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REVIEW ARTICLE

The impact of maternal psychopathology on child–mother attachment

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Abstract This review aims to consider evidence for the impact of maternal psychopathology on the child's attachment to the mother, and the role of this in mediating the known transmission of developmental and clinical risk to children. The studies reviewed focus on mothers with depression and psychotic disorder. A number of studies (mainly of mothers with depression) demonstrate an association between insecure/disorganised infant attachments and severe maternal psychopathology, whether chronic or current, in the presence of comorbid disorder, maternal insecure or unresolved attachment state of mind, trauma/loss, or low parenting sensitivity. Whether such effects last into middle childhood, however, is unclear. Our understanding of the role of attachment in determining developmental trajectories in this group is at an early stage. Some evidence suggests that attachment may have a role in mediating the intergenerational transmission of internalising and other problems in this group, although the presence of co-occurring contextual risk factors may account for the variability in findings. A multifactorial longitudinal approach is needed to elucidate such factors. However, the current literature highlights which subgroups are likely to be vulnerable and provides an evidence-based rationale for taking an attachment-based approach to intervention in this group.

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Introduction

Children of mothers with mental health problems are at risk of later psychopathology and poor functioning in a range of developmental domains (Goodman and Gotlib 1999; Wan et al. 2008a). The extent to which early child–caregiver attachment mediates such developmental trajectories remains an important question for our understanding of the social inheritance of developmental and clinical problems. Although the children of parents with mental disorder have been the focus of research, relatively little attention has been given to the early attachment relationship as a mechanism for the transmission of risk. This is surprising given that (1) the implications of suboptimal attachment for psychopathology are well conceptualised in attachment theory (e.g. Sroufe et al. 1999); and (2) studies of adults with psychopathology reveal high rates of non-secure adult attachment states of mind regarding their family of origin (Riggs et al. 2007; Ward et al. 2006). Such attachment states can be measured using the Adult Attachment Interview (AAI; George et al, unpublished manuscript), which asks about the subject's present and past experiences with attachment figures in the family of origin, including losses and trauma, and is assessed through discourse analysis. As a parent, this state of mind regarding attachment is understood to influence caregiving sensitivity, which then impacts on the infant's attachment (Main et al. 1985; Van Ijzendoorn 1995). An effect therefore of maternal psychopathology on attachment provides a mechanism by which children are made developmentally vulnerable. An additive risk in this context may be the relative lack of social

or partner support found in more chronic and psychotic disorder (e.g. Abel et al. 2005). This may place further stress on parenting competency; children in this context are more likely to spend time in foster care (Sands 1995).

In this paper we first outline, from attachment research, how the early attachment dynamic might constitute a pathway for the transmission of risk from maternal psychopathology to child vulnerability.

The importance of the child–caregiver attachment

In attachment theory (Bowlby 1984), attachment refers to a specific domain within the parent–child relationship that develops during the first year of life, which describes a set of adapted infant behaviours from which we observe whether the infant comes to represent a caregiver as a 'secure base'. Such observations led to the classification of attachment behaviours into three 'types': secure, and two insecure patterns: avoidant and ambivalent/resistant (Ainsworth et al. 1978). Sensitive caregiving gives rise to secure attachment, which promotes optimal development, whereas insecure (avoidant or ambivalent) attachment arises from lower carer sensitivity. Empirical research is generally convergent with this view: insecure attachment is determined mainly by shared environmental factors (rather than non-shared environmental or genetic factors; Bokhorst et al. 2003; Fearon et al. 2006; O'Connor and Croft 2001) and relates specifically to low maternal sensitivity (Moran et al. 2008; DeWolff and van Ijzendoorn 1997).

There are good reasons to believe that maternal mental disorder might impact on parenting sensitivity. Maternal depression is associated with reduced parenting responsiveness, affection and reciprocity, and increased intrusion and punitiveness (c.f. Goodman and Gotlib 1999; Robbins Broth et al. 2004). Despite considerable variation in behavioural sensitivity in this group (Lovejoy et al. 2000), depressed mothers also tend to report feeling less attached to, and more negative toward, their children, compared with controls (Cornish et al. 2006; Nagata et al. 2003; Rogosch et al. 2004). Psychotic disorder has been associated with even stronger tendencies toward unresponsive, withdrawn and non-infant-focused interaction (Goodman and Brumley 1990; Wan et al. 2007a, 2008b). The consequent theoretical vulnerability to insecure attachment in children of parents with mental illness is significant because, such attachment in infancy has been generally associated with later low social competence (Schneider et al. 2000) and possibly internalising and externalising behaviour (NICHD Early Child Care Research Network 2006).

