Contextual effects on the processing of object control in temporal adjuncts

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Adjunct control is the referential relation between the implicit (PRO) subject of a non-finite adjunct clause and its understood antecedent, as in (1). In recent years it has been shown[1,2] that temporal adjunct control is not limited to coreference between PRO and the matrix subject, as was previously assumed.[3] For some speakers, even control by the object as in (2) is sometimes available.[1,4,5] Although object control is in principle possible, subject control is still often strongly preferred.[1,2,5] Janke and Bailey[5] found that establishing the referent of the object as a strong topic facilitates object-control interpretations. However, this study used only an offline forced-choice task, and it is unclear how difficult it was for participants to process object-control interpretations. In addition, Landau[1] argues that non-subject control should be more acceptable for animate than inanimate controllers, and Janke and Bailey had only animate controllers.

(1) The window$_i$ broke [after PRO$_i$ being hit with a rock].

(2) Hermione is looking after the birds. Hermione takes out the food. Ron tapped Hermione$_i$ [while PRO$_i$ feeding the owl].[5]

The current study addresses two main research questions: (i) how does implicit causality[6] affect online processing and offline interpretation adjunct control, and (ii) what effect does the animacy of the potential controller have? In a $3\times2\times2$ design (Table 1), we manipulated the form of the subject of the adjunct clause (PRO or a pronoun matching the matrix subject (pron$_{subj}$) or object (pron$_{obj}$)) in gender), whether context and IC biased toward coreference with the subject or object, and the animacy of the biased referent. For each item, adult participants read the context, and then were presented with the critical item in self-paced reading format. They then indicated who or what performed the action in the adjunct clause using a five-point scale ranging from “definitely [the referent of the matrix subject]” to “definitely [the referent of the matrix object]”. Results were analyzed using linear mixed-effects models.

Preliminary results and discussion (n=31): In contrast with previous findings[1,7], we found no effect of animacy on the online or offline processing of PRO ($p>.1$). RTs at the critical verb and two spillover regions (Fig. 1) showed an interaction between form, bias, and region ($p<.001$): RTs were slower when the bias conflicted with the pronoun by the first spillover region, but for PRO bias did not have an effect until the second spillover region, when object bias resulted in slowdowns. This is true even though previous research[8] has demonstrated rapid resolution of adjunct control dependencies. This suggests that IC may be enough to weaken the bias toward subject control in online measures. In offline judgments (Fig. 2), IC bias affected referential preferences for all three form types ($p<.001$). This may be evidence of good-enough processing[9], with participants sometimes allowing overt pronouns to refer to non-gender-matching characters when such reference was favored by IC. There was also an interaction between form and bias ($p<.001$), and importantly, the interpretation of PRO items did not match that of pron$_{subj}$ items: when IC bias favored subject control, reference was resolved similarly for PRO and pron$_{subj}$, with more coreference with the matrix subject than for pron$_{obj}$. But with object bias, PRO was more likely to corefer with the object than pron$_{subj}$ was, but not as likely as for pron$_{obj}$. This suggests that object-control interpretations of PRO were due to more than just good-enough processing.

These findings confirm theories[1,2,5] that argue that object control is grammatical for temporal adjuncts, given sufficient context, but suggest that the effect of animacy may be weaker than previously assumed. This also has implications for studies of child language processing, in which frequent object-control interpretations of temporal adjuncts have been seen as “non-adult-like”.[10]

Table 1: Sample item sets. Critical words in bold.

Animate item: Context		
Sergio is a big fan of Alyssa and has watched her soccer games since he was a kid. Although they've never met, Sergio recently got better tickets so he could get her attention for the first time.		
Form	**Bias**	**Animate item: Critical sentence**
PRO	Subj bias	Sergio got Alyssa's attention after **sitting** in a front-row seat.
	Obj bias	Alyssa noticed Sergio after **sitting** in a front-row seat.
$Pron_{subj}$	Subj bias	Sergio got Alyssa's attention after **he sat** in a front-row seat.
	Obj bias	Alyssa noticed Sergio after **she sat** in a front-row seat.
$Pron_{obj}$	Subj bias	Sergio got Alyssa's attention after **she sat** in a front-row seat.
	Obj bias	Alyssa noticed Sergio after **he sat** in a front-row seat.
Inanimate item: Context		
Cody's new skateboard is sick. It's got fireball stickers on the bottom and is supposed to be extra flexible.		
Form	**Bias**	**Inanimate item: Critical sentence**
PRO	Subj bias	The skateboard infuriated Cody after **bending** too much, which led to a broken ankle.
	Obj bias	Cody was furious with the skateboard after **bending** too much, which led to a broken ankle.
$Pron_{subj}$	Subj bias	The skateboard infuriated Cody after **it bent** too much, which led to a broken ankle.
	Obj bias	Cody was furious with the skateboard after **he bent** too much, which led to a broken ankle.
$Pron_{obj}$	Subj bias	The skateboard infuriated Cody after **he bent** too much, which led to a broken ankle.
	Obj bias	Cody was furious with the skateboard after **it bent** too much, which led to a broken ankle.

Figure 1: Reading time results.

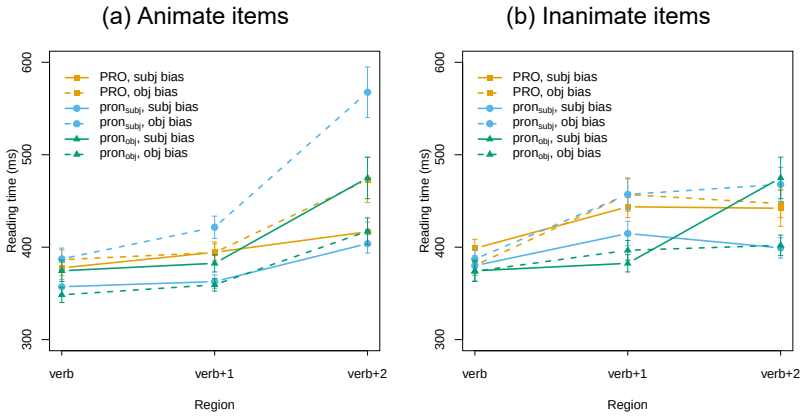
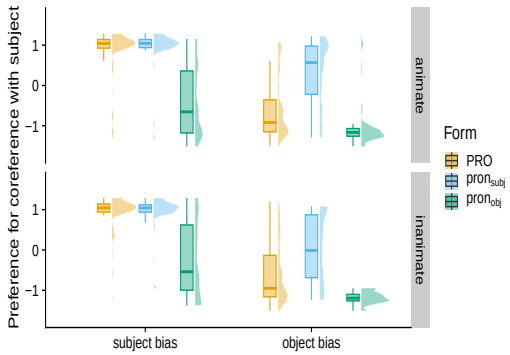


Figure 2: Referential preferences.



References

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