Infant Behavior & Development 35 (2012) 150–157

Contents lists available at ScienceDirect

Infant Behavior and Development

Object perception in 5-month-old infants of clinically depressed and nondepressed mothers

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ARTICLE INFO

Article history:
Received 19 July 2011
Accepted 29 July 2011

Keywords:
Object perception
Maternal depression

ABSTRACT

Five-month-old infants of clinically depressed and nondepressed mothers were familiarized to a wholly novel object and afterward tested for their discrimination of the same object presented in the familiar and in a novel perspective. Infants in both groups were adequately familiarized, but infants of clinically depressed mothers failed to discriminate between novel and familiar views of the object, whereas infants of nondepressed mothers successfully discriminated. The difference in discrimination between infants of depressed and nondepressed mothers is discussed in light of infants' differential object processing and maternal sociodemographics, mind-mindedness, depression, stress, and interaction styles that may moderate opportunities for infants to learn about their world or influence the development of their perceptuocognitive capacities.

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1. Introduction

Infants of depressed mothers have different experiences from infants of nondepressed mothers (Field, 1992), and those experiences appear to have ramifications for infants' perception, cognition, and socioemotional development. For example, de Haan, Belsky, Reid, Volein, and Johnson (2004) reported a relation between the emotional environment provided by mothers (as indexed by affective measures of their personality) and their 7-month-olds' sensitivity to facial expressions (as indexed by visual attention and event-related potentials), and Bornstein, Arterberry, Mash, and Manian (2011) reported that 5-month infants of nondepressed mothers discriminated between neutral and smiling facial expressions of a face, whereas infants of clinically depressed mothers failed to make the same discrimination. These studies matched infants' social experience with their social perception and discrimination.

Perhaps expectedly, infants of depressed mothers experience difficulty processing and discriminating faces and facial expressions (see also Hernandez-Reif, Field, Diego, Vera, & Pickens, 2006). However, research that compares children of depressed and nondepressed mothers has also uncovered links between depression status in mothers and more generally compromised perceptual and cognitive functioning in children (Sohr-Preston & Scaramella, 2006). For example, children of depressed mothers, relative to children of nondepressed mothers, manifest attentional deficiencies (Weissman, Leckman, Merikangas, Gammon, & Prusoff, 1984; Winters, Stone, Weintraub, & Neale, 1981), such as inferior scores on the orientation cluster of the NBAS (Abrams, Field, Scafidi, & Prodromidis, 1995; Field et al., 2004; Lundy et al., 1999); they process information more slowly (Field et al., 2004; Hernandez-Reif, Field, Diego, & Largie, 2002; Hernandez-Reif, Field, Diego, & Largie, 2003) and learn contingency with greater difficulty (Kaplan, Bachorowski, Smoski, & Hudenko, 2002; Stanley, Murray

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0163-6383/$ – see front matter Published by Elsevier Inc.
doi:10.1016/j.infbeh.2011.07.008

& Stein, 2004); they score lower on the MDI and PDI of the Bayley Scales (Cornish et al., 2005), even when behavior during the test, general behavioral problems, birth weight, parental IQ, measures of the family climate and home environment, and breast-feeding during infancy are taken into account (Cogill, Caplan, Alexandra, Robson, & Kumar, 1986; Sharp et al., 1995) and have more problem-solving deficits (Hay, Zahn-Waxler, Cummings & Iannotti, 1992); they score lower on tests of cognitive-developmental milestones (Murray & Cooper, 1997); and they suffer lags in school readiness (NICHD, 1999).Thus, the capacities of infants and young children of clinically depressed mothers may be broadly compromised.

Most germane to the present study, Murray (1992) reported that infants of postnatally depressed mothers had low scores on 9-month Stage IV and 18-month Stage V object concept tasks. The infant's understanding of the permanence of objects has been described by many theorists to depend on an ability to direct attention to cues in the environment in an effort to find invisible or partially visible objects. As such, individual differences in attention and perception appear to play a significant part in passing or failing object permanence tasks such as those administered by Murray (1992). Moreover, it appears that this deficit may be continuing: children ages 6–10 years of parents with childhood-onset depression display subtle deficits in selective attention (Pérez-Edgar, Fox, Cohn, & Kovacs, 2006). Indeed, residual consequences to mother–child interactions or children's cognitive and socioemotional development are acknowledged to persist even after depression has remitted or been treated successfully (e.g., Forman et al., 2007; Nylen, Moran, Franklin, & O'Hara, 2006).

