Assessing the Development of Infant Attention to Dynamic Events: A Simple Procedure

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Background

Although it is widely agreed that infants prefer social over nonsocial events, there has been little systematic assessment of the basis for this preference or when it emerges in infancy. Our recent findings suggest that heightened attention to social events emerges, in part, as a result of the attentional salience of intersensory redundancy (Bahrick et al., 2009). According to the Intersensory Redundancy Hypothesis (Bahrick & Lickliter, 2002, in press), infants show heightened attention to bimodal, audiovisual events as compared with unimodal (visual, auditory) events because they provide intersensory redundancy (e.g., synchrony, rhythm, and tempo invariant across the senses). Relative to nonsocial events, social events provide a great amount of intersensory redundancy, particularly across face, speech, and gesture. Bahrick et al. (2009) demonstrated that although infant processing time to events decreases across age, infants show greater attention (longer processing time, longer looks, fewer disengagements) to bimodal (audiovisual, redundant) than unimodal (visual, nonredundant) events, and to social than nonsocial events, with differences increasing across age. Thus, preferences for dynamic, multimodal social events emerge gradually across infancy with increasing experience in the social world.

These findings have potential applications for identifying atypical developmental patterns, including infants at risk for autism. However, our previous results were based on data from infant control habituation sessions which are complex and lengthy to administer, particularly outside research lab settings. The present study explored a shorter, simpler alternative for measuring infant attention by using only the first two infant-controlled trials (baseline interest) of the habituation procedure.

Method

Data from Bahrick et al. (2009), which included a number of infant-control habituation studies conducted in our lab over the past decade, with 718 infants of 2, 3, 4-5, or 6-8 months (N = 167, 189, 205, 157, respectively) were rescored and analyzed. Infants had been habituated to one of four types of dynamic events, bimodal audiovisual or unimodal visual (silent) social events (women speaking using infant-directed speech), or bimodal audiovisual or unimodal visual nonsocial events (toy hammer tapping a rhythm; see Figure. 1). Three measures of attention were computed from the first two trials of habituation (defined by a 1.5 s look-away): mean total looking time (processing time), mean length of look, and mean number of looks away per minute (disengagement).

Figure 1: Static image of one example of the social and nonsocial events.

