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**Mind-mindedness: an examination of relational, attentional and  
psychological correlates, and response to intervention**

**Robin Schacht, B.A., Ed.M, D.Clin.Psy.**

**A thesis submitted for the degree of Doctor of Philosophy in the Department of  
Psychology at Durham University**

**September 2015**

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## **Declaration**

I, Robin Schacht, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

This thesis was prepared in accordance with the guidelines outlined by Durham University's Graduate School and in the Department of Psychology's Postgraduate Handbook. References have been amalgamated at the end of the thesis for ease of reading.

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The copyright of this thesis rests with the author. No quotation from it should be published without the author's prior written consent and information derived from it should be acknowledged.

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## Thesis Abstract

The studies reported in this thesis examined several questions in relation to mind-mindedness and maternal mental health, intervention, emotion processing, and generalization across relationships.

Study 1 compared levels of mind-mindedness in mothers with severe mental illness (SMI) to those of psychologically health controls, and evaluated a newly-designed video feedback intervention to facilitate mind-mindedness in a sample of mothers hospitalised for treatment of SMI. Results showed that, on admission to hospital, mothers showed two patterns of mind-related comments with their infants: in high levels of non-attuned mind-related comments relative to a group of psychologically well mothers, and few appropriate mind-related comments compared with psychologically well mothers. The findings suggest that SMI may impact mothers in one of two ways: they may fail to comment on their infants' internal states, or they may make frequent misattributions about their infants' internal states. Results from Study 2 also suggested that the mind-mindedness intervention was successful in reducing high levels of non-attuned comments at admission to levels no different from those of psychologically well mothers at discharge.

Study 2 investigated whether participation in the mind-mindedness intervention in hospital had an impact on attachment quality in the second year of life. This study also sought to add to the limited data on attachment security in the context of maternal mental illness, and to attempt to delineate factors that may influence attachment security in this context, such as nature, chronicity, and duration of illness. Results showed that mothers who participated in the mind-mindedness video feedback intervention were significantly more likely to have infants classified as secure and as organised than mothers who received the standard care video

feedback intervention. Results also showed a high rate of disorganised attachment and a low rate of secure attachment relative to previously published research with both normative and clinical samples. Attachment security and organisation were unrelated to the nature, chronicity, or duration of mothers' illnesses, or to the majority of demographic variables for which data were available.

Study 3 investigated relations between adults' mind-minded descriptions of friends and partners and performance on (a) a new task to assess internal state interpretations of the behaviour of unknown mothers and infants (Unknown Mother–Infant Interaction Task; UMIIT), and (b) an attentional emotion processing task. Mind-minded descriptions were unrelated to performance on both tasks. Mind-minded descriptions of partners and friends were also unrelated to internal state interpretations on the UMIIT. Parents and non-parents did not differ in their internal state interpretations during the UMIIT. Parents showed more attentional bias to infant faces than to adult faces, but only before controlling for age. Attentional bias to all faces was negatively related to internal state interpretations during the UMIIT. These results are discussed in relation to the proposal that mind-mindedness is a quality of close relationships, rather than a trait-like construct.

Findings are discussed in terms of limitations, and theoretical and clinical implications, and directions for future research are suggested.

## CHAPTER 1

### General Introduction

Attachment theory (Bowlby, 1969) proposes that infants are biologically programmed to seek proximity to adults in order to receive comfort, nourishment, and protection from danger. They signal their needs through attachment behaviours such as crying, babbling, and smiling in order to elicit attention from potential caregivers. Infants quickly discriminate between familiar and unfamiliar adults, and from six months onwards, tend to orient their attachment behaviours towards maintaining proximity to their particular caregivers, such as clinging, following, protesting departure, and greeting on return. When their caregivers are present and their attachment needs are met, infants will decrease attachment behaviours and turn their attention to exploring the environment.

Bowlby (1969, 1973) further proposed that “internal working models” of childhood attachment experiences form templates for subsequent love relationships. An infant whose needs have been met in a supportive, loving manner may develop a model of others as trustworthy and dependable, while an infant who has been neglected may subsequently expect others to be uncaring and unreliable. The child’s model of the self develops in a complementary fashion on the basis of “how acceptable or unacceptable he himself is in the eyes of his attachment figures” (Bowlby, 1973, p. 236).

Since Bowlby’s initial proposals, there has been a great deal of interest in exploring variations in and contributions to individual differences in the quality of mother–infant attachment relationships. It has generally been thought this is shaped by two main factors: maternal sensitivity towards the infant, and a mother’s internal

representation of her own attachment relationships. Empirical research on these two constructs, however, has called the importance and strength of these assumed relations into question. This is discussed in further detail below.

### **1.1 Maternal sensitivity**

Using Bowlby's theory as a template, Ainsworth's research on mother–infant interactions in Uganda and Baltimore elucidated individual differences in infant attachment behaviours as well as specific types of maternal behaviours that influenced the quality of the attachment relationship. From an in-depth series of home-based observations, Ainsworth noted wide variations in the frequency, strength, and duration of infants' attachment behaviours, as well as in the way in which they organised their responses in relation to their mothers' behaviours (Ainsworth, 1963, 1967; Ainsworth, Bell, & Stayton, 1971). Believing that the infant's response to separations from and reunions with the mother was particularly indicative of the quality of the attachment relationship, Ainsworth developed the Strange Situation Procedure as brief means of formally assessing the attachment patterns she had observed in the home (Ainsworth & Wittig, 1969). Involving two separations from and reunions with the mother over a 20-minute period, the Strange Situation assesses 1- to 2-year-old infants' behaviour towards the mother in terms of proximity-seeking, contact maintenance, avoidance, and resistance. She noted three main patterns of attachment in the Strange Situation with her Baltimore mother–infant pairs: 1) secure, which characterised infants who were distressed by their mothers' departures but comforted on her return and were able to explore the room freely in her presence; 2) insecure-avoidant, which characterised infants who showed little distress at their mothers' departure and seeming indifference on her return, and

were generally distant in her presence; and 3) insecure-resistant, which characterised infants who were highly distressed on their mothers' departure but unable to be comforted on her return, continuing to display signs of unsettlement such as anger or passivity in her presence (Ainsworth, Blehar, Waters, & Wall, 1978). These three attachment patterns are considered 'organised' strategies by which infants have learned to deal with distress (Benoit, 2004). Main and Solomon (1986) subsequently identified a fourth category, disorganised, to describe infants who exhibit odd, simultaneously contradictory or fearful behaviours on reunion, such as freezing, turning in circles, or approaching then avoiding, thus seeming to lack a organised strategy for dealing with the stress of the Strange Situation and seeking comfort (Kochanska, 2001).

Ainsworth believed that maternal behaviour was highly influential in shaping the infant responses she observed in the Strange Situation. Again based on her home observations in Baltimore, she noted that some mothers seemed highly sensitive to their babies, attuned to the child's points of view, and regarded the child "as a separate person; she also respects his activity-in-progress and thus avoids interrupting him" (Ainsworth et al., 1971, p. 43). She observed that other mothers, however, seemed less able to read their babies' signals, leading them to try to "socialize with the baby when he is hungry, play with him when he is tired, and feed him when he is trying to initiate social interaction" (Ainsworth, Bell, & Stayton, 1974, p. 129).

Ainsworth rated her Baltimore mothers' behaviour on a variety of scales, and reported on six of these (Ainsworth & Bell, 1969): mother's perception of the baby, mother's delight in the baby, mother's acceptance of the baby, appropriateness of mother's interaction with the baby, amount of physical contact, and effectiveness of

mother's response to the baby's crying. She ultimately believed, however, that "sensitivity" was the core construct underlying these different behaviours, which she defined as the mother's "ability to perceive and interpret accurately the signals and communications implicitly in her infant's behaviour, and given this understanding, to respond to them appropriately" (Ainsworth et al., 1974, p. 127). She and her colleagues thus developed a 9-point sensitivity scale designed to assess mothers' sensitive behaviour in the last quarter of the first year of the infants' life and to explore links between these ratings and the quality of the subsequent infant–mother attachment relationship as assessed by the Strange Situation. The scale rates mothers on five anchor points: 1) highly insensitive, 3) insensitive, 5) inconsistently sensitive, 7) sensitive, and 9) highly sensitive.

Ainsworth et al. (1971) reported that the sensitivity scale was able, at a broad level, to distinguish secure- from insecure-group mothers, although it was not able to differentiate between avoidant- and resistant-group mothers. They thus developed three additional scales to assess other relevant maternal behaviours: acceptance–rejection, cooperation–interference, and accessibility–ignoring. Though the figure they provide to depict their results suggests that acceptance–rejection was the only scale of the four to distinguish avoidant from resistant-group mothers, they did not provide a statistical analysis of the differences, so a formal quantification remains elusive. They did find, however, that mothers who were rated as more highly sensitive also received higher scores on acceptance, suggesting both scales were assessing the same construct.

Despite these less than straightforward findings, subsequent research has tended to focus on maternal sensitivity over any of Ainsworth et al.'s other scales in predicting attachment security. Most research has supported Ainsworth's claim that

maternal sensitivity is linked to secure attachment (e.g. Egeland & Farber, 1984; Goldberg, Perotta, Minde, & Corter, 1986; Grossmann, Grossmann, Spangler, Suess, & Unzner, 1985; Isabella, 1993) yet also replicated Ainsworth's findings that sensitivity does not predict attachment at the three-way (secure-avoidant-resistant) level (e.g. Egeland & Farber, 1984; Isabella, 1993; Stifter, Couleham, & Fish; 1993). A meta-analysis of 66 studies by De Wolff and van IJzendoorn (1997) found an overall effect size for sensitivity to be somewhat more modest than Ainsworth's original findings. The authors thus suggested that Ainsworth's study was an outlier in the field, without which the proposed causal link between sensitivity and attachment would not have been established.

Research on the antecedents of a disorganised attachment style has similarly implicated parenting quality in the development of this attachment pattern in children. Like organised forms of attachment, however, a meta-analysis of research suggests only a modest association between parental insensitivity and disorganisation (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). Other specific parental behaviours such as fear, role reversal, withdrawal, intrusiveness, negativity, and contradictory communication have been found to relate to attachment disorganisation as well (Lyons-Ruth, Bronfman, & Parsons, 1999), again suggesting an influence beyond that of maternal sensitivity.

## **1.2 Maternal attachment representations**

Bowlby suggested that "internal working models" of one's childhood attachment relationships form the basis by which we parent our own children. Attachment security is thereby transmitted from one generation to the next (Bowlby, 1969, 1973, 1980). A large body of attachment research has subsequently focused on

measuring adults' internal representations of attachment relationships and assessing their contribution to their children's attachment security.

One of the most widely used tools for assessing internal representations of attachment is the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985). This is a semi-structured interview in which adults are asked about their early experiences with attachment figures, life-time experiences of loss and trauma, and whether they believe their childhood experiences continue to influence them. Based on their responses, adults are assigned to one of four categories: autonomous (those who speak about their attachment relationships coherently and positively, are able to reflect on and demonstrate a resolution of any difficulties encountered in their past, and value attachment relationships); dismissing (those who minimise the importance of their attachment relationships, provide an unsubstantiated idealized account of childhood, disparage their attachment figures, or insist they have no memory of childhood); preoccupied (those who seem still overwhelmed by or over-involved in their childhood experiences); and unresolved (those who show substantial lapses, bizarre reasoning, or dissociation in their discourses around attachment experiences, which are marked by experiences of trauma, abuse, or loss). Classifications are based thus not on the nature or quality of childhood attachment experiences, but on the extent to which the adult appears to have integrated their experience and resolved any difficulties.

The attachment literature has generally supported Bowlby's assertion of the intergenerational transmission of attachment. Mothers classified as autonomous on the AAI have been shown to be more likely to have secure attachment relationships with their infants, both when interviewed prenatally (Fonagy, Steele, & Steele, 1991; Levine, Tuber, Slade, & Ward, 1991) and postnatally after their relationship with

their infants has been established (Dozier, Stovall, Albus, & Bates, 2001; Main, Kaplan, & Cassidy, 1985; van IJzendoorn, Kranenburg, Zwart-Woudstra, van Busschbach, & Lambermon, 1991). Steele, Steele, and Fonagy (1996) found the same relation between fathers' representations of attachment and the security of their attachments to their infants. Meta-analyses of attachment research have also demonstrated moderate to strong relations between adults' dismissing, preoccupied, and unresolved classifications on the AAI, and avoidant, resistant, and disorganised attachments, respectively, in their infants (Madigan et al., 2006; Van IJzendoorn, 1995).

Similarly to maternal sensitivity, however, concerns have been raised in the interpretation of these findings. Meins (1999) noted that the literature on the AAI has not adequately addressed how attachment relationships with the mother can be different from those with the father, despite Bowlby's (1969) assertion that the nature of internal working models of attachments are distinct to specific relationships. Meins (1999) also noted that, despite the concordance between adult attachment representations and adult–infant attachment security, it is not clear exactly *how* one's ability to talk coherently about childhood attachment experiences is related to establishing a secure attachment relationship with one's own infant. Although it had been presumed that parents' sensitive behaviour was the mechanism responsible for the link between adult attachment representations and parent-infant attachment, van IJzendoorn's (1995) meta-analysis found that parental sensitivity accounted for only 23% of the variance in the relation between maternal AAI and infant attachment. The analysis also showed that while fathers' AAI classifications were less strongly related to infant attachment security than mothers', fathers' AAI classifications were *more* strongly related to their sensitivity scores than were

mothers'. This led to van IJzendoorn's now well-known suggestion of a "transmission gap" in the means by which attachment security patterns are transferred across generations. Meins and Bernier (2008) similarly note that while atypical maternal behaviours account for a portion of the relation between unresolved status on the AAI and disorganised attachment, a more precise mediation analysis reveals a substantial proportion of unexplained variance between unresolved AAI and disorganised attachment. This finding again suggests other mechanisms responsible for the relation between adult attachment style and attachment relationship with one's own infant.

### 1.3 Mentalization and the transmission gap

In recent decades, Meins and Fonagy have independently proposed that the mechanism by which the transmission gap may be bridged is caregiver *mentalization*, or a parent's capacity to accurately ascribe thoughts, feelings, intentions, and desires to their infant (Fonagy & Sharp, 2008; Meins, 1999). They also argue that this capacity may be a better predictor of attachment security than Ainsworth's sensitivity scale, which has been used over time less precisely than Ainsworth seems to have intended to assess a wide array of "sensitive" caregiver behaviours with little regard to the *appropriateness* of caregivers' responses (Meins, 1999). Fonagy has chosen the term "reflective function" to describe this capacity, while Meins has coined the term "mind-mindedness". The former has its origins in adult attachment representations, whereas the latter developed from the concept of sensitivity in responding to the infant's cues. These two terms are reviewed and contrasted below, and empirical research on both constructs and their relation to child outcomes is summarised.

### 1.3.1 Reflective function

Fonagy, Steele, Steele, Moran, and Higgit (1991) first defined the “reflective self”: “The reflective self reflects upon mental experience, conscious or unconscious. It registers psychic life and constructs representations of feelings and thoughts, desires and beliefs. Most important, it is aware that its representations of its behaviour and actions are shaped by the content of others’ mentation” (p. 202). These ideas about the reflective self were initially based on clinical observations of patients who showed “an extraordinarily diminished capacity to reflect on feelings they [were] so obviously experiencing” (Fonagy et al., 1991a, p.202-3), leading to difficulty in making sense of themselves and those around them. Fonagy et al. argued that the reflective self originates from the individual’s ability to form a coherent representation of their own attachment experiences in childhood, and thus used Adult Attachment Interview (George, Kaplan, & Main, 1996) transcripts to develop a coding scheme to assess the extent to which parents appeared to understand others’ intentions.

This original concept of reflective-self function has developed into the construct of reflective functioning (RF), which was formally operationalized in a coding manual in 1998 (Fonagy, Target, Steele, & Steele, 1998). RF is assessed from the individual’s capacity to reflect upon the mental states and intentions of their own caregivers in attachment situations in response to questions on the AAI that target reflection of unobservable mental states, such as “Why do you think your parents behaved the way they did?” and “How do you think your childhood experience may affect your behaviour as a parent?” (Slade, 2005). Responses are coded on an 11-point scale with six anchor points, ranging from bizarre (-1) to high (+9) RF based on

the extent of awareness of the nature of mental states, their developmental aspects, and their influence on behaviour. Low-level RF is indicated by responses that are over-general, banal, characterised by platitudes, lacking in reference to motives guiding others' behaviour, or that ascribe behaviour to external factors. Individuals displaying moderate RF take mental states into consideration, but in a superficial, self-deceptive, or self-serving manner. At the high end of RF, interviewees make frequent references to multiple mental states underlying interactions, are able to acknowledge both malevolent and benign behaviour in themselves and their parents, and are aware of differences between child and adult mental functioning.

Fonagy and colleagues have subsequently elaborated on the distinction between the more general capacity of mentalization and reflective functioning. Mentalization is a construct derived from Freud's initial concept of "Bindung," or linking, defined as a qualitative change from physical (immediate) to psychic (associative) ways of representing internal affairs (Fonagy et al., 2004). It also shares similarities with Klein's (1946) notion of the "depressive position," which entails recognition that others suffer, and the ability to acknowledge our role in that suffering without resorting to primitive defences or distortions (Fonagy et al., 2004; Slade, 2005).

Mentalization is "our capacity to ascribe thoughts, feelings, ideas and intentions to ourselves as well as to others, and to employ this capacity in order to anticipate and influence our own and others' behaviour" (Sharp & Fonagy, 2008, p. 738). This ability allows one to make sense of interpersonal experiences, regulate affect, and form intimate and adaptive social relationships (Slade, 2005; Sharp & Fonagy, 2008). Encompassing both cognitive and affective ways of knowing, it is "the ability to think about feeling and to feel about thinking," and "a non-defensive

willingness to engage emotionally, to make meaning of feelings and internal experiences without becoming overwhelmed or shutting down” (Slade, 2005, p. 71). When the capacity for mentalization is employed within the context of an attachment relationship, Fonagy and colleagues refer to it as reflective functioning, described as “the parent’s capacity to reflect upon his/her own or the child’s internal mental experience within the context of attachment style” (Sharp & Fonagy, 2008, p. 740).

The original AAI-based RF scale has also been adapted for use with other interviews, including the Parent Development Interview (PDI; Aber, Slade, Berger, Bresgi, & Kaplan, 1985) and the Working Model of the Child Interview (WMCI; Zeanah, Benoit, Hirshberg, Barton, & Regan, 1994). These interviews assess parents’ internal working models of relationships to their children (or unborn children) and their capacities to reflect on or imagine their children’s thoughts, feelings, and behaviours. They are coded on dimensions of parents’ representation of their own and their child’s affective experience, as well as richness of perception and coherence (Slade, 2005). While the PDI is coded for RF using the same 11-point ordinal scale as outlined for the AAI (Slade et al., 2005), the WMCI is coded for RF with a reduced 5-point scale, consistent with the coding for other WMCI scales (Rosenblum et al., 2008).

### **1.3.1.1 Reflective functioning and infant–caregiver attachment security.**

In developing their ideas about RF, Fonagy and colleagues have attempted to expand traditional attachment theory, with its emphasis on cognitive processing and representational models, to incorporate the recognition that attachment relationships are oriented around the regulation of intense affect (Slade, 2005). Fonagy et al. (2004) suggested that a secure attachment relationship develops initially through the

mother's capacity to hold complex mental states in mind and to access emotions and memories from her own attachment experience coherently. This enables her to hold a representation of her child as also having feelings, desires, and intentions, and to help make meaning of the child's affective experience by recognising and "re-presenting" these states back in an accurate, regulated manner. This process is begun in infancy through "affect mirroring," whereby mothers produce exaggerated expressions of emotion in response to their infants' affect, allowing infants to observe their own mental states in their mothers and gradually to recognise these states in themselves (Slade, 2005). In childhood, this process continues through the mother's capacity to playfully enter into and reflect the imaginative world of the child during conversations and play (Fonagy et al., 2004), to recognise the mental states underlying her child's behaviour, and adjust her own behaviour accordingly (Fonagy, Steele, Steele, Moran, & Higgit, 1991). A child thus develops a sense of security by having affect, tolerable and intolerable, recognised, mirrored, and contained (Fonagy & Target, 1997).

Their first empirical exploration of the ramifications of this reduced capacity for reflection took place in a study examining the concordance of parents' attachment representations on the AAI assessed before the birth of their first child, and their children's attachment security to the mother at 12 and to the father at 18 months (Fonagy, Steele, & Steele, 1991). They found a strong predictive relation between mothers' representations of their childhood attachment relationships and their infants' attachment security, as well as a somewhat weaker but independent relationship between paternal attachment representations and infant attachment. Secure infant-parent attachment was associated with secure/autonomous parental AAI, and the coherence subscale of the AAI was the best predictor of infant-parent

attachment security. When Fonagy and colleagues applied the RF scale to the AAI interviews from this study, they found that parental RF was more strongly correlated with infant attachment security than was coherence on the AAI, and that when RF was controlled for, coherence no longer related significantly to infant security, implying that it was possible to explain the relationship between adult and infant attachment patterns in terms of parental RF (Fonagy et al., 1991).

Two subsequent studies have also linked maternal RF to infant attachment security. In a study which administered the AAI to 40 mothers during pregnancy and the PDI at 10 months post-partum, Slade, Greinenberger, Bernbach, Levy, and Locker (2005) found that maternal RF on the PDI post-partum was predicted by mothers' AAI classifications during pregnancy, and RF predicted infant attachment security in the Strange Situation at 14 months. There was a weak positive correlation between maternal attachment on the AAI and infant attachment in the Strange Situation, but when RF on the PDI was factored in as a mediator, this correlation disappeared. The authors noted, however, that factors including a small sample size and the weak link between adult and infant attachment security necessitate further exploration of RF as a mediator within a larger sample.

In a sample of 41 mothers with PTSD resulting from interpersonal violent trauma and their children aged 8 – 50 months, Schechter et al. (2005) also found a strong association between higher mean RF and mothers' balanced representations of their attachment relationships with their children, both coded from the WMCI. (Note that this study used Fonagy and colleagues' [Fonagy et al., 1998] original RF coding scheme, and added additional probes to the WMCI to elicit mothers' thinking about mental states. WMCI classifications and RF were then rated separately by independent coders.) Since this study did not assess infant attachment, it is not

possible to know how mothers' RF may have mediated any relations between WMCI classifications, PTSD, and infant security in this sample.

