

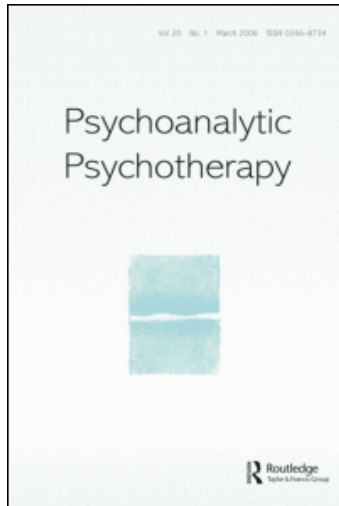
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The development of children of postnatally depressed mothers: Evidence from the Cambridge longitudinal study

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Children with a parent who suffers from depression are at raised risk for the disorder themselves. Relatively little is known about the development of psychological vulnerability to depression through childhood, particularly during infancy and early childhood. This paper describes results from a longitudinal prospective study of the development of children, studied from birth to 16 years, of mothers who experienced postnatal depression; it highlights the roles of the developing mother-child relationship, and of physiological functioning and social relationships in the development of adolescent vulnerability.

Prevalence and risk for depression

Understanding the development and occurrence of depression prior to adulthood (typically defined as that occurring before age 17 (Harrington et al., 1990; Jaffee et al., 2002)) is obviously of importance in its own right. However, the fact that episodes at this time are associated with particularly poor outcomes in terms of severity, chronicity and risk of recurrence endows the area with even more significance (Hammen, Burge, Burney, & Adrian, 1990). Strong positive associations between disorder in parents and their offspring are found in both 'top-down' samples comprising the offspring of depressed parents, whether from the clinic (Weissman et al., 2006; Hammen et al., 1990) or community (Hammen & Brennan, 2003; Beardslee et al., 1993), and 'bottom-up' samples of the parents of depressed children (see review of Beardslee et al., 1998). Twin studies show a genetic contribution to childhood depression, but reveal that environmental influences are also of undoubted importance. Among the various possible family influences, chronic parental conflict and parenting difficulties have been considered particularly salient in mediating the link between parental and offspring disorder (see review by Downey & Coyne, 1990).

Notwithstanding awareness of the significant, yet still limited, role of genetic factors, and continuing difficulties in fully accounting for the extent of the risk to offspring, the important questions concerning the development of vulnerability in the child who is at risk by virtue of parental depression have received relatively little research attention. Greater dependency on the parent in early life, together with the early plasticity of neurological systems, prompt the question of

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whether exposure to maternal depression during the first year or so may, even at this early stage in development, place the offspring at greater subsequent risk for depression. Early exposure to a disturbed parenting environment may directly render the individual vulnerable, or else it may set in train certain developmental processes which then place the child at risk, particularly when accompanied or followed by additional environmental adversity. These possibilities are considered below in the light of the findings of the prospective Cambridge longitudinal study of the development of children of postnatally depressed mothers (Murray, 1992). These will be set in the context of the wider literature on the development of children of depressed parents and research on early parenting and attachment.

The Cambridge Study

The Cambridge study was set up in 1986, with support from the Winnicott Trust and the Medical Research Council (MRC). Over a two-year period, a community sample of primiparous mothers, all of whom were intending to be their infant's primary carer, were screened at 6 weeks postpartum for possible depression. Since the study aimed to examine the impact of maternal depression, rather than that of general adversity, single and teenage mothers were excluded, and all infants were healthy. Women who met these criteria were interviewed to confirm their diagnosis, along with a random sample of non-depressed mothers. A sample of 100 was recruited (58 depressed, 42 controls) and has now been followed up into adolescence (principally with support from the Tedworth Trust & the MRC). Assessments have been at infancy, at five, eight, 13 and, most recently, at 16 years, with over 90% retention at each stage. Over the years, several colleagues have played a key role: Peter Cooper, Ian Goodyer, Sarah Halligan, Alison Hipwell, Sheelah Seeley, Alan Stein and Matt Woolgar.