Social

Nonsocial

First Two Trials of Habituation

Figure 2 (a). Mean Looking Time

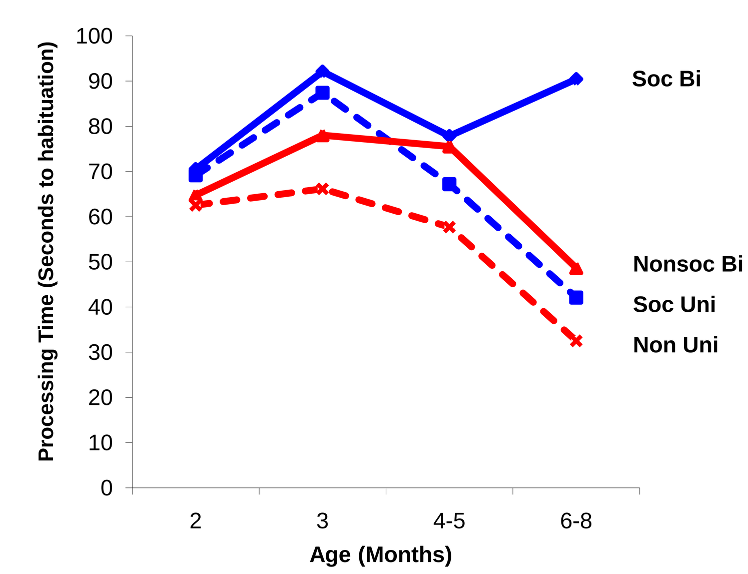


Figure 2 (b). Mean Length of Look

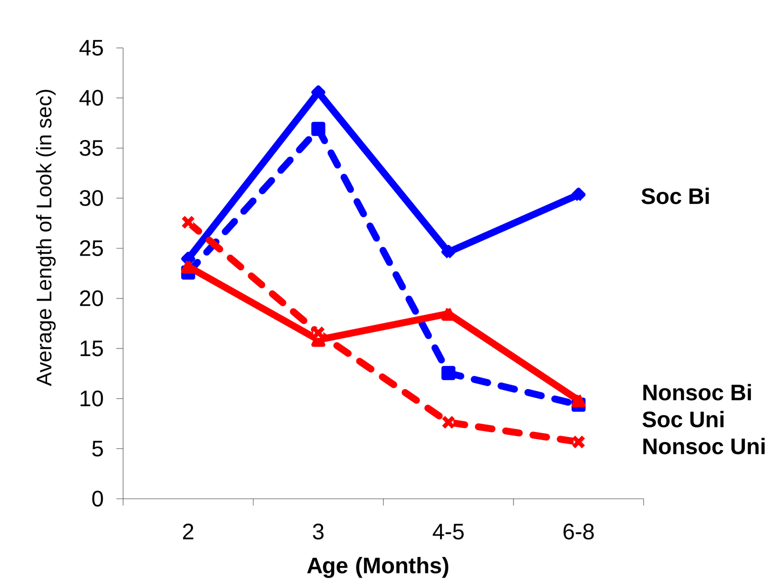
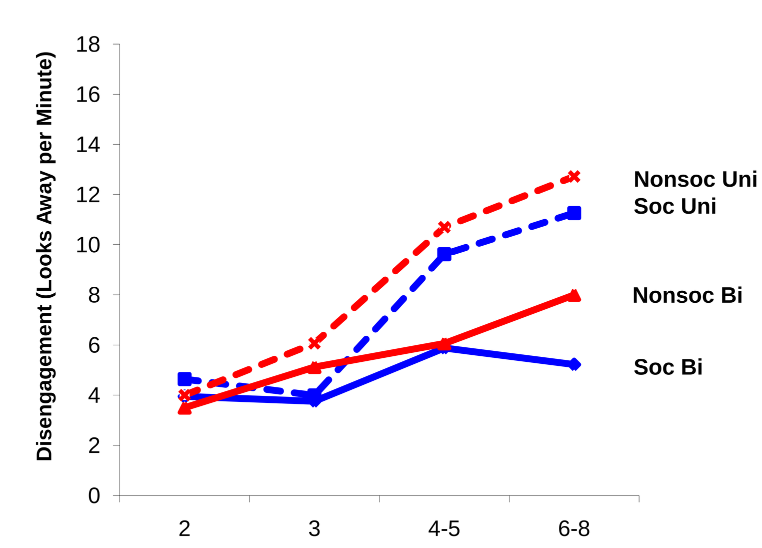


Figure 2 (c). Number of Looks Away per Minute



Overall Habituation (Bahrick et al., 2009)