### 1.3.2 Mind-mindedness

As discussed above, parental RF is assessed from caregivers' discourse during interviews and therefore does not reflect caregivers' ability to reflect on their children's internal states during actual caregiver–child interaction. In contrast, caregiver mind-mindedness (Meins, 1997) is assessed from observations of infant–caregiver interaction. Sharp and Fonagy (2008) recognised and discussed this difference, suggesting that mind-mindedness and RF are unified by their attention to parents' capacities to treat children as mental agents and the importance this has for children's later understanding of their own and others' minds. Further, they differ only in operationalisation: “It may be argued that both concepts share a common underlying neurobiology, with [maternal mind-mindedness] expressing itself in real-life interaction with the child, and RF expressing itself through the metacognitive representations that the mother holds about the relationship with the child” (p. 744). However, one critical difference that results from mind-mindedness being assessed directly from observations of infant–caregiver interaction is that mind-mindedness allows one to assess the extent to which parents' representations of their infants' internal states are *accurate*.

The construct of mind-mindedness grew from Ainsworth's concept of maternal sensitivity. As noted earlier, Ainsworth et al. (1971, 1974) had observed that sensitive mothers are attuned to their children's points of view, while insensitive mothers, though just as responsive to their infants as sensitive mothers, seemed less able to accurately read their babies' signals. Thus, insensitivity did not involve

ignoring or failing to register the infant's cues, but an inability to understand what the cues meant. Consequently, Ainsworth et al.'s concept of sensitivity is considerably more than the mere behavioural response to a cue.

Meins (1999) argued that the lack of specificity in Ainsworth et al.'s (1974) rating scale regarding particular behaviours indicative of sensitivity, the context in which the measure should be used, or the ideal length of the observational period has resulted in "a serious mismatch between the types of behaviour now considered to be indicative of sensitivity and those that Ainsworth et al. appear to have intended when they devised their scale" (p. 329). In particular, Meins noted that much of the subsequent research on sensitivity and attachment had focused on mothers' prompt or contingent responses to their infants while ignoring the *appropriateness* of these responses, which in Ainsworth's theory is crucial to the establishment of a secure attachment relationship.

Meins, Fernyhough, Fradley, and Tuckey (2001) operationalised the construct of mind-mindedness to capture Ainsworth's distinction between sensitive and insensitive mothering, but also explicitly to assess sensitivity to the child's mental states. "Mind-minded" mothers are sensitive to their infants' desires and intentions and will thus change the focus of their own attention in response to infants' behavioural cues, such as shifts in attention: the essential quality of maternal sensitivity.

In their initial attempt to quantify this new construct, Meins et al. (2001) made observations of mothers playing with their 6-month-olds and defined five dimensions in which mothers could express mind-mindedness. The first two, *responsiveness to change in infant's direction of gaze* and *responsiveness to infant's object-directed action* focused on instances in which mothers looked at, touched, or

named an object to which the infant was directing his or her attention or behaviour. These behaviours were presumed to be indicative of mind-mindedness as they entailed a recognition that the infant's agenda was not necessarily the same as the mother's as well as a willingness to shift to the infant's focus of interest. Mothers were given proportional scores for both indices based on the number of contingent changes in attention they made in response to infants' gaze changes or object-directed actions relative to the total number of gaze changes and object-directed actions displayed by the infant. The third dimension, *imitation*, was also scored as a proportion of the number of precise repetitions mothers made of infant sounds relative to the number of sounds the infant produced. Meins et al. reasoned that imitation was indicative of mind-mindedness as it suggested mothers attributed meaning and intention to their infants' vocalisations.

The fourth dimension, *encouragement of autonomy*, was scored based on the number of times mothers encouraged their infants to perform actions by themselves, such as sitting up or getting a toy just out of reach, relative to the total number of maternal behaviours coded. This type of maternal behaviour was thought to be indicative of mind-mindedness as it suggested that mothers viewed their infants as intentional beings capable of autonomous action. The fifth dimension, *appropriate mind-related comments*, was defined as the number of verbal references mothers made to their infants' mental states, such as their knowledge, thoughts, desires, interests, emotional states, or attempts to manipulate others' beliefs, that appeared accurately to reflect the mental state the infant seemed to be experiencing. Mothers were then given scores for appropriate mind-related comments relative to the total number of comments made by mothers during the testing session.

More recently, Meins et al. (2012) explored in greater detail comments that

indicated a misinterpretation of the infant's internal states. The coding scheme for mind-mindedness requires any comment that pertains to the infant's internal states to be coded as appropriate or non-attuned, but Meins et al.'s (2001) study focused only on appropriate mind-related comments. Their later study reported that non-attuned comments were unrelated to maternal sensitivity; non-attuned comments were also unrelated to appropriate mind-related comments. This null association between appropriate and non-attuned mind-related comments was also reported by Arnott and Meins (2007). Meins and colleagues (Meins et al. 2012) thus argued that mind-mindedness has two separate dimensions: appropriate, which encompasses sensitivity, responsiveness and engagement, and non-attuned, which indexes the caregiver's lack of engagement with the infant's point of view and imposition of their own agenda. Meins et al. also argued that it is possible for caregivers to evidence both kinds of attunement. This is in contrast to the unidimensional construct of sensitivity, which is assessed on a scale ranging from low to high sensitivity; therefore, a caregiver cannot be rated as both highly sensitive and insensitive in the same assessment. Due to the fact that appropriate and non-attuned mind-related comments have been demonstrated to be the only one of the five original indices to predict children's later development (Meins, 2013; Meins et al., 2003), mind-mindedness research now focuses exclusively on mind-related comments as an index of caregivers' attunement to their infants' internal states.

Meins, Fernyhough, Arnott, Turner, and Leekam (2011) found concordance in both appropriate and non-attuned mental state comments over a 4-month period between 3 and 7 months, suggesting that both indices of mind-mindedness show a degree of stability during the first year of life. Over the longer term, Meins et al. (2003) reported that mothers' mind-mindedness in free play with their 6-month-olds

was positively correlated with their use of mental state characteristics to describe their children at age four years.

**1.3.2.1 Mind-mindedness and attachment security.** As well as exploring relations between the mind-mindedness indices and maternal sensitivity, Meins et al. (2001) investigated how mind-mindedness predicted attachment security at age 12 months. Of the five mind-mindedness dimensions, only mothers' appropriate mind-related comments was a significant predictor of attachment security at 12 months; higher levels of appropriate mind-related comments were associated with secure infant–mother attachment. Moreover, appropriate mind-related comments predicted attachment security independently of maternal sensitivity and accounted for more variance in attachment security than did maternal sensitivity (12.7% compared with 6.5%). Lundy (2003) and Laranjo, Bernier, and Meins (2008), using the Attachment Q-sort, and Arnott and Meins (2007), using the Strange Situation procedure, all replicated this positive relation between appropriate mind-related comments and infant attachment security.

These previous studies did not consider the role of non-attuned mind-related comments in predicting attachment security and, due to their small sample size, were unable to investigate how mind-mindedness related to attachment security across all four categories (secure, insecure-avoidant, insecure-resistant, insecure-disorganised), reporting only on dichotomous (secure/insecure) attachment security. Meins et al.'s (2012) large scale study, however, addressed these shortcomings. In a socially diverse sample of 206 mother–infant pairs, they found that higher scores for appropriate mind-related comments and lower scores for non-attuned comments made by mothers in free play with their 8-month-old infants distinguished secure

from insecure-avoidant, insecure-resistant, and insecure-disorganised attachment groups in the Strange Situation at 15 months. They also found that higher scores for appropriate mind-related comments and lower scores for non-attuned mind-related comments independently predicted attachment security at a dichotomous organized/disorganized level. Maternal sensitivity, however, did not predict attachment security or organization, except in the case of low socioeconomic status, in which sensitivity was related to dichotomous secure/insecure attachment. These results point to the importance of both appropriate and non-attuned mind-related comments in predicting attachment security and organisation.

### **1.3.3 Mind-mindedness and RF**

Thus far, only two studies have directly examined the relation between mind-mindedness and RF. In a study of couples, Arnott and Meins (2007) found that paternal RF in the AAI during pregnancy was positively correlated with use of appropriate mind-related comments in interactions with their infants at 6 months, while maternal RF in pregnancy was negatively correlated with use of non-attuned mind-related comments in parents' interactions with their 6-month-olds. Rosenblum, McDonough, Sameroff, and Muzik (2008) also studied the relation between mothers' mind-mindedness in interactions with their 7-month-old infants and concurrent ratings of maternal RF using the WMCI, reporting a positive correlation between RF and total number of appropriate mind-related comments.

From the current review of mind-mindedness and RF, it could be suggested that their differences stem from the theoretical orientations of their authors, which have subsequently influenced the ways in which each concept is measured and the domains in which they are researched. Fonagy's ideas about RF emerged from his

study of self-object relations in analytic writings, his clinical observations of the ways patients represented their relationships with others in the context of therapy sessions, and his observations of instances of mentalization within adult narratives of childhood attachment relationships in the AAI. As such, RF as a concept is measured at the *representational* level in the ways in which adults talk about their attachment relationships, with attention to an individual's understanding of affect and mental states in both *self* and *the other*. Meins' ideas about mind-mindedness, by contrast, stem from her cognitive-developmental orientation, and were influenced by her laboratory-based observations of the ways parents expressed recognition of their young children's mental states through their *behaviour* and use of mental state language in interactions, and the resulting impact on children's emotional and cognitive development. Meins' concept of mind-mindedness is less a product of the interest in the parent's recognition of his or her own mental experience, but more the extent to which parents can accurately recognise the *child's* internal world and express this understanding through language and behaviour in live interactions with their children.

The differences in the assessments might suggest that, despite their similarities, mind-mindedness and RF are tapping slightly different capacities. The capacity to be reflective offline may or may not translate to the ability to be mind-minded in a live interaction with one's child, which requires quick and accurate perception of the thoughts, feelings and desires underlying the child's behaviour in the moment, while simultaneously experiencing any of one's own positive or negative emotions that may have been triggered in the interaction. Support for this proposal would come from finding stronger relations between mind-mindedness and the quality of infant–mother interaction than between RF and the quality of infant–

mother interaction.

Results from a few existing studies so far yield equivocal findings on this question. Meins et al. (2001) investigated how the five mind-mindedness indices related to Ainsworth's et al.'s (1974) maternal sensitivity scores. They found that sensitivity was positively correlated with scores for all of the mind-mindedness indices except *Encouragement of autonomy*, but that the two mind-mindedness indices that were most strongly correlated with sensitivity (*Maternal responsiveness to change in infant's direction of gaze* and *Appropriate mind-related comments*) each accounted for only 16% of the variance in sensitivity. They interpreted this to mean that mind-mindedness and sensitivity, though related, are measuring distinct aspects of mother–infant interaction. In their more recent large-scale study, Meins et al. (2012) found an almost identical correlation between appropriate mind-related comments and maternal sensitivity (.39 cf. .40 in Meins et al., 2001), but no relation between non-attuned mind-related comments and maternal sensitivity. Other authors have similarly found positive associations between maternal sensitivity and appropriate mind-related comments (Laranjo et al., 2008; Lundy, 2003). Meins et al. (2012) argued that appropriate mind-related comments and sensitivity appear to index the same general responsiveness in caregivers, whereas non-attuned mind-related comments are orthogonal and tap into a distinct inability to read the infant's internal states.

Two studies (Rosenblum et al., 2008; Stacks et al., 2014) have explored the relation between RF and sensitivity. Rosenblum et al. (2008) reported that RF as assessed in the WMCI was positively correlated with sensitive interactive behaviour and negatively correlated with intrusive, angry, and anxious maternal behaviour. The authors also stated that mothers' appropriate mind-related comments did not predict

the variables assessing the quality of maternal interaction once RF had been controlled, however they did not report the specific analyses, so it is difficult to draw strong conclusions from this study. In a study of women with and without a history of childhood maltreatment and their infants, Stacks et al. (2014) found that RF as assessed in the PDI was positively correlated with parenting sensitivity and negatively correlated with parenting negativity. Children classified as secure in the Strange Situation were also more likely to have mothers high in RF than children classified as avoidant or disorganized, and mediational analyses revealed an indirect effect of RF on attachment security via parenting sensitivity as well as, in a separate analysis, via parenting negativity.

#### **1.4 Mentalization and children's development**

As well as predicting infant–caregiver attachment security, maternal mind-mindedness has been found to predict various aspects of children's later development. Meins et al. (2002) found that mothers' appropriate references to their children's mental states during free play at 6 months was positively correlated with children's performance on a battery of theory of mind tasks at 45 and 48 months. Laranjo, Bernier, Meins, and Carlson (2010) found that mothers' appropriate mental state comments during free play without toys with their 12-month old children was related to children's performance on discrepant desires understanding at 26 months, while mothers appropriate mental comments in play with toys at 12 months was related to children's understanding of visual perspectives at 26 months. Bernier, Carlson, and Whipple (2010) found a positive association between mothers' appropriate mind-related comments with their infants at 12 and 15 months, and their children's executive functioning at 18 and 26 months.

In contrast to this well-established literature on relations between mind-mindedness in the first year of life and children's later development, no study has investigated links between early parental RF and aspects of children's development other than infant attachment security and quality of parent-child interaction.

## **1.5 Questions addressed in this thesis**

The sections above show that mind-mindedness is a direct measure of caregivers' representations of their infants' internal states and thus enables researchers to assess the extent to which any conjecture about the infant's thoughts or feelings matches the infant's concurrent state and can thus be deemed to be an accurate reflection of the infant's mind. Mind-mindedness in the first year of life also appears to have long term consequences for children's development, with early appropriate mind-related comments predicting positive aspects of development and non-attuned comments predicting less optimal development. Given that mind-mindedness is a predictor of positive developmental outcomes, a number of obvious questions arise: (a) what makes some parents more mind-minded than others? (b) can parents be taught to become more mind-minded, and if so, would this have a positive impact on children's later development? and (c) is mind-mindedness trait-like, specific to relationships, or influenced by other implicit psychological factors such as emotion processing? Addressing these questions was the aim of the studies reported in this thesis.

### **1.5.1 Individual differences in mind-mindedness**

Research has approached the question of why individuals vary in mind-mindedness by investigating whether mind-mindedness is determined by the

characteristics of either the caregiver or the child. Studies have explored how a number of characteristics relate to caregivers' appropriate and non-attuned mind-related comments in the first year of life. Maternal mind-mindedness has been shown to be unrelated to infant characteristics such as temperament, gender, birth order or cognitive ability (Meins et al., 2001; Meins et al., 2011). It has also been found to be unrelated to maternal education, SES, or perceived social support (Meins et al., 2001; Meins et al., 2011). Maternal mind-mindedness has, however, been found to be associated with lower levels of self-reported parenting stress (McMahon & Meins, 2012), perhaps because having an understanding of the mental states underlying children's behaviour makes parents less likely to view the behaviours as irritating or difficult, or, alternatively, because parents who are less stressed have more attentional and emotional capacity available to consider their children's internal states.

There is a small but growing body of research looking at mind-mindedness in relation to more significant emotional distress. In a small scale study, Lundy (2003) investigated how depressive symptoms related to individual types of appropriate mind-related comments in a community sample of mothers and fathers. Depression was unrelated to all types of appropriate mind-related comments in fathers, but there was a more complex pattern of findings in mothers. Results showed a negative association between depression and mothers' comments on thoughts, knowledge, and desires, no relation between depression and comments on emotional engagement and speaking on the infant's behalf, and a positive association between depression and comments that the infant was seeking to manipulate the mother's internal state. However, the frequencies of all types of mind-related comment were very low in all categories, and parents' overall verbosity was not controlled, so these findings must

be treated with caution. In the largest community study to have investigated relations between early mind-mindedness and maternal mental health, Meins et al. (2011) found that appropriate mind-related comments were unrelated to self-reported concurrent depression, and that while non-attuned mind-related comments were positively correlated with depression, the effect for this relation was small.

Only one study has investigated how clinical levels of mental illness relate to caregivers' mind-mindedness in the first year of life. Pawlby et al.'s (2010) study involved women resident on a psychiatric inpatient unit who were suffering from a range of severe mental illnesses (depression with or without psychosis, schizophrenia, and mania with or without psychosis). Mothers were filmed interacting with their infants on admission to the unit, and a second interaction was filmed when women were discharged. As well as investigating differences in appropriate and non-attuned comments between the different diagnostic groups, the hospitalised women were compared with psychiatrically healthy controls. Pawlby et al. found that on admission, there was a non-significant trend for mothers with depression to be less likely to comment appropriately on their infants' mental states than mothers with schizophrenia, mania, or no mental illness. This difference was not present at discharge and there were no other differences in either appropriate or non-attuned mind-related comments between the groups. However, this study did not compare mind-mindedness in the hospitalised women as a whole against psychologically well mothers, and levels of both appropriate and non-attuned mind-related comments at both admission and discharge appeared low in all of the diagnostic groups compared with the psychologically well mothers, suggesting that mental illness was associated with a decline in mothers' references to their infants' internal states.

Study 1 of this thesis returned to the relation between severe mental illness (SMI) and mind-mindedness to investigate whether levels of mind-mindedness were different in mothers hospitalised with SMI compared with psychologically well mothers.

### **1.5.2 Intervening to improve mind-mindedness**

As well as investigating the question of whether varying levels of maternal mental health might help explain individual differences in mind-mindedness, Study 1 also focused on the first part of the second question of the thesis: can parents be taught to become more mind-minded?

Numerous parent–infant interventions aiming to promote secure attachment have been developed and empirically evaluated over the past two decades in at-risk families including those affected by poor maternal mental health. These interventions have sought to facilitate secure attachment via a number of mechanisms: enhancing parental behavioural sensitivity, altering parents' own representations of attachment and negative perceptions of their children, eliciting greater social support, and improving maternal mental health. Many interventions are delivered via video feedback, a method in which parents are videotaped interacting with their children and then later review the tape with a clinician focusing on particular problematic or successful interactions. These include the Circle of Security intervention (Marvin, Cooper, Hoffman, & Powell, 2002), the Video-Feedback Intervention to Promote Positive Parenting (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2008), Attachment and Biobehavioural Catch-up (Bick & Dozier, 2013), and the Clinician Assisted Videofeedback Exposure session (Schechter et al., 2006). Video feedback has been shown to result in rapid, positive changes in parenting perceptions and

interactive behaviour over short periods of time (Beebe, 2003; Van den Boom, 1994).

The aim of Study 1 was to explore whether a newly-designed video feedback intervention specifically targeting mind-mindedness – in other words, purposefully drawing a mother’s attention to the mental states underlying her infant’s behaviour during play interactions and helping her perceive these states accurately – would be viable, effective, and feasible in a sample of mothers with SMI who were hospitalised in a mother and baby psychiatric unit in the first year postpartum.

### **1.5.3 Does facilitating mind-mindedness have a positive impact on children’s development?**

As well as evaluating the efficacy of the intervention in improving mind-mindedness, we sought to establish whether the intervention would be associated with more positive longer-term outcomes. Study 2 of this thesis examined whether mothers with SMI who received a video feedback intervention focusing on increasing mind-mindedness in the first year post-partum were more likely to have children classified with secure or organised attachments in the second year of life. This study also explored the more general question of how maternal mental illness relates to attachment security and organization, a topic around which the existing literature is limited and inconclusive. Though there is a general association between maternal mental illness and insecure and disorganised attachment, factors such as the nature, severity, and chronicity of the illness have more specific effects on attachment quality (Atkinson et al., 2000; Hipwell, Goossens, Melhuish, & Kumar, 2000; Tharner et al., 2012). It may also be that maternal mind-mindedness has a mediating role between maternal mental illness and attachment security.

#### 1.5.4 Is mind-mindedness trait-like?

Little is known about the social cognitive processes that underlie mind-mindedness. The associations between mind-mindedness and infant–caregiver attachment security and the largely null findings between individual child and caregiver characteristics and caregiver mind-mindedness suggest that mind-mindedness is not trait-like, but Meins, Fernyhough, and Harris-Waller’s (2014) study is unique in testing the nature of the mind-mindedness construct directly.

It is important to point out that Meins et al.’s (2014) study assessed mind-mindedness in a different format to the observational measure of appropriate and non-attuned comments that has been the sole focus of the material discussed above. Meins et al. assessed mind-mindedness from descriptions of target individuals or items, based on Meins, Fernyhough, Russell, and Clark-Carter’s (1998) ‘describe-your-child’ measure of mind-mindedness. Meins et al. (1998) developed this description-based assessment to measure caregiver mind-mindedness in relation to children of preschool age and above. Parents are simply given an open-ended invitation to describe their child, and the extent to which they focus on mental and emotional characteristics denotes mind-mindedness. This measure can also be used to assess mind-mindedness in adults’ descriptions of their adult friends (Meins, Harris-Waller, & Lloyd, 2008).

Meins et al. (2014) argued that, if mind-mindedness is trait-like, individuals should show the same level of mind-mindedness regardless of the individual toward whom they are demonstrating mind-mindedness. In order to test this hypothesis, Meins et al. conducted a series of studies in which adults were asked to describe a

range of different targets, with mind-mindedness being coded from their descriptions. Good concordance in mind-mindedness was observed for adults' descriptions of different individuals with whom they had close personal relationships (partner and child, friend and partner). However, adults' tendency to describe a famous figure or work or art in mind-minded terms was unrelated to their mind-mindedness in relation to a significant other. Moreover, levels of mind-mindedness were significantly higher when describing a significant other than when describing a famous figure or work of art. On the basis of these findings, Meins et al. argued that mind-mindedness is not trait-like; rather, it is a quality of close relationships.

Mind-mindedness may also be affected by emotion-processing abilities. Individuals who spontaneously focus on internal states when describing significant others may be biased toward attending to emotional states, or they may process emotions more effectively than individuals who are not mind-minded. Research has demonstrated that humans tend to show attentional bias to emotionally salient faces; for instance adults are quicker to detect faces expressing anger and fear than those expressing happiness or sadness (e.g., Mogg, Garner, & Bradley, 2007), perhaps as a way to motivate self-protection from potential danger, and women who are pregnant have been shown to have an attentional bias for distressed infant faces over happy or neutral infant faces (Pearson, Cooper, Penton-Voak, Lightman, & Evans, 2010), perhaps as a way to ensure the survival of the species.

However, there are individual differences in attention processing. For instance, mothers appear to demonstrate greater attentional bias to infant faces than women who do not have children, and to distressed infant faces in particular (Thompson-Booth et al., 2014a, 2014b). A caveat to this is a finding by Pearson et al. (2010) that women who reported symptoms of depression in pregnancy disengaged

their attention from pictures of distressed infants more quickly than non-depressed women, and also disengaged from pictures of distressed infants more quickly than they did from pictures of happy or neutral infant faces. It may be that attentional bias towards or avoidance of infant faces or different emotional expressions may be a salient factor influencing an individual's ability to be mind-minded. In addition, if mind-mindedness were found to be related to individuals' general emotion-processing abilities, this would call into doubt the assumption that mind-mindedness is a quality of personal relationships.