A central focus of the Study has been the nature of the mother's relationship with the infant and later with the developing child. This was selected in the light of the evidence that, even in the first weeks and months of development, infants are highly sensitive to other people's responses to them. A large volume of research with normal populations also confirms that the quality of parental responsiveness is a key influence on child development. The Study's fundamental hypothesis was that any adverse impact of the mother's depression on the child would at least partly arise by virtue of difficulties in the mother-child relationship. In this context, it is important to note that parent-child relationships are bi-directional. Individual differences in infant behaviour can have a profound effect on parents, including the parental risk for depression (Murray et al., 1996a) and the quality of maternal responsiveness (Murray & Trevarthen, 1986). The role of fathers is also likely to be of considerable importance. It may buffer the child against the effects of maternal disorder, or else if there is paternal disorder it may exacerbate them (Ramchandani et al., 2008), especially given that the incidence of co-occurrence of depression in mothers and fathers is high.

The Study has tracked the children through to adolescence and assessments have been done to throw light on how children might become vulnerable to depression. In early development, we focused on vulnerability as expressed through observed relationships, such as the nature of the infant's attachment to the mother. As the children developed, we more focussed upon the way their relationships evolved with peers, and how they represented qualities of relationships with them. One way these were assessed was through doll play, and narratives concerning friendships. We also assessed vulnerability to depression through challenge tasks and *via* parameters of physiological functioning.

Effects of depression on early maternal responsiveness

Winnicott's term, 'Primary Maternal Preoccupation' (PMP) refers to the state of mind that generally develops as pregnancy advances whereby the mother becomes increasingly focussed on her infant. This evolves after the birth into the capacity to empathise with the infant and provide responsive care that is precisely attuned to the infant's needs and experience. Primary Maternal Preoccupation is manifest in the very earliest mother-infant contacts for example, in the way a mother will generally cradle her infant against her left breast where the infant can best sense her heart beat. A maternally preoccupied mother will position herself so that her face is at just the distance where the infant can keep her features in focus, and she will mirror the infant's facial expressions. The unconscious adaptations made when mothers engage with their young infant are particularly evident the speech changes that occur. When compared to speech addressed to adults mothers speak to young infants with higher pitch, more slowly and repetitively, and with a distinctive intonation consisting of exaggerated contouring and fewer utterances with falling intonation. These characteristics of 'baby-talk', or 'motherese' are precisely adjusted to the preferences and capacities of the infant to discriminate. They serve to entrain the infant in periods of mutual engagement and help to regulate the infant's emotional state (Marwick & Murray, 2008). These multi-faceted, unconscious, parental adjustments to their young infants have been termed 'intuitive parenting' (Papousek & Papousek, 1987). However, such adjustments are often lacking or disturbed in the mother who is depressed after childbirth. This is especially so for those who are depressed in the context of wider adversity. The depressed mother is often more preoccupied with her own concerns and negative thoughts rather than being preoccupied with her infant. This makes it hard for her to notice and respond to her infant's cues or to demonstrate the normal profile of sensitive responsiveness.

In the Cambridge sample we examined the early mother-infant relationship by recording face-to-face interactions in a subsample through infancy. We analysed both maternal speech and behavioural responsiveness. In common with much other speech research, we found that, typically, the usual intuitive adaptations failed to occur when the mother was depressed. Instead the mother's speech to the infant remained similar to speech to adults, with low pitch and a preponderance of

repeated falling contours (Marwick & Murray, 2008). Together, these features give speech a flat and monotonous quality, similar to that found to be associated with the perception of sorrow or sadness in non-depressed individuals. Notably, the prosodic features of infant-directed speech signalling emotion share characteristics with those vocalisations between non-human primates that serve important relational, social-affective functions. This suggests they may be of particular importance in attuning the infant to specific emotions during a sensitive developmental period when selective responsiveness to the particular characteristics of the language environment emerges (Kuhl, 2008). Indeed, our preliminary analyses of the association between these early maternal speech features signalling sadness and low mood in offspring as they reach adolescence are consistent with this idea. We have also found that the *content* of speech material is affected by depression (Murray et al., 1993): the principal features are that depressed mothers' speech reflects their concern with their own agenda rather than being centred on the infant's experience. In relation to boy infants they also expressed more hostility. As is so often the case, depression in this sample was accompanied by marital conflict. Interestingly, it was particularly in this context that mothers would express hostility to their sons (Morrell & Murray, 2003).

