

Animacy Effects on Production and Comprehension of English Object Relative Clauses

Introduction: Picture-based elicitation studies of object relative clause (ORC) production in English, Spanish, Mandarin, and Japanese have shown that speakers strongly favor passives (e.g., *the baby carried by the woman*) over actives (e.g., *the baby that the woman carries*) when both the agent and the head noun are animate, but not when the head noun is inanimate (e.g., *the books that the woman carries*). This pattern has usually been attributed to **similarity-based competition** between the two animate nouns^[1-3]. However, this idea has been based on studies that included only two conditions (AA and IA: animate/inanimate head noun, animate agent). In their study of Japanese and Spanish, Rodrigo et al (2018) included a third condition (AI) with animate head noun and inanimate agent (e.g., *the man that is knocked down by the swing*) and found a similar strong passive preference. Since this result could not be due to similarity-based competition, the authors proposed instead that an **animacy-based accessibility mechanism** promotes passive use when the head noun is animate. To further explore these two accounts, the present study of English ORCs introduces a novel fourth condition (II) in which both the head noun and the agent are inanimate (e.g., *the barrel that the helicopter lifts*) (Table 1). This unique manipulation allows us to disentangle animacy congruence from head noun animacy. We use a picture-based elicitation task together with a sentence-picture matching task to examine whether these mechanisms operate similarly in production and comprehension. *H1* (Production): rate of passive use should be high in AA condition (two animate nouns), the lowest in IA condition, and intermediate for AI and II (top of Figure 3). *H2* (Comprehension): lower accuracy and slower RTs will be shown for active ORCs in the same conditions where passives are used more often. *H3*: Individuals with higher WMC will produce more active ORCs and show faster RTs for active ORCs.

Method: *Participants:* 30 adult L1 American English speakers will be recruited to complete three tasks in the same session. Data collection is ongoing, with seven participants reported here. *Experiment 1 (Picture-Based Elicitation):* 20 oral responses (plus 50 fillers) were elicited per participant across four animacy conditions using pictures and question prompts (e.g. “What is yellow?”). Accuracy and structure choice (passive vs. active) were measured. *Experiment 2 (Sentence-Picture Matching):* 24 experimental sentences (plus 36 fillers) were presented aurally, each together with a picture, across eight conditions (4 animacy x 2 structures). Participants judged sentence-picture matches, with comprehension accuracy and RT measured. Finally, participants completed a Backward Digit Span Task to measure working memory capacity.

Preliminary Results: *Production Result:* A significant main effect of **ANIMACY** was observed ($p < 0.01^{**}$), indicating that ORC structure choice varied significantly across animacy conditions, with fewer passive forms in IA compared to AA (estimate = -0.21, $p = 0.02^{*}$) and AI (estimate = -0.25, $p < 0.01^{**}$) (Figure 1). *Comprehension Accuracy:* Accuracy was at the ceiling (100%) across all conditions except for slightly lower accuracy in the AI-active condition (95.23%). *Reaction Time:* No significant main effects of **ANIMACY** or **STRUCTURE** were found, suggesting no substantial differences in RT across conditions (Figure 2).

Discussion: Consistent with *H1*, our preliminary findings reveal that animacy plays a key role in ORC structure choice in production (Figure 3). In AA, where both animacy mechanisms are activated (animate nouns claim the subject role, and delaying the agent reduces competition), a strong passive bias is shown. In AI, similarity-based competition is reduced but the animate head noun still promotes a strong passive bias. In II, two inanimate nouns may induce competition, favoring passives to an intermediate degree, while in IA, where neither mechanism is activated, the least passive preference is shown (illustrated in Figure 3). In comprehension, no significant effects of animacy or structure were found for either accuracy or RT. While these preliminary findings require a cautious interpretation due to the small dataset, they suggest that both *the animacy-based accessibility mechanism* and *the similarity-based competition mechanism* may jointly govern ORC production, while playing a more limited role in ORC comprehension. A fuller dataset including analyses of working memory capacity will be presented at the conference.