The aim of Study 3 was thus to examine whether mind-mindedness is a relational construct by investigating whether underlying differences in emotion processing could explain why some individuals are more likely to focus on internal states when describing significant others, and whether mind-minded descriptions of significant others related to internal state interpretations of interactions between unknown mothers and infants.

## CHAPTER 2

### **Study 1: Assessing the efficacy of an intervention to facilitate mind-mindedness in mothers hospitalised for severe mental illness**

#### **2.1 Introduction**

Longitudinal studies have highlighted maternal mind-mindedness as a positive predictor of core aspects of children's social-emotional and cognitive development. Mind-mindedness is assessed in the first year of life on the basis of the caregiver's tendency to comment appropriately on the infant's internal states (e.g., saying that the infant wants a toy if he gestures towards it, or that the infant is happy if she smiles) or misinterpret the infant's thoughts and feelings (e.g., saying that the infant is scared in the absence of any startled behaviour or fearful expression). Mind-mindedness is associated with high levels of appropriate mind-related comments and low levels of non-attuned mind-related comments (Meins, Fernyhough, Fradley, & Tuckey, 2001; Meins et al., 2012).

Caregivers' appropriate mind-related comments in the first year of life predict secure attachment (Lundy, 2003; Meins et al., 2001, 2012) and superior executive function (Bernier, Whipple, & Carlson, 2010), theory of mind (Laranjo, Bernier, Meins, & Carlson, 2010, 2014; Meins et al., 2002, 2013), and emotion understanding (Centifanti, Meins, & Fernyhough, 2015) abilities. In contrast, non-attuned mind-related comments are negatively related to children's early language acquisition and symbolic play (Meins et al., 2013). While all of these studies have demonstrated considerable individual differences in caregiver mind-mindedness, previous research has so far shed little light on why some caregivers are more mind-minded than others. For example, mind-mindedness is unrelated to maternal characteristics such

as socioeconomic status (Meins, Fernyhough, Arnott, Turner, & Leekam, 2011), and to infant characteristics such as general cognitive ability (Meins et al., 2001) or temperament (Meins et al., 2011). Meins, Fernyhough, and Harris-Waller (2014) thus argued that mind-mindedness is a quality of relationships rather than being driven by the characteristics of the individual caregiver or child.

The aim of the present study was to investigate how more complex psychological characteristics are related to mind-mindedness, focusing specifically on maternal mental health. Only two studies have investigated relations between maternal mental health and mind-mindedness in the first year of life. In their community sample, Meins et al. (2011) reported that appropriate mind-related comments were not related to mothers' reported depressive symptoms, and while the positive correlation between depressive symptoms and non-attuned mind-related comments was significant, the effect was small. Pawlby et al. (2010) investigated the relation between mind-mindedness and mental health in a sample of mothers who were hospitalised for a range of severe mental illnesses (SMI) on a residential mother-and-baby unit (MBU). Mind-mindedness was assessed from infant–mother interactions both on admission to and discharge from the unit. There were no differences in mind-mindedness among the different diagnostic groups (depression, schizophrenia, and mania), and no statistically significant differences compared with psychologically well controls, although there was a trend for depressed mothers to be less likely to comment appropriately on their infants' internal states on admission. However, these null findings compared with controls were unexpected. Pawlby et al. had hypothesised that the social withdrawal, impaired concentration, low mood, and fatigue associated with clinical depression would impair mothers' mind-mindedness,

as would the theory of mind deficits associated with schizophrenia (Brune, 2005; Corcoran et al., 1995).

Although Pawlby et al.'s (2010) study found no significant differences between the different diagnostic groups and psychologically well mothers, no analyses were conducted comparing psychologically well mothers with those in the diagnostic groups combined. Calculating the overall means for appropriate mind-related comments (2.67) and non-attuned mind-related comments (0.98) in mothers with SMI shows that both are noticeably lower than those from the psychologically well controls (5.34 and 2.37 respectively). This suggests that the mothers with SMI in this study rarely talked about their infants' internal states. The first aim of the present study was thus to establish that levels of mind-mindedness were indeed different in mothers with SMI compared with psychologically healthy controls. Once this had been achieved, our main aim was to design and evaluate an intervention that highlighted infants' internal states in order to facilitate mind-mindedness in a sample of mothers hospitalised for SMI.

We chose to deliver the intervention using video feedback, a method used in various parent–infant therapies, in which parents are filmed interacting with their children, and later review the film with a clinician focusing on particular problematic or successful interactions. This approach allows parents to notice and reflect on behaviour that is out of conscious awareness and become more aware of their infant's active participation in the interaction (Beebe, 2010). Video feedback interventions described in the literature generally take two approaches, sometimes individually and sometimes in combination: (a) interventions at the behavioural level with the aim of increasing parental sensitivity and attachment security (e.g., the Circle of Security intervention, Marvin, Cooper, Hoffman, & Powell, 2002; the

Video-Feedback Intervention to Promote Positive Parenting, Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2008); or (b) interventions that target parental reflective function and aim to change parents' negative or distorted internal representations of their children (e.g., psychoanalytically-oriented microanalysis of taped interactions, Beebe, 2003; the Clinician Assisted Videofeedback Exposure Session (CAVES), Schechter et al., 2006). Fukkink's (2008) meta analysis showed that both approaches are equally effective in improving parental sensitivity and increasing positive perceptions of parenting in families with young children, often within a period of a few months.

Though most research has been conducted with families in the community with a range of difficulties and levels of risk, two studies have reported on the use of video feedback to increase behavioural sensitivity in mothers hospitalised with SMI (Bilszta et al., 2012; Kenny et al., 2013). Kenny et al. found that, following participation in behaviourally-focused video feedback designed to increase maternal sensitive responsiveness to infant cues, mothers with diagnoses of schizophrenia, depression, and mania showed an increase in sensitivity and responsiveness to levels comparable with a group of healthy mothers. Bilszta et al., however, found no difference between a video feedback intervention designed to increase understanding of infant signals and speed and accuracy of maternal responsiveness in a group of depressed mothers relative to verbal feedback and standard inpatient treatment in changing mothers' confidence or perceptions of their infants. This study, however, did not report on objective observations of mother-infant interaction, which may have showed some differences. Including the infant in treatment for maternal mental illness, as these studies have done, is important as some research has shown that improvement in mothers' symptoms following treatment does not necessarily

translate into more sensitive interactions with their infants (Weinberg & Tronick, 1998) or longer-term benefits for child attachment or cognitive development (Murray et al., 2003).

The CAVES intervention, which has been trialled specifically with mothers with post-traumatic stress disorder and their infants, was of particular interest when designing our intervention for mothers with SMI. Based on their clinical observations, Schechter et al. (2005) suggest that mothers with severe post-traumatic stress disorder, because of their own hyper-arousal to threat, can misperceive their young children's separation distress as angry, coercive, or threatening, and may respond by "blocking out" their children's affect in order to maintain their own emotional regulation. In the CAVES intervention, mothers with PTSD were filmed interacting with their young children, and later invited to review points in the tape with the clinician, during which the clinician asked a series of questions, such as, "Tell me the story of what happened in that moment. What do you think was going on in your child's mind? In your mind?" (p. 435). They found a significant reduction of negative attributions by mothers towards their children following this intervention, and suggested that the intervention enabled mothers accurately to perceive and respond to distress in their children in a way they might previously have avoided due to their own associations around trauma.

We wanted to explore whether a similar video feedback intervention specifically targeting mind-mindedness—drawing a mother's attention to the mental states underlying her infant's behaviour and helping her perceive these states accurately—would be viable, effective, and feasible for treating mothers hospitalised for SMI. In designing the intervention, we focused solely on mothers' perceptions of their infants, rather than encouraging mothers to consider their own past experiences

of attachment in relation to their behaviour and feelings towards their infants. The reasoning for this was that reflections on past experiences may overwhelm the attentional and emotional capacities of mothers who are currently experiencing a severe episode of depression, anxiety, mania, or psychosis while simultaneously endeavouring to care for a young infant, a task that is challenging for even emotionally well parents. Moreover, encouraging a mother's reflection on potentially painful and traumatic attachment experiences and linking these to her caregiving behaviour with her infant while she is unwell may have the unintended effect of drawing a mother's attention away from her infant and decreasing maternal self-esteem at a point when it may be particularly fragile in the post-partum period.

Mothers who were resident on a MBU which treated mothers with SMI were recruited as participants. Mothers resided on the unit with their infants throughout their course of treatment. In order to establish the efficacy of the new intervention, mothers who received the mind-mindedness intervention were compared with those who received standard care on the mother-and-baby unit. As part of the standard treatment on the unit, mothers were filmed interacting with their infants on admission and discharge, and had a session with the unit's developmental psychologist which involved viewing the interaction filmed on admission. The aim of this standard treatment session was to highlight the importance of engaging with the infant, while avoiding intrusiveness, in order to support sensitive caregiving. The standard care group thus provided an ideal comparison group against which to evaluate the efficacy of the mind-mindedness intervention.

The present study thus had two aims: (a) to clarify the relation between SMI and mind-mindedness in a sample of mothers hospitalised with their infants in the first year postpartum, and (b) to test the feasibility and effectiveness of a video-

feedback intervention to increase mind-mindedness. If the intervention is successful in facilitating mind-mindedness, one should observe an increase in appropriate mind-related comments and a decrease in non-attuned mind-related comments from pre- to post-intervention. If the intervention is more successful than standard care in facilitating mind-mindedness, one should also see greater improvements in mind-mindedness in the intervention group than in the standard care group.

## **2.2 Method**

### **2.2.1 Participants**

Participants were 68 mothers who had experienced an episode of severe psychiatric illness following childbirth and had been admitted to the MBU with their infants. Participants were divided into two groups: an intervention group ( $n = 36$ ) who received a video feedback intervention focused specifically on increasing mind-mindedness; and a standard care group ( $n = 32$ ) who had previously received a more general video feedback intervention broadly focused on increasing maternal sensitivity and confidence. The standard care group consisted of a sub-sample of the mothers with SMI that participated in Pawlby et al.'s (2010) study, selected to have the same or similar diagnoses to those in the intervention group, after the intervention study had been completed. Data for the standard care group were thus collected before the mind-mindedness intervention was developed. From December 2012, the mind-mindedness intervention was administered to all women admitted to the unit. The mind-mindedness intervention and standard care video feedback were therefore not run consecutively, and mothers were not randomly assigned to the two groups. Given that the unit employed only one developmental psychologist, blocking the standard care and intervention groups in this way meant that there was no

possibility of the mind-mindedness intervention techniques contaminating the standard care procedure. A control group was also created using data from the 49 psychologically healthy mothers who had served as the control group in the Pawlby et al. (2010) study.

Of the 36 women who participated in the mind-mindedness intervention, 10 were discharged from the unit before outcome interactions could be filmed, and four women spoke to their infants in languages for which there was no readily available option for translation, so mind-mindedness could not be coded from their observations. Data for these 14 women were thus excluded from the final results reported below.

Women in the clinical groups were ethnically, culturally, and socioeconomically diverse, reflecting the population of southeast London and southeast England which the MBU served. Table 2.1 shows various demographic details of the intervention, standard care and control groups.

**Table 2.1. – Demographic details**

	Intervention group ( <i>n</i> = 22)	Standard care group ( <i>n</i> = 32)	Control group ( <i>n</i> =49)
Ethnicity (% Caucasian)	59%	66%	100%
Maternal age in years	Mean = 33 (range = 23-40; <i>SD</i> = 5.1)	Mean = 31 (range = 19-45; <i>SD</i> = 6.8)	Mean = 30.5 (range = 18-38; <i>SD</i> = 4.6)
Marital status (% single)	23%	13%	0%
First born infant (%)	59%	53%	56%
Infant gender (% female)	55%	31%	47%
Infant age at first video in weeks	Mean = 13 (range = 3–33; <i>SD</i> = 8.2)	Mean = 11 (range = 2–36; <i>SD</i> = 8.3)	Mean = 12 (range = 12- 17)

Details of the intervention and standard care participants' mental health-related information are presented in Table 2.2.

**Table 2.2 – Maternal mental health details**

	Intervention group ( <i>n</i> =22)	Standard care group ( <i>n</i> =32)
Bipolar affective disorder	2	4
MDD – psychotic and non-psychotic	14	15
OCD	3	1
Post-partum psychosis	1	4
Anxiety	1	1
Schizoaffective disorder	1	2
Schizophrenia	0	1
Personality disorder	0	3
PTSD	0	1
Voluntary admission	17	24
Maternal history of mental health difficulties (% Yes)	14	21 (2 unknown)
Maternal history of previous inpatient admissions (% with one or more previous admissions)	4	3
Prescribed psychotropic medication	22	32

### 2.2.2 Ethical approval and informed consent

Video feedback was a standard part of therapeutic care on the unit, and thus no additional ethical approval was sought for the video feedback interventions used in this study. All mothers who were well enough were routinely invited to participate in video feedback work but were given the opportunity to decline if they wished. Prior to being filmed, all mothers gave verbal consent to participate in video feedback and provided informed written consent for the recordings of their interactions to be used for research purposes. They were informed that, at any time,

they could request for recording to be stopped or their data to be destroyed. They were also informed that participation in or withdrawal from the video feedback intervention would have no implications for their treatment.

Ethical approval for the study involving the control participants was gained from the relevant university committees, and, like the participants in the clinical groups, control participants gave informed consent for participation when they attended the testing session.

### **2.2.3 Procedure**

The intervention study took place on a 12-bedded, publicly funded MBU which provides inpatient treatment for mothers experiencing SMI in the first year post-partum and supports them in caring for their infants. Mothers can be admitted on an informal (voluntary) basis, or by sectioning under the Mental Health Act. On admission, mothers are assessed and given an ICD-10 diagnosis by a psychiatrist, and a care plan is developed to help manage any risk posed by the mother to the child. While resident on the unit, mothers are provided with a range of multidisciplinary support to help them recover from their psychiatric illnesses and provide appropriate care for their babies, including input from a social worker, medication review by a psychiatrist, activity scheduling with an occupational therapist, individual psychological therapy with a clinical psychologist, and guidance in infant care from nursery nurses. Mothers are also supported in developing their relationships with their infants through video feedback work with a developmental psychologist.

Mothers are discharged from the unit when a further psychiatric assessment and input from clinicians involved in their care has confirmed that they are well

enough to return home under the care of a community psychiatric team and there is no risk to their babies. In rare cases, mothers who do not recover sufficiently to care for their babies safely are discharged to their homes independently or transferred to another psychiatric care facility while their infants are placed in foster care or in the care of relatives.

In the first week after admission to the unit, or as soon as they were well enough to give informed consent to be filmed, mothers in the intervention and standard care groups were filmed for three minutes engaging in unstructured play with their infants. Infants were seated in a baby seat with their mothers facing them, and a mirror was angled so that the video camera simultaneously captured both mother and infant faces. Mothers were subsequently filmed in a session of unstructured play with their infants identical to the admission session just prior to discharge from the unit, following clinical recovery.

Control group mothers were observed in a 3-minute face-to-face interaction with their infants in a baby seat when the infants were 12 weeks of age. Note that control group dyads were observed only once; mind-mindedness data were therefore available at one time-point for control dyads.

At a later date in the admission, when mothers were well enough, they were invited to review their admission video with the developmental psychologist on the unit, Dr Susan Pawlby, who had substantial clinical experience with mothers and infants and who also helped design and co-supervise this study. The standard care and mind-mindedness video feedback reviews generally lasted about 20 minutes for each mother, although they were sometimes shorter or longer depending on the mother's verbosity. The content of the feedback session for the intervention and standard care groups was different, as outlined below.

**2.2.3.1 Intervention group.** The feedback for the intervention group focused on increasing appropriate mind-related comments by directing mothers' attention specifically to what their infants might be thinking, feeling, wanting, or experiencing in particular moments in the interaction. The intervention feedback also sought to lower the number of non-attuned mind-related comments through the psychologist offering an alternative perspective on the infant's internal state if she believed the mother had misinterpreted them. Dr Pawlby viewed the admission observation in advance of the intervention session and selected three segments in the observation that would be the focus of the feedback session. These moments were generally points at which (a) the infant shifted his/her attention or focus of interest, or (b) there was a state change (e.g., from smiling to crying), or (c) the mother made a mind-related comment (appropriate or non-attuned), or (d) Dr Pawlby felt there was a 'missed' opportunity for the mother to comment on the infant's mental state. Dr Pawlby was trained in identifying and coding mind-related comments in order for her to select appropriate moments in the observation to use in the mind-mindedness intervention. There was also a scripted protocol that she used during the intervention.

At the beginning of the intervention session, Dr Pawlby introduced the concept of mind-mindedness, saying, "I'll be watching this video back with you so that we can pay attention to what your baby might be thinking, feeling, experiencing, or wanting. Research has shown that mums who are better able to 'read' what's on their babies' minds tend to have improved relationships with their children when they are toddlers, and their children also seem to better understand other people's thoughts and feelings, which also helps them in relationships. We call a mum's

ability to ‘read’ their babies’ minds ‘mind-mindedness’ and that’s what I’ll be focusing on with you.”

Dr Pawlby then paused the film at each of the three moments that were chosen to help the mother reflect on her infant’s putative mental state. At these moments, she asked the mother to think about the infant’s desires, cognitions, emotions, or epistemic states. All mothers were asked: (a) “What is your baby thinking here?”, and (b) “What do you think your baby would be saying to you right now if s/he could talk?” Mothers were also asked additional questions that were tailored to the content of the particular interaction (e.g., “Is he interested in the song you’re singing?”, “What do you think his crying means about how he’s feeling?”). If Dr Pawlby disagreed with the mother’s interpretation of the baby’s mental state, this was discussed further; Dr Pawlby offered her own ideas about the baby’s thoughts and feelings and tried to arrive at a shared agreement with the mother. After all three moments had been discussed, Dr Pawlby asked each mother to talk about a time outside the filmed interaction when she felt she had really “tuned in” to what her baby was thinking or feeling, and a time when she felt she had misread her baby’s thoughts or feelings. Mothers were encouraged to put what they had learnt during the session into practice and to try to take the child’s perspective and talk to the child about what he or she may be thinking or feeling.

**2.2.3.2 Standard care group.** For mothers in the standard care group, the filmed interaction was reviewed in the manner described above, with Dr Pawlby choosing various points of interest at which to stop and review the interaction with the mother. The feedback in the standard care sessions focused on increasing mothers’ understanding of infant behaviour and their own self-confidence. During

the feedback session, mothers were helped to recognise their infant's various behavioural cues (e.g., gaze direction, vocalisation, gesture) and to notice when things seemed to be working well in the interaction. Mothers were encouraged to see the interaction as a 'conversation' between them and their babies, and to practise 'turn taking', leaving space for their babies to respond verbally to the mother's vocalisations. The feedback session for the standard care group also focused on increasing maternal confidence by praising the mother for skills and strengths she demonstrated in her interactions with her infant. In this vein, Dr Pawlby might say things such as: "You're doing really well there at keeping up a dialogue with your baby – having conversations like this is important for babies," or "You're doing really well at maintaining eye contact — your face is one of your baby's favourite things."

### **2.3.4 Outcome measures**

**2.3.4.1 Mind-mindedness.** Each interaction was transcribed verbatim and coded for mind-mindedness using procedures outlined by Meins and Fernyhough (2015). Each maternal comment containing a mental state term pertaining to what the infant may have been thinking, experiencing, or feeling, or in which the caregiver was talking on the infant's behalf was identified and coded as either appropriate or non-attuned. Mind-related comments were classified as appropriate if (a) the coder agreed with the mother's interpretation of the infant's mental state, (b) the comment linked the infant's current activity with past or future experiences, (c) the comment attempted to clarify how the infant wanted to proceed after a lull in the interaction, or (d) the mother voiced what the infant might say if s/he could speak.

Mind-related comments were classified as non-attuned if (a) the coder

disagreed with the mother's interpretation of the infant's mental state, (b) the comment referred to the infant's thoughts or feelings about a past or future event unrelated to his/her current activity, (c) the mother suggested the infant wanted to become involved in a new activity when s/he was already engaged in something else, (d) the comment appeared to be a projection of the mother's own internal state onto the infant, or (e) the referent of the comment was not clear. Scores for both appropriate and non-attuned comments were calculated as a proportion of the total number of maternal comments made during the interaction.

The standard care and control groups' observations were coded by two trained raters who were unaware of the study's hypotheses, the fact that some mothers were hospitalised for SMI, and whether the observations were made on admission or discharge. The raters were informed that some mothers were observed twice, but they were not told the order in which the observations were filmed. A randomly selected 20% of observations was coded for a second time; inter-rater reliability for coding mind-related comments as appropriate or non-attuned was  $\kappa = .80$ . The intervention group observations were coded by a third rater who was blind to whether the observations were on admission or discharge, with a fourth blind rater coding a randomly selected 20% of observations; inter-rater reliability was  $\kappa = .82$ .

**2.3.4.2 CARE-Index.** The CARE-Index is a research tool which assesses the dyadic interaction and affective attunement between mothers and infants aged birth to 15 months based on a three- to five-minute videotaped play interaction (Crittenden, 2004). It focuses on seven aspects of behaviour within the dyad: facial and verbal expressions, body contact, affection, turn-taking, control, and developmental appropriateness of the activity. It was chosen as an additional outcome measure in

this study as it is particularly concerned with the ‘fit’ between the infant’s signals and mother’s responses, as well as being attentive to possible underlying meanings of behaviours—: for instance, coding ‘false positive affect’ which may hide maternal hostility or infant displeasure. It thus adds an additional non-verbal dimension of maternal attunement beyond that of mind-mindedness.

The CARE-Index rates maternal behaviour on three scales: sensitivity, control, and unresponsiveness. Scores on each scale range from 0–14, with zero denoting severe problems, 7 denoting behaviour within a normal range, and 14 denoting maternal behaviour that is outstandingly sensitive, non-controlling, and responsive (Crittenden, 2005). A controlling pattern of maternal behavior has been associated with abusing mothers, an unresponsive pattern with neglecting mothers, and a sensitive pattern with “adequate” mothers (Crittenden, 1981, 1985). The index has been used in previous research as an outcome measure for parent-infant psychotherapy (Cramer, Robert-Tissot, Stern, & Serpa-Rusconi, 1990), as a cross-validation tool for mothers’ self-reports of their infants’ difficult behaviour (Leadbeater, Bishop, & Raver, 1996), and in multiple studies of interactions between maltreated infants and their mothers (e.g. Crittenden, 1988; Crittenden, 1992; Jacobsen & Miller, 1998; Ward, Kessler, & Altman, 1988).

