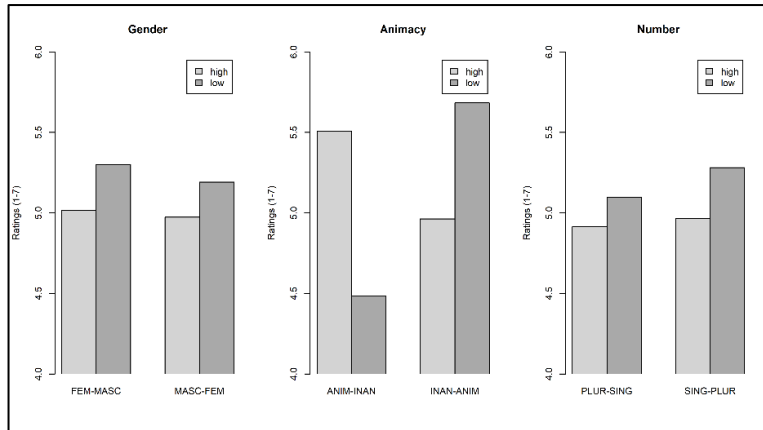


## Number, gender and animacy effects on RC-attachment preferences in Italian.

Francesca Foppolo, Martina Abbondanza  
University of Milan-Bicocca  
francesca.foppolo@unimib.it

Relative-clause (RC) attachment preferences of sentences like (1) have been a matter of a cross-linguistic vivid debate, with mixed and controversial results. The availability of pseudo-relatives in a given language has been claimed to affect preferences (Grillo & Costa, 2014). Pioneering work in Italian (De Vincenzi & Job, 1997) report low-attachment preferences (to NP2) in a self-paced reading task report, consistently with *Late Closure* (Frazier & Fodor, 1979, Frazier & Clifton, 1996). **Our study.** The aim of this study is to extend these findings by testing Italian RC high-low attachment preferences by means of an acceptability judgement task (Exp.1), a self-paced reading task (Exp.2) and a hybrid maze task (Exp. 3) with more controlled stimuli. Across all studies, we tested sentences like (2-4) in which the low/high attachment is resolved in the verb region either by gender (2), number (3) or animacy (4) to test if and how these factors modulate RC-attachment preferences (in the animacy condition, disambiguation was solved via number or gender, counterbalanced). Materials in all studies comprised 144 sentences (72 fillers) in the 3 (gender/number/animacy) x 2 (low/high) conditions (position of the NPs was counterbalanced). We avoided perception verbs to control for pseudo-relatives (Pozniak et al., 2019). Different groups of participants were tested across the studies. In **Exp. 1** participants (N=42) rated sentences on a 7-point Likert scale. Results (Fig. 1) were analyzed by means of a cumulative link mixed-model for each condition and showed that: (i) in the gender condition there is a general preference for low rather than high attachment ( $z=-1.9$ ,  $p=.05$ , m1-Table1) but no significant interaction between the gender of the NPs and high/low attachment ( $z=-.06$ ,  $p=.9$ , m2-Table1); (ii) in the number condition no preference between low/high attachment emerged ( $z=-1.2$ ,  $p=.2$ , m3-Table1) and no effect of number (sing/plu) of the NPs preceding the relative clause ( $z=.2$ ,  $p=.8$ , m4-Table1); (iii) in the animacy condition, attachment was significantly modulated by the animacy of the NPs ( $z=3.8$ ,  $p=.0001$ , m5-Table1): when the NP1 was animate and NP2 inanimate, there is a significant preference for high attachment, when NP1 is inanimate and NP2 animate, low attachment received significantly higher ratings. **Exp. 2** was a self-paced reading task (79 participants). Results of reading times (Fig. 2) on the interest areas, which included the word preceding the disambiguation region, the disambiguating word and the word that followed the disambiguation, showed that there is no preference between high and low attachment sentences in any condition ( $t=-.1$ ,  $p=.9$ , m6-Table1). We tested the interaction between the properties of the NPs (gender, number, animacy) and attachment (high-low) and results were not significant across any of the conditions (m7-Table1). In **Exp. 3**, sentences were presented word by word until participants (N=53) had to choose between two verb forms (the disambiguating words) to continue the sentence in the most natural manner. Results showed a general preference for high rather than low attachment (Fig. 3,  $z=6.6$ ,  $p<.0001$ , m8-Table1). This preference was significantly modulated by gender, number and animacy: when NP1 was masculine, singular or animate, the verb chosen was masculine or singular or compatible with an animate entity above 85% of the cases, showing a clear preference for high attachment; when it was feminine or plural or inanimate, no difference emerged in the selection of fem/masc or sing/plur or anim/inanim continuations (around 50% in all cases), suggesting that in these cases there is no clear preference for high/low attachment. Separate logit mixed effects models with random intercepts for participants and items showed significant effects of gender, number and animacy in attachment preferences ( $z= 3.4$ ,  $z = -3.7$  and  $z = -3.2$  respectively, all  $ps.<.001$ , m9-Table1). **Conclusions.** There is great variability of Italian speakers in RC-attachment preferences. In the self-paced reading task (Exp.2), no preference was observed. In Exp.1 and Exp.3, the preference is modulated by the linguistic properties of the antecedents, especially by the animacy: an animate noun triggers the RC-attachment more than gender and number, although a slight preference for high attachment when the antecedent is masculine or singular was also observed. This suggests that semantic and morphosyntactic features modulate syntactic preference, suggesting the need for further cross-linguistic research.