In the present study, we extended this general line of work on nonsocial perception downward and compared young infants of mothers with a history of clinical depression and of nondepressed mothers on a basic component in object perception. Sensitivity to variations in object representation is a fundamental ingredient in object perception, and so of accurate object recognition, identification, and processing. Normally, infants are skilled at such a task (e.g., Arterberry & Yonas, 2000; Bornstein, Ferdinandsen, & Gross, 1981; Bornstein, Gross, & Wolf, 1978; Bremner, 1994; Mash, Arterberry, & Bornstein, 2007; Slater & Johnson, 1998; Slater, Morison, & Somers, 1988). Research indicates that as early as 2–3 months of age infants (of nondepressed mothers) can reliably discriminate a range of object perspective, including as fine as 10° disparities between different orientations (Bornstein, Krinsky, & Benasich, 1986). Although abilities to recognize objects and make fine discriminations based on their features improve as acuity and stereovision develop (e.g., Yonas, Arterberry, & Granrud, 1987), experience exerts rapid as well as lasting influences on early visual development. Taken together, the literature suggests the hypothesis that infants of nondepressed mothers will discriminate perspectival variation of an object, whereas infants of depressed mothers might be challenged in making a similar discrimination. We tested this hypothesis. Each infant in this study was familiarized to a single view of an object and, following familiarization, tested for discrimination of the same object in a novel view.

The present study attempts to advance the extant literature on object perception in infants of depressed versus nondepressed mothers with the following features. (a) Measures of maternal depression (symptom report vs. clinical diagnosis) add to variability in the field. Most studies enlist infants of mothers with self-reported depressive symptoms (typically using a scale of symptoms experienced over the previous week and administered on the maternity ward shortly after delivery) and so do not provide an affirmed clinical diagnosis. Here we first identified mothers with a history of depressive symptomatology and subsequently selected into the study only those who received a diagnosis of clinical depression as defined by extensive interview. (b) Brief maternal depression does not appear to impact infant performance so much as chronic depression (Cornish et al., 2005). As their duration and number of depressive symptoms increase, mothers report fewer child-oriented concerns and positive emotions and more parent-oriented negative emotions; mothers also display less supportive behavior (Dix, Gershoff, Meunier, & Miller, 2004). Variation in the operational definition of maternal depression reduces the comparability of findings across studies and may account for some of the variation in results concerning the effects of maternal depression on child development. Here we studied infants of mothers who had experienced clinical depression in the lifetime of their infant. (c) In most studies of infants of depressed mothers, depression and low SES, both of which independently undermine infant performance, are confounded (Sharp et al., 1995). Here we assessed infants of clinically depressed and nondepressed mothers from comparable middle-SES families. Mothers were also the same age and parity. (d) Many perinatal factors are known to affect development, and thus the links between the mother illness and child attainments could be explained by children's pre-existing vulnerability. Here, infants in depressed and nondepressed maternal groups were term, normal birth weight, and healthy. (e) Most studies of object perception use images of objects normally known to infants (thereby ceding control over the independent variable). Here we used images of wholly novel objects equally unknown to all infants. (f) Finally, existing studies have tested relatively easy discriminations between different objects. Here we asked if infants could make finer discriminations of different perspectives of the same object.

2. Methods

2.1. Participants

Thirty-six infants (M age = 155.22 days, SD = 6.28; 18 girls) participated. Infants of clinically depressed and nondepressed mothers did not differ in age or birth weight. The sample was 78% European American, 11% Asian American, 8% African American, and 3% Latin American. An additional 7 infants began the procedure, but their data were not included due to inattention or fussiness (5), experimenter error (1), or equipment failure (1). Clinically depressed and nondepressed mothers were the same age (M = 32.67 years, SD = 4.58) and the same marital status, equal numbers of clinically depressed and nondepressed mothers were working, and among those who were working clinically depressed and nondepressed mothers