A large body of research has shown that the depressed mother is likely to miss the infant's social cues. In terms of her behavioural responsiveness, she may appear lost in her own thoughts and withdraw from contact with her baby or else behave in an intrusive, sometimes overtly hostile, manner (see Murray et al., 2009a for a review). Either way, there is a failure to empathise with and support the infant's experience at a time when the infant's own capacities for self-regulation are immature. In Winnicott's view, when such failures of 'containment' are marked, they may create intolerable anxiety in the infant, such as the sensation of 'falling forever'. Consistent with the generally low-risk status of our Cambridge sample (Murray et al., 1996b), we did not encounter the extremes of intrusive hostile behaviour in the depressed mothers found in more deprived populations. Instead, in the context of displaying a reduced sensitivity to the infant's cues overall, the Cambridge depressed mothers in behavioural terms mainly appeared withdrawn and disengaged. Particularly pronounced was the difficulty depressed mothers had in responding supportively to infant distress. Typically, distress would be followed by rejecting or unsympathetic maternal responses which, in turn, would cause the infant's behavioural regulation to become disrupted (Murray et al., 1996b).

Effects of depression and early parenting on the physiological functioning of offspring

Evidence from animal studies indicates that disturbances in early contacts between parent and offspring may have direct long-lasting effects on development. In the human context these may increase the risk for depression. For example, research with both rodents and non-human primates has shown that

early experience may determine adult functioning of the HPA axis, and associated stress responding (Champagne & Meaney, 2001; Suomi, 1997; Coplan et al., 2001; Lyons et al., 1998). With respect to human populations, a number of studies have found evidence of elevated morning or daytime cortisol levels, for example, in children adopted from very deprived institutional environments, or in maltreated children (see review by Tarullo and Gunnar (2006)). The severity and persistence of early deprivation appear to be significant factors in such findings (Kertes et al., 2008). Studies of the impact of exposure to maternal depression or parental bipolar disorder have also reported elevated basal cortisol secretion in the offspring (Essex et al., 2002; Hessel et al., 1998; Mannie et al., 2007; Ellenbogen et al., 2006). While these findings are consistent with animal models, until recently their interpretation has been limited by a lack of evidence concerning the details of the rearing experience and, in many cases, by the presence of concurrent psychopathology (Tarullo & Gunnar, 2006).

In the Cambridge sample we addressed the question of the longer-term impact on the developing child's physiological functioning of this early exposure to parenting difficulties. We found that basal morning cortisol levels were elevated in the 13 years old adolescent children of postnatally depressed mothers. This association was not accounted for by exposure to maternal depression subsequent to infancy, suggesting that maternal depression occurring early in offspring development may be particularly relevant (Halligan et al., 2004) and, specifically, maternal withdrawal and disengagement during interactions with the infant in the first nine months (Murray et al., 2009b). By contrast, *later* parenting (5 years) was unrelated to adolescent HPA axis functioning. Of further note was that even when controlling for earlier symptoms elevations cortisol levels at 13 years old predicted depressive symptomatology at 16 (Halligan et al., 2007). The study of offspring of parents with bipolar disorder by Ellenbogen and Hodgins (2009) also found that reduced active, structured, parenting predicted higher basal morning cortisol levels and greater stress reactivity in offspring at 16 years, although in this study parenting was measured by self-report, and timing effects were not examined. Our findings are also in line with data emerging from a developmental study of cortisol responding in over 1000 infants and toddlers, which found that reduced maternal engagement during infancy predicted overall levels of cortisol secretion in the course of a test challenge task in toddlerhood (Blair et al., 2008).