The 'disorganised attachment' classification was later added to the classic tripartite framework of 'organised' attachment strategies, and describes the child's inability to organise a coherent strategy for eliciting comfort from the caregiver (Main and Hesse 1990). Disorganised attachment is understood to result from anomalous (rather than insensitive) caregiving behaviour and experiences of unresolved loss/trauma (Main and Hesse 1990; Van Ijzendoorn 1995). Although disorganised attachment has been linked empirically with atypical parenting behaviour (e.g. Forbes et al. 2007), frightened and frightening behaviour (e.g. Abrams et al. 2006) and disrupted communication (e.g. Goldberg et al. 2003), such anomalous behaviours may not fully explain disorganised attachment (e.g. Madigan et al. 2006a). Other possible contributors include hostile/helpless parental states of mind (Lyons-Ruth et al. 2003) and child genetic factors (e.g. Gervai et al. 2007). Some of these proposed parental antecedents of disorganised attachment are commonly described also in adults with psychosis, such as loss and trauma (Janssen et al. 2005) and unresolved/insecure attachment state of mind (Berry et al. 2007). At a behavioural level, the atypical and disoriented behaviours intrinsic to psychotic disorder (e.g. thought disorganisation) are unlikely to be compatible with the infant's formation of an organised attachment. Recent studies also identified the DRD4 polymorphism as a potential link associated with disorganised infant attachment (Gervai et al. 2007; Van Ijzendoorn and Bakermans-Kranenburg 2006), as well as adult depression severity (Zalsman et al. 2004) and particular personality traits (Joyce et al. 2003; Tochigi et al. 2006). In line with attachment theory, studies suggest that early disorganised attachment, more than any organised attachment (secure or insecure), increases risk for later problems, such as externalising behaviour (e.g. Smeekens et al. 2007; Van Ijzendoorn et al. 1999).

In summary, there are strong theoretical reasons to believe that maternal mental health could impact on the formation of an organised and secure attachment in infancy —and the latter may confer developmental risk on the child. This paper reviews whether the empirical evidence supports this view, and if so, what the precise mechanisms of the transmission of risk might be. Specifically, our aim is to evaluate from direct empirical study: (1) whether maternal depression and psychotic disorder impact on child–caregiver attachment in infancy and childhood and, if so, how; and (2) whether it is the presence of insecure or disorganised attachment in the child that explains the behavioural and emotional problems in children of mothers with mental disorder. We focused exclusively on studies that used standard, validated measures of attachment (unless otherwise specified), and on mothers with depression or psychotic disorder (as very few such studies involved other psychopathology). The review is set out in two overall sections, the first reviewing evidence on the impact of maternal mental illness (depression and then psychosis) on the formation of infant and childhood attachment. The second section examines attachment as a potential mediator of risk between maternal mental disorder and child psychopathology in the later