The individual who conducted the CARE-Index coding was not involved in coding mind-mindedness. Note that the CARE-Index was only used to code the standard care and intervention group interactions as funding and time constraints did not allow the control group videos to be rated.

## **2.3 Results**

### **2.3.1 Descriptive statistics and preliminary analyses**

The intervention and standard care groups did not differ in duration of stay on the unit,  $t(52) = 0.67, p = .674$ . There were no further significant differences between the intervention and standard care groups in terms of maternal age,  $t(52) = -1.13, p = .264$ , infant age on admission,  $t(52) = -.83, p = .412$ , maternal ethnicity,  $\chi^2(1) = 3.98, p = .553$ , infant parity,  $t(52) = .49, p = .624$ , mothers' marital status,  $\chi^2(1) = 2.22, p = .330$ , or infant gender,  $\chi^2(1) = 1.24, p = .265$ . The control group did not differ from the intervention or standard care groups in terms of maternal age,  $F(2, 92) = 83.880, p = .261$ , infant gender,  $\chi^2(2) = 2.18, p = .336$ , or infant parity,  $\chi^2(2) = .190, p = .909$ , but were significantly more likely to be White,  $\chi^2(2) = 22.877, p < .001$ , and married,  $\chi^2(2) = 11.391, p < .001$ , than mothers in the intervention and standard care groups.

Table 2.3 shows the mean scores for the intervention, standard care, and control groups in terms of mind-minded comments and maternal CARE-Index variable scores at admission and discharge (pre- and post-treatment).

CARE-Index data were not available on admission for one mother in the standard care group due to this mother's baby being born prematurely, and the coding scheme was deemed not appropriate due to premature infants' reduced interactive behaviour (Crittenden, 2004).

Two mothers in the standard care group were discharged from the unit without their babies; one baby was discharged to statutory care and one baby was discharged to the father's care. No mothers in the intervention group were discharged without their babies.

**Table 2.3 – Mean mind-mindedness and CARE-Index scores for intervention and standard care groups at admission and discharge and mind-mindedness scores for control group single assessment (standard deviations in parentheses)**

	Intervention	Standard Care	Control
<u>Admission</u>			
AMRC (%)	3.13 (4.88)	2.32 (4.03)	5.34 (5.78)
NAMRC (%)	8.00 (5.57)	1.13 (3.03)	2.37 (3.70)
Total comments	54.64 (12.93)	66.91 (35.01)	76.49 (22.15)
CARE-Index sensitivity	4.82 (2.42)	4.10 (1.54)	–
CARE-Index controlling	6.50 (2.65)	5.65 (3.61)	
CARE-Index unresponsive	2.77 (2.58)	4.16 (3.42)	
<u>Discharge</u>			
AMRC (%)	6.40 (6.46)	3.06 (3.67)	–
NAMRC (%)	2.82 (3.40)	0.68 (1.31)	–
Total comments	57.41 (14.65)	82.03 (37.36)	–
CARE-Index sensitivity	6.45 (2.48)	5.10 (1.68)	–
CARE-Index controlling	5.41 (2.70)	6.97 (2.91)	
CARE-Index unresponsive	2.09 (2.16)	1.52 (2.10)	
Duration of admission (weeks)	11.41 (4.67)	12.19 (7.70)	–

AMRC = Appropriate mind-related comments; NAMRC = Non-attuned mind-related comments

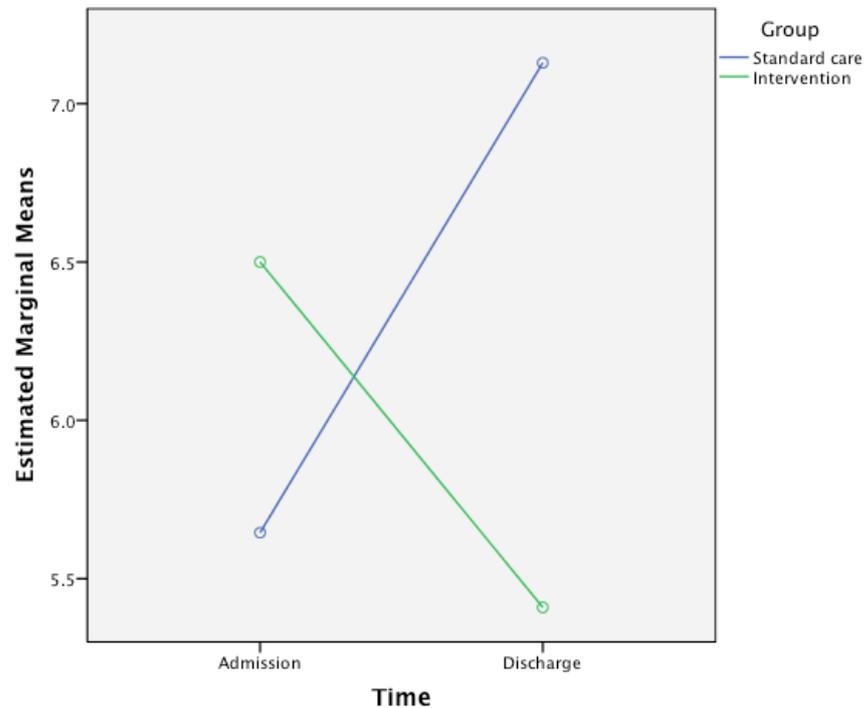
### **2.3.2 Change in CARE-Index scores from admission to discharge**

As the CARE-Index was used as a control variable in subsequent analyses, analyses for this variable are presented first. Possible differences between the mind-mindedness and standard care groups in change in maternal sensitivity scores on the CARE-Index between admission and discharge were investigated using a repeated

measures ANOVA with sensitivity scores at admission and discharge entered as the dependent variables and group (standard care, intervention) entered as a fixed variable. There was an overall increase in sensitivity scores between admission and discharge,  $F(1, 51) = 15.15, p < .001, \eta^2 = .297$ , a main effect of group,  $F(1, 51) = 5.51, p = .023, \eta^2 = .108$ , and no interaction between group and change in sensitivity between admission and discharge,  $F(1, 51) = 2.61, p = .352, \eta^2 = .017$ . Post-hoc independent sample t tests showed that the standard care and intervention groups did not differ in sensitivity on admission,  $t(51) = 1.33, p = .190, d = .36$ , but at discharge, sensitivity scores were higher for the intervention group than for the standard care group,  $t(51) = 2.13, p = .038, d = .65$ .

Possible differences between the intervention and standard care groups on CARE-Index scores for maternal controlling behaviour between admission and discharge were investigated using a repeated measures ANOVA with scores for controlling behaviour at admission and discharge entered as the dependent variables and group (standard care, intervention) entered as a fixed variable. There was no change in maternal controlling behaviour between admission and discharge,  $F(1, 51) = 0.14, p = .712, \eta^2 = .003$ , and no main effect of group,  $F(1, 51) = 0.44, p = .511, \eta^2 = .008$ , but there was a significant group  $\times$  change in controlling behaviour interaction between admission and discharge,  $F(1, 51) = 5.92, p = .019, \eta^2 = .116$ . The interaction is shown in Figure 2.1.

**Figure 2.1: Change in CARE-Index scores for maternal controlling behavior between admission and discharge for standard care and intervention groups**

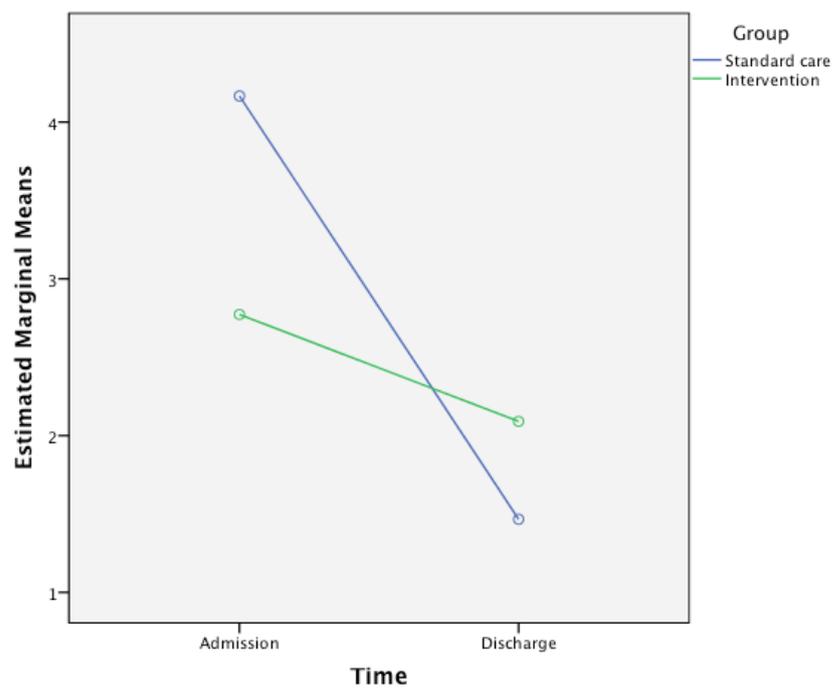


Post-hoc paired samples *t* tests showed a trend for maternal controlling behaviour scores to increase in the standard care group between admission and discharge,  $t(30) = 1.80, p = .082, d = .46$ , and a decrease in maternal controlling behaviour scores between admission and discharge in the intervention group,  $t(21) = 2.32, p = .030, d = .41$ .

Finally, possible differences between maternal unresponsive behavior scores on the CARE-Index at admission and discharge for the standard care and intervention groups were investigated using a repeated measures ANOVA with scores for unresponsive behaviour at admission and discharge entered as the dependent variables and group (standard care, intervention) entered as a fixed variable. There was an overall decrease in unresponsive behaviour between admission and discharge,  $F(1, 51) = 13.22, p = .001, \eta^2 = .264$ , no main effect of

group,  $F(1, 51) = 0.43, p = .518, \eta^2 = .009$ , and a significant group  $\times$  change in unresponsive behaviour interaction,  $F(1, 51) = 4.71, p = .035, \eta^2 = .094$ . The interaction is shown in Figure 2.2.

**Figure 2.2: Change in CARE-Index scores for maternal unresponsive behaviour between admission and discharge for the standard care and intervention groups**



Post hoc paired samples  $t$  tests showed a decrease in unresponsiveness in the standard care group,  $t(30) = 4.27, p < .001, d = .97$ , but no change in unresponsiveness in the intervention group,  $t(21) = 1.03, p = .313, d = .27$ .

### 2.3.3 Changes in mind-mindedness from admission to discharge

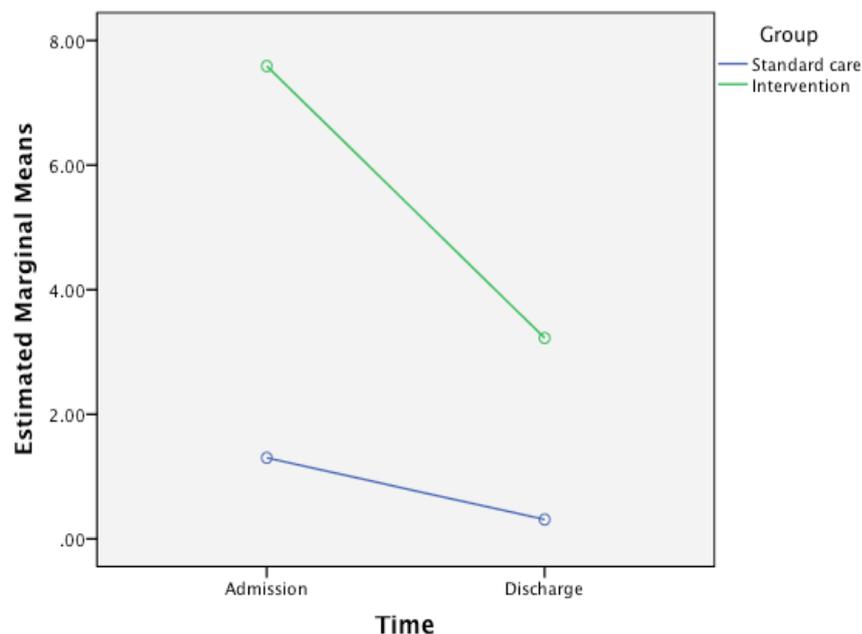
Possible differences in changes in appropriate mind-related comments from admission to discharge between the standard care and intervention groups were investigated using a repeated measures ANOVA with scores for appropriate mind-

related comments at admission and discharge entered as the dependent variables and group (standard care, intervention) added as a fixed variable. Though the previous analyses showed group differences in maternal behaviours on the CARE-Index between admission and discharge, there were no relations between mind-mindedness at admission or discharge and CARE-Index scores for sensitivity, control, and unresponsiveness at admission and discharge,  $r_s < .203, p > .145$ . CARE-Index scores were thus not considered as a confound in terms of these analyses. There was a significant change in appropriate mind-related comments between admission and discharge,  $F(1, 52) = 6.91, p = .011, \eta^2 = .117$ , a main effect of group which approached significance,  $F(1, 52) = 3.86, p = .055, \eta^2 = .069$ , and no interaction between change in appropriate mind-related comments and group,  $F(1, 52) = 2.73, p = .104, \eta^2 = .050$ . Post hoc t tests showed that there was no group difference in appropriate mind-related comments on admission,  $t(52) = 0.66, p = .509, d = .18$ , but scores for appropriate mind-related comments were significantly higher in intervention group mothers than in standard care group mothers at discharge,  $t(52) = 2.41, p = .019, d = .66$ .

Possible differences in changes in non-attuned mind-related comments from admission to discharge between the standard care and intervention groups were investigated using a repeated measures ANOVA with scores for non-attuned mind-related comments at admission and discharge entered as the dependent variables and group (standard care, intervention) added as a fixed variable. There was a significant change in non-attuned comments between admission and discharge,  $F(1, 52) = 18.27, p < .001, \eta^2 = .260$ , a main effect of group,  $F(1, 52) = 42.77, p < .001, \eta^2 = .451$ , and an interaction between group and change in non-attuned comments,  $F(1, 52) = 12.88, p = .001, \eta^2 = .198$ . The interaction is shown in Figure 2.3.

Post hoc independent samples t tests showed that the intervention group mothers had significantly higher non-attuned comments scores than their counterparts on the standard care group both at admission,  $t(52) = 5.85, p < .000, d = 1.60$ , and discharge,  $t(52) = 3.23, p = .002, d = .91$ . Post-hoc paired samples t tests showed that non-attuned mind-related comments significantly decreased between admission and discharge in the intervention group,  $t(21) = 3.95, p = .001, d = 1.15$ , but did not change in the standard care group,  $t(31) = 0.73, p = .473, d = .21$ .

**Figure 2.3: Change in non-attuned mind-related comments between admission and discharge for standard care and intervention groups**



### 2.3.4 Response to interventions by diagnosis

Small numbers for individual diagnoses unfortunately precluded meaningful analysis of responsiveness to each intervention on the basis of mental health diagnosis, so this was examined descriptively on the basis of mean scores only.

Individual diagnoses were collapsed into three broad diagnostic categories for the purposes of calculating means for mind-mindedness across intervention groups: mood disorders (major depressive disorder with and without psychosis; obsessive compulsive disorder; anxiety; PTSD); psychotic disorders (schizophrenia; schizoaffective disorder; post-partum psychosis); and bipolar illness. For the three mothers with a primary diagnosis of personality disorder in the standard care group, secondary diagnoses (one mood, two bipolar) formed the basis for assignment to a broad diagnostic category. The decision to collapse diagnoses in this manner was made following the precedent set by Pawlby et al. (2010), who used the same broad diagnoses to examine group differences in mind-mindedness with the standard care participants. Numbers for each diagnostic group are presented in Table 2.4.

**Table 2.4 Mental health diagnostic groupings for standard care and intervention groups**

	Standard care group	Intervention group
Mood	19	18
Psychosis	7	2
Bipolar	6	2

Mean scores for mind-mindedness at admission and discharge were then calculated for each diagnostic category within the standard care and intervention groups. The mean scores for these variables are shown in Table 2.5.

**Table 2.5 Mean scores for mind-mindedness and CARE-Index variables at admission and discharge for standard care and intervention groups by diagnostic category**

		<u>Admission</u>		<u>Discharge</u>	
		AMRC	NAMRC	AMRC	NAMRC
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
<u>Standard care</u>	Mood	1.57 (2.91)	.49 (1.46)	2.52 (2.26)	.83 (1.48)
	Psychosis	4.16 (5.66)	2.78 (4.83)	5.53 (4.99)	.27 (.87)
	Bipolar	1.21 (2.71)	.00 (.00)	.00 (.00)	.97 (1.49)
<u>Intervention</u>	Mood	2.63 (4.46)	8.82 (5.62)	6.42 (6.36)	3.29 (3.56)
	Psychosis	7.55 (10.67)	.94 (1.32)	8.18 (11.57)	1.37 (1.94)
	Bipolar	3.17 (2.09)	7.73 (1.06)	4.41 (6.24)	.00 (.00)

AMRC = Appropriate mind-related comments; NAMRC = non-attuned mind-related comments

The mean scores above show that, in both the intervention and standard care groups, mothers with psychosis had the highest scores for appropriate mind-related comments at admission and discharge, although the large standard deviations suggest wide variation in scores within this group. Mothers with psychosis also showed generally low levels of non-attuned mind-related comments at both admission and discharge. Intervention group mothers with mood disorders and bipolar illness, on the other hand, showed relatively high levels of non-attuned mind-related comments at admission.

In terms of change between admission and discharge in different diagnostic groups, intervention group mothers with mood disorders showed a particularly large increase in appropriate mind-related comments relative to other mothers (2.63 to 6.42) and a relatively large decrease in non-attuned mind-related comments (8.82 to 3.29). Intervention group mothers with bipolar illness also showed a large decrease

in non-attuned mind-related comments (7.73 to .00) relative to mothers in other diagnostic groups. Though both intervention and standard care group mothers with psychosis had relatively high levels of appropriate mind-related comments and low levels of non-attuned mind-related comments at both admission and discharge, this diagnostic group showed the least change, overall, between admission and discharge relative to mothers with mood disorders or bipolar illness.

### 2.3.5 Mind-mindedness in clinical versus control groups

Differences in mind-mindedness between the standard care, intervention, and control groups were investigated using a one-way ANOVA. The first series of analyses investigated differences between scores for mind-mindedness on admission for the standard care and intervention groups and the mind-mindedness scores for the control group (recall that the control group was only observed at one time point). There was a main effect of group for appropriate mind-related comments,  $F(2, 102) = 3.73, p = .027, \eta^2 = .069$ ; post hoc pairwise comparisons showed that the standard care group mothers made fewer appropriate comments compared with control group mothers ( $p = .028$ ). No other pairwise comparisons were significant. There was also a main effect of group for non-attuned mind-related comments,  $F(2, 102) = 21.25, p < .001, \eta^2 = .298$ ; post hoc pairwise comparisons showed that intervention group mothers made more non-attuned comments compared with mothers in both the standard care and control groups ( $ps < .001$ ). No other pairwise comparisons were significant.

The next analyses investigated differences in mind-mindedness scores between the two clinical groups at discharge and the single assessment for the control group. There was a marginally significant main effect of group for

appropriate mind-related comments,  $F(2, 102) = 2.69, p = 0.73, \eta^2 = .051$ ; post hoc pairwise comparisons showed that intervention group mothers made marginally more appropriate mind-related comments compared with mothers in the standard care group ( $p = .089$ ). No other pairwise comparisons were significant. There was also a main effect of group for non-attuned mind-related comments,  $F(2, 102) = 4.28, p = .017, \eta^2 = .079$ ; post hoc pairwise comparisons showed that standard care group mothers made fewer non-attuned comments compared with mothers in the intervention group ( $p = .024$ ), and also made marginally fewer non-attuned comments compared with control group mothers ( $p = .052$ ). No other pairwise comparisons were significant.

## 2.4 Discussion

The main aim of the present study was to test the feasibility and efficacy of a newly-devised video feedback intervention for increasing mind-mindedness in mothers hospitalised for SMI by comparing differences in mind-mindedness at admission and discharge between mothers who participated in the mind-mindedness intervention and mothers who participated in a standard care intervention, to those of psychologically well mothers. The study also attempted to clarify the relation between SMI and mind-mindedness in a sample of mothers hospitalised with their infants in the first year postpartum in order to add to the existing limited data.

On the relation between SMI and mind-mindedness, results showed that, on admission to the MBU, mothers in the intervention group made significantly higher levels of non-attuned mind-related comments relative to both mothers in the standard care group and psychologically well mothers in the control group (group mean of 8.00 versus 1.13 and 2.37, respectively). Intervention group mothers did not differ

significantly from standard care or control groups in terms of appropriate mind-related comments at admission, but mothers in the standard care group made significantly fewer appropriate mind-related comments on admission to the MBU compared with psychologically well mothers (group mean of 2.32 versus 5.34, respectively). The findings for the intervention group are consistent with one pattern predicted for mothers with SMI by Pawlby et al. (2010), who argued that the social and cognitive impairments associated with SMI would be associated with an elevated level of non-attuned comments. The findings for the standard care group are consistent with the second pattern predicted by Pawlby et al.: that SMI would be associated with few appropriate comments about the infant's mental state. Thus, though these results do not lend themselves to a single characterisation of how SMI impacts mind-mindedness, it could be suggested that SMI appears to impact on mothers' tendency to engage with their infants' thoughts and feelings in two distinct ways: mothers may fail to talk appropriately about their infants' internal states, or may frequently misread what their infants are thinking or feeling. Alternatively, the significant difference between the standard care and intervention groups at admission in terms of non-attuned mind-related comments could suggest that the two MBU groups were qualitatively different in some manner. This possibility will be discussed in further detail below.

A different pattern of findings emerged at discharge. Despite their high levels of non-attuned mind-related comments on admission, by discharge, mothers in the intervention group did not differ from psychologically well mothers in their use of non-attuned comments (group mean of 2.82 versus 2.37, respectively). The mind-mindedness intervention thus appeared successful in reducing the elevated number of non-attuned comments to a level that was no different from controls. In addition,

results showed that mothers in the intervention group displayed a marginally significant increase in appropriate mind-related comments between admission and discharge (from a mean of 3.13 to 6.40, respectively), although the mean score for appropriate mind-related comments in the intervention group on admission was not significantly different from that for psychologically well mothers (5.34). No such change in mind-mindedness was observed in the standard care group, who continued to show relatively low levels of both appropriate and non-attuned mind-related comments at discharge (means of 3.06 and 0.68, respectively).

