

Autistic traits and effects of context on processing object control in temporal adjuncts

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Adjunct control is the understood relationship between the implied subject (PRO) of a non-finite adjunct clause and its antecedent, as in (1). The previous assumption that adjunct control is limited to coreference between PRO and the matrix subject^[1] has recently been refuted.^[2,3] While subject control is often strongly preferred,^[2,3,4] control by the matrix object is at times available for some speakers,^[2,4,5] as in (2). Janke and Bailey^[4] found that establishing the referent of the object as a strong topic facilitates object-control interpretations in an offline forced-choice task. Green and Coito-Paz^[6] found corroborating evidence in an online self-paced reading task with offline judgments. The current study investigated what effects autistic traits have on online and offline processing of temporal adjunct control. Autism (ASD) is a lifelong neurodevelopmental disorder that affects social interaction and communication,^[7] as well as information processes like central coherence^[8] and cognitive flexibility.^[9] Autistic traits can be observed across the general population using standardized questionnaires.^[10] Janke and Perovic^[11] found that children with ASD favor an object control interpretation from a weakly established topic cue more often than typically developing peers. However, it is unclear whether the presence of autistic traits affects the accessibility of object-control interpretations in the general adult population.

(1) The window_i broke [after PRO_i being hit with a rock].^[6]

(2) Hermione is looking after the birds. Hermione takes out the food. Ron tapped Hermione, [while PRO_i feeding the owl].^[4]

Methods: Task 1 (partial replication of [6]): in a 3x2 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) and implicit causality bias (IC)^[12] favoring coreference with the subject or object. Adult native English speaking participants read the context before being presented the critical item in a self-paced reading format. Next, they used a five-point scale to indicate who performed the verb in the adjunct clause (ranging from “definitely [the referent of the matrix subject]” to “definitely [the referent of the matrix object]”). Task 2: participants completed the Autism Quotient (AQ)^[10] to measure autistic traits. The effect of autistic traits on judgments and RTs in task 1 were analyzed using linear mixed-effects models.

Results and discussion (n=98): Initial results (before accounting for autistic traits) corroborate the findings of [6] in that implicit causality affected RTs and offline judgments for all three forms (Figure 1). RTs showed no interaction with AQ scores. Subject control interpretations in offline judgments, however, revealed two-way interactions between AQ score and both form and IC bias (ps<.01, Fig. 2). In PRO items, higher AQ scores correlate with selecting a subject control interpretation less often; when IC is biased towards the subject, higher AQ scores correlate with selecting a subject control interpretation more often. For pronouns, it appears that higher AQ scores correlate with a higher likelihood of selecting an interpretation matching IC bias regardless of pronoun gender. We will explore variables for autism questionnaire subscales regarding specific traits in the presentation. These findings suggest that autistic traits affect the offline resolution of both PRO and pronouns in temporal adjuncts. This may be due to effects on central coherence,^[8] cognitive flexibility,^[9] or other factors, which we will explore in the presentation. These factors, however, may have a more limited effect on online processing of PRO, at least as captured by self-paced reading. Effects of autistic traits on offline interpretation of PRO and pronouns highlights the need for language processing models to account for processing variation across neurotypes.

Table 1. Sample Item Set. Critical words in bold.

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	Item: Critical sentence
PRO	Subj bias Obj bias	Sergio got Alyssa's attention after sitting in a front-row seat. Alyssa noticed Sergio after sitting in a front-row seat.
pron _{subj}	Subj bias Obj bias	Sergio got Alyssa's attention after he sat in a front-row seat. Alyssa noticed Sergio after she sat in a front-row seat.
pron _{obj}	Subj bias Obj bias	Sergio got Alyssa's attention after she sat in a front-row seat. Alyssa noticed Sergio after he sat in a front-row seat.

Figure 1: Self-paced reading times

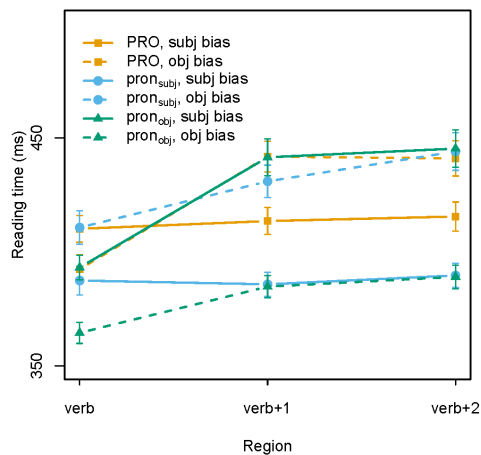
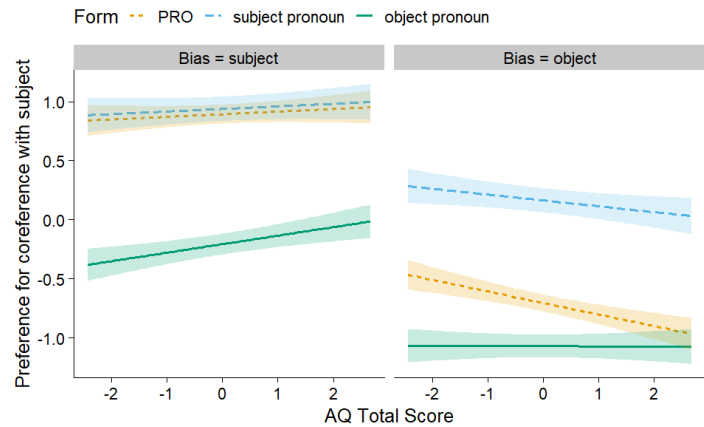


Figure 2: Interaction between AQ score, form, and IC bias



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