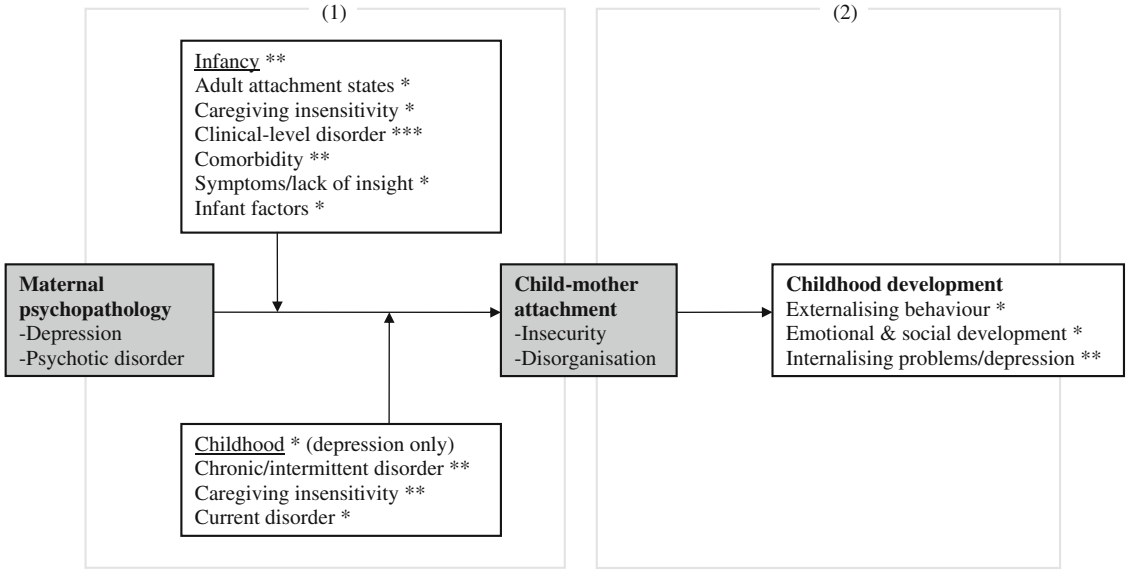

Fig. 1 The current evidence base from studies of maternal mental disorder for: (*1*) the vulnerability of offspring to attachment insecurity/disorganisation, and potential moderators/mediators; (*2*) attachment as a pathway to poor developmental and clinical outcome. Levels of evidence: *Very little/contradictory evidence; **Suggestive evidence; ***Converging evidence

years. An overview of the current evidence to be reviewed is summarised in Fig. 1.

Maternal psychopathology and attachment

Maternal depression and attachment in infancy

It is commonly assumed that maternal depression impairs later child attachment, but three meta-analyses actually show an equivocal effect. Martins and Gaffan (2000) analysed six studies (N=373, after removing one outlier study), predominantly of middle-income families to minimise other risk factors, and found that maternal depression was associated with slightly increased infant avoidant or disorganised attachment (weighted Z scores: 2.37 and 2.34), with more homogeneity reported in disorganised attachment. However, a more inclusive meta-analysis, which focused on insecure attachment in fifteen studies (N=953) yielded a weak significant effect of maternal depression (r=0.18; Atkinson et al. 2000). Socioeconomic status (SES) was not examined. Van Ijzendoorn et al.'s (1999) meta-analysis involved many of the same studies but examined disorganised attachment specifically (N=1,053 in sixteen studies) and found it to be unrelated overall to maternal depression (r=0.06). Larger samples with older children produced smaller effect sizes, and contrary to Martins and Gaffan's (2000) sampling rationale, SES had no overall moderating effect. In summary, sample variation is likely to explain much in the inconsistencies found, which is not easily explained by other factors, such as the depression or attachment measures used. The more robust findings came from clinically depressed samples (in contrast with community samples) whose infants and young children showed an elevated risk of disorganised (Z=2.24; p=0.01; Van Ijzendoorn et al. 1999) and insecure attachment (Z=2; p<0.05; Atkinson et al. 2000). However, even in the subset of clinical samples, Van Ijzendoorn et al. (1999) reported a homogenous effect size but Atkinson et al. (2000) did not.

Studies since the publication of these meta-analyses have attempted to elucidate the factors that may moderate or mediate the link between maternal depression and infant attachment, which may also explain the diversity of findings unaccounted for in earlier studies. Here, we present the evidence for such mechanisms.

Chronicity of depression Although we have reported that studies of clinical samples are more likely to show an effect, recent work further suggests that it may be the length of time to which the infant is exposed to the effects of maternal depression, and the timing, that impacts of attachment rather than the severity of depression per se. McMahon et al. (2006) reported that persistent depression, measured at 12 months in a predominantly middle class sample (N=111), was associated not with disorganised but with insecure attachment: three quarters of infants of chronically depressed mothers were insecurely attached, while rates in the briefly and never depressed groups were statistically similar. A longitudinal study of the NICHD

sample (N=1,077) further emphasised the long-term effect of chronic maternal depression on attachment, raising risk to both insecure and disorganised attachment at 3 years (Campbell et al. 2004). Mothers with elevated symptoms in two or more non-consecutive periods were more likely to have young children with insecure-ambivalent attachments specifically. However, depressive symptoms limited to the first 15 month postpartum showed no associations with attachment, unless combined with low maternal sensitivity.

Adult attachment state of mind Attachment theory purports that insecure or unresolved adult attachment states of mind, as determined by the AAI, impacts on parenting behaviour and, in turn, child attachment. How maternal depression impacts on this process, however, remains unclear. We may hypothesise that an unresolved (from loss or trauma) attachment state is particularly harmful to parenting capacity through impeding on the mother's ability to hold her infant's mental states in mind (known as 'reflective functioning'; Fonagy and Target 2005), but there is little evidence that this is the case. A study that addressed this found that, among 111 middle-class mothers, one third of those with chronic depression were classified as unresolved, and a quarter, as insecure (McMahon et al. 2006). More significantly, mothers who were both depressed and had an insecure attachment state of mind were particularly likely to have an insecurely attached infant (65% among the briefly depressed group and 76% among the chronically depressed group). Unresolved attachment state as a potential moderator was not examined, however, as there was no overall effect of depression (briefly and chronically depressed combined) on attachment. Maternal attachment state of mind may interact with chronicity of depression, as insecure mothers were seven times more likely to report persistent depression (McMahon et al. 2008). Another study used rating scales to measure the attachment states of mind of 62 low-SES mothers, and linked higher preoccupied-insecure attachment scores to less supportive and more hostile parenting, and a more negative child relationship to the mother (Bosquet and Egeland 2001). Unresolved scores were associated with less supportive parenting only. However, although almost half of the sample met the clinical cut-off for depression, depression score was unrelated to both maternal attachment state scores and parenting.