In sum, the parenting difficulties we observed in depressed mothers during early mother-infant interactions appear to have been significant for adolescent physiological functioning which, in turn, posed risk for the development of depressive symptoms in offspring at age 16 years.

The mother-child relationship in late infancy and early childhood, and the role of attachment

Rightly, there has been concern that the scope of what are considered to be attachment issues has been too broad, and that not all relationship influences

of relevance to child psychopathology are attachment influences (e.g., Rutter, 1995). Notwithstanding these caveats, the role of close, dependent, relationships and of their actual or threatened loss in the genesis of depression is well established (Brown & Harris, 1978). Therefore, in considering the effects of maternal depression on the mother-child relationship beyond early infancy, we asked the question of whether or not the child's development of a secure or an insecure attachment to the mother was relevant to the child's subsequent vulnerability to psychopathology.

In the section which follows, Bowlby's theory of attachment and its relation to mental health is first outlined, together with the evidence linking infant attachment quality to subsequent functioning. This is then followed by the findings in the Cambridge longitudinal sample bearing on the development of attachment and later vulnerability.

John Bowlby, one of the key originators of attachment theory, distinguished attachment from other aspects of relationships. Attachment concerns the propensity to make intimate emotional bonds with particular individuals in which issues of vulnerability and the need for protection feature prominently. Especially during the early years whenever threat or vulnerability is increased, the child's anxiety and need for contact with their parent increases. Attachment also includes the sense of security and the capacity for independence that develops when the child can be confident that parental care will be available when needed, and that their distress can be resolved.

Bowlby held that the way the child's attachment to their parent developed was primarily influenced by the quality of parental care, a view that has been consistently supported by subsequent empirical research. Furthermore, Bowlby saw that the quality of parental care was critically influenced by whether the circumstances facing parents were good or bad. Given that maternal depression is associated with parenting difficulties, and especially with difficulty in being sensitively responsive to the infant's needs, it is unsurprising that a number of studies have found that infants whose mothers experience postnatal depression are significantly more likely to develop an insecure pattern of attachment (see meta-analysis by Martins & Gaffan, 2000).

Bowlby's early work centred on the impact of major disruptions to attachment relationships, for example, through loss or prolonged separation. Later, in tandem with Mary Ainsworth and colleagues, an account was developed of differences between infants in the pattern of their attachment behaviour, as revealed when placed in unfamiliar surroundings under the stress of a brief test separation from their parent or other attachment figure - the Strange Situation Procedure (SSP). Three patterns of attachment were identified from responses in the SSP:

The *secure* infant becomes distressed during the separation, seeks contact with the parent on their return, is able to be comforted, and finally resumes exploration of the novel environment. This pattern is shown by about 60% of children in general population samples. The theory is that, because these children

have received care that has been reliably available and sensitive to their needs, they are able to be open about their difficult feelings, have the confidence that the parent will be a source of support for relieving their distress and, once reassured of their presence, are secure enough to leave the parent's side to explore.

The other two patterns reflect insecure responses:

Some infants are described as having an anxious *avoidant* insecure attachment (about 15% infants); they show little, if any, distress at the parent's departure in the SSP and, on the parent's return, they avoid close contact, seeming to prefer playing on their own. The theory here is that these children will have experienced consistent rejection by the parent, particularly at times when the infant showed distress; they therefore have no confidence that, when they seek care, they will be responded to helpfully, but expect to be rebuffed, and they learn that it is safer to minimize the expression of distress.

The third pattern is termed insecure anxious *ambivalent*, or *resistant*, attachment (about 10% infants); this is characterised by the infant's rapidly becoming extremely distressed by the parent's departure in the SSP; but when the parent returns, the infant fails to be consoled, and typically shows a mixture of clinging desperately to the parent and resisting contact, sometimes pushing the parent away. The theory here is that such infants have experienced unreliable, or inconsistent care from the parent, leaving them feeling anxious about the parent's availability, and that the expression of their needs has to be maximized in order to obtain a response.

