

Attention to distractors during social and nonsocial events: Changes across age and predicting  
language outcomes

Kaitlyn Testa, James Torrence Todd, Bret Eschman, Elizabeth V. Edgar,  
and Lorraine E. Bahrick

The development of sustained attention (maintaining attention to objects and events when a distractor is present) is critical for perceptual and cognitive processing (Richards, 2004). Better sustained attention is accompanied by reduced attention to distractors (Richards & Turner, 2001; Ruff & Capozzoli, 2003) and better word learning (Dixon & Sally, 2007). However, few studies have assessed longitudinal developmental trajectories of attention to distractors during audiovisual events, nor looked at individual differences in distractibility as predictors of later outcomes (but see Dixon & Sally, 2007, for an example). These questions can now be addressed using a newly established individual difference measure, the Multisensory Assessment Protocol (MAAP; Bahrick, Todd, & Soska, 2018). Trials during the MAAP consist of two laterally-presented audiovisual social or nonsocial events with a centrally-presented irrelevant distractor event. We assessed changes in attention to the distractor event from 3-36 months and relations between distractor attention and language outcomes.

Children ( $N=104$ ) participating in an ongoing longitudinal study received the MAAP at 3-, 6-, 12-, 18-, 24-, and 36-months. Each trial begins with a silent 3s central visual event (moving animated shapes) followed by two lateral events (12s) of women speaking (social) or objects striking a surface (nonsocial; Figure 1). The visual movements of one lateral event are synchronous with its natural soundtrack while those of the other event are asynchronous. For half the trials (distractor trials), the distractor event remains on during the lateral events, and these trials are the focus of this poster. Attention to the distractor was calculated as the proportion of

total looking time to the distractor event divided by the total looking time to the distractor plus both lateral events. For language outcomes, we calculated vocabulary size on the MB-CDI at 12- and 18-months and language scores on the Mullen at 18-months.

Attention to the distractor decreased with age (Figure 2). For social events, it decreased from 65% ( $SD=18\%$ ) at 3-months to 47% ( $SD=23\%$ ) at 6-months,  $p<.001$ , with no change after 6-months. For nonsocial events, there was no change between 3-6 months but a decrease from 72% ( $SD=16\%$ ) at 6-months to 39% ( $SD=17\%$ ) at 18-months,  $p<.001$ , with no change after 18-months. At 3- and 6-months, children showed greater distractor attention on nonsocial than social trials,  $ps<.001$  (Figure 2). Pearson correlations indicated that at 6-months, less distractor attention on nonsocial trials predicted higher 12-month expressive vocabulary size on the MB-CDI,  $p = .05$ . At 12-months, less distractor attention on social trials predicted higher 18-month receptive language scores on the Mullen,  $p = .02$ .

Consistent with prior research, infant attention to a distractor event decreased across development, with significant decreases from 3-6 months (social events), and from 6-18 months (nonsocial events). Further, better sustained attention (less distractor looking) predicted better language outcomes later in development. Infants who are more distractible may be less attentive to language input. Characterizing developmental trajectories of attention to distractors may be useful for identifying children at risk for attention and language impairments.

## References

- Bahrnick, L. E., Todd, J. T., & Soska, K. C. (2018). The Multisensory Attention Assessment Protocol (MAAP): Characterizing individual differences in multisensory attention skills in infants and children and relations with language and cognition. *Developmental Psychology*, 54, 2207–2225. doi:10.1037/dev0000594
- Dixon, W., & Salley, B. (2007). “Shhh! We’re tryin’ to concentrate”: Attention and environmental distractors in novel word learning. *The Journal of Genetic Psychology*, 167(4), 393-414.
- Richards, J. (2004). The development of sustained attention in infants. In M. I. Posner (Ed.), *Cognitive Neuroscience of Attention* (pp. 342-356). Guilford Press.
- Richards, J. & Turner, E. (2001). Extended visual fixation and distractibility in children from six to twenty-four months of age. *Child Development*, 72(4), 963-972.
- Ruff, H. A. & Capozzoli, M. C (2003). Development of Attention and Distractibility in the First 4 Years of Life. *Developmental Psychology*, 39(5), 877-890. doi:10.1037/0012-1649.39.5.877

