Agent Preference in Children: The Role of Animacy and Event Coherence

Ceren Barış[α*], Ercenur Ünal[β]

[α]*Özyeğin University, Istanbul, Turkey;* [β]*Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands*

[α]Corresponding Author E-mail: ceren.baris@ozu.edu.tr

ABSTRACT

According to linguistic theory, thematic roles in language are hierarchically organized in terms of their salience.[1,2] Within this view, the causer of the action (*Agent*) is more salient than the entities being affected (Patient); and this is rooted in their counterparts as event participants in cognition. This parallel is supported by research showing that adults can rapidly extract event participants from briefly presented event visuals.[3] Further work has shown that the ease with which different event participants are extracted varies.[4,5] However, less is known about how children extract event participants and whether they are sensitive to the asymmetries between them. An open question is how conceptual and perceptual factors characterize such asymmetries. Here, we investigate whether children show a higher salience of Agents in coherent causative events and whether this asymmetry is modulated by the animacy of the Patient.

We tested 33 Turkish-speaking preschoolers (M_{age} = 4.67 years). Stimuli were pictures of two-participant events. The Agent was always animate; the Patient was animate only in half of the stimuli. We used an eye-tracked change detection paradigm in which two versions of a picture switched back and forth, with a gray mask in between. The only difference between the versions was the color of one event participant. We also manipulated the presence of a coherent event by including 'non-event' versions in which the event participants were back-to-back. We measured change detection accuracy and recorded children's eye movements.

We examined whether accuracy and target fixations varied based on the changing role and animacy of the Patient. A *glmer* model revealed a significant interaction between changing role (Agent, Patient) and animacy of the Patient (animate, inanimate) on the binary dependent variable of accuracy (0=inaccurate; 1=accurate) for face-to-face events (β = -2.172, *SE* = 0.831, *z* = -2.615, *p* = .009). Participants were more accurate when detecting changes to Agents than Patients in events with an inanimate Patient. However, they were equally accurate in detecting changes to Agents and Patients in events with an animate Patient. A separate *glmer* model showed that participants were equally accurate at detecting changes to Agents and Patients in back-to-back (non-)events regardless of animacy of the Patient.

For eye movements, we computed the proportion of fixations to the changing component (Agent or Patient) out of all fixations to the stimuli. From this, we aggregated the proportion of target fixations in 1000 ms time windows for the first 2000 ms of each trial. A *lmer* model revealed a significant main effect of changing role on the proportion of target fixations for face-to-face events (β = 0.117, *SE* = 0.053, *t* = 2.181, *p* = .03). For events with an animate or an inanimate Patient, participants fixated more on the target when detecting changes to Patients compared to when detecting changes to Agents. A separate *lmer* model showed that participants fixated on the target equally when detecting changes to Agents and Patients in back-to-back (non-)events, both with an animate or an inanimate Patient.

In sum, when there was a coherent event, children were more accurate in detecting changes in Agents than in inanimate Patients. They also had more target fixations and hence took longer to accurately detect changes in Patients compared to changes in Agents. This suggests that children needed to glean more information from Patients, more so from inanimate Patients to accurately detect the changes to them, presumably because they were less salient. The asymmetries between Agents and Patients disappeared when there was no coherent event. These results strongly suggest that the higher relative salience of Agents is the result of an interplay between event roles and animacy but not low-level visual features. Our results support an influential proposal on language development that underlines the importance of learning the connections between verbs and event structure.[6] Indeed, studies show that 2-year-olds can resolve ambiguous pronouns by favoring subjects over objects as referents.[7] This linguistic subject preference may reflect the cognitive bias toward Agents demonstrated in our study.

Keywords: Event cognition; Thematic Hierarchy; Agent preference; eye tracking.

Figure 1. Average accuracy across changing role and animacy of the Patient in face-to-face events and back-to-back (non-)events.

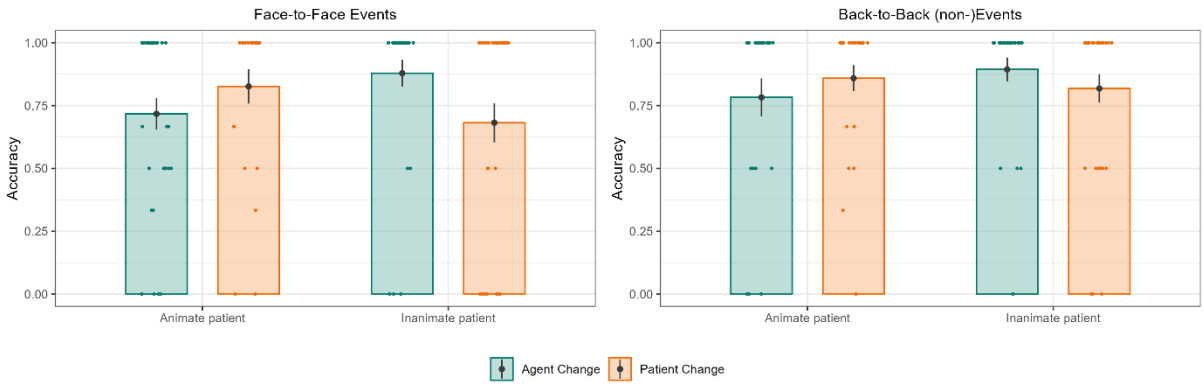
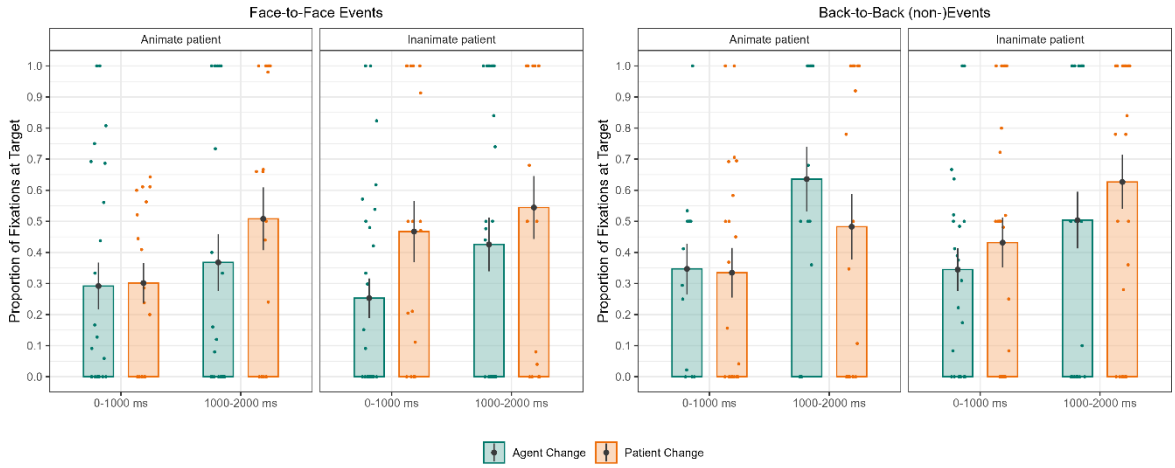


Figure 2. Average proportion of fixations at target across changing role in each time window across animacy of the Patient for face-to-face events and back-to-back (non-)events.



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