Hughes et al.'s (2001, 2006) study of next-born children following previous stillbirth suggests a counterintuitive effect of unresolved attachment state of mind: Among such unresolved mothers, those whose infants had an organised attachment were more likely to have intrusive thoughts than those whose infants had a disorganised attachment. Thus, feeling depressed and having intrusive thoughts (a realistic response to recent loss) may actually protect the mother from the dissociative state related to infant disorganised attachment in particular contexts.

Behavioural intrusion or disengagement Depressed mothers may show more intrusive and/or disengaged behaviours toward their infant (Goodman and Gotlib 1999), and this may adversely affect the attachment process. Children exposed to these types of behaviour have been shown to be highly vulnerable to disorganised attachment, although studies have almost exclusively involved cases of parent trauma/unresolved attachment states or maltreatment (e.g. Lyons-Ruth and Jacobvitz 1999; Madigan et al. 2006b). There is little direct evidence from maternal depression samples. A study of a deprived South African community sample (N=147) suggested that depression and intrusive/disengaged parenting implicate attachment in different ways: Maternal depression at 2 months predicted insecure infant attachment, but high disengagement or intrusion uniquely predicted disorganised attachment (Tomlinson et al. 2005). Another study of a low-income sample (N=153) found that insecure infant attachment was predicted by maternal depression, and mediated partially by negative maternal interaction and spanking frequency (Coyl et al. 2002). However, such maternal behaviour was measured through self-report.

Comorbid mental health problems Adults with depression often have comorbid mental health problems, such as anxiety and addictive disorders (Kessler et al. 1997). Such comorbidity effects are often overlooked yet they may raise the vulnerability of the child to disorganised or insecure attachment. Carter et al.'s (2001) study (N=69) reported the effects of a comorbid lifetime diagnosis (e.g. anxiety, eating disorder, substance abuse) on child attachment: Four fifths of infants in the comorbid group were insecurely attached, compared with a third in the depression-only group. Comorbidity was not associated with depression severity. Although maternal depression was related to insecure infant attachment, this effect was accounted for by having comorbid diagnoses, which was related to lower maternal sensitivity. Findings from the NICHD study on daycare (1997) involving N=1,131 may also be viewed as consistent; their measure of maternal psychological adjustment, which included depression and personality items, varied with security of infant attachment (all categories). This effect was due mainly to the low adjustment found in the mothers of children with insecure-avoidant rather than disorganised attachments.

Maternal psychotic disorder and attachment in infancy

Maternal interactive deficits are widely documented in the context of maternal psychosis (Goodman and Brumley 1990; Näslund et al. 1985; Persson-Blennow et al. 1986; Wan et al. 2007a, 2008b). However, studies that attempt to

elucidate the attachment classifications of infants of mothers with psychotic disorder are few, and typically involve small samples. D'Angelo (1986) found that infants of mothers with schizophrenia (n=15) and depression (n=15) exhibited higher rates of insecure attachment than controls, with more avoidant attachments in the schizophrenia group. Attachment disorganisation was not considered. Näslund et al. (1984) showed that infants of mothers with psychosis (N=46) were no more likely to be insecurely attached than controls, although insecure attachment was most prevalent in infants of mothers with schizophrenia specifically. DeMulder and Radke-Yarrow (1991) reported that half of infants of mothers with bipolar disorder were classed as having disorganised attachments, compared with a quarter of infants with depressed mothers. In contrast, Hipwell et al. (2000) reported that only one of ten mothers with bipolar disorder had infants with insecure or disorganised attachments, compared with seven of nine mothers with psychotic/non-psychotic depression. These inconsistencies may be due in large part to the small sample sizes and to an extent to sample and comparison group characteristics. Overall, the findings suggest an elevated attachment risk in infants of mothers with more severe disorder, such as schizophrenia. We discuss here the limited evidence to date on possible mechanisms for this association.