The results above could suggest that the standard care procedure simply had no impact on mothers' behaviour with their infants, and that this lack of impact accounted for the differences between the standard care and intervention groups at discharge. However, the standard care procedure resulted in a significant increase in maternal sensitivity and decrease in maternal unresponsiveness. Given that the aim of the standard care procedure was to facilitate sensitive caregiving by informing mothers about the importance of talking to their infants and interacting in a non-intrusive way, it appears to have been successful in achieving its aim, despite not being effective in increasing mothers' mind-mindedness. It thus could be argued that the two video feedback procedures had distinct effects.

It is also interesting to note that the mind-mindedness intervention led to improvements in maternal sensitivity and controlling behaviour between admission and discharge even though, in general, this was not targeted in the mind-mindedness intervention. As sensitivity was not related to mind-mindedness at admission or discharge, the observed impact of the intervention on mind-mindedness was independent of the increase in sensitivity. Moreover, levels of sensitivity were higher in the intervention group than in the standard care group at discharge, suggesting that

the mind-mindedness intervention was more effective than the standard care procedure in increasing maternal sensitivity.

It could also be argued that the significant difference in levels of mind-mindedness between the intervention and standard care groups at admission and the enduring low levels of mind-mindedness in the standard care group at discharge indicates that the two groups were not comparable to start. This is unfortunately difficult to quantify with the existing data. One possibility is that mothers in the intervention group were less severely ill than their counterparts in the standard care group. However, women in the two groups did not differ in the time spent on the unit—if intervention group mothers had been less severely ill, they might have been discharged significantly earlier than their standard care group counterparts. In addition, both groups had equal rates of prescribed psychotropic medication while on the unit, and, the standard care group women were selected so that their diagnoses were the same or similar to those of the women in the intervention group. It thus was not the case that mothers in the standard care group had diagnoses that were typically associated with longer periods of hospitalization. Finally, the discharge observations were made when both groups were psychiatrically assessed as well enough to be discharged from the unit.

It is possible, however, that changes in treatment practices on the MBU in the approximately 10-year gap between the standard care and intervention group admissions have contributed to the differences seen in the two groups. For instance, though all participants in both groups were prescribed psychotropic medication, different consultant psychiatrists coordinated treatment for the two groups, and they may have had different prescribing practices. Perhaps the standard care group were more heavily sedated, which could explain their consistent and remarkably low

levels of mind-minded comments at both admission and discharge. Unfortunately the types and doses of the standard care group's psychotropic medication were not specified in the data file that was created before this study began, so this possibility can only remain speculative. Additionally, the last decade has witnessed a great increase in public awareness of attachment, mind-mindedness and mentalization via current programmes such as NSPCC's 'Minding the Baby' and recent newspaper articles such as 'Why secure early bonding is essential for babies: What happens between conception and the age of two shapes the adult a child will become' (*The Guardian*, 12 September 2012). It is therefore possible that the intervention group, who arrived on the unit 10 years after the standard care group, had been exposed to more information about the importance of mother-infant relationship quality and were thus more motivated to focus on their infant's minds, which could account for their higher levels of mind-mindedness. It thus could be that the mind-mindedness intervention would not have achieved similar success with the standard care group if they were, in fact, more heavily sedated or less psychologically informed.

The outcomes of the intervention group alone, however, do suggest that it is possible to effect a significant improvement in mind-mindedness in mothers with SMI with only a single session of video feedback, so that, on discharge, they exhibit levels of mind-mindedness very similar to psychologically healthy controls. This is despite the fact that the intervention group mothers were significantly less likely to be White and married than the control group, factors which could potentially serve as stressors negatively affecting mind-mindedness. This is in line with results of Bakermans-Kranenburg, van IJzendoorn, and Juffer's (2003) meta-analysis which found that interventions with fewer sessions and a clear focus appeared to be more effective than longer interventions for parents and young children. The results are

also in line with those of Schechter et al. (2006) who found that a single session of video feedback with mothers with PTSD using the CAVES intervention was effective in reducing mothers' negative perceptions of their infants.

These findings are in contrast to those of Bilszta et al. (2012) who found that a brief video feedback intervention at both the behavioural and representational levels delivered to mothers and infants on a psychiatric inpatient unit had no advantage over standard inpatient care incorporating therapeutic and practical support in improving maternal confidence or perceptions of infant behaviour. The authors interpreted their results as evidence that the intervention was too short and that psychologically unwell mothers may be too internally focused to benefit from abstract discussions of attachment and sensitivity to infant needs. The results of this study, however, suggest that a single session video feedback intervention can be effective in helping mothers who are experiencing a severe episode of mental illness requiring hospitalisation post-partum to become both more behaviourally sensitive with their infants and to be more accurate in their perceptions of their infants' internal states. The current study may have shown different effects to Bilszta et al. (2012) because we used behavioural observations rather than maternal self-report as our outcome measures, and because our intervention was specifically focused on increasing appropriate mind-mindedness rather than also incorporating information about attachment and reflection on mothers' relational experiences, and as such, may have been easier for mothers to absorb.

The results also suggest that brief mother–infant video feedback focusing on mind-mindedness is a feasible intervention even with mothers who are experiencing severe mood disturbances or psychotic symptoms, despite the fact that their symptoms may initially impede mind-mindedness. Descriptive statistics suggested

that the mind-mindedness intervention group mothers generally showed the intended increase in appropriate mind-related comments and decrease in non-attuned mind-related comments between admission to and discharge from the MBU. The clinical impressions of the developmental psychologist administering the intervention and my own impressions as a clinical psychologist was that the video work helped mothers become more aware of their infants as individuals with minds, preferences, and feelings, rather than simply beings that must be fed, changed, bathed, and dressed. We also observed that the intervention seemed to help mothers become more aware of their babies' interests in interacting with them and their own ability to make the interaction positive and enjoyable by responding appropriately, which often appeared to increase mothers' confidence and sense of self-efficacy.

While the results from the intervention group showed that their levels of mind-mindedness did not differ from psychologically well controls when they were discharged from the unit, an important next step is to investigate whether the mind-mindedness intervention had a positive impact on infant development. Comparing the development of children whose mothers received standard care on the MBU with those whose mothers received the mind-mindedness intervention would be a stringent test of whether the mind-mindedness intervention is beneficial over the longer term. As discussed previously, one of the most well-established outcomes of mind-mindedness is infant-caregiver attachment security. If children whose mothers had received the mind-mindedness intervention were found to have higher rates of secure attachment than their standard care counterparts, this would provide convincing evidence of the benefits of tailoring interventions to facilitate mind-mindedness in mothers with SMI. The study reported in Chapter 3 thus investigated attachment security in infants whose mothers had received standard care or the mind-

mindfulness intervention while resident on the mother-and-baby unit.

## CHAPTER 3

### Study 2: Attachment in relation to maternal mental illness and participation in a mind-mindedness intervention

#### 3.1 Introduction

The study reported in the previous chapter demonstrated the efficacy of the intervention procedure in increasing mothers' mind-mindedness between admission to and discharge from the MBU. The main aim of the study reported in this chapter is to investigate whether the mind-mindedness intervention had a continued positive impact, focusing on the quality of the mother–infant relationship as the outcome measure.

Maternal mental illness in the perinatal period is a topic of interest and concern to health professionals and policymakers due to its oft-reported association with poor child outcomes. Research has shown that children of mothers with postnatal depression are at increased risk of difficulties with emotion regulation and social behaviour in infancy (Field, 2010; Tronick & Reck, 2009), internalising disorders and poor social competence in the school years (Kersten-Alvarez et al., 2012; Murray et al., 2011), and depression (Murray et al., 2011; Verbeek et al., 2012) and attention deficit disorder (Avan, Richter, Ramchandani, Norris & Stein, 2010; Fihrer, McMahon, & Taylor, 2009; Van Batenburg-Eddes et al., 2013) during adolescence. Antenatal depression has similarly been linked to childhood emotional problems (Leis et al., 2013) and externalising behaviour (Barker et al., 2011), as well as depression in adolescence (Pawlby et al., 2009).

Compared to depression, there is relatively little research on child outcomes in relation to other forms of perinatal mental illness, although what has been

published also tends to suggest elevated risk of emotional and behavioural difficulties. Children of mothers with anxiety in the postnatal period have shown heightened distress to novelty in infancy (Reck, Muller, Tietz, & Mohler, 2013) and externalising disorders in later childhood (Glasheen, Richardson, & Fabio, 2010). Maternal post-traumatic stress disorder has also been associated with difficulties in emotional regulation in infancy and mothers' reports of externalising and internalising infant behaviour at 13 months (Bosquet et al., 2011).

The evidence on maternal mental illness and child outcomes also demonstrates, however, that deleterious effects are not inevitable, and a recent summary of the research reported that the effect sizes for associations between perinatal mental health disorders and negative child outcomes were generally small to moderate (Stein et al., 2014). Various strands of research have therefore attempted to identify the underlying genetic, behavioural, and psychosocial mechanisms that influence whether disturbances will manifest, as well as those which serve as protective factors moderating the strength of the disturbance.

Some research has focused on the nature of the attachment relationship between mothers with mental health problems and their infants as a mechanism for transmission of risk. Attachment is usually empirically assessed in infants aged 1 to 2 years using the Strange Situation, a laboratory-based procedure developed by Ainsworth and colleagues (Ainsworth, Blehar, Waters, & Wall, 1978). The procedure involves two episodes of brief separation and reunion between infant and caregiver; during the first separation, the infant is left with an unfamiliar female experimenter (the stranger), and on the second separation, the infant is first left alone before being re-joined by the stranger and subsequently the caregiver.

Strange Situation attachment classifications are assigned based on the infant's interactive behaviours toward the mother in the two reunion episodes, specifically the extent to which the infant seeks comfort from or proximity to the mother on her return versus avoiding or resisting contact. Ainsworth and colleagues categorised three main patterns of response to the Strange Situation: secure, to describe infants who are distressed at separation and reassured by reunion, use their mothers as a "secure base" to explore the room, and are comfortable in her presence; insecure-avoidant, to describe infants who are distant in their mothers' presence, do not protest at separation, and avoid their mothers on reunion; and insecure-resistant, to describe infants who are extremely distressed by their mothers' departure, yet unable to be comforted upon her return. Main and Solomon (1986, 1990) subsequently identified a fourth category, insecure-disorganised, to describe infants who exhibit odd, contradictory, or fearful behaviours on reunion, such as freezing or turning in circles.

Infant behaviour in the Strange Situation is presumed to reflect the extent to which the mother has provided contingent and sensitive responses to the infant's need for both exploration and comfort when distressed over the course of their relationship (Ainsworth et al., 1978). Secure, avoidant, and resistant forms of attachment are all considered 'organised' strategies to reduce distress, while the disorganised classification reflects a lack of a consistent strategy to regulate emotion, and is thought to result from atypical, frightened, or frightening behaviours on the part of the caregiver (Hesse & Main, 2000; Lyons-Ruth, Bronfman & Parsons, 1999), as well as a parent's unresolved state of mind regarding earlier attachment experiences (van IJzendoorn, 1995).

The overarching finding from studies of attachment in the context of maternal

depression is that there is an association between maternal ante- and post-natal depression and insecure and disorganised attachment (Stein et al., 2014). However, studies which have examined this relation in closer detail suggest that this association differs between clinical groups of mothers who meet official diagnostic criteria for depression in a standardized interview versus community mothers who have endorsed non-clinical levels of depressive symptoms on a self-report questionnaire, with the latter group showing a weak link between depression and attachment security (Atkinson et al., 2000; Tharner et al., 2012). Some research further suggests that the chronicity rather than the severity of depression is more influential in determining attachment security, with significantly higher rates of insecure attachment found in children of chronically depressed mothers versus briefly and never-depressed mothers (McMahon, Barnett, Kowalenko, & Tennant, 2006).

As with the outcomes discussed previously, the literature on relations between attachment and other types of maternal mental health problems, including psychosis and bipolar disorder, is limited, and existing studies typically involve small samples of varying clinical severity (Wan & Green, 2009), making it difficult to draw definitive conclusions. D'Angelo (1986) found that mothers with schizophrenia ( $n = 15$ ) had higher rates of insecure attachment, particularly avoidant attachment, than 15 psychologically well mothers. In a sample of 46 mothers with psychosis and 80 mothers with no history of psychosis, Naslund, Persson-Blennow, McNeil, Kaij, and Malmquist-Larsson (1984) found that infants of mothers with a diagnosis of schizophrenia were significantly more likely than controls to show a complete absence of fear of the stranger in a modified Strange Situation procedure, but that a composite measure of severity of psychotic disturbance in the infant's first

year of life did not relate to infant fear of the stranger. In a community study, DeMulder and Radke-Yarrow (1991) found that half of infants of mothers with bipolar disorder were classified as disorganised compared with one quarter of infants of depressed mothers. By contrast, Hipwell, Goossens, Melhuish, and Kumar (2000), in a small study of mothers admitted to a psychiatric unit with their infants in the first year post-partum, found that only one in 10 infants of mothers with bipolar disorder was classified as disorganised in the Strange Situation, while seven out of nine infants of mothers with psychotic or non-psychotic depression were rated as insecure (five avoidant and two disorganised).

A large body of research has also focused on the quality of mothers' interactive behaviour with their infants as a possible mechanism responsible for the poor outcomes in children of women with mental health problems. Compared to non-depressed parents, mothers with depression have been observed to be less vocal, less visually communicative, to smile less with their infants (Righetti-Veltema, Conner-Perreard, Bousquet, & Manzano, 2002), and to be less sensitively attuned to their infants (Murray, Fiori-Cowley, Hooper, & Cooper, 1996). It has been noted that depressed mothers tend to have two predominant styles of interacting with their infants: intrusive, controlling, and overstimulating, or withdrawn, passive, and understimulating (Field, 2010; Malphurs et al., 1996). Again, less research has focused on mother–infant interaction in the context of other types of mental illness, although a small body of research has focused on interactions between mothers with psychosis and their infants. Two older studies found that mothers with schizophrenia were responsive and affectionate to their infants (Schachter et al., 1977; Sameroff et al., 1982), while more recent research has found that mothers with schizophrenia are less responsive and sensitive, but also more remote and behaviourally intrusive than

mothers with other illnesses (Riordan et al., 1999; Wan et al., 2007).

Stein et al. (2014) proposed that the most important mediator between perinatal mental health problems and child outcome is the quality of parenting behaviour; for example, the parent's ability to focus their attention on their infant's cues and provide appropriate and contingent responses, or their ability to recognise their child's thoughts, feelings, and individual perspectives. This argument is supported by Murray, Cooper, and Hipwell (2003), who suggest that the withdrawn/intrusive behaviour observed in mothers with postnatal depression may stem from difficulties the mother has focusing on her baby's experience because of preoccupation with her own feelings and depressive symptoms. In light of findings that mothers with schizophrenia tend to show the least engagement with their infants compared to mothers with mania and depression, Murray et al. suggest that these mothers may find it difficult to tune into their infants due to preoccupation with their symptoms, poor concentration and fatigue, and a lack of insight as to how their behaviour may affect their infant.

Further support for the potential impediment of mental illness for a mother's ability to accurately recognise her child's thoughts and feelings is found in the clinical observations of Schechter et al. (2005), who suggest that mothers with severe post-traumatic stress disorder, because of their own hyper-arousal to threat, can misperceive their young children's separation distress as angry, coercive, or threatening, and may respond by "blocking out" their children's affect in order to maintain their own emotional regulation. Their children are thus left alone to manage their distress at an age when they are too young to successfully achieve this, and it may be that, for the children, focusing a disproportionate amount of their emotional resources on this task means little is available for tasks around cognitive

development.

An experimental study by Stein and colleagues (2012) which purposefully induced rumination in mothers who had experienced major depression and generalised anxiety disorder (GAD) in the post-partum period and subsequently observed their play interactions with their 10-month-old infants provides further support for this assertion. Stein et al. found a particularly strong negative impact in mothers with GAD, who showed significantly decreased vocalisation and responsiveness to their infants, and whose infants showed decreased emotional tone and more withdrawal following their mothers' rumination. They thus suggested that worry and rumination about negative topics, which are common to depression, anxiety, and many other mental health disorders, make substantial demands on a parent's attention, such that there is a reduced capacity available to be attuned and sensitively responsive to their infants. They further suggested that, as infants are highly sensitive to the quality of their parents' responsiveness, infants of parents with depression or anxiety are likely to perceive their parents' mental distraction and respond with negative vocalisations or behaviours in a bid for attention, or by giving up and withdrawing from the interaction.

It can be argued that the type of attunement Stein et al. (2012; 2014) and Murray et al. (2003) described in their work is synonymous with mind-mindedness (Meins, Fernyhough, Fradley, & Tuckey, 2001), and that deficits in child outcomes associated with maternal mental illness may arise when mothers have difficulty accurately perceiving their infants' mental states. We wished to examine this proposition more fully in the present study.

Mind-mindedness has been linked to several of the child outcomes discussed above in relation to maternal mental illness. Various studies have shown that

caregivers who are more mind-minded in the first year of life are more likely to have children who are classified as securely attached to them (Meins et al., 2001, 2012; Lundy, 2003; Arnott & Meins, 2007). In a large-scale study, Meins et al. (2012) investigated whether both indices of mind-mindedness—appropriate and non-attuned mind-related comments—made independent contributions to mother–infant attachment security. Meins et al. reported that both appropriate and non-attuned comments in the first year of life predicted children’s attachment security at age 15 months. Mothers whose children were secure made fewer non-attuned comments and more appropriate comments than mothers whose children were insecure-avoidant, insecure-resistant, or insecure-disorganised. In the secure group, 56% of mothers made only one or no non-attuned comments during the 8-month free play interaction, while 100% of insecure-resistant mothers and 92% of avoidant group mothers made at least one non-attuned comment (Meins et al., 2012). Non-attuned comments also distinguished between the insecure-avoidant and insecure-resistant groups, with mothers of resistant infants making more non-attuned comments than those of avoidant infants. These predictive relations between mind-mindedness and attachment security were independent of mothers’ behavioural sensitivity as assessed using Ainsworth et al.’s (1974) scale.

Caregiver mind-mindedness has also been shown to predict positive outcomes in children’s cognitive development, such as superior internal state language acquisition, symbolic play (Meins et al., 2013) and executive function abilities (Bernier, Carlson, & Whipple, 2010) at age 2, and superior theory of mind performance at ages 2 (Laranjo, Bernier, Meins & Carlson, 2010) and 4 (Meins et al., 2002, 2003). Further, maternal mind-mindedness in the first year of life has been linked to fewer behavioural difficulties in children from low socioeconomic status

(SES) families, specifically, at 44 and 61 months (Meins et al., 2013). As the same relation between mind-mindedness and behavioural difficulties was not observed in families of high SES, Meins et al. suggest that mothers' ability to accurately perceive the thoughts and feelings underlying their children's behaviour is specifically protective in the context of life stressors associated with low SES, such as depression, lower perceived social support, and lower child language abilities, enabling mothers to cope with difficult behaviours they might otherwise interpret as problematic.

Though there are both clinical observations and empirical evidence suggesting that parental mind-mindedness may contribute to difficulties in interactions between parents with mental illness and later deficits in child outcomes, there is so far very little research that has used established measures of these constructs in order to formally test the relation, and only one published study looking at mind-mindedness in mothers with severe mental illness. This study, by Pawlby et al. (2010), found a trend for clinically depressed mothers to make fewer appropriate mind-related comments than psychologically well mothers on admission to a residential treatment unit. The study reported in Chapter 2 showed that mothers in the mind-mindedness intervention group produced very high levels of non-attuned mind-related comments on admission to the MBU, whereas mothers in the standard care group produced abnormally low levels of both appropriate and non-attuned mind-related comments. Taken together, these results suggest that mothers with severe mental health difficulties have difficulties accurately reading their infants' thoughts and feelings.

The present study thus had three aims: to investigate (a) how maternal mental illness relates to mind-mindedness with one's infant and later infant-mother

attachment security and organisation; (b) whether mothers with SMI who received an intervention focused on increasing mind-mindedness are more likely to have secure or organised infants, and (c) whether life events and concurrent mental illness relate to attachment security and organisation.

## **3.2 Method**

### **3.2.1 Participants**

Participants for this study were mother-infant pairs who had been admitted to the MBU described in Chapter 2 during the first year post-partum, who had participated in video-feedback sessions during their treatment, and who had given consent to be contacted for research purposes following discharge. In the three and a half year period covered by this study, a total of 117 mothers participated in video-feedback sessions on the unit. All mothers provided informed consent for the video observations to be used for research purposes, and 86 (74%) of these mothers gave permission to be contacted for a future follow-up study prior to their discharge. In 26 of the 31 cases where consent for future contact was not obtained, the reason was because the mothers had been discharged from the MBU before they could be asked about future research contact. Of the remaining five cases, two mothers stated they did not want to participate in future research, and three mothers were discharged without full care of their babies.

When the 86 mothers were contacted for the current study (referred to subsequently as ‘the follow-up assessment’) at 15 months post-partum, 49 (57%) agreed to participate, 9 (10%) agreed although then proved impossible to schedule for an assessment, 15 (17%) declined, 11 (13%) could not be located, and 2 mothers (2%) no longer had care of their children. Ten of the mothers who participated in the

follow-up assessment had substantial portions of missing data and are not included in the analyses reported in this thesis.

The remaining 39 mothers who completed the follow-up assessment were demographically diverse, reflecting the nature of the area of southeast London and southeast England that the hospital served. Their mean age at the follow-up assessment was 33.84 years (range 18-43 years; *SD* 5.04). Twenty-two (56.4%) were White, 12 (30.8%) were Black, and five (12.8%) were Asian. On average, their infants were 2.7 months at admission to the MBU (range one day – 10 months; *SD* 3.5 months), and 17.1 months old (range 15 – 23 months; *SD* = 2.1) at the follow-up assessment. Twenty-one infants (53.3%) were female and 24 (61.5%) were first-born.

At the follow-up assessment, 12 mothers (30.8%) were single, 6 (15.4%) were cohabiting or in a long-term relationship, and 21 (53.8%) were married. Two mothers (5.1%) had no formal educational qualifications, 9 (23.1%) were educated to GCSE level, two (5.1%) had completed 'A' levels, three (7.7%) had completed vocational qualifications, and 23 (59.0%) had completed a university degree or higher. At the time of the follow-up assessment, 16 mothers (41.0%) were employed, two (5.1%) were full-time students, and 21 (53.8%) were not working. A majority of the mothers (25, or 64%) cared for their children full-time; 11 (28%) of the children were in part-time child care (under 30 hours per week), and 3 (8%) were in child care more than 30 hours per week.