Animacy Conditions		Head Noun Animacy	
		Animate (A)	Inanimate (I)
Agent Noun Animacy	Animate (A)	AA ACTIVE: <i>the baby that the woman lifts</i> PASSIVE: <i>the baby that's lifted by the woman</i>	IA ACTIVE: <i>the box that the woman lifts</i> PASSIVE: <i>the box that's lifted by the woman</i>
	Inanimate (I)	AI ACTIVE: <i>the tiger that the helicopter lifts</i> PASSIVE: <i>the tiger that's lifted by the helicopter</i>	II ACTIVE: <i>the barrel that the helicopter lifts</i> PASSIVE: <i>the barrel that's lifted by the helicopter</i>

Table 1. Animacy Conditions for Target Productions (Expt 1) and Stimulus Sentences (Expt 2)

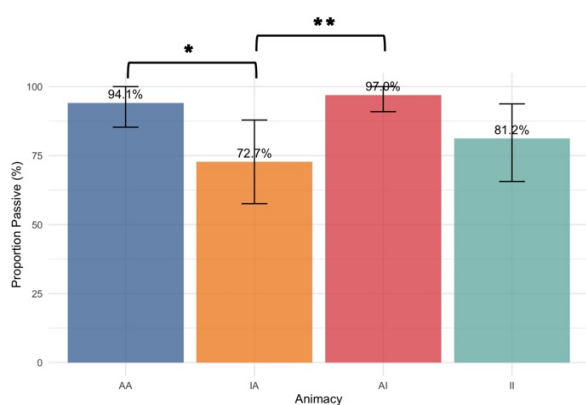


Figure 1. Passive ORC Proportion by Animacy

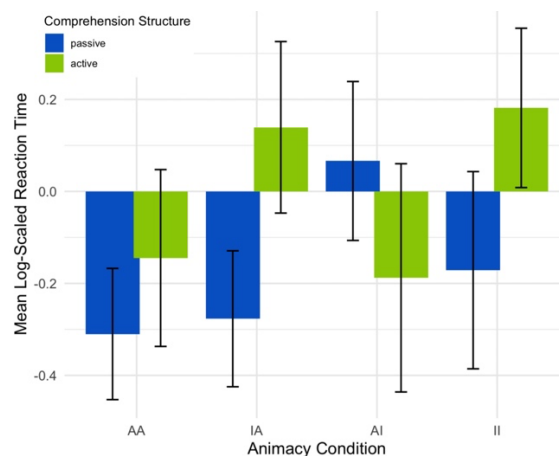


Figure 2. Reaction Time by Animacy

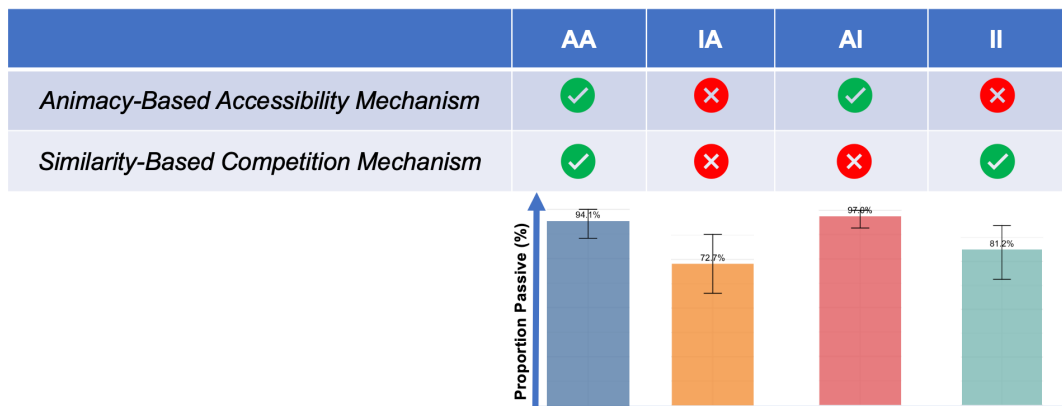


Figure 3. Illustration of ORC Production Result and Two Mechanisms

Selected References:

- Gennari, S. P., Mirković, J., & MacDonald, M. C. (2012). Animacy and competition in relative clause production: A cross-linguistic investigation. *Cognitive psychology*, 65(2), 141-176.
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- Humphreys, G. F., Mirković, J., & Gennari, S. P. (2016). Similarity-based competition in relative clause production and comprehension. *Journal of Memory and Language*, 89, 200-221.
- Rodrigo, L., Igoa, J. M., & Sakai, H. (2018). The interplay of relational and non-relational processes in sentence production: The case of relative clause planning in Japanese and Spanish. *Frontiers in psychology*, 9, 325103.