Direct effect of psychotic symptoms There is some evidence that parenting is impeded by positive symptoms (Chandra et al. 2006; Snellen et al. 1999), yet neglect and remoteness may be more problematic in the long-term (Goodman 1987). We located one study of a mentally ill maltreatment sample, over half of whom were psychotic, which found that a lack of insight (into the effects of their disorder on parenting) was associated with child disorganised attachment (Jacobsen and Miller 1999). An important question for future studies is the extent to which 'disorganised' thought processes, speech and behaviour, which form some of the positive symptoms intrinsic to psychosis, bear similarities in their behavioural manifestation to the anomalous parenting behaviour associated with disorganised attachment (Main and Hesse 1990).

Parent attachment state of mind Although studies have shown that adults with psychotic disorder are likely to have an insecure (dismissing) or unresolved attachment state of mind (Berry et al. 2007), and to have experienced trauma and loss (Janssen et al. 2005), none have focused on parents specifically in this context. Moreover, the validity of using the AAI in adults with psychotic disorder may be questionable, as symptoms may impede the organisation of thoughts and speech, which potentially impact on the AAI coding since speech characteristics and content are part of the analysis.

Neonatal infant behaviour Some studies have found early neurobehavioural abnormalities in infants of parents with psychosis (e.g. Hans et al. 2005). Although it may reasonably follow that such atypicalities impede the infant attachment process, there is little evidence that directly supports this possibility. Näslund et al.'s (1984) study of infants of mothers with psychosis found that those with insecure attachments had shown lower social contact and more crying early in infancy compared with controls, which could be taken to support this notion.

Maternal disorder and attachment in childhood

After toddlerhood, evidence that maternal disorder impacts on child attachment is weaker. A meta-analysis found that the effects of maternal depression on disorganised attachment lessen with age, although no specific effect size was reported (Van Ijzendoorn et al. 1999). A study of school-age children (N=85) also failed to find any relation between insecure attachment and maternal depressive symptoms (Graham and Easterbrooks 2000). The longitudinal NICHD study, which we described earlier, suggests that the lasting impact of maternal depression on attachment in toddlerhood depends on maternal depression characteristics and maternal sensitivity, rather than simply the amount of depression exposure. Campbell et al. (2004) (N=1,077) reported that depressive symptoms in the first 15 months did not predict preschool attachment, but mothers with intermittent symptoms in the first 3 years were more likely to have children with insecure-ambivalent or disorganised attachments. Chronic depression was associated with disorganised attachment. Moreover, mothers with recent, intermittent, or chronic depression and low behavioural sensitivity were more likely to have an insecurely attached child than depressed mothers with high sensitivity. Half of the sample with such 'dual risk' was insecurely attached at 3 years. Mills-Loonce et al. (2008) (N=1,040) further demonstrated that, overall, almost half of mothers of children with disorganised attachments at 3 years had clinical levels of depression in at least one of the four assessment points, compared with around a third in the other attachment groups. Maternal depressive symptoms were associated with reduced parenting sensitivity during the first 3 years among mothers of children who, at 3 years, had a disorganised attachment combined with an underlying pattern of insecure behaviour.

Children's family doll play narratives also appear to be affected by maternal depression, and may be taken to reflect insecure or disorganised attachment in school-aged children (e.g. Bretherton and Ridgeway 1990). Murray et al. (1999a) employed a dolls-house play procedure with 55 children whose mothers had been postnatally depressed and 40 controls. Girls whose mothers had been depressed postna-

tally tended to present idealised representations of maternal care, whereas boys gave a lower degree of narrative structure. Children exposed to recent maternal depression were also more likely to depict the child caring for the mother. In a clinical sample with behaviour problems (N=77), Wan and Green (2009) also found that those who depicted role reversal had mothers with more depressive symptoms, although this was partially accounted for by child behaviour problems.

To our knowledge, childhood attachment has not been studied beyond infancy in relation to maternal psychosis. A small study of young children of mothers with severe postnatal psychiatric illness (N=16) found more insecure attachments in children of mothers with current disorder (Wan et al. 2007b).

Attachment as a mediator of child psychopathology

Maternal depression studies

The second aim of this review is to examine whether insecure or disorganised attachment may explain the developmental trajectories of children of mothers with mental disorder. Our review found that relatively few studies involving children of depressed mothers have considered whether and how attachment may play such a mediating role. Furthermore, none of these studies considered the interactive role of genes, which may account particularly for the transmission of depression to children. Although some studies were longitudinal in design, many used concurrent measures of attachment, which further limits our ability to draw causal inferences. Studies tend to focus on a specific area of developmental functioning, so empirical evidence for each developmental domain will be presented in turn.