Regarding their mental health, 27 (69.2%) of the mothers participating in the follow-up assessment had a history of mental health difficulties prior to their pregnancy, and 16 of these mothers (41%) had experienced one or more psychiatric hospital admissions prior to their admission to the MBU. Twenty-six mothers

(66.7%) had been admitted as informal (voluntary) patients to the MBU while the remaining 13 (33.3%) had been admitted by section (involuntary). Their mean length of stay on the unit was 11.95 weeks (mode = 8 – 9 weeks; range = 4 – 25 weeks; *SD* = 5.4). During their stay on the MBU, their primary diagnoses were confirmed as outlined in Table 3.1.

**Table 3.1: Maternal MBU diagnoses**

Bipolar disorder (psychotic)	6 (15.4%)
Bipolar disorder (non-psychotic)	3 (7.7%)
Major depressive disorder (psychotic)	2 (5.1%)
Major depressive disorder (non-psychotic)	14 (35.9%)
Schizophrenia	3 (7.7%)
Schizoaffective disorder	5 (12.8%)
Post-partum psychosis	2 (5.1%)
Obsessive compulsive disorder	1 (2.6%)
Mixed anxiety and depressive disorder	2 (5.1%)
Manic episode associated with the puerperium	1 (2.6%)

Nine of the 39 mothers who participated in the follow-up assessment had received the mind-mindedness video feedback intervention described in Chapter 2. The remaining 30 mothers had received the standard video feedback intervention described in Chapter 2.

There were no differences between the 39 mothers who completed the follow-up assessment and the remaining 78 mothers who refused, were not able to be contacted or scheduled, or were discharged from the MBU before consent for future

contact could be obtained on any of the following variables: length of admission,  $t(113) = .98, p = .328$ , unit diagnosis,  $\chi^2(11) = .267, p = .266$ , mother's age at admission,  $t(112) = 1.85, p = .067$ , mothers' ethnicity,  $\chi^2(3) = 3.62, p = .306$ , infant age at admission,  $t(113) = 1.90, p = .075$ , or infant gender,  $\chi^2(1) = 3.27, p = .087$ . There was a difference between the two groups in terms of admission type,  $\chi^2(2) = 7.36, p = .025$ ; the 78 mothers who did not complete the follow-up assessment were more likely to have been admitted to the MBU on an informal (voluntary) basis and less likely to have been admitted by section than the 39 mothers who completed the follow-up. Unfortunately, differences between the two groups on other variables of interest, including education, employment, and previous history of mental health difficulties, were not able to be examined as this data was confirmed at the follow-up assessment.

### 3.2.2 Overview of Procedure

Mind-mindedness was assessed while mothers were resident on the MBU, and mothers' mental health was re-assessed at the follow-up assessment along with mother–infant attachment security, as outlined below.

**3.2.2.1 MBU assessment.** In the first week after admission to the unit, or as soon as they were well enough to give informed consent to be filmed, mothers were filmed for six minutes engaging in unstructured interactions with their infants. For the first three minutes, infants were seated in an infant chair with their mothers facing them, and a mirror was angled so that the video camera simultaneously captured both mother and infant faces. No toys were provided for this segment. For the second three minutes, mothers sat on a blanket or sofa with their infant and were

given a set of infant toys to use in a free play interaction. Mothers and infants were filmed for a second time in the few days prior to discharge from the unit, following maternal clinical recovery, using the same procedure described above.

Infants were an average of 3.2 months old when the admission video was filmed (range 19 days – 11 months; *SD* 3.1) and 5.4 months at the date of the discharge video (range one month – 13 months; *SD* 3.5).

The mother–infant observations were transcribed verbatim, and maternal comments were coded for mind-mindedness using the criteria outlined by Meins and Fernyhough (2015). First, all comments which either (a) pertained to the child’s internal state (e.g. knowledge of a toy; memory of an experience; emotional engagement with the activity at hand; or attempts to manipulate others’ beliefs by teasing or playing a joke); or (b) in which the mother voiced what the infant might say if he/she could talk (e.g., “You’re saying, ‘Don’t be silly, Mummy!’”) were identified.

Comments were subsequently coded dichotomously as appropriate or non-attuned by a researcher who was blind to maternal diagnosis and other measures. In line with Meins and Fernyhough’s (2015) criteria, comments were classified as appropriate if (a) the independent coder agreed with the mother’s reading of her infant’s mental state (e.g., “You like that rattle,” as the infant repeatedly picks up a toy rattle); (b) the comment linked current activity to a similar past or future event (e.g. “Do you remember seeing a rattle like that at your cousin’s house?”); or (c) the comment served to clarify how to proceed after a lull of at least several seconds in the interaction (e.g., “Do you want to sing a song now?”). Comments were classified as non-attuned if the coder disagreed with the mother’s reading of her infant’s mental state (e.g., “You don’t want to sit in that seat any more,” when the infant has shown

no signs of agitation or frustration); (b) the comment referred to a past or future event unrelated to the infant's current activity (e.g. "Would you like to go for a walk with Daddy tomorrow?"); (c) the caregiver suggests the infant wants to shift activities when the infant is actively engaged with something else; (d) the comments appear to be a projection of the mother's own internal state onto the infant (e.g. "You're thinking about that little outfit we're going to dress you in today,"); or (e) the mother's comment is not obviously related to any particular object or activity.

A variety of issues unfortunately resulted in a significant amount of missing mind-mindedness data. On occasion, one video segment was skipped when the infant's state was no longer conducive to filming (e.g. too sleepy or hungry), and some older/larger infants were only filmed in the free-play interaction as they did not fit comfortably in the infant seat. In addition, some mothers did not speak in English with their infants, and mothers were frequently discharged before a discharge video could be filmed. Technical issues were later discovered with several videos, preventing playback. In total, mind-mindedness was able to be coded for the following number of cases: 31 admission chair observations; 31 admission free play observations; 19 discharge chair observations; and 24 discharge free play observations. Seven of the admission chair observations and six of the discharge chair observations were of mother-infant pairs who had participated in the mind-mindedness intervention, and thus were also included in Study 1.

**3.2.2.2 Follow-up assessment.** When infants were 15 months old, mothers who had given consent to be contacted for research purposes post-discharge were invited to participate in the follow-up assessment by post and a subsequent telephone call. This time point was chosen for the assessment to give mothers and infants some

time to settle back into their home routine following their admission, as some mothers had been resident on the MBU up to the time their infants were 12 months old. In the telephone call, mothers were told that the purpose of the study was to assess maternal well-being since leaving the unit, and children's reactions to their mother leaving them briefly with a stranger or leaving them alone. If mothers desired, I also visited them at home to explain the study in person and answer any questions.

The follow-up assessment was completed at the MBU, as it was both a centrally convenient location for most participants, and because it had video rooms appropriate for administration of the Strange Situation to assess attachment. At the assessment, mothers confirmed basic demographic details and provided information about current medication and mental health treatment, as well as any time spent away from their infants since discharge. They were interviewed using the Structured Clinical Interview for DSM-IV Axis I Disorders, Research Version, Patient Edition (SCID-I; First, Spitzer, Gibbon, & Williams, 2002) to assess mental health since discharge. Information from the SCID-I and observations of mothers' behaviour during the assessment were used to rate current maternal mental health on the British Psychiatric Ratings Scale (BPRS; Overall & Gorham, 1962). Mothers also completed the Life Events Questionnaire (LEQ; Norbeck, 1984; Sarason, Johnson, & Siegel, 1978) in order to account for any additional stressful experiences post-discharge from the MBU that may have affected their mental health.

After a short break, mother–infant attachment security was assessed using the Strange Situation (Ainsworth et al., 1978). The Strange Situation tapes were coded by a rater who has formal training and reliability who was blind to maternal

diagnosis and all other measures, and to whether participants had received the mind-mindedness intervention.

### **3.2.3 Ethical considerations**

Full ethical approval was granted by the relevant local research ethics committees, and all procedures were carried out in accordance with their guidelines. Informed consent was obtained for the video recordings to be made and used for the purposes of research. Mothers were informed that they could withdraw from the study at any time without giving a reason, and without implications for their treatment. Mothers were not provided with any incentive to participate in this study apart from reimbursement of their travel expenses to and from the MBU for the follow-up assessment.

## **3.3 Results**

### **3.3.1 Descriptive statistics**

**3.3.1.1 Maternal MBU diagnoses.** Due to the small cell numbers for individual diagnoses, the MBU diagnoses were collapsed into three broad categories for the purposes of data analysis: mood disorders (major depressive disorder with and without psychosis; obsessive compulsive disorder; mixed anxiety and depressive disorder); psychotic disorders (schizophrenia; schizoaffective disorder; post-partum psychosis); and bipolar illness (bipolar disorder with and without psychosis; manic episode associated with the puerperium). Participant numbers for each broad diagnostic category are presented in Table 3.2 below.

**Table 3.2: Categorical maternal MBU diagnoses**

Mood	19 (48.7%)
Psychosis	10 (25.6%)
Bipolar	10 (25.6%)

**3.3.1.2 Maternal mental health at the follow-up assessment.** Twenty-four mothers reported enduring symptoms of their mental illnesses between their discharge from the MBU and the follow-up assessment, while fifteen women reported making a full recovery post-discharge. Sixteen mothers were still unwell at the date of the follow-up assessment. Thirty-three mothers (84.6%) were still taking psychotropic medication at the follow-up assessment. Fifteen mothers (38.4%) were having or had had psychological therapy since discharge from the MBU.

The number of women meeting diagnostic criteria for past and current mood, psychotic or bipolar illnesses in the period since discharge are presented in Table 3.3.

**Table 3.3: Diagnoses at follow-up assessment**

Mood	Past (post-discharge)	13 (33.3%)
	Current	8 (20.5%)
Psychosis	Past (post-discharge)	5 (12.8%)
	Current	5 (12.8%)
Bipolar	Past (post-discharge)	6 (15.4%)
	Current	3 (7.7%)
Full recovery post-discharge		15 (38.5%)

**3.3.1.3 Attachment security at the follow-up assessment.** Twelve infants (31%) were classified as securely attached in the Strange Situation, four (10%) were classified as avoidant, and 23 (59%) were classified as disorganised. Infants in the

disorganised group were given further forced classifications for security as follows: 9 (23.1%) secure; 12 (30.8%) avoidant; and two (5.1%) resistant.

Four mothers had experienced separations of two to three weeks from their babies following their discharge from the MBU. Two of these mothers had further admissions to a psychiatric unit for treatment of their mental illness, one mother travelled abroad to visit family, and one mother went on a work trip abroad. Three of these children were classified as disorganised and one was classified as secure.

Again due to the small sample size, attachment classifications were collapsed into dichotomous groups for the purpose of data analysis: secure vs. insecure, and organised vs. disorganised. Numbers for security are presented in Table 3.4, and numbers for organisation are presented in Table 3.5.

**Table 3.4: Dichotomous secure/insecure attachment classifications at follow-up**

Secure	12 (30.8%)
Insecure	27 (69.2%)

**Table 3.5: Dichotomous organised/disorganised attachment classifications at follow-up**

Organised	16 (41%)
Disorganised	23 (59%)

### 3.3.2 Attachment in relation to demographic characteristics

Infant attachment security was not related to any of the following maternal demographic variables: age,  $F(1, 37) = 1.30, p = .261$ , ethnic category,  $\chi^2(1) = 4.04, p = .223$ ; marital status (single, long-term/cohabiting relationship, or married),  $\chi^2(1) = 2.24, p = .350$ ; highest level of education,  $t(37) = .26, p = .799$ ; or current employment status,  $\chi^2(1) = 5.45, p = .212$ . Attachment organisation was also not

associated with mothers' age,  $F(1, 37) = .63, p = .434$ , ethnic category,  $\chi^2(1) = 2.86, p = .434$ , marital status,  $\chi^2(1) = .63, p = .822$ , highest level of education,  $t(37) = .28, p = .785$ ; or current employment status,  $\chi^2(1) = 4.75, p = .275$ .

Although male infants were marginally more likely to be classified as insecurely attached than female infants, this difference was not statistically significant,  $\chi^2(1) = 3.12, p = .096$ , and infant gender was unrelated to attachment organisation,  $\chi^2(1) = 2.43, p = .192$ . Infant birth order (first born versus later born) was not related to attachment security,  $\chi^2(1) = .98, p = .478$ , or attachment organisation,  $\chi^2(1) = .32, p = .740$ . Infant age was also not related to attachment security,  $F(1, 37) = .48, p = .493$ , or attachment organisation  $F(1, 37) = .02, p = .879$ .

Mothers' experience of brief separations from their infants following discharge from the MBU was not related to attachment security,  $\chi^2(1) = .11, p = 1.000$ , or attachment organisation,  $\chi^2(1) = .67, p = .610$ . Experience of child care following discharge was related to attachment security; infants who were in full-time care (more than 30 hours per week) were more likely to be classified as securely attached than children in part-time or no child care,  $\chi^2(1) = 6.16, p = .045$ . (Note that only three children in the sample were in full-time child care, but all three of these children were classified as securely attached.) Child care was not related to attachment organisation, however,  $\chi^2(1) = 4.16, p = .124$ .

### 3.3.3 Attachment in relation to maternal mental health

Dichotomous attachment security was not related to any of the following variables: mothers' self-reported past experience of mental illness prior to their pregnancy and admission to the MBU,  $\chi^2(1) = 0.27, p = .719$ ; one or more previous admissions to a psychiatric inpatient unit prior to their MBU admission,  $\chi^2(1) = 0.00,$

$p = 1.000$ ; whether mothers had been voluntarily admitted to the MBU or admitted by section,  $\chi^2(1) = 2.17, p = .163$ ; or length of stay on the MBU,  $F(1, 37) = 2.77, p = .105$ . Dichotomous attachment organisation was also unrelated to past mental illness,  $\chi^2(1) = 0.42, p = .726$ , previous psychiatric admissions,  $\chi^2(1) = 0.08, p = 1.00$ , voluntary/section admission to the MBU,  $\chi^2(1) = 1.325, p = .312$ , or length of stay on the MBU,  $F(1, 37) = .945, p = .337$ . Table 3.6 shows the number of secure/insecure infants in relation to each of the above variables, and Table 3.7 shows the number of organised/disorganised infants in relation to the above variables.

**Table 3.6 Numbers of infants classified as secure/insecure in relation to maternal mental health**

	Secure	Insecure
Mental illness prior to MBU admission	9	18
No mental illness prior to MBU admission	3	9
Previous inpatient admissions	5	11
No previous inpatient admissions	7	16
Voluntary admission to MBU	6	20
Section admission to MBU	6	7
Length of stay on the MBU	$M = 9.83$ weeks	$M = 12.89$ weeks

**Table 3.7 Numbers of infants in classified as organised/disorganised in relation to maternal mental health**

	Organised	Disorganised
Mental illness prior to MBU admission	12	15
No mental illness prior to MBU admission	4	8
Previous inpatient admissions	7	9
No previous inpatient admissions	9	14
Voluntary admission to MBU	9	17
Section admission to MBU	7	6
Length of stay on the MBU	$M = 10.94$ weeks	$M = 12.65$ weeks

Maternal MBU diagnoses of mood, psychotic and bipolar illness were unrelated to attachment security,  $\chi^2(1) = .01, p = 1.000$ , or to attachment organisation,  $\chi^2(1) = .02, p = 1.000$ . Maternal diagnostic groupings at the follow-up assessment (mood, psychotic, bipolar, or no illness) were also unrelated to attachment security,  $\chi^2(1) = 1.43, p = .715$ , or organisation,  $\chi^2(1) = 2.57, p = .465$ . In terms of subsequent treatment since discharge from the MBU, mothers' participation in psychological therapy had no relation to attachment security,  $\chi^2(1) = .18, p = 1.000$ , or attachment organisation,  $\chi^2(1) = .23, p = .899$ , nor did use of psychotropic medication relate to attachment security,  $\chi^2(1) = .66, p = .416$ , or to attachment organisation,  $\chi^2(1) = 1.74, p = .370$ . Table 3.8 shows the numbers of infants in the dichotomous secure/insecure attachment categories in relation to

maternal diagnoses, psychotherapy and medication use, and Table 3.9 shows the number of infants in the dichotomous organised/disorganised attachment categories in relation to maternal diagnoses, psychotherapy, and medication use.

**Table 3.8 Numbers of infants classified as secure/insecure in relation to maternal diagnoses, psychotherapy, and medication**

	Secure	Insecure
MBU diagnosis of mood illness	6	13
MBU diagnosis of psychotic illness	3	7
MBU diagnosis of bipolar illness	3	7
MBU diagnosis of mood illness	4	9
Follow-up diagnosis of psychotic illness	1	4
Follow-up diagnosis of bipolar illness	3	3
No diagnosis at follow-up	4	11
Psychotherapy since discharge	5	10
No psychotherapy since discharge	6	14
Medication since discharge	11	22
No medication since discharge	1	5

**Table 3.9 Numbers of infants classified as organised/disorganised in relation to maternal diagnoses, psychotherapy, and medication**

	Organised	Disorganised
MBU diagnosis of mood illness	8	11
MBU diagnosis of psychotic illness	4	6
MBU diagnosis of bipolar illness	4	6
MBU diagnosis of mood illness	5	8
Follow-up diagnosis of psychotic illness	1	4
Follow-up diagnosis of bipolar illness	4	2
No diagnosis at follow-up	6	9
Psychotherapy since discharge	7	8
No psychotherapy since discharge	8	12
Medication since discharge	15	18
No medication since discharge	1	5

Finally, attachment security,  $\chi^2(1) = 2.15, p = .174$ , and organisation,  $\chi^2(1) = .90, p = .509$ , were unrelated to whether mothers were currently unwell at the follow-up assessment. Neither security,  $F(1,37) = .21, p = .646$ , nor organisation,  $F(1,37) = .00, p = .979$ , were related to mothers' self-reported levels of distress on LEQ items following discharge from the MBU. There were also no significant differences in the researcher-rated BPRS scores at the follow-up assessment between secure ( $M = 29.75, SD = 5.40$ ) and insecure group mothers ( $M = 30.63, SD = 9.14$ ),  $t(37) = .31, p = .759$ , or between organised ( $M = 29.75, SD = 5.85$ ) and disorganised group mothers ( $M = 30.78, SD = 9.47$ ),  $t(37) = .39, p = .701$ .

In order to examine the possible impact of duration and chronicity of SMI on infant attachment security and organisation, mothers were grouped into one of six categories to denote their experience of clinical episodes of mental illness prior to their MBU admission episode, since discharge, and at the time of the follow-up assessment. Because the numbers in each cell were small, it was not possible to analyse any group differences statistically, but a descriptive summary is provided. Mothers were coded according to whether they had experienced an episode of SMI at four separate time points: past (prior to pregnancy and admission to the MBU); at their admission to the MBU (a time point which obviously included all 39 mothers); post-discharge from the MBU; and at the time of the follow-up assessment.

The six categories were as follows, and are presented in hypothesised order of increasing severity for the child:

- 1) MBU only ( $n = 11$ ; 28%)
- 2) past and MBU ( $n = 4$ ; 10%)
- 3) MBU and post-discharge ( $n = 5$ ; 13%)
- 4) past, MBU, and post-discharge ( $n = 2$ ; 8%)
- 5) MBU, post-discharge, and follow-up assessment ( $n = 6$ ; 15%)
- 6) past, MBU, post-discharge, and follow-up assessment ( $n = 11$ ; 28%).

Numbers for the six categories in relation to attachment security are presented in Table 3.10, and numbers for the six categories in relation to attachment organisation are presented in Table 3.11. Table 3.12 shows numbers for the six categories in relation to participation in the mind-mindedness versus standard care video feedback intervention.

**Table 3.10 – Attachment security in relation to duration and chronicity of SMI**

	1. MBU	2. Past & MBU	3. MBU & post-discharge	4. Past, MBU, & post-discharge	5. MBU, post-discharge, follow-up	6. Past, MBU, post-discharge, follow-up
Secure	1 (8%)	3 (25%)	0	1 (8%)	2 (17%)	5 (42%)
Insecure	3 (11%)	8 (30%)	2 (7%)	4 (15%)	4 (15%)	6 (22%)

**Table 3.11 – Attachment organisation in relation to duration and chronicity of SMI**

	1. MBU	2. Past & MBU	3. MBU & post-discharge	4. Past, MBU, & post-discharge	5. MBU, post-discharge, follow-up	6. Past, MBU, post-discharge, follow-up
Organised	1 (6%)	5 (31%)	0	2 (13%)	3 (19%)	5 (31%)
Disorganised	3 (13%)	6 (26%)	2 (9%)	3 (13%)	3 (13%)	6 (26%)

**Table 3.12 – Type of video feedback intervention received in relation to duration and chronicity of SMI**

	1. MBU	2. Past & MBU	3. MBU & post-discharge	4. Past, MBU, & post-discharge	5. MBU, post-discharge, follow-up	6. Past, MBU, post-discharge, follow-up
Standard care	7 (23%)	4 (13%)	5 (17%)	2 (7%)	4 (13%)	8 (27%)
Intervention	4 (44%)	0	0	0	2 (22%)	3 (33%)

### 3.3.4 Mind-mindedness and maternal mental health

There were generally no differences between mothers in the three MBU diagnostic groups (mood, psychosis, and bipolar) in terms of mind-mindedness at admission or discharge, with the exception of appropriate mind-related comments in the chair admission video,  $F(1, 28) = 4.95, p = .014$ . A post-hoc Bonferroni test

indicated that mothers with mood disorders made significantly more appropriate mind-related comments in the admission chair observation ( $M = .09$ ) than mothers with psychosis ( $M = .04$ ),  $p = .043$ , or bipolar disorders ( $M = .04$ ),  $p = .033$ .

### 3.3.5 Mind-mindedness and attachment

Mothers' levels of mind-mindedness in the chair and free play admission and discharge observations at Time 1 were largely unrelated to infant attachment security ( $ts < 2.47$ ,  $ps > .128$ ) and organisation ( $ts < 1.01$ ,  $ps > .323$ ) at Time 2, with the exception of non-attuned mind-related comments during the free play observation at admission, which were lower for mothers of children classified as secure ( $M = .01$ ,  $SD = .02$ ) than insecure ( $M = .05$ ,  $SD = .06$ ),  $t(26) = 2.65$ ,  $p = .014$ ) and lower for mothers of children classified as organised ( $M = .02$ ,  $SD = .03$ ) than disorganised ( $M = .05$ ,  $SD = .06$ ),  $t(26) = 2.07$ ,  $p = .049$ . Organised mothers also made slightly more non-attuned comments ( $M = .03$ ,  $SD = .04$ ) than disorganised group mothers ( $M = .01$ ,  $SD = .01$ ) during the discharge chair observation, but the overall participant numbers for this particular observation were too small to analyse this difference statistically.