It subsequently became apparent that the behaviour of some infants' did not clearly fit any of the patterns in this three-way categorisation. Whereas even when insecure, the three main patterns were systematically organised to achieve their goal of reducing distress, the responses of some infants' appeared *disorganised*, showing bizarre, often contradictory behaviours, particularly at the point of the parent's return plus, for example, episodes of momentary freezing. If forced to classify according to one of the three groups, most would be seen as either avoidantly, or ambivalently insecure. In general population samples, some 15% infants show this behaviour. This response is held to arise from the infant's experience of frightening or inexplicable behaviour on the part of their parent placing them in a bind, whereby the person on whom the infant depends is at the same time also a source of threat and danger. Populations with high rates of disorganised responses often also have elevated rates of maltreatment and abuse.

In Bowlby's view, and as developed by other attachment theorists (e.g., Bretherton, 2005), the repeated experience of these different patterns of interaction gradually becomes internalised by the young child in the form of an 'internal working model' (IWM) of the self and others. Bowlby held that these models tend to be self-perpetuating, but are still relatively flexible in the early years, and open to being modified by subsequent experiences. Over time, however, they become more fixed, so that they become more difficult to alter with changes in experience.

Like many subsequent attachment theorists, Bowlby held that early experience is special in providing a setting point, or frame, for subsequent developments.

Bowlby's theory of early attachment and its relation to later functioning and mental health

Bowlby made a number of suggestions about how insecure attachment might relate to mental health problems. For example, he saw the infant who was avoidantly attached as defensively excluding information from conscious awareness that would otherwise cause suffering. The avoidantly attached individual is prone to deny the existence of their own needs, and may attempt to live without others' love and support, but nevertheless carry an underlying sense of themselves as being unworthy of love, and of others as prone to be rejecting. By contrast the insecure ambivalent child is liable to experience anxiety, especially about separation and the reliability of others' care, and is prone to be anxious about exploring the world, with the result that their capacity to cope with difficulties is impaired. The development of an insecure attachment pattern provides a possible mechanism contributing to the association between parental depression and difficulties in children's long-term close interpersonal relationships and later mental ill-health.

The evidence broadly supports the proposals of attachment theory regarding the association between early attachment status and later child social relationships. For example, children who were secure as infants are less likely to bully or be bullied by other children or to behave aggressively. Results of meta-analyses have shown that infant attachment insecurity predicts difficulties in social functioning with peers across childhood and, indeed, the prediction becomes stronger with age (Schneider, Atkinson, & Tardiff, 2001). However, there are few studies of long-term outcome associated with infant attachment, and of those that there are most have focussed on the nature of personal relationships and the security of attachment in adolescence/early adulthood, rather than on mental health outcomes. Nevertheless, it is worth considering this research given the role that close and supportive relationships have in protecting against mental health problems such as depression. Generally, studies have shown continuity of attachment from infant to adult (Waters et al., 2000; Hamilton, 2000; Main et al., 2005; Sroufe et al., 2005), although in the more recent studies of Lewis et al., 2000 and Grossman et al., 2005 this was not always the case. However, both these contrary studies indicated that under certain conditions attachment processes might change in a way that seemed lawful. Lewis et al. (2000) for example found that parental divorce was associated with insecure attachment in adulthood, independently of attachment security in infancy. Grossman et al. (2005) also found that adult attachment security was lawfully related to the quality of parental care after infancy (age 5-10 years). Indeed, similarly lawful effects of intervening developmental influences on continuity and change in attachment patterns have been found in those studies that did find long-term continuity

(Waters et al., 2000; Hamilton, 2000). These findings are consistent with a view that patterns of attachment may be generally stable over time, but may change in response to significant alterations in family circumstances.