Externalising behaviour

Although maternal depression is often associated with child externalising behaviour, we found surprisingly little research on the possible mediation of attachment. In a study of infants of adolescent mothers (N=101), the link established between early insecure-avoidant/disorganised attachment and externalising behaviours at 9 years, particularly in girls, was independent of maternal depression (Munson et al. 2001). However, for children with an insecure-avoidant attachment, they found that changes in externalising behaviour followed fluctuations in depressive symptoms (independent of the effect of depression), whereas no such pattern was found among children with secure or disorganised attachment. A study by the NICHD Early Child Care Research Network (2006) examined changes in maternal sensitivity rather than depression per se (N=1,069), and their findings are consistent with the notion that ongoing changes in maternal caregiving/depression impact on externalising behaviour in children who were insecurely attached in infancy. When maternal sensitivity improved over time, children with insecure attachments in infancy showed fewer externalising behaviours at 4 years than those who received stable or declining maternal sensitivity. The link between parenting sensitivity and externalising behaviour increased with age for children with disorganised attachment. Even with declining parent sensitivity, children with early secure attachments were protected from developing externalising behaviour.

Other studies downplay the role of attachment, although none of these measured fluctuations in parenting sensitivity. Murray et al. (1999b) studied 55 children whose mothers had been depressed postnatally and 39 controls. Although postnatal depression was the strongest predictor of 5-year behaviour problems, insecure attachment at 18 months was not a mediator. Lyons-Ruth et al. (1997) followed up a low-SES group who were at risk of mother-infant relational problems (N=50). At 7 years, 83% of children with externalising problems had both a disorganised attachment and below average cognitive ability in infancy. Despite this strong association, externalising behaviour was predicted uniquely by depressive symptoms and not by any attachment variables. Furthermore, Trapolini et al. (2007) found that 4-year-old children of depressed mothers (N=84) enacted more aggression in their family doll play representations, particularly when depression was current, but no (concurrent) attachment security/disorganisation effects emerged.

Internalising behaviour

Although the most consistent findings overall were for internalising problems, most of these studies included risk factors in addition to insecure attachment, such that the relative contribution of attachment is unclear. In a longitudinal study, Murray et al. (2006) attempted to link adolescent depression to earlier emotional development and attachment in children of postnatally depressed mothers (N=51). They found that adolescent depressed mood was associated with heightened emotional sensitivity earlier in adolescence, which in turn was linked to insecure attachment in infancy *and* raised awareness of emotional aspects of family relationships at 5 years. Partial support is offered by another longitudinal study of a low-income sample (N=50), which reported that the number of depressive episodes experienced by the mother in the first 5 years predicted internalising problems in their children at 7 years (Lyons-Ruth et al. 1997). Although attachment did not mediate this effect, those with an insecure-avoidant attachment in infancy showed more childhood internalising behaviours in the non-clinical range.

Two studies used concurrent measures of maternal depression and attachment in school-age children. In a low-risk sample (N=85), Graham and Easterbrooks (2000) showed that insecure attachment at 7 to 9 years, combined with maternal depressed symptoms and economic risk, accounted for half of the variance in children's depression scores. Whether attachment was a mediator was not reported. In a study of 6- to 14-year-old children of parents with a history of major depression (N=140), Abela et al. (2005) found that insecure attachment (assessed by a self-report measure), combined with excessive reassurance-seeking, was associated with more child depressive symptoms.

Emotional development

Despite close theoretical links between attachment and subsequent emotional development, few studies have examined this process in children of depressed mothers. The three studies we located focused on different aspects of emotional functioning, none being in emotional regulation, and the findings are mixed. Greig and Howe (2001) found that poor emotional understanding at 3 years in a low SES sample (N=60) was predicted not by maternal depression but by low verbal IQ and insecure attachment. Another low-SES study (N=42) showed that, although securely attached toddlers referred more to emotion in conversation, it was maternal depression at 2 years that independently impaired emotion understanding (Raikes and Thompson 2006).

Murray et al.'s (2006) longitudinal study of children whose mothers had been depressed postnatally (N=51) found that, at 13 years, girls (but not boys) were more likely to show higher emotional expression/accessibility (when describing events involving friends) than children whose mothers had not been depressed (N=38). Such heightened emotional sensitivity among girls was predicted by insecure attachment in infancy and raised awareness of emotional aspects of family relationships at 5 years, whereas emotional maturity (behavioural and cognitive aspects) was unrelated to attachment in infancy irrespective of gender. However, whether 'emotional sensitivity' positively impacts on adolescents' emotional adjustment or places them at risk of depression is unclear; the predictive contribution of insecure attachment would suggest it to be a risk factor.

