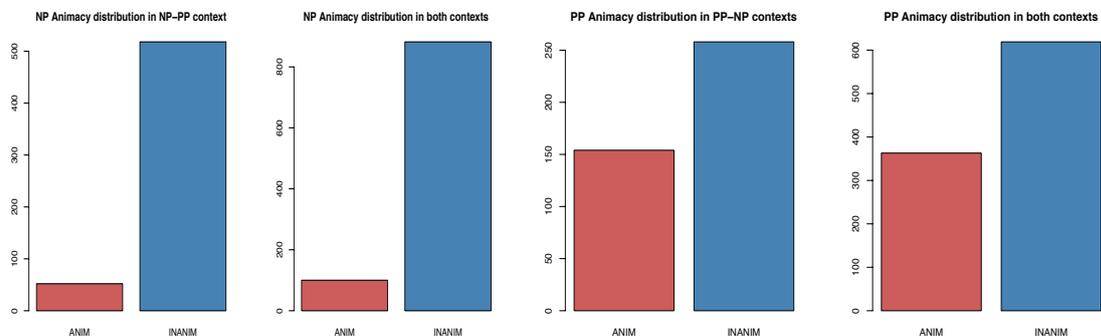
We then built a second model (CM) removing non significant factors by likelihood ratio test ($\chi^2 = 0.55$), keeping only relative length (favoring short before long), and collocation (favoring PP-NP). We computed variable interaction and only one was significant: collocation and NP non-animacy (p = 0.012), but with an effect contrary to what would be expected, collocation and NP non-animacy voting for NP-PP order.

In order to neutralize the relative length effect, and give animacy more chances to show up, we extracted 23 sentences from our corpora with complements of equal length (1) for our

questionnaire study. We tested 25 subjects for preferences between NP-PP and PP-NP continuations using a 5 point likert scale (with each order as an endpoint on the scale) and coded the results from 1 = strong PP-NP preference to 5 = strong NP-PP preference. The experiment confirms the overall preference for NP-PP order (with average rating 3.5). We built a linear mixed model to predict the ratings, with the same predicting variables as the corpus study (minus complement relative length, plus subject as random effect). In this model, NP definiteness becomes significant ($p = 0.02$), but pronominality and animacy effects remain non significant (animacyNP $p = 0.9$, animacyPP $p = 0.5$). Compared to English and German, the lack of pronominality effect can be explained by the fact that French has a different strategy (preverbal cliticization) for ordering pronominal arguments. But the lack of Animacy effect is a major surprise, which should be confirmed with other experiments and other constructions, but which nevertheless undermines its supposed universality for argument ordering.

Examples

(1) Pierre fonce dans la nuit porter la bonne nouvelle à sa fiancée (Est Républicain)
    'Pierre runs in the night to-bring the good news to his fiancee'

 (2) verser au fisc les 4,80% droits d'enregistrement (Le Monde)
'give to-the taxes the 4.8% registration rights'

 (3) un administrateur provisoire qui proposera aux actionnaires différentes possibilités. (Le Monde)
'a temporary admistrator who will-propose to-the shareholders different possibilities'

 (4) la Banque fédérale d'Allemagne (…) permit de mettre en échec la spéculation. (Le Monde)
'The German Federal Bank permitted to defeat the speculation'

(CM)Corpus model

Formula: ordre ~ lengthSN-lengthSP + collocatePP + (1 | corpus) + (1 | verbLemma)
Data: snspoanim

AIC	BIC	logLik	deviance
613.9	638.4	-302	603.9

Random effects:

Groups	Name	Variance	Std.Dev.
verbLemma	(Intercept)	1.78145	1.33471
corpus	(Intercept)	0.17067	0.41312

Fixed effects:

	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	-1.2679	0.3238	-3.916	9e-05 ***
log(lengthSN)-log(lengthSP)	2.8432	0.2071	13.731	< 2e-16 ***
collocatePP	1.2192	0.4604	2.648	0.00809 **

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