The Minnesota longitudinal study of a high-risk sample of children from birth to 20 years was unusual in assessing mental health in relation to infant attachment, as well as to later attachment security. This study found striking relationships between the nature of attachment to the mother in infancy and mental health and behaviour problems in late adolescence. Both avoidant and disorganized attachments were associated with more global pathology (the number and severity of diagnoses), and there were also a number of specific links: anxious ambivalent attachment was uniquely and specifically associated with the occurrence of anxiety disorder (Warren et al., 1997); avoidant attachments were associated with externalising, and early-onset, persistent antisocial problems (Aquilar et al., 2000; Sroufe, 2005); those who had shown disorganized attachment were at increased risk for symptoms of dissociation (Carlson, 1998); and finally, those who had shown either kind of anxious attachment in infancy (i.e., ambivalent or avoidant), were at raised risk for depression. While these associations are notable, it is important to bear in mind that infant attachment insecurity seems to account for only a modest proportion of the total variance in global adjustment. The prediction of later psychopathology is substantially improved when account is taken of intervening negative experiences (although it must be acknowledged that the occurrence of these is not always independent of the subject).

Findings from the Cambridge study concerning effects of maternal depression on attachment and later social functioning

When our sample was assessed in late infancy, we found, consistent with other studies, that maternal depression increased the odds of *insecure* attachment by a factor of nearly four (Odds Ratio 3.8) (Murray et al., 1996b). Notably, almost all the insecure children (83% of the insecure children of postnatally depressed mothers) were classified as insecure-avoidant. Subsequently, we found difficulties in the mother-child relationship that continued beyond infancy: direct observations revealed that the children of postnatally depressed mothers showed continuing unresponsiveness to their mothers' bids to engage with them when five years old, despite mothers having generally recovered from depression and no longer being insensitive to the child. This association with the mother's postnatal depression was entirely mediated by the child's earlier insecure infant attachment (Murray et al., 1999a).

Therefore, one possible way children who are insecurely attached may develop raised risk for behaviour and mental health problems is that they may exclude themselves from potentially supportive relationships, or otherwise make it difficult for others to provide effective support. Extensive observations in preschool of children in the Minnesota study supported this possibility, showing for example how those classed as avoidant in infancy were later treated by their

teachers both in a less warm or nurturant way and more angrily when compared to secure children, (Eliker, 1992). In this study of peer relationships at summer camp, later assessments showed that effects like these were persistent. Similar effects are also well-documented in the literature on children previously in institutional care who show continuing relationship difficulties, despite his or her moving into a favourable environment (e.g., Hodges & Tizard, 1989).

In the Cambridge sample, the persisting difficulties in the mother-child relationship in those where there had been postnatal depression were also accompanied by peer relationship difficulties: at five years old direct observations of peer interactions at school also showed postnatally depressed mothers' children to be unresponsive to positive social approaches by other children (Murray et al., 1999a) and in the home they were more aggressive in peer play. This last finding was strongly associated with the marital conflict. This is common in those where the mother was postnatally depressed and it emphasises the importance of the child's exposure to continuing problems in the family environment (Hipwell et al., 2005). Our own findings echo those of Wright et al. (2000), who also found raised rates of peer relationship problems and aggression at age five in depressed mothers' children; and in the study of Maughan and colleagues (2007), where children's own reports of social difficulties at age 5-8 years also showed an association with earlier maternal depression.

Cognitive vulnerability in depressed mothers' children in the Cambridge sample

As well as directly observed relationship difficulties, the Cambridge study has included assessments of the child's cognitions placing an emphasis on those kinds of cognitions thought to be specifically relevant to the development of depression. Two spheres of functioning have been investigated: personal resilience or vulnerability, and family relationships. With respect to personal vulnerability cognitions (Murray et al., 2001), we designed a test situation assessment for the five and nine-year old follow-ups in which the children's vulnerability *vs.* resilience to depressive feelings and thoughts could be assessed. We observed the study children as they each played a specially designed competitive card game with a friend. The order of the playing cards dealt by the researcher was experimentally fixed such that the study child and their friend both experienced being dealt winning hand, but also a mild threat of receiving losing card deals. The children's responses revealed wide variations in the capacity to cope with the stress of possibly losing the game. Some slipped quickly into a feeling that the outcome was bound to be negative ('I know she's going to win'), and manifested clear signs of general low self-worth ('I never win at games'). Others showed impressive resilience, for example, being able to reflect on positive personal attributes ('I can run faster than the big boys'), or rationalising the situation ('it's only a game, isn't it'), or imagining positive outcomes ('the winner just might be me, it might be me') (Murray et al., 2001). Although

research using methodologies such as questionnaire or interview has generally not elucidated cognitive vulnerability to depression in children this young, we found that, in the more ecologically valid context of the card game where the children's emotions were engaged, postnatally depressed mothers' children were substantially more likely to evince depressive cognitions. This was particularly likely where their mother had shown high levels of hostility to them.