Social development

In their earlier follow-up of children of postnatally depressed mothers (N=55), Murray et al. (1999b) found that insecure attachment in infancy mediated the relationship between postnatal depression and low responsive engagement to mother at 5 years. However, neither postnatal depression nor attachment was related to social behaviour in school, which seemed to link more with recent depression. Two studies from the NICHD sample lend stronger support. Firstly, friendship quality was studied in 1,130 third-grade children by observing them interact with their best friend (Lucas-Thompson and Clarke-Stewart 2007). Friendship quality was not influenced directly by maternal depression at 2 years, but did so via secure attachment, thus lending strong support for a mediating effect. Maternal depression also had a substantial impact on marital quality, which predicted friendship quality directly and via attachment security. A second study (N=946) examined how socioemotional competence was affected by contextual risk factors—maternal depression being one of those (Belsky and Fearon 2002). Rather than a general mediating effect, they found specifically that, in infants with an insecure-avoidant attachment, fewer contextual factors were needed before later socioemotional ability was adversely affected. This finding may suggest that infants with insecure-avoidant attachments who are exposed to maternal depression and associated environmental adversity would be particularly vulnerable.

Maternal psychosis studies

We discussed earlier the evidence that exposure to maternal psychotic disorder might affect the child's attachment (D'Angelo 1986, DeMulder and Radke-Yarrow 1991, Näslund et al. 1984). However, the consequences of disorganised or insecure attachment in this group have been very little studied. We located only one small study by McNeil et al. (1988) who followed up 12 infants of mothers who had experienced a postpartum psychotic episode. They found that attachment security was unaffected, as was 6-year cognitive functioning and mental health.

However, several studies support the importance of the parent–child relationship, in a wider sense, for child outcomes. Such studies have shown that young people whose mothers have a psychotic disorder (N=110) are more likely to report poorer, more stressful, relationships with them (Burman et al. 1987; Schiffman et al. 2002), while positive relationships with both parents appeared to protect against the later development of schizophrenia (Schiffman et al. 2002). A study of mothers with severe puerperal disorder (41% psychosis/bipolar disorder) did not examine the parent–child relationship, but by showing that children who were born when the psychiatric episode occurred were more likely to develop a psychiatric disorder, compared with those born before or after, they highlight the importance of the early environment for mental health trajectories (Abbott et al. 2004). Although we know that psychosis is highly heritable (Cardno et al. 1999), only one study has examined the possible transaction of genes with

the early social environment: Walhberg et al.'s (2004) adoptive study reported that adoptees whose biological mother had schizophrenia were at elevated risk of developing psychotic disorder, but only when the adoptive parents showed disrupted/unclear verbal communication. This suggests that parent–child interaction (and not social exposure to psychosis) transacts with genetic factors to influence offspring clinical outcome.

Discussion

Despite the links between attachment and psychopathology purported by attachment theory, our review highlights that much rigorous research is needed to understand the role and consequences of the attachment dynamic for child development in the context of maternal psychopathology. Work in this area is still in its relatively early stages, and understanding adult psychopathology from a developmental psychopathology approach, which considers the impact of the early social environment, has yet to evolve—even in this area related to parenting. Studies of maternal depression (differing widely in sample characteristics) predominate. We found some association between maternal mental disorder and vulnerability in infant attachment, with stronger evidence when maternal disorder is chronic, current or intermittent through infancy, and where there is comorbid disorder, trauma or loss, an insecure or unresolved attachment state of mind, and/or insensitive caregiving (Fig. 1). The relative contributions of such mediators have yet to be studied. There is some evidence that the pathway that links depression exposure to insecure attachment differs from that anteceding disorganised attachment (e.g. Campbell et al. 2004; Tomlinson et al. 2005), but on the whole, the evidence is not as clear-cut as attachment theory would contend. Further, a number of studies did not examine disorganised attachment specifically, perhaps due to sample size constraints or a specific interest in the security of attachment. As children get older, the effect of maternal depression on the child seems to diminish, although it may continue to have some effect on the caregiving environment and child perceptions of family relationships. There is little evidence overall that depression limited to the postnatal period has a direct, long-term impact on child attachment and subsequent developmental trajectories.