### 3.3.6 Attachment and participation in the mind-mindedness intervention

Mothers who received the mind-mindedness intervention were significantly more likely to have infants classified as secure than insecure at the follow-up assessment than mothers who participated in the standard care intervention,  $\chi^2(1) = 12.14$ ,  $p = .001$ . Mothers who received the mind-mindedness intervention were also significantly more likely to have infants classified organised versus disorganised at

the follow-up than mothers who participated in the standard care intervention,  $\chi^2(1) = 11.08, p = .001$ . Table 3.13 shows the number of infants classified as secure vs. insecure relative to maternal participation in the mind-mindedness. Table 3.14 shows the number of infants classified as organised vs. disorganised relative to maternal participation in the mind-mindedness intervention.

**Table 3.13 – Numbers of infants classified as secure/insecure relative to participation in the mind-mindedness intervention vs. the standard care intervention**

	Secure	Insecure
Standard care intervention	5	25
Mind-mindedness intervention	7	2

**Table 3.14 – Numbers of infants classified as organised/disorganised relative to participation in the mind-mindedness intervention vs. the standard care intervention**

	Organised	Disorganised
Standard care intervention	8	22
Mind-mindedness intervention	8	1

### 3.4 Discussion

The main aims of Study 2 were to investigate the impact of the mind-mindedness intervention reported in Study 1 in terms the quality of the mother–infant relationship and to add to the existing literature on maternal mental illness and attachment security. In terms of the study’s aims, results showed that: (a) maternal mental illness as grouped by diagnostic category was unrelated to mind-mindedness in mother–infant interactions during hospitalisation and unrelated to infant–mother

attachment security and organisation; (b) mothers with SMI who received an intervention focused on increasing mind-mindedness were more likely to have secure or organised infants; and (c) life events and concurrent mental illness did not relate to attachment security and organisation. Attachment security and organisation were also unrelated to any of the mother-infant demographic variables for which data were available.

Despite concerted recruitment efforts, the confidence with which results can be generalised from this study is unfortunately limited by its small sample size and missing portions of data. Of a potential 117 participants, only 39 (33.3%) completed the full follow-up assessment. Though there were no differences between mothers who completed the follow-up assessment and those who did not in terms of basic demographic and mental health data, it may be that group differences would have emerged with a larger proportion of participating mothers. In addition, data on other variables such as mind-mindedness on the MBU or past history of mental health difficulties was not examined for non-participating mothers due to logistical and time constraints, which may have highlighted other group differences.

The substantial proportion of missing video observations recorded when mothers were on the MBU also makes it difficult to draw definitive conclusions about mind-mindedness in relation to attachment in the mind-mindedness or standard care interventions. Discharge mind-mindedness data was available for only one secure child in the standard care group, and discharge and admission chair data were available for only one insecure child in the intervention group. For the entire follow-up assessment group, discharge chair data was only available for 19 infants (39% of the group) and discharge free play data was only available for 24 infants (62% of the group). Further research is therefore needed with this population in order to construct

meaningful statements on the relation between mind-mindedness and attachment in mothers with SMI.

It must also be noted that the Strange Situation procedure was administered on the MBU, which may have uniquely influenced the findings. Though infants would not have had conscious memories of the MBU, there may have been some implicit familiarity with the setting which could have affected the display of attachment behaviour. For instance, infants could have been more prone to display disorganised behaviour if implicit memories of their mothers' distress was somehow triggered by being back on the MBU. Mothers would have had conscious memories and feelings about the MBU, which also may have affected their behaviour towards their infants in the Strange Situation on the unit. Also, this group of mothers had the unusual experience in the first year post-partum of having their mental health and parenting closely monitored and evaluated, an experience that most mothers will never have. Their behaviour towards their infants in the Strange Situation at the follow-up assessment may have thus been inhibited by assumptions that they were again being monitored and assessed, and this may again have affected their infants' responses and therefore the results in some way.

Of all the variables assessed, attachment was only meaningfully related to the type of video feedback intervention received on the MBU. Mothers who participated in the mind-mindedness video feedback intervention were more likely to have infants classified as secure and as organised than mothers who received the standard care video feedback intervention. Though only nine of the 39 mothers in the current study participated in the mind-mindedness intervention, it is striking that such a high proportion of their infants were classified as secure ( $n = 7$ ) and organised ( $n = 8$ ) given the high rates of insecurity and disorganisation in the sample. The seven secure

infants in the intervention group comprised 58% of the total number of secure infants and the eight organised infants comprised 50% of the total number of organised infants in the sample. Though the relation between participation in the mind-mindedness intervention and attachment quality may be a spurious finding, it does warrant further exploration in a larger sample given that increasing mind-mindedness was the aim of the intervention and that mind-mindedness has been linked to attachment security in previous research (Meins et al., 2001; Meins et al., 2012), presumably because mothers who are more attuned to their infants' mental states are more likely to be sensitive to their attachment needs.

Comparing the rates of attachment security in this study (31% secure, 10% avoidant, 0% resistant, and 59% disorganised) to the attachment distributions reported in a meta-analysis by van IJzendoorn and colleagues (1999) provides some context in terms of their relation to the broader population. An analysis of studies with normative, middle-class, non-clinical mothers and infants ( $n = 920$ ) yielded proportionally higher rates of secure (51%), avoidant (20.2%) and resistant (10.3%) attachment, and a lower proportion of disorganised attachment (18.5%). For studies of mothers with depression ( $n = 340$ ), the overall rate of secure attachment was slightly lower (41.2%) and disorganisation was slightly higher (20.8%). The attachment security rates found in this study are slightly more similar to rates van IJzendoorn et al. (1999) report for mothers with alcohol or drug abuse ( $n = 144$ ): 26.4% secure; 14.6% avoidant; 16.0% resistant; and 43.1% disorganised; and groups of maltreating parents ( $n = 165$ ): 9.1% secure; 28.5% avoidant; 14.5% resistant; 47.9% disorganised. Meta-analyses, of course, yield information only at a very broad level, and it is perhaps not surprising that that attachment distributions in this study do not correspond to van IJzendoorn et al.'s findings given the differences between

the largely normative populations used for the meta-analysis and the participants in this study.

Two individual studies of mother–infant attachment in mothers with mental health difficulties published since van IJzendoorn et al.’s review also report different security distributions than found here. Tharner et al. (2012) reported a distribution of 48.5% secure, 13.6% avoidant, 16.3% resistant, and 21.7% disorganised in a sample of 627 mothers with and without depression (only 27.9% of the sample had experienced depression either pre- or post-natally, however). Hipwell et al. (2000) recruited 19 mothers from the same MBU where Study 2 was conducted (nine with depression and 10 with manic or bipolar disorder). In their sample, they found significantly different rates of disorganisation in particular: 58% secure, 26% avoidant, 0% resistant, and 16% disorganised.

It is particularly interesting that the attachment distributions found in Study 2 do not correspond to those reported in mothers recruited from the same MBU approximately 15 years ago. Hipwell et al.’s sample differed somewhat from Study 2 in that it was smaller (19 participants versus 39 in the current study), mothers with psychosis were excluded, and the Strange Situation procedure was administered when infants were 12 months of age versus 15–23 months in Study 2. As Study 2 showed no differences in attachment distributions between mothers with psychosis and mothers with bipolar or mood disorders, however, it seems unlikely that the exclusion of mothers with psychosis from Hipwell et al.’s study would account for the contrast in attachment distributions between the two studies. It also does not seem immediately clear why administering the Strange Situation at 15–23 months versus 12 months might account for such a disparity in attachment rates, and disorganised attachment in particular. Though the current study administered the

Strange Situation over a much broader infant age range than Hipwell et al., there was no demonstrated relation in the current study between infant age and attachment security and organisation. In addition, studies which have assessed attachment at both 12 and 18 months of age (e.g. Vaughn, Egeland, Sroufe, & Waters, 1979; Waters, 1978) have shown significant stability in attachment classifications at both time points. The meta analysis by van IJzendoorn et al. (1999) also reports remarkable long-term stability in disorganised attachment across 1-60 months of age. However, Vaughn et al. also showed that attachment classifications were less stable in low socioeconomic than middle class families and when mothers reported high levels of stressful events in the 12–18 month period.

The finding that attachment stability can be affected by stressors such as low socioeconomic status and difficult life experiences demonstrates that infant attachment can be responsive to change in environment and maternal behaviour. This allows an extremely tentative hypothesis that infant attachment security and stability may be negatively affected by more prolonged exposure to mothers who have experienced SMI. Infants in both Hipwell et al.'s study and Study 2 had significant experience of being cared for over the first year of life by clinical staff on the MBU in addition to their mothers. Hipwell et al. administered the Strange Situation at 12 months, at which point infants would have been discharged home in the sole care of their mothers (and fathers) for a relatively short period of time. Infants in Study 2, on the other hand, would have had an additional three to nine months at home in the care of their mothers before the Strange Situation procedure was administered, and thus greater exposure than Hipwell et al.'s sample to any lingering mental health symptomatology or other environmental stressors. It may thus be that experience of care and support outside the family (e.g., from MBU staff) has a beneficial effect on

mother–infant attachment in this population, which accounts for the greater levels of attachment security and lower levels of disorganisation in Hipwell et al.’s sample compared to Study 2. This would also help explain the finding in Study 2 that children in full-time child care were more likely to be classified as securely attached than children in part-time or no child care, although this finding must also be treated with caution given that there were only three children in full-time child care in the entire sample.

It is interesting to note that the chronicity and duration of mothers’ illnesses was not related to attachment security or organisation in the current study. There was wide variation in chronicity and duration of SMI in the current sample; at the least severe end of the spectrum, 28% of mothers experienced only one lifetime episode of SMI following childbirth, while another 28% of mothers reported chronic episodes of SMI, lasting from before pregnancy to the point of the follow-up assessment. This wide variation in such a small sample may again have implications for the validity of findings. However descriptive statistics suggested that mothers who had experienced clinical levels of mental illness both prior to their pregnancy and following their discharge from the MBU did not have higher proportions of insecurely attached or disorganised infants than mothers who had a one-time onset of mental illness postpartum and experienced a full recovery from their illness post-discharge from the MBU. This is in contrast to two studies on disorganised attachment which suggested that antenatal depression which is at least moderate in severity and a recurrence of past depression is associated with attachment disorganisation (Tharner et al., 2012; Hayes et al., 2013). However, the results from Study 2 are in line with Hayes et al. (2013)’s findings of no direct association between postpartum depression and attachment disorganisation. It must be noted that neither of these studies included

mothers who had been hospitalised for SMI, and were thus likely studying mothers with less severe clinical presentations.

It is also interesting to note that levels of maternal self-reported experience of stress from difficult life events post-discharge from the MBU did not relate to attachment security and organisation, when attachment quality has been found to be affected by stress in other samples (e.g. Vaughn et al., 1979). In addition, this was a very diverse sample containing significant numbers of single mothers, mothers of low socioeconomic status, and immigrant mothers, all factors which conceivably add to the burden of parenting in the context of SMI and may thus increase the risk of infant insecurity or disorganisation. None of these risk factors, however, related to the quality of the attachment relationship in the current sample.

It therefore seems that the quality of the attachment relationships amongst the mothers and infants in the current sample was affected by factors for which there was not enough data to test meaningfully (e.g. mind-mindedness) or which were not examined at all. For instance, this study did not assess mothers' representations of their own attachment relationships, which, as stated in the General Introduction, has been found to relate to infant attachment (e.g. van IJzendoorn et al., 1991). Though there are likely behavioural and psychological mechanisms responsible for the relation between AAI and infant attachment (van IJzendoorn, 1995), including maternal mentalization (Sharp & Fonagy, 2008; Meins, 1999), knowing something about these mothers' resolution of their early experiences of being parented, along with more complete mind-mindedness data, may have helped shed more light on their relationships with their infants, and would ideally be included in a future study.

Including other relational measures in a future study would also be important in order to clarify whether the null relation between mind-mindedness and

attachment in this study may be due to a lack of sensitivity of the mind-mindedness measurement. Though early maternal mind-mindedness has been shown to predict attachment security in normative populations (e.g. Meins et al., 2001), it seems plausible that the number of mind-minded comments mothers with SMI make with their babies during free play may not be a sensitive enough measure to capture difficulties in mother-infant interaction or predict insecure or disorganised attachment in the context of maternal SMI.

Collapsing mental health diagnoses into broad categories in order to be able to statistically examine relations to attachment may have also accounted for the lack of relation between any aspects of maternal mental health and attachment. The decision to collapse diagnoses in this manner was made to be in line with the broad diagnostic groupings defined by the SCID-I and in order to allow statistical analyses to be conducted despite the small sample, but a future study may find more meaning in looking at the impact of individual mental health disorders on attachment. A young child would arguably find it very different to be parented by a depressed mother who hears voices versus a depressed mother without psychotic features, and their attachment strategies would reflect this. Similarly, a mother with the rigid, anxious symptoms of obsessive compulsive disorder would likely relate very differently to her young child than an emotionally flat and withdrawn mother with depressive disorder, which would, again, be reflected in their child's attachment style. All four of these disorders, however, were grouped together in the current study, which very likely muted any specific impacts on the attachment relationship. Future research with mothers with SMI would ideally either get a robust number of mothers with a singular mental health disorder, such as major depressive disorder without psychosis, in order to understand the impact of this particular profile of

illness more fully, or group mothers on the basis of an aspect of their behaviour that has been theorised to affect the attachment relationship, such as withdrawal or intrusiveness, rather than a motley group of standardised clinical diagnoses.

It may also be that attachment quality in the current study is affected by mothers' ability to process, tolerate, and respond to infant emotion. This suggestion comes from recent work by Pearson et al. (2010), summarised in the General Introduction, that women who reported symptoms of depression in pregnancy were quicker to disengage their attention from pictures of distressed infants than non-depressed women, and also disengaged from pictures of distressed infants more quickly than from pictures of happy or neutral infant faces. This is at odds with the general finding that mothers tend to show greater attentional bias to infant faces than women who do not have children, and to distressed infant faces in particular (Thompson-Booth et al., 2014a, 2014b). It would thus be interesting to explore whether there are any links between a bias towards or avoidance of infant faces and different emotional expressions, SMI, and attachment, and to understand whether an attentional bias to emotion influences one's propensity to be mind-minded. The study reported in Chapter 4 begins to explore the latter question in a normative sample of parents and non-parents.

## CHAPTER 4

### Study 3: Is Mind-Mindedness a Relational Construct?

#### 4.1 Introduction

The previous chapters reported on mind-mindedness in samples of newly-delivered mothers who had experienced significant mental health difficulties following the birth of their infants, and had received inpatient psychiatric treatment postpartum. Results suggested a complex picture of factors that may influence maternal mind-mindedness and later infant attachment security in this sample. For instance, mind-mindedness was unrelated to specific mental health diagnoses, to a history of mental health problems prior to the current pregnancy, or to mother-infant attachment security generally, with the exception of non-attuned mind-related comments which were higher at admission for insecure/disorganised than secure/organised group mothers. Similar to previous research findings, mind-mindedness in this sample was also unrelated to maternal demographic factors such as employment status, ethnicity, previous experience of parenting, or marital status. Mind-mindedness was, however, apparently positively influenced by an intervention delivered on the MBU which specifically focused on increasing mothers' accurate perceptions of their infants' mental states. Mothers who participated in this intervention were also more likely to have infants classified as secure and as organised in the Strange Situation procedure at 18 months of age than mothers who had received the standard care video feedback intervention which focused on increasing general sensitivity.

As mind-mindedness has been shown to vary widely across individuals (Meins et al., 2011), including the variation observed amongst mothers with SMI in

the previous two studies, it seems, therefore, that inherent qualities that were not assessed in the previous studies may contribute to a mother's propensity to be mind-minded. It also seems that mind-mindedness has the potential to be influenced and increased by therapeutic intervention. As noted in Chapter 1, it has been suggested that caregiver mind-mindedness and RF is influenced by the caregiver's own earlier attachment experiences and the extent to which these have been processed and integrated in a coherent and balanced manner (Arnott & Meins, 2007; Fonagy et al., 2004). It is not known, however, whether early experiences affect the propensity to be mind-minded solely with one's own children or significant others, or equally in less close relationships as well as towards unknown individuals. It is also not known whether mind-mindedness might be influenced by other factors inherent in the individual, such as an attentional bias to infant faces or emotion, which itself has been found to be affected by factors such as age and life experiences such as being a parent (e.g. (Thompson-Booth et al., 2014a, 2014b). The current study attempted to explore the relational nature of mind-mindedness in more detail and clarify whether it relates to attentional processing of faces and emotion.

As noted in previous chapters, research over the last two decades has demonstrated positive associations between caregivers' mind-mindedness and children's development. Caregivers' tendency and motivation to be mind-minded about their children—to view them as individuals with their own thoughts, feelings, desires, and beliefs—predicts secure attachment (Lundy, 2003; Meins et al., 2001; Meins et al., 1998; Meins et al., 2012) and children's executive function (Bernier et al., 2010) and theory of mind abilities (Laranjo et al., 2010, 2014; Lundy, 2013; Meins et al., 1998; Meins et al., 2002; Meins, Fernyhough, Arnott, Leekam, & de Rosnay, 2013).

In the studies mentioned above, mind-mindedness has been assessed using both the describe-your-child measure (Meins et al., 1998) with preschoolers, and the observation-based measure (Meins et al., 2001, 2012) in the first year of life. The former assesses mind-mindedness in terms of caregivers' tendency to focus on internal state characteristics when given an open invitation to describe their children. The latter indexes mind-mindedness during infant–caregiver interaction in terms of the extent to which caregivers comment appropriately on their infants' internal states, while avoiding misinterpreting the infant's putative thoughts and feelings. Research has established that mind-mindedness varies widely in caregivers, and that such individual differences remain stable over periods of months (Meins et al., 2011) and years (Meins et al., 2003). Considerable variation in mind-mindedness has also been identified in other types of relationships, such as adults' descriptions of friends and romantic partners (Meins, Fernyhough, & Waller, 2014; Meins, Harris-Waller, & Lloyd, 2008), and children's descriptions of their best friends (Meins, Fernyhough, Johnson, & Lidstone, 2006).

An individual's tendency to be mind-minded in relation to others appears to depend on the nature of the relationship. Meins et al. (2014) found that adults were more likely to focus on internal state characteristics when describing a friend or romantic partner than when describing a famous person or work of art. Moreover, there was no relation between levels of mind-mindedness in adults' descriptions of friends and partners and their descriptions of famous people or works of art. Meins et al. thus argued that mind-mindedness is specific to close relationships, rather than a trait-like construct which is invariant across contexts. Individuals spontaneously represent significant others in terms of their internal states because they have come

to know about the person's likes, motivations, desires, and intentions through being in a close personal relationship.

The present study sought to explore in greater detail the proposal that mind-mindedness is a relational construct. Meins et al.'s (2014) conclusion to this effect was based on a lack of association between adults' descriptions of significant others and those of famous people or works of art. However, it could be that considering unknown people or works of art in the abstract does not engage individuals' emotional and cognitive attention sufficiently to provoke their capacity to focus on internal states. To address this shortcoming, a novel task to assess adults' tendency to focus on internal states in relation to unknown individuals was developed for the present study: the Unknown Mother–Infant Interaction Task (UMIIT). The UMIIT involves participants viewing clips of unknown mothers and infants interacting. The interactions depicted include (a) explicit internal state language that matched the infant's internal state, (b) explicit internal state language that was at odds with the infant's internal state or the mother's behaviour, or (c) no internal state language. The initial aim of the present study was to establish whether this task was suitable for eliciting internal-state interpretations of the behaviour of unknown individuals.

In order to test the hypothesis that mind-mindedness is a relational construct, we investigated relations between participants' mind-minded descriptions of mothers and infants on the UMIIT and their mind-mindedness when describing a significant other. If mind-mindedness is a relational construct, one would predict no association between individuals' UMIIT performance and their mind-minded descriptions of a significant other, on the grounds that the individuals in the UMIIT are not known to the participants. However, if mind-mindedness is a trait-like tendency to interpret any individual's behaviour with reference to their internal states, positive

associations should be observed between mind-minded descriptions of a significant other and internal state interpretations during the UMIIT. A further aim of the present study was to include parents and non-parents to establish whether mind-minded interpretations of these unknown infant–mother interactions in the UMIIT related to personal experience of parenting. We thus chose to assess mind-mindedness using the description measure in relation to friends and partners rather than the observation-based measure with caregivers and infants, given that not all participants had children.

The present study also sought to evaluate the proposal that mind-mindedness is a relational construct by investigating whether underlying differences in emotion processing could explain why some individuals are more likely to be mind-minded when describing significant others. Individuals who spontaneously focus on internal states when describing significant others may process emotional states differently from those for whom internal states are less salient. Thus, it may be that individuals who are highly mind-minded are biased toward attending to emotional states, or that they process emotions more effectively than individuals who are not mind-minded. If mind-mindedness were found to be related to individuals' general emotion-processing abilities, this would suggest that mind-mindedness is multifactorial, involving both relationship-general and relationship-specific elements. To investigate this issue, the present study included an attentional emotion-processing task.

A substantial body of research has demonstrated that our attention generally tends to be captured more readily by adult faces expressing positive or negative emotion than by neutral faces (e.g., Hodsoll, Viding, & Lavie, 2011), and that we are quicker to detect faces expressing anger and fear than those expressing happiness or sadness (e.g., Mogg, Garner, & Bradley, 2007). Adults also show a bias towards

attending preferentially to infant faces over adult faces (e.g., Luo, Li, & Lee, 2011; Pearson, Cooper, Penton-Voak, Lightman, & Evans, 2010). It has been suggested that this bias towards both threatening and infant faces has evolved in order to allow us to protect ourselves from danger and to trigger caretaking behaviour necessary for species survival. However, research has also identified individual differences in the extent to which adults show these characteristic biases.

