



# Infant Attention and Social Competence Predict Childhood Temperament

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## BACKGROUND

Individual differences in temperament across infancy and childhood are influenced by early social interactions and foundational skills, such as attention and perception (e.g., Kochanska et al., 2000; Ruff & Rothbart, 1996). For example, greater sustained attention (an index of attentional control) predicts lower negative affect (e.g., Kochanska et al., 1998) and greater effortful control (e.g., Eisenberg et al., 2011). Further, greater social competence predicts greater effortful control and lower negative affect (e.g., Rothbart & Putnam, 2002; Eisenberg et al., 2011).

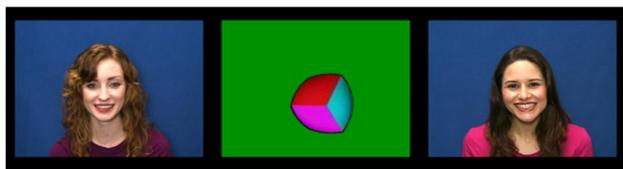
Although much of the research on social competence and temperament has focused on individual differences, until now, there have been few individual difference measures appropriate for assessing attention, particularly to dynamic faces and voices. Thus, developmental relations among attention, temperament, and social competence remain unclear. To address this gap, we used a new fine-grained, individual difference measure of multisensory attention skills (sustained attention, shifting/disengaging, and intersensory matching) appropriate for preverbal infants, the Multisensory Attention Assessment Protocol (MAAP; Bahrack et al., 2018). The present study explored developmental relations among infant sustained attention, social competence, and childhood temperament.

## METHODS

Children ( $N = 90$ ) participated in a longitudinal study from 3 to 72 months of age. *Predictors:* At 12 months, sustained attention to social events was assessed by the MAAP (see Figure 1) and was calculated as the proportion of available looking time spent fixating to the video displays of the two women speaking in the presence of a distractor event. At 18 months, social competence was assessed via the Infant Toddler Social Emotional Assessment (Carter & Briggs-Gowan, 2006). *Temperament Outcomes:* At 48 months, surgency, negative affectivity, and effortful control were assessed via the Children's Behavior Questionnaire (Rothbart et al., 2001).

Figure 1

Static Images of Social Events From the MAAP



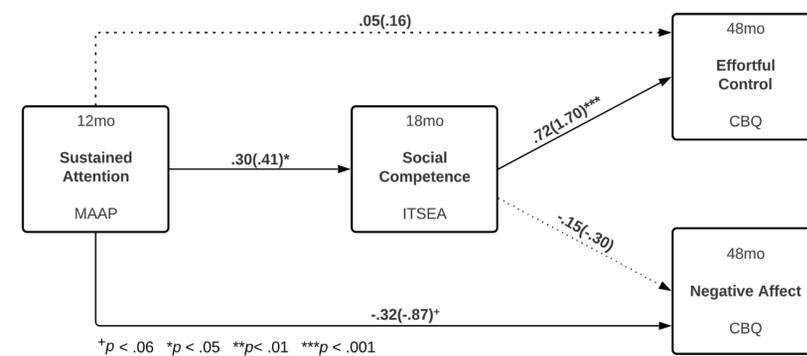
*Note.* Trials on the MAAP consisted of a 3-s central stimulus (geometric animation), followed by two side-by-side lateral events of women speaking. The movements of one of the women were synchronous with the natural soundtrack, while the movements of the other were asynchronous. For half of the trials, the central stimulus remained on, providing an additional source of distracting information (Bahrack et al., 2018).

## RESULTS

Correlational analyses revealed that greater sustained attention in the presence of a distractor at 12 months predicted greater social competence at 18 months, and lower negative affect at 48 months,  $ps < .05$ . Greater social competence also predicted greater effortful control,  $p < .001$ . No significant correlations between predictors and surgency were evident. Given these patterns of correlations, we used structural equation modeling to assess developmental pathways from sustained attention to social competence, and in turn, negative affect and effortful control (see Figure 2). The model showed excellent fit ( $\chi^2 = .88, p = .35$ ). Results revealed that the pathway between sustained attention at 12 months and effortful control at 48 months was not significant. However, the pathway between sustained attention at 12 months significantly predicted social competence at 18 months,  $p < .05$ , which in turn significantly predicted effortful control at 48 months,  $p < .001$ . Further, the indirect effect was significant,  $p < .05$ , indicating that social competence at 18 months mediates the relation between sustained attention and effortful control. Social competence did not predict negative affect. Instead, sustained attention independently and marginally predicted negative affect,  $p = .057$ , indicating that infants with greater sustained attention at 12 months displayed lower negative affect at 48 months.

Figure 2

A Structural Equation Model Depicting Pathways From Sustained Attention at 12 Months to Social Competence at 18 Months to Temperament (Effortful Control and Negative Affect) at 48 Months



*Note.* Standardized path coefficients are presented outside parentheses and unstandardized path coefficients are presented within parentheses. Significant pathways are depicted by solid lines and non-significant pathways are depicted by dashed lines.

## CONCLUSIONS

Findings demonstrate a novel link between infant attention at 12 months and temperament outcomes at 48 months, and that this relation is mediated by social competence at 18 months. Greater sustained attention to faces and voices in the presence of a distractor predicts greater social competence and in turn greater effortful control. Further, infants with greater sustained attention to faces also showed lower negative affectivity. These findings may improve our ability to identify early markers of poor socioemotional outcomes, including low effortful control and high negative affect, and inform and guide the creation of interventions to promote optimal development and flourishing in children.

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