Eyes as Windows of Cognition: Developing eye-tracking techniques to understand infants' developing control of attention

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Theme 3: Intensive data collection methods
Theme 4: Content-specific measurement

The environment presents children with a wealth of input that can inform learning; however, not all input is equally informative because some stimuli are preferentially attended to. This symposium explores how young learners selectively allocate attention to visual input and how this selectivity influences learning. To address these questions, each paper utilizes eye-tracking methodology in a way that moves beyond the standard "region of interest" analyses prevalent in the literature.

Paper 1 uses eye-tracking to separate several components of attention (including fixation and maintenance) to understand how different actors and actions attract and maintain attention. Paper 2 outlines a novel method for assessing selective sustained attention and a novel method of analyzing smooth pursuit eye-movements. Paper 3 uses eye-tracking to examine the effect of selective attention on statistical learning. Finally, Paper 4 presents a novel head-camera methodology to analyze – from first-person perspective – how infants allocate visual attention in naturalistic environments and data analytic techniques required to interpret these data. Each paper uses eye-tracking methodology to provide a much richer dataset than the typical proportion of looking time analysis. Each paper also demonstrates the methodological advances necessary to deal with these richer datasets, developing techniques such as new data-reduction algorithms or novel conceptual approaches to dividing the data into manageable categories. Taken together, these papers demonstrate that more sophisticated use of eye-tracking technology, and concomitant advances in methodological sophistication, play an important role in understanding how children select items to attend to and learn from in complex visual environments.