Among children of depressed mothers, insecure or disorganised attachment may be a risk factor for the development of internalising problems in early childhood and later depression. The evidence regarding other areas of development is more mixed, and more detailed longitudinal studies are needed to determine such long-term consequences, which also consider other maternal, social environmental and genetic/biological factors. Current evidence suggests that effects may depend on various factors that require further study, such as maternal loss/trauma, fluctuations in parenting sensitivity, gender, and cognitive delay in infancy. Within the insecure category of attachment, factors that lead to an ambivalent as opposed to an avoidant attachment are also important to study; several studies suggest that children with the latter tend to be more vulnerable to contextual risk, including maternal depression and maternal insensitivity.

There are a number of limitations to consider in the evidence we present. As this review focused on depression and psychosis studies only, the findings cannot be generalised to other groups. Variability in sample characteristics limits the extent to which studies could be compared, particularly as many studies involve multi-risk families. Space constraints limit our description of measures of attachment; however, such measures may not be comparable, particularly as assessments are age-specific. Little is yet known about the impact of specific symptoms on the attachment process, although lack of insight, the presence of intrusive, disengaged and hostile interaction, and poor reflective functioning are possible candidates. The precise impact of positive symptoms is unknown. On the other hand, research to date focuses heavily on parental cognitions as a means of transmitting risk to children. Developmental pathways are likely to be more complicated than research designs in most studies allow, which is a major caveat of the studies reviewed in the "Attachment as a mediator of child psychopathology" section. Since mental disorder is heritable, we cannot exclude a possible main effect of genetics in most studies. For example, antisocial personality disorder symptoms have linked maternal depression with offspring antisocial behaviour (Kim-Cohen et al. 2005). Studies have yet to consider complex gene-environment transactions in determining attachment in children exposed to maternal psychopathology.

Clinical implications

This review highlights that most children whose mothers have mental health problems do not develop lasting attachment difficulties. Indeed, the deterministic view that maternal disorder necessarily leads to disorganised/insecure attachment is not only empirically unfounded but also stigmatises these parents, and impedes help-seeking in those cases where attachment is a concern. The evidence is more complex, and suggests that, in the context of prolonged or severe maternal psychopathology, and especially when other associated risk factors are present (e.g. parent trauma or unresolved attachment status), children are vulnerable to developing insecure or disorganised attachments. However, in these circumstances, those children

who still go on to develop a secure attachment appear to be protected from the developmental outcomes often associated with having a parent with psychopathology. Thus, altering attachment may be an important way to enhance childhood resilience.

A main approach to attachment-based intervention centres on working with a mother's caregiving behaviour to enhance interactive sensitivity at a behavioural level, usually with reference to the infant or toddler. This intervention approach encompasses a variety of methods, often involving the use of personalised video feedback (e.g. Juffer et al. 2008). Although there is little empirical evidence to date on the efficacy of such interventions for mothers with mental disorder (Wan et al. 2008c), such methods have been effective in a range of vulnerable groups (Bakermans-Kranenburg et al. 2003; Green et al. 2008). These methods have the advantage of working on a proximal final common pathway for a number of difficulties, as well as attachment. However, most of the evidence comes from altering parenting sensitivity rather than child attachment specifically. Moreover, empirical studies using this intervention approach do not generally observe or evaluate maternal behaviour across a range of contexts; e.g. exploratory and stressful situations (Cassidy et al. 2005). Such evidence may be important in the context of maternal psychopathology, due to possible fluctuations in maternal sensitivity and the presence of other environmental stressors.

Another attachment-based approach focuses on changing the parent's attachment state of mind or 'inner working model', as well as the child–parent relationship, and therefore aims to work beyond the behavioural level. This approach typically involves psychotherapy with the mother in relation to the dyad. Although this approach has attracted less empirical study overall, parent–infant/toddler psychotherapy has some evidence base for altering attachment in toddlers of mothers with depression (Cicchetti et al. 1999; Toth et al. 2006) and for improving maternal attachment representations (Bosquet and Egeland 2001; Moran et al. 2005). In real-life practice, attachment-based programmes often include elements of both (and possibly other) 'approaches' but with different emphases (c.f. Berlin et al. 2005). Our review suggests that the most appropriate approach will depend on individual needs, and is best informed by understanding the factors associated with mental disorder that may make sensitive caregiving difficult. Such factors may include chronic symptoms, insecure or unresolved attachment state of minds, and loss or trauma in the parent. The development of interventions needs finally to be informed by investigating those mothers who maintain high maternal sensitivity despite their mental health difficulties, and who protect their child from poor outcomes.

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