Infant Behavior & Development 37 (2014) 398–405

Contents lists available at ScienceDirect

Infant Behavior and Development

Maternal depression and expressive communication in one-year-old infants

Peter S. Kaplan*, Christina M. Danko, Kevin D. Everhart, Andres Diaz, Ryan M. Asherin, JoAnn M. Vogeli, Shiva M. Fekri

Department of Psychology, University of Colorado Denver, United States

ARTICLE INFO

Article history:
Received 12 August 2013
Received in revised form 1 April 2014
Accepted 26 May 2014

Keywords:
Bayley scales
Maternal depression
Cognitive development
Expressive communication

ABSTRACT

To separate effects of maternal depression on infant cognitive versus language development, 1-year-olds were assessed using the revised Bayley Scales of Infant and Toddler Development (BSID-III). Percentile scores on the Bayley Expressive Communication (*EC*) subscale were significantly negatively correlated with maternal self-report scores on the Beck Depression Inventory (BDI-II). However, mothers' BDI-II scores did not correlate with infant percentile scores on the general cognitive (*COG*) or receptive communication (*RC*) subscales. Boys had significantly lower percentile scores than girls on the *RC* and *EC* scales, but did not differ on the *Cog* scale. Gender and maternal depression did not significantly interact on any of the scales. These findings suggest problems with expressive communication precede, and may at least partially account for, apparent deficits in general cognitive development.

1. Introduction

Maternal depression in the postpartum period, either by itself or in conjunction with other factors such as child gender, the presence of contextual risk, or the chronicity and timing of the mother's depression, has been linked to multiple effects on child cognitive and linguistic development (Coghill, Caplan, Alexandra, Robson, & Kumar, 1986; Feldman & Eidelman, 2009; Grace, Evindar, & Stewart, 2003; Hay & Kumar, 1995; Kurstjens & Wolke, 2001; Murray, Kempton, Woolgar, & Hooper, 1993; NICHD, 1999; Petterson & Albers, 2001; Sohr-Preston & Scaramella, 2006; Sutter-Dallay et al., 2011; Whiffen & Gotlib, 1989). These effects have been most often attributed to disruptions in depressed caregivers' ability to support or "scaffold" infant state and behavior, with resulting deficits in infants' extraction of information about environmental contingencies (e.g., Hay, 1997). However, beyond effects on general cognitive processes, recent research has suggested that parents scaffold pre-linguistic infants' speech perception and rudimentary language development to an extent not previously recognized (Kuhl, 2007). If so, then in cases in which such scaffolding is likely disrupted – as in postpartum depression (Bettes, 1988) – early effects on infant communicative development, separate from effects on general cognitive development, may be observable. In fact, because in some earlier assessments measures of cognitive development were heavily dependent on infant communicative skills, effects that have been attributable to delays in cognitive development may instead be partly or wholly attributable to delays in language development. The purpose of the present paper is to report such findings.

* Corresponding author at: Department of Psychology, University of Colorado Denver, P.O. Box 173364, Denver, CO 80217, United States.
E-mail address: peter.kaplan@ucdenver.edu (P.S. Kaplan).

http://dx.doi.org/10.1016/j.infbeh.2014.05.008
0163-6383/

The evidence for effects of maternal depression on infant communicative development comes both from laboratory-based studies on pre-linguistic infants and outcome studies focused on infancy, the toddler years, and beyond. Caregivers support infant communicative development in a number of ways, including through the quantity and quality of vocal stimulation they provide, along with the extent to which it is contingent on infant behavior (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Rollins, 2003). For example, a child's developing vocabulary is predicted to some extent by the amount and complexity of language stimulation the mother gives (Gleitman, Newport, & Gleitman, 1984; Hart & Risley, 1995; Huttenlocher et al., 1991). In addition, when addressing infants, parents tend to exaggerate changes in vocal pitch, hyperarticulate vowels, and produce slowed, simplified, and repetitive utterances (Fernald, 1984). Evidence indicates that this infant-directed speech (IDS) is especially effective at promoting important foundational processes for pre-linguistic infants, including phoneme discrimination (Liu, Kuhl, & Tsao, 2003), word segmentation (Thiessen, Hill, & Saffran, 2005), word learning and memory (Ma, Golinkoff, Houston, & Hirsh-Pasek, 2011; Singh, Nestor, Parikh, & Yull, 2009), and the detection of phrase boundaries (Jusczyk et al., 1992). Consistent with the hypothesis that IDS highlights key aspects of linguistic stimuli for the infant, mothers of 1-year-old infants who produce IDS with relatively greater pitch modulation also report their children have higher concurrent productive vocabulary (Porritt, Zinser, Bachorowski, & Kaplan, 2014). More broadly, recent evidence suggests that the volume of infant-directed speech in the home environment has an effect on the efficiency of child language processing, with resulting effects on the rate of language growth (Weisleder & Fernald, 2013).