Figure 3 (a). Mean Looking Time

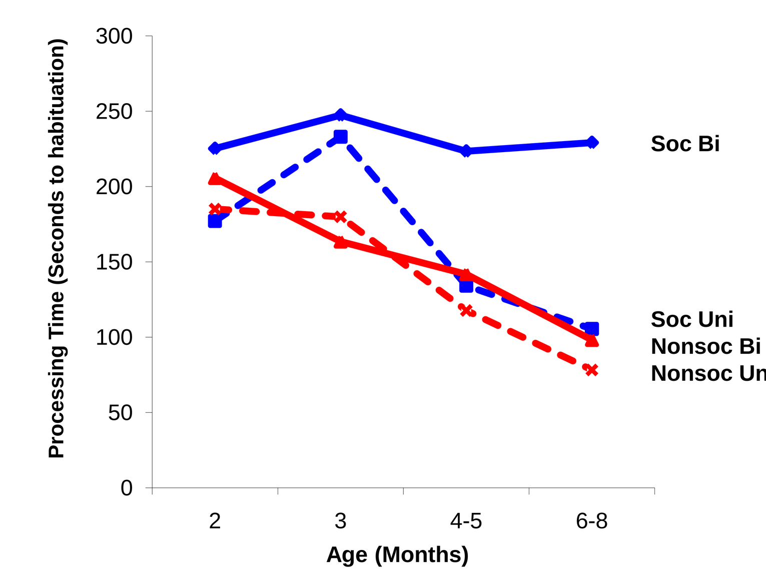


Figure 3 (b). Mean Length of Look

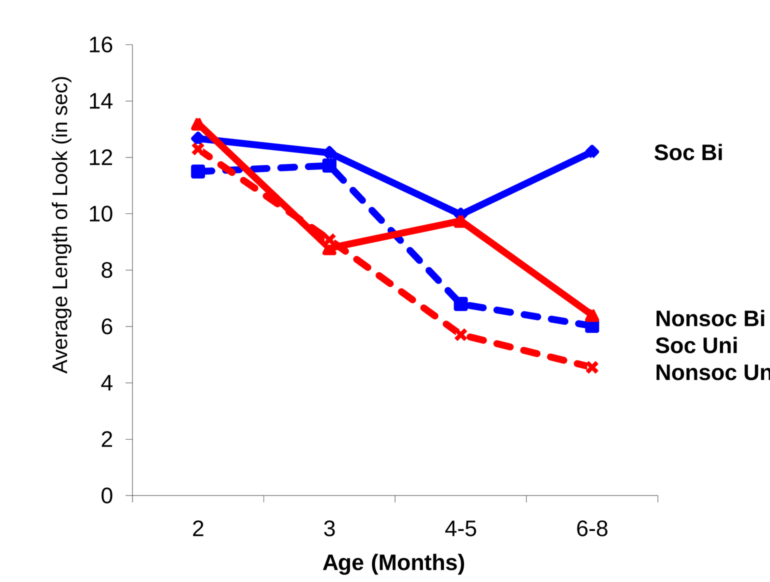
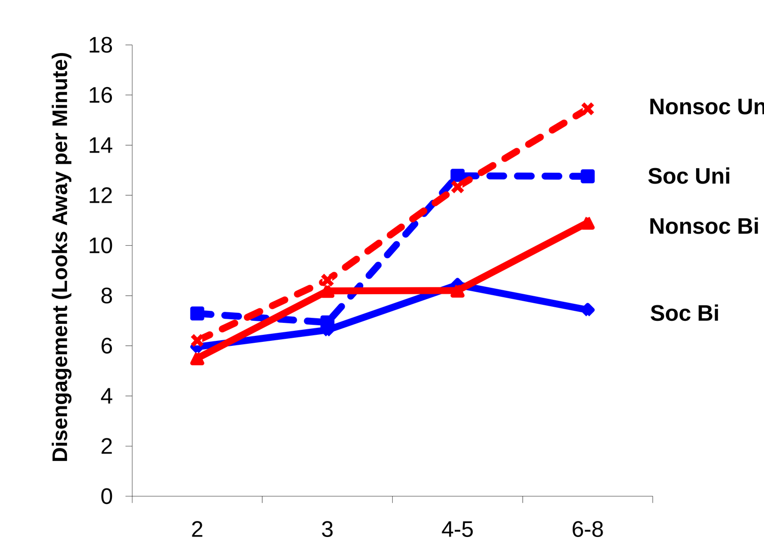


Figure 3 (c). Number of Looks Away per Minute



Results

Results from the first two habituation trials are displayed in Figure 2a, b, c, alongside results from the overall habituation phase (Figure 3a, b, c). Age (2, 3, 4-5, 6-8 months) by event type (social, nonsocial) by type of stimulation (bimodal, unimodal) ANOVAs were conducted (all factors between subjects) for each of the three indices of attention. ANOVAs revealed findings similar to those of our prior study, including decreasing looking times across age (*ps* < .001) and greater attention (longer processing time, longer looks, fewer disengagements) to bimodal than unimodal stimulation, and to social than nonsocial events (*ps* < .002). In addition, the effects of condition and event type were increasingly apparent across age (*ps* < .04), with greatest attention (processing time) to bimodal social events than all other event types (nonsocial or unimodal) emerging by 6-8 months of age (*ps* < .001).

Conclusions

Results of the present study using two infant-controlled trials replicated those of our prior study based on complete habituation data for infants of 2-8 months of age. Consistent with predictions of the Intersensory Redundancy Hypothesis, infants showed greater attention (longer processing time, longer looks, fewer disengagements) to bimodal audiovisual social events than to all other event types (unimodal visual, nonsocial), with differences emerging gradually across infancy. They also showed greater attention to bimodal events (that provide intersensory redundancy) than to unimodal visual events (that provide no redundancy). These findings have important theoretical and methodological implications. They demonstrate the feasibility of assessing three fundamental indices of infant attention in a relatively simple procedure based on two infant-controlled looking trials (an average of 68 s), making assessments in applied settings possible. Further, they indicate that attentional differences as a function of infant age, event type, and intersensory redundancy are evident in early processing, when events are most novel.

References

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