The Study assessed cognitions (or IWM's) regarding the family *via* doll play at five years (Murray et al., 1999b; Woolgar & Murray, 2009). Using a furnished doll's house, with doll characters of the child's own choosing, we employed a relatively open-ended methodology, in which the child was invited to show a researcher what happened at home in a range of universal family situations, namely meal time, bed time, a bad time and a favourite time. Ratings of the family relationships children depicted (parental care and neglect, and the child in a caring role) showed recent, as well as postnatal depression to be influential, as well as the occurrence of parental conflict. Particularly noteworthy was the fact that key aspects of the representations of family relationships in early childhood were also reflected in the way close friendship experiences were represented at 13 years (Murray et al., 2006). By this age, episodes of depression in the sample were beginning to emerge, often following on earlier experience of anxiety disorder (Halligan et al., 2007b). When the adolescents were asked to describe a recent experience with friends that had been difficult in some way, these 13 years old girls of postnatally depressed mothers, who had earlier appeared (especially where the mother continued to be depressed) to be highly sensitive to interpersonal relationships in their doll play (for example, giving extended accounts, and enacting how they and their mother cared for each other), showed the same kind of heightened sensitivity to their own and others' emotional experience. For example, they would dwell in detail on the subtleties of feelings experienced during recent interpersonal encounters. This pattern was particularly likely to occur in girls who had been insecurely attached as infants, whereas, as in early childhood, the insecure adolescent sons of depressed mothers often struggled to give an account of friendship difficulties. Of particular note in our adolescent assessments was that, when these relationship representations were examined in relation to mood, we found that the emotional sensitivity of these daughters of depressed mothers, especially in the context of infant insecurity, was significantly associated with high levels of their own depressive symptoms. Thus, high interpersonal sensitivity in the context of infant insecurity and a mother with depression, was a combined risk factor for girls' adolescent depressive symptoms, whereas in the context of a secure attachment, and without exposure to maternal depression, such heightened sensitivity was not associated with risk. Similar associations have also been reported by Hammen and Brennan (2001), whose follow up study found social relationship difficulties among adolescents of depressed mothers, together with insecure child-parent attachment, as assessed by self-report questionnaire.

Conclusions

Taken together, our analyses to date from the Cambridge longitudinal study reveal an unfolding vulnerability in the offspring of postnatally depressed mothers. Their vulnerability was evident in a number of domains, ranging from a pattern of HPA axis physiological functioning known to pose risk for depression (e.g., Goodyer et al., 2001), to difficulties in observed relationships, to depressive cognitions concerning the self, and possibly others. Although several of these difficulties were associated with early experiences, including mother-infant interactions in the first year, as well as insecurity in the mother-infant relationship at 18 months, it is important to note that, in common with much other research, we found that subsequent difficult family experiences were also of importance. These included continuing maternal depression (which applied to the majority of mothers with postnatal episodes), and the occurrence of parental conflict. Notwithstanding the role of these continuing difficulties, the fact that families where the child had started on a trajectory of increased risk for later mental health difficulties could be identified in the first eighteen months, suggests the possible benefit of early interventions, as well as of subsequent monitoring of vulnerable parents and their children. Our assessments to date have been fully analysed only up to age 13 years, when depressive disorder in the offspring was beginning to emerge. It should be borne in mind that a more comprehensive understanding of the role of early experience in relation to offspring disorder in this sample is likely to emerge with our analyses of outcome at 16 years and beyond.

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