However, depressed mothers exhibit differences relative to non-depressed mothers in the pitch characteristics, linguistic content, degree of contingent delivery, and degree of infant focus in their speech (Bettes, 1988; Breznitz & Sherman, 1987; Herrera, Reissland, & Shepherd, 2004; Murray et al., 1993; Porritt et al., 2014; Reissland, Shepherd, & Herrera, 2003; Zlochower & Cohn, 1996). Thus, there are clear deficits in the kinds of maternal behavior thought to promote rudimentary language development, and these may be a root cause of later delays in vocabulary development.

Consistent with the language-promoting effects of infant-directed speech, some evidence suggests a delay in the "perceptual commitment" to the parents' native language for infants of depressed mothers. Whereas infants typically exhibit the ability to discriminate non-native phonemes at 6 months, but lose this ability toward the end of the first year as they commit to their native language (Werker & Lalonde, 1988), infants of depressed mothers showed poor discrimination of non-native phonemes at 6 months, but better-than-normal discrimination of non-native phonemes at 10 months (Weikum, Oberlander, Hensch, & Werker, 2012). Direct links have been established between native speech sound discrimination and later word learning (Tsao, Liu, & Kuhl, 2004; Werker & Yeung, 2005). Interestingly, infants of mothers who had taken selective serotonin reuptake inhibitors (SSRIs) during gestation showed an opposite effect: faster commitment to the native language, possibly attributable to neurochemical acceleration of brain development (Weikum et al., 2012).

Taken together, this research suggests that delays in language development may start very early in the lives of infants of depressed mothers, and highlights some potential behavioral mechanisms. Although not specifically tied to the ways in which mothers talk to their infants, delays in language development have been observed in several large-scale outcome studies with children of depressed mothers. For example, the NICHD Early Child Care Research Network (1999) followed a large sample of mothers and infants at 6, 15, 24, and 36 months, and assessed general cognitive and language development at 36 months. After demographic risk factors had been taken into account, relative to infants whose mothers had no epochs with elevated self-report scores of depression, children of mothers with chronically or occasionally elevated depression scores not only performed more poorly on an assessment of "school readiness" – which included items on color recognition, letter identification, number/counting skills, comparisons, and shape recognition – but also on a measure of verbal comprehension and expressive language. Expressive language scores were lower for children of mothers with chronically elevated than occasionally elevated scores. Possibly related to maternal scaffolding of infant language development as outlined above, these differences were mediated by ratings of maternal sensitivity coded from separate play sessions averaged across the 4 multiple assessment ages.

Similar outcomes were reported by Stein, Malmberg, Sylva, Barnes, and Leach (2008), who performed a longitudinal study on the effects of maternal depression on child language development at 36 months, with an explicit focus on the roles of parenting and socio-demographic risk factors. Structural equation modeling suggested that maternal depressive symptomology had an indirect effect on language development, and that the pathway was through the negative effects of depression on the quality of the mother's early observed caregiving. The negative effect of elevated maternal depressive symptoms on caregiving was stronger for socioeconomically more disadvantaged families, but there was no moderating effect of SES on the path between caregiving and language.

Several smaller studies have yielded similar conclusions. For instance, Milgrom, Westley, and Gemmell (2004) reported that 42-month-old children of mothers who had been treated as inpatients for major depression in the perinatal period had significantly lower full-scale WPPSI-R scores (but not Verbal IQ) and significantly lower cognitive and language scores on the Early Screening Profile relative to controls. The outcomes on cognitive-linguistic development were mediated by observation-based assessments of maternal responsiveness obtained at 6 months postpartum, after the mothers' acute depressive episodes had remitted.

These studies are consistent with the hypothesis that depression leads to deficits in the quality of maternal parenting behavior, which in turn contributes to poorer language development, possibly via general effects of enrichment on cognitive development, but also possibly due to specific effects on the quantity and/or quality of maternal vocal input. Given the evidence for very early effects of maternal stimulation of rudimentary language processing, an important question is how early during development the effects of maternal depression on infant language development can be detected. However,