- (1) The reporter interviewed the daughter<sub>NP1</sub> of the colonel<sub>NP2</sub> who was injured AMB
- (2) a. L'avvocato ha difeso il padre<sub>[+M]</sub> della ragazza<sub>[+F]</sub> che si è tradita<sub>[+F]</sub> al processo. LA  
 b. L'avvocato ha difeso il padre<sub>[+M]</sub> della ragazza<sub>[+F]</sub> che si è tradito<sub>[+M]</sub> al processo. HA  
*The lawyer has defended the father of the girl who betrayed him/herself in the trial*
- (3) a. Il reporter ha intervistato il maestro<sub>[+S]</sub> dei musicisti<sub>[+P]</sub> che sono saliti<sub>[+P]</sub> sul palco. LA  
 b. Il reporter ha intervistato il maestro<sub>[+S]</sub> dei musicisti<sub>[+P]</sub> che è salito<sub>[+S]</sub> sul palco. HA  
*The reporter has interviewed the teacher of the musicians that was/were on the stage*
- (4) a. Luca ha visitato i commercianti<sub>[+A]</sub> del paese<sub>[+I]</sub> che è stato colpito<sub>[+I]</sub> dal terremoto. LA  
 b. Luca ha visitato i commercianti<sub>[+A]</sub> del paese<sub>[+I]</sub> che sono stati colpiti<sub>[+A]</sub> dal terremoto. HA  
*Luca has visited the traders of the village that was/were hit by the earthquake*



**LEFT: Figure 1.** Mean ratings of Experiment 1. The labels under the bars indicate the features of NP1-NP2 in the three conditions.

**BELOW, LEFT: Figure 2.** Reading times in Experiment 2

**BELOW, RIGHT: Figure 3.** Proportion of lexical choice responses of low and high attachment in Experiment 3.

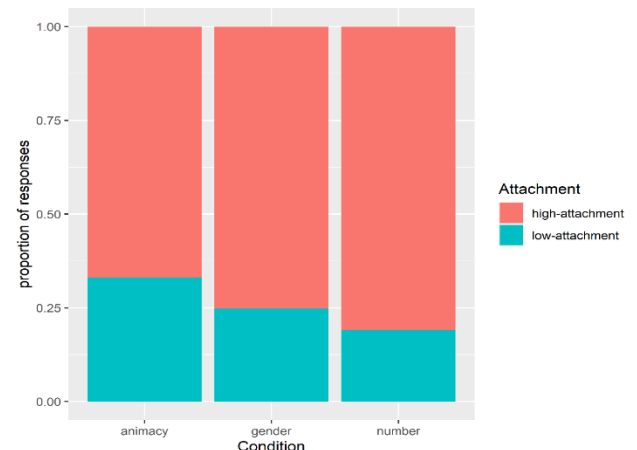
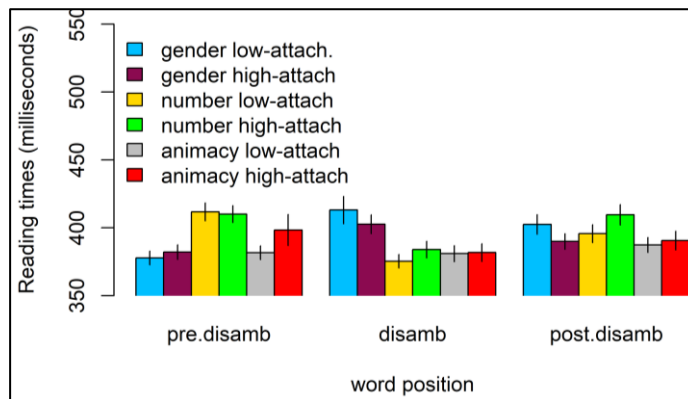


Table 1. Fitted Models

m1	clmm(rating ~ attachment +(1 participant)+(1 item),data=data_gend)
m2	clmm(rating ~ attachment*Gender +(1 participant)+(1 item), data_gend)
m3	clmm(rating ~ attachment +(1 participant)+(1 item),data=data_num)
m4	clmm(rating ~ attachment*Number +(1 participant)+(1 item), data_num)
m5	clmm(rating ~ attachment*Animacy +(1 participant)+(1 item), data_anim)
m6	lmer(reading_times ~attachment + (1 participant)+(1 item), data=data)
m7	lmer(reading_times~attachment*NP1_properties+ (1 participant)+(1 item), data=data)
m8	glmer(attachment~ (1 participant) + (1 item), data=data, family="binomial")
m9	glmer(attachment~ NP1_properties+(1 participant) + (1 item), data=data, family="binomial")

**References** De Vincenzi & Job (1993). Some observations on the universality of the Late Closure strategy. *JPR*; Frazier & Clifton (1996). *Construal*. The MIT Press; Frazier & Fodor (1978). The sausage machine: A new two-stage parsing model. *Cognition*; Grillo & Costa (2014). A novel argument for the Universality of Parsing principles. *Cognition*; Pozniak et al. (2019). Seeing events vs. entities: The processing advantage of Pseudo Relatives over Relative Clauses. *JML*.