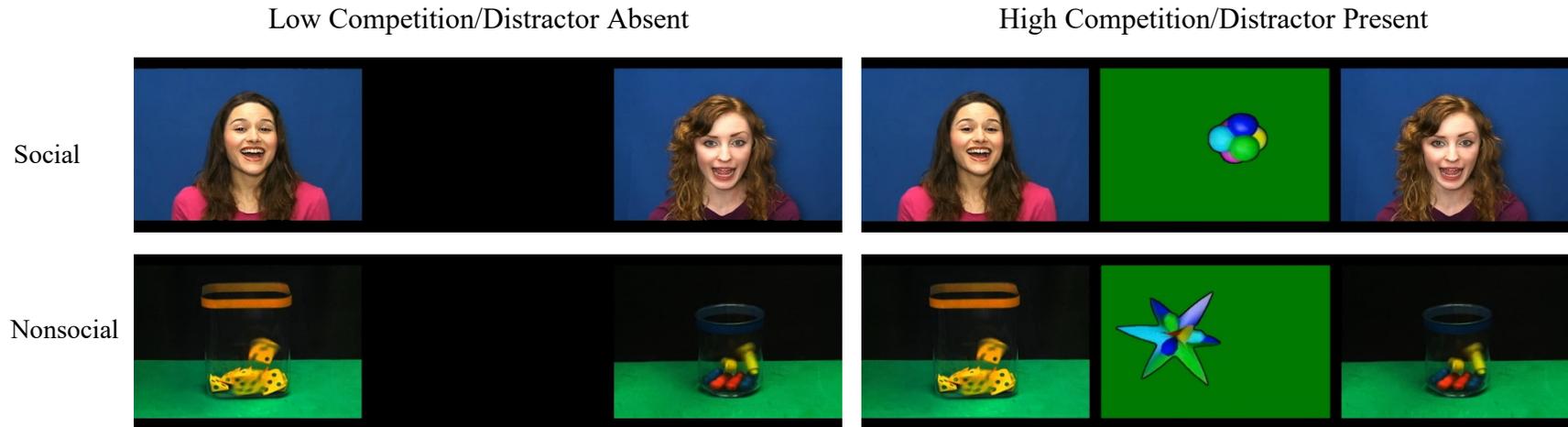


Figure 1. Static images of the dynamic audiovisual events from the MAAP.

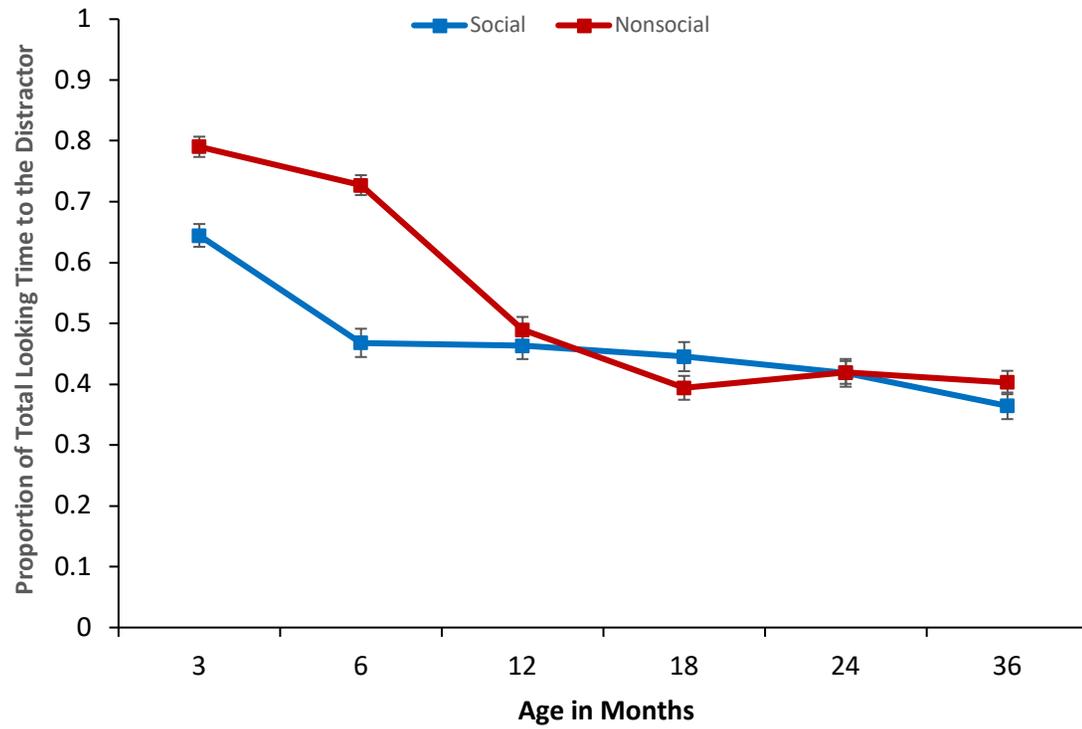


Figure 2. Attention to the distractor event as a function of event type (social, nonsocial) and age in months.

