The perception of direct gaze in human infants

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Direct eye contact with another human face is one of the most important foundations of our social behavior. A major debate in cognitive neuroscience concerns the origins of the "social brain" in humans, and the extent to which this is acquired through experience. In the first of two experiments, we measured 4-month–old infants' brain electrical activity to assess the neural processing of faces when accompanied by direct or averted eye gaze. High-density event-related potentials (ERPs) were recorded in response to the direction of eye gaze of this face stimulus. The results show that, consistent with previous studies (de Haan, Pascalis, & Johnson, 2002), an "infant N170" component peaked around 240 msec post-stimulus. Further, the amplitude of this component over mid-line occipital channels was higher in response to direct than averted gaze. To rule out alternative explanations, in a second experiment we showed babies inverted female faces, with either direct or averted gaze. Inspection of averaged ERPs time-locked to the onset of the stimulus revealed no effect on the “infant N170” corresponding to that observed in Experiment 1. These results suggest that from at least 4 months of age there is enhanced brain processing of upright faces with direct eye gaze.