

Cues to Pronoun Resolution

Joshua K. Hartshorne, Jesse Snedeker, Harvard University

Some pronoun-resolution cues apply widely: in many contexts, pronouns refer to the first-mentioned entity in the previous sentence (*first-mention bias*):

(1) Mary₁ went to the store with Sally₂. She₁ bought ice cream.

Others are narrower in scope. In sentences like (2), pronoun resolution systematically depends on the verb (*implicit-causality bias*). Experiencer-object verbs (*frighten*) give rise to subject resolutions (*Mary*) whereas experiencer-subject verbs (*fear*) give rise to object resolutions (*Sally*). Changing the location of the connective *because* (3) reverses this effect: experiencer-object verbs now elicit *object* resolutions and experiencer-subject verbs, *subject* resolutions.

(2) *Mary VERBs Sally because she...*

(3) *Because Mary VERBs Sally, she...*

The *first-mention bias* might be learned prior to *implicit causality* because *first-mention* is more widely-applicable and thus occurs more often. The reverse should be true if pronoun resolution is an emergent property of discourse interpretation or if cue reliability is more critical than cue frequency.

Adults and 5yos listened to like (2) as they viewed accompanying illustrations and their eye movements were tracked. These sentences were completed with neutral continuations (*is such a silly girl*), after which participants were asked to *point at her*. Like adults, children were pointed to the subject (*Mary*) more in sentences with experiencer-subject relative to experiencer-object verbs ($ps < .05$). This effect reversed in sentence frame 3 ($ps < .05$). Eye-tracking measures revealed compatible results.

Thus, at an age at which evidence for the first-mention bias is inconclusive (Arnold et al., 2007; Song & Fisher, 2007), children showed clear sensitivity to *implicit causality*.