Pearson and colleagues (Pearson et al., 2010; Pearson, Lightman, & Evans, 2011), drawing on both evolutionary and psychophysiological approaches, have shown that this preferential bias for infant faces is heightened in women who are pregnant, perhaps as part of the body's physiological preparations for motherhood. Using a computer-based reaction time paradigm, in which participants have to disengage their attention from centrally presented infant or adult faces displaying neutral, positive, or negative expressions in order to respond to a peripheral task, they found that women who were pregnant appeared have more difficulty disengaging their attention from distressed infant faces than happy or neutral infant faces as they took longer to respond to items for which distressed infant faces were the backdrop. However, a caveat to these findings is that women who reported symptoms of depression in pregnancy disengaged their attention from pictures of distressed infants more quickly compared with non-depressed women, and also appeared to disengage from pictures of distressed infants more quickly than they did from pictures of happy or neutral infant faces as they averaged shorter reaction times for items associated with distressed faces (Pearson et al., 2010). Similar research using a computer-based paradigm in which participants have to identify the odd one out in three faces depicting emotional expressions has also found that mothers seem to demonstrate a greater attentional bias to infant faces compared with women who

do not have children, and to distressed infant faces in particular (Thompson-Booth et al., 2014a, 2014b). The present study used Pearson et al.'s (2010) task to assess emotion processing to investigate whether differences in attentional bias to particular faces or emotions were systematically related to mind-minded descriptions of significant others.

As well as investigating links between emotion processing and mind-mindedness, the present study also explored whether emotion processing related to performance on the UMIIT. Regardless of whether emotion processing relates to individuals' tendency to focus on internal states when describing a significant other, emotion processing abilities may be linked to awareness and recognition of internal states while observing people interacting. For example, processing faces and emotions more effectively may make one more attuned to the thoughts and feelings of people one observes. Consequently, performance on the attentional emotion processing task might be expected to relate to mind-minded interpretations during the UMIIT. Once again, we investigated whether experience of parenthood moderated any observed relations.

In summary, the present study addressed the proposal that mind-mindedness is a relational construct by investigating how mind-minded descriptions of significant others related to performance on tasks assessing (a) internal state interpretations of interactions between unknown mothers and infants, and (b) attentional processing of emotions. Null findings for relations between mind-mindedness and performance on both of these tasks would be consistent with the proposal that mind-mindedness is a quality of close relationships. We also investigated how performance on the attentional processing of emotion task related to individuals' internal state

interpretations during the UMIIT. Finally, the potential moderating effect of being a parent was explored.

## 4.2 Method

### 4.2.1 Participants

Participants were 96 adults (80 women) recruited via online advertisements at university campuses and neighbourhood forums, and by word of mouth. The mean age of participants was 32.8 years, ( $SD = 11.57$ , range 18–68). Most participants ( $n = 85$ ) were White; of the remaining 11 participants, seven were Asian, one was mixed race, and three were Black. All but four participants were either attending university or had completed a university degree, and 45 participants had completed a post-graduate qualification. The majority of participants ( $n = 69$ ) were in a romantic relationship, which varied in length from 1 month to 45 years ( $M = 7.93$  years,  $SD = 8.72$ ). Twenty-seven participants (nine men, 18 women) had children, with 12 of these having two or more children, and their children ranged in age from one week to 43 years ( $M = 12.11$  years, median = 8.00 years,  $SD = 12.63$ ).

The study received ethical approval from the relevant university committee and participants gave informed consent to participate. All testing was carried out in accordance with guidelines published by the American Psychological Association and the British Psychological Society.

### 4.2.2 Materials and methods

All tasks were completed on a laptop in a quiet room at participants' homes or in an office setting while I was present. After providing informed consent, participants first completed the attentional processing of emotion task, and then filled

in an online questionnaire in which they were asked to provide basic demographic details about themselves as well as written descriptions of a friend and their current partner (where applicable). Finally, participants watched the clips of the mother–infant interactions and typed their responses in an online questionnaire. The entire procedure took approximately 45 minutes. Participants were not given any incentive to participate, apart from research participation credit in the case of university undergraduates.

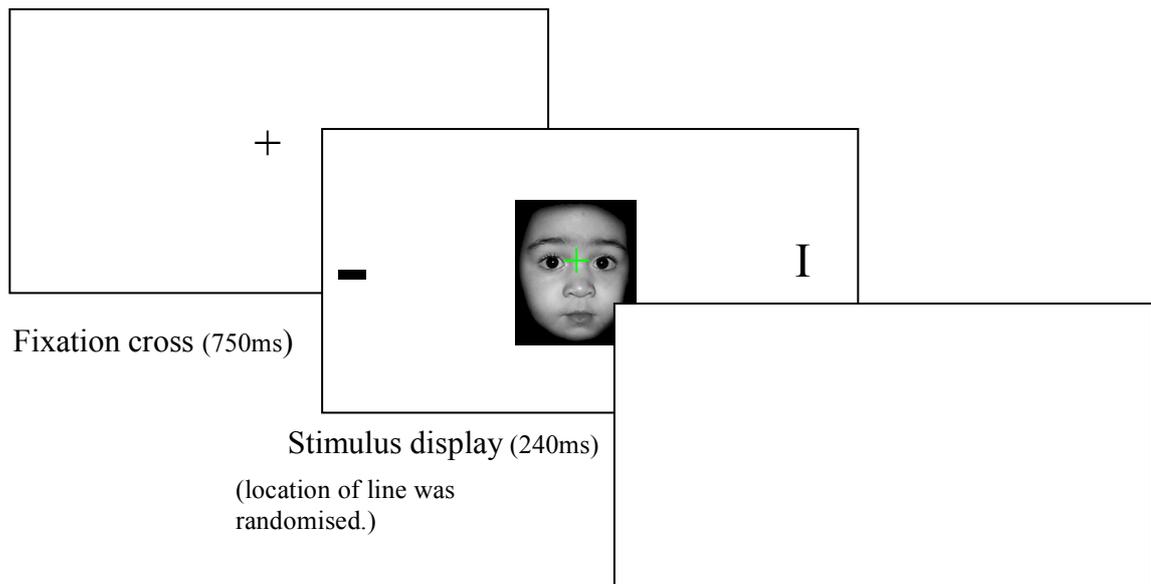
### 4.2.3 Measures

**4.2.3.1 Attentional processing of emotion.** A task designed to measure attentional bias to visual stimuli, developed by Bindemann, Burton, Hooge, Jenkins and de Haan (2005) and modified by Pearson et al. (2010), was used. The task was generated using e-prime software (Psychology Software Distribution, UK) and presented on a Dell laptop (screen size 33 cm × 20 cm). Viewing distance was approximately 30cm from the screen.

During the task, participants viewed a series of short presentations on the computer screen. Each presentation began with a small black cross, measuring 0.5 cm × 0.5 cm, which appeared in the middle of a white screen for 750 ms, followed by a stimulus display lasting 240 ms. In the stimulus display, the cross turned either red or green, while photographs of happy, neutral, or distressed/fearful adult and infant faces, measuring approximately 9cm × 6 cm, were displayed behind the cross. Two small lines, one vertical and one horizontal, approximately 1.5 cm in length, appeared simultaneously 14 cm to the left and right of the centre of the screen.

When the cross turned green, this signalled a Go trial. On Go trials, participants were instructed to use the keyboard to identify on which side of the screen the vertical line had appeared, pressing the 'A' key with their left hand if it appeared on the left side of the screen, and the 'L' key with their right hand if it appeared on the right side of the screen. (The 'A' and 'L' keys were used for this task as they are located at the left and right ends, respectively, of the middle row of letters on a standard keyboard.) Participants were told to make their choice as quickly as possible and to try to ignore the pictures behind the cross. Go trials thus required participants to disengage attention from the central cross and accompanying photograph to the peripheral lines in order to make a response.

When the cross turned red, this signalled a No-Go trial. On No-Go trials, participants were instructed to simply press the space bar to go on to the next trial. No-Go trials were included to ensure participants were motivated to fixate on the central cross initially (and thus the photograph behind the cross), rather than only focusing their attention on the peripheral lines on each side of the screen. A blank screen appeared following each type of presentation until a response was registered. Figure 4.1 shows an example presentation sequence for an infant face trial.

**Figure 4.1: Example presentation sequence**

Blank screen until a response is registered.  
Reaction time to indicate location of line was recorded.

Participants first completed one practice block of 36 trials with no images and a second practice block of 21 trials containing adult and infant images. This was followed by six blocks of 30 trials (20 Go and 10 No-Go), each followed by a rest. There was one block for each of the six face types: adult happy, adult neutral, adult fearful, infant happy, infant neutral, and infant distressed. Trial order within blocks, block order, and location of the target lines were randomized.

The length of time participants took to identify the location of the vertical line was recorded and analysed for each Go trial. It was presumed that slower response times indicated greater difficulty disengaging attention from the central stimuli to the peripheral target lines.

Further details of the task and the process by which the images were chosen and validated can be found in Pearson et al. (2010).

**4.2.3.2 Mind-mindedness.** After providing information about basic demographic details on an anonymised computer-based questionnaire, participants were asked to think of a person they regarded as a close friend and then their partner, if they were in a relationship, and to type a description of each person in a blank text box. For each relationship, the instructions stated simply: *Please use the space below to tell us a little about this person. There are no right or wrong answers.*

The text from each participant's description of the friend or partner was divided into single verbs, adjectives, or phrases indicating discrete descriptions. Each description was assigned exclusively to one of the following categories according to the guidelines provided by Meins and Fernyhough (2015): (a) *Mind-minded* (references to the person's mental life including emotions, intellect, or interests); (b) *Behavioural* (descriptions of the person's activities, interactions with others, and other characteristics that could be interpreted on a behavioural level); (c) *Physical* (references to physical attributes including appearance and age); (d) *Self-referential* (comments focused on the participant's own thoughts, feelings, or behaviours, rather than those of the person being described); (e) *Relationship* (any references to the relationship between the participant and the person being described, such as length or quality); and (f) *General* (other comments not falling into one of the above categories, including name, where the person grew up, and non-specific value judgments about the person such as, "She's lovely."). Scores for mind-minded descriptions were expressed as a percentage of the total number of descriptions to control for amount written.

Descriptions were coded by an experimenter who was blind to all other data, with a randomly selected 25% being coded by a second blind experimenter. Inter-rater reliability was  $\kappa = .89$ .

**4.2.3.3 Unknown mother–infant interaction task (UMIIT).** Participants were asked to watch 12 short video clips, each lasting less than 45 seconds, of four different mothers participating in unstructured play with their 8-month-olds in a research laboratory. The play clips were selected from a previous study (mothers had given permission for their observations to be viewed), and were chosen to exemplify a range of maternal behaviours that could be commented on: (a) five clips in which there was no internal state language, (b) three clips in which the mother commented appropriately on the infant’s internal state (e.g., saying the child was excited when she squealed happily), and (c) four clips in which the mother misinterpreted the infant’s internal state (e.g., saying the infant was crying because he was tired, when he had injured himself), or did not behave in accordance with the infant’s internal state (e.g., saying that the infant liked a particular toy, but then took it away from the infant). Participants were asked to watch each clip twice, and were then given the following instructions: *Please tell us something about what’s happening in the interaction. There are no right or wrong answers.* Participants typed their responses into blank text boxes on a computer screen. If participants asked the researcher for further guidance, they were told that they could write about whatever came to mind when they watched the clips.

Each participant’s description of their friend or partner was divided into single verbs, adjectives, or phrases indicating discrete descriptions. A sample of 10 descriptions was used to establish whether the mind-mindedness coding scheme described above was suitable for coding descriptions of infant–mother interactions. The behavioural and physical categories were maintained unchanged, but a number of adaptations were made. Several participants described an interaction to indicate that they believed the mother has misinterpreted the child’s internal state (e.g., “She

says he's crying because he's tired, but I think he's upset that he hurt his head"). The adapted mind-minded category thus included these disagreements about the mother's interpretation of her infant's internal states as well as attributions about the mother's or infant's internal states. Several participants also made value judgements about the mother's behaviour or the infant–mother relationship (e.g., "She's trying too hard", "They seem to have a close relationship"), and so a *Value* category replaced the General category in the original scheme.

The categories for the interactions were as follows: (a) *Internal state* (any reference to the mother's or infant's internal state, including their thoughts, feelings, beliefs, or intentions, or any suggestions that the mother had misinterpreted her infant's internal state); (b) *Behavioural* (comments about the mother's or child's behaviour or play); (c) *Physical* (references to the mother's or child's physical attributes including appearance or age); (d) *Value* (judgments from the participant that went beyond what was actually happening in the clip). Participants received a score for the number of mental references they made in the three types of clip (non-internal state, appropriate internal state, misattributed internal state).

All transcripts were coded by an experimenter who was blind to all other data and a second blind experimenter coded a randomly selected 25% transcripts; inter-rater reliability across the four categories was  $\kappa = .79$ .

## 4.3 Results

### 4.3.1 Preliminary analyses

Reaction time data from the attentional processing of emotion task was first examined for accuracy and outliers. The overall accuracy on the task was 86% ( $SD = .17$ ), indicating that participants were generally able to follow the task instructions.

Inaccurate responses and outlying reaction times (defined as more than three standard deviations above the block mean reaction time) for accurate ‘Go’ trials were identified and removed from each participant’s data before analysis because of the possibility that errors and significantly delayed responses were due to participants looking away from the screen momentarily or being distracted. Using the same reasoning, four participants (two parents and two non-parents) whose overall accuracy was more than three standard deviations below the group mean and one parent participant whose response times were more than three standard deviations above the group mean were excluded from analyses related to this task. Data for the adult faces for one participant was missing due to a technical error with the task.

There were no gender differences on any of the attentional processing of emotion, mind-mindedness, or UMIIT variables ( $t_s < 1.67, p_s > .098$ ). Participant age was unrelated to mind-minded descriptions of partner and friend and to the UMIIT variables ( $r_s < .18, p_s > .073$ ), but participant age was positively correlated with reaction time to all of the stimuli on the attentional processing of emotion task ( $r_s$  from .21 to .35). Age was also related to parent status; parents were significantly older ( $M=42.41$  years,  $SD=8.98$ ) than non-parents ( $M=29.07$  years,  $SD=10.27$ ),  $t(94) = 5.92, p < .001$ .

Reaction times for infant happy, neutral, and distressed faces were highly positively correlated with each other in both parents ( $r_s > .90$ ) and non-parents ( $r_s > .77$ ), as were reaction times for adult faces in both parents ( $r_s > .77$ ) and non-parents ( $r_s > .64$ ). This was in contrast to findings of Thompson-Booth et al. (2014a, 2014b) that mothers seem to demonstrate a greater attentional bias to infant faces compared with women who do not have children, and to distressed infant faces in particular. Replicating previous findings (Meins et al., 2008, 2014), scores for mind-minded

descriptions of friends were positively correlated with those for mind-minded descriptions of partner,  $r(66) = .32, p = .009$ .

The possible effect of parenthood on reaction times for infant versus adult faces on the attentional processing of emotion task was explored further using a multivariate ANOVA with parent status (parent, non-parent) added as a fixed variable and total reaction times for infant and adult faces as the dependent variables. There was a significant main effect of parent status on reaction times,  $F(2, 85) = 3.98, p = .022, \eta^2 = .09$ , with parents showing slower reaction times for both infant ( $M = 2295.64$  ms) and adult ( $M = 2232.80$  ms) faces than non-parents ( $M_s = 2088.82$  ms and  $2103.19$  ms, respectively). As age was correlated with reaction time and because parents were significantly older than non-parents, the analysis was rerun as a multivariate ANCOVA, with age added as a covariate. After controlling for age, there was no main effect of parent status on reaction times,  $F(2, 84) = 1.48, p = .234, \eta^2 = .03$ .

The possible effect of parenthood on reaction times for the three types of emotional expression for infant and adult faces was also explored further using a multivariate ANOVA, with expression (positive, neutral, negative) added as dependent variables and parent status (parent, non-parent) added as a fixed factor. There was a main effect of parent status on reaction times for different emotional expressions,  $F(6, 81) = 2.58, p = .024, \eta^2 = .161$ . When age was added as a covariate, there was no main effect of parents status on reaction times for different types of emotional expression,  $F(6, 80) = 1.31, p = .261, \eta^2 = .09$ .

### 4.3.2 Performance on the unknown mother–infant interaction task (UMIIT)

Table 4.1 shows the descriptive data for performance on the UMIIT. There was good variance in internal state interpretations in all three types of clip (no internal state language, appropriate internal state language, and misattributed internal state language) included in the UMIIT. A multivariate ANOVA with parent status added as the between subjects factor and average number of internal state interpretations for each type of clip added as dependent variables showed no effect of parent status on internal state interpretations on any of the types of clip,  $F(3, 91) = .65, p = .583, \eta^2 = .021$ .

**Table 4.1 – Descriptive statistics for internal state comments on the unknown mother–infant interaction task (UMIIT) for parents and non-parents**

<i>Type of Clip</i>	Parents (n = 27)		Non-Parents (n = 67)	
	<i>M (SD)</i>	Range	<i>M (SD)</i>	Range
No ISL	8.70 (4.99)	2–24	7.49 (4.67)	0–20
Appropriate ISL	5.88 (3.42)	2–15	5.06 (3.03)	0–16
Non-attuned ISL	9.59 (4.51)	2–23	9.16 (6.83)	0–52
All clips	24.38 (11.99)	8–62	21.71 (11.97)	2–61

ISL = internal state language.

Paired samples t tests showed that participants used more internal state language when interpreting the misattributed internal state clips than (a) no internal state language clips,  $t(95) = 2.53, p = .013$ , and (b) appropriate internal state language clips,  $t(95) = 7.21, p < .001$ . However, there were robust positive correlations between the use of internal state interpretations across the three types of clip ( $r_s > .50, p_s < .001$ ).

### 4.3.3 Relations between mind-mindedness and unknown mother–infant interaction task (UMIIT) performance

Table 4.2 shows the correlations between scores for mind-minded descriptions of friend and partner and the internal state variables from the UMIIT. None of the correlations were significant, suggesting that individuals' tendency to describe significant others using internal state language is not related to their tendency to describe the behaviour of unknown others using internal state language.

**Table 4.2 – Correlations between mind-minded descriptions of partners and friends and internal state comments on the unknown mother–infant interaction task (UMIIT)**

	Mind-Mindedness Friend	Mind-Mindedness Partner
<i>Type of Clip</i>		
No ISL	.00	-.11
Appropriate ISL	.11	.08
Non-attuned ISL	.02	-.14
All clips	.04	-.09

ISL = internal state language.

### 4.3.4 Relations between mind-mindedness and emotion processing

Given that parents and non-parents differed in their responses on the emotion processing task, analyses were conducted separately for parents and non-parents. Correlational analyses investigated how participants' mind-minded descriptions of friend and partner related to their reaction times in processing positive, negative, and neutral facial expressions in both adults and infants. Reaction times for all infant and adult face stimuli were unrelated to scores for mind-minded descriptions of friends ( $r_s < .14$ ,  $p_s > .526$ ) and partners ( $r_s < .11$ ,  $p_s > .466$ ). Given the high correlations

between reaction time scores for the different infant and adult faces, correlations between mind-mindedness and total reaction times for the infant or adult faces were also explored; all correlations were non-significant ( $r_s < .07$ ,  $p_s > .578$ ).

The effect sizes achieved in the above calculations can be classified as ‘small’, according to guidelines by Cohen (1992). A post-hoc power analysis using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007) showed that, in order to have .80 power to detect a small effect (.10) as significant at the .05 level, a sample of 398 participants in each group would be required, while .80 power to detect medium (.30) or large effects (.50) as significant would require sample sizes of 84 or 29 in each group, respectively. Thus, while the sample size of 27 parents and 67 non-parents provided insufficient power to detect small and medium effects, there was sufficient power to detect large effects. These results thus suggest that the null relation between mind-mindedness and emotion processing cannot fully be explained in terms of lack of power.

#### **4.3.5 Predictors of mind-mindedness**

Hierarchical regression was used to explore whether participants’ age, experience of parenthood, nature of descriptions on the UMIT, or attentional processing of emotion might predict mind-mindedness. Scores for mind-minded descriptions of friends were used as the dependent variable, with age, parent status, total internal state interpretations on the UMIIT, adult face total reaction time scores, and infant face total reaction time scores added at the first step, and scores for mind-minded descriptions of partners added at the second step. As shown in Table 4.3, none of the variables predicted independent variance in mind-minded friend descriptions at the first step, and mind-minded partner descriptions was the only

significant predictor at the second step, accounting for an additional 14% of the variance.

**Table 4.3 – Results of regression analysis for predictors of mind-minded descriptions of friends scores**

Variable	B	$\beta$	<i>p</i>
<u>Step 1</u>			
Age	.00	.10	.554
Parent status	.02	.03	.876
Total UMIIT internal state interpretations	.00	-.05	.744
Total adult face reaction time scores	.00	-.08	.873
Total infant face reaction time scores	.00	.03	.957
<u>Step 2</u>			
Age	.01	.16	.292
Parent status	.08	.12	.450
Total UMIIT internal state interpretations	.00	-.07	.570
Total adult face reaction time scores	.00	-.03	.945
Total infant face reaction time scores	.00	.03	.946
Mind-minded partner description scores	.45	.39	.005
$\Delta R^2 = .14$			

#### **4.3.6 Relations between attentional processing of and unknown mother–infant interaction task (UMIIT) performance**

In order to reduce the number of correlations, and given the high correlations among the variables within both the UMIIT and the attentional emotion processing task, total reaction time scores for infant or for adult faces, and total internal state references in the UMIIT were used in the analyses. Analyses were again conducted separately for parents and non-parents.

As shown in Table 4.4, reaction times with both infant and adult faces were negatively correlated with internal state references in the UMIIT for parents, but not for non-parents. This pattern of findings was maintained when participants' age was partialled out, suggesting that parents who were more mind-minded disengaged more quickly from both infant and adult faces in the emotion processing task, regardless of age. Fisher's r-to-z transformation suggested a significant difference between the correlation coefficients associated with infant reaction times for parents and non-parents when age was partialled,  $z = -1.96$ ,  $p = .05$ , two-tailed, and a difference approaching significance between correlation coefficients associated with adult reaction times for parents and non-parents,  $z = -1.88$ ,  $p = .06$ , two-tailed.

**Table 4.4 – Correlations between reaction times to infant/adult faces and internal state references on unknown mother–infant interaction task (UMIIT) in parents and non-parents**

	Parents		Non-Parents	
	Infant Total	Adult Total	Infant Total	Adult Total
Total mental comments	-.40* (-.46*)	-.41* (-.46*)	.00 (-.02)	-.02 (-.04)

\* $p < .05$

Correlations with participant age partialled out are shown in parentheses.

#### 4.4 Discussion

The main aim of the present study was to explore the properties of the construct of mind-mindedness, evaluating Meins et al.'s (2014) proposal that it is not trait-like, but a quality of close relationships. In support of this proposal, there was no relation between participants' mind-mindedness in relation to friends or partners and (a) their tendency to use internal state interpretations when commenting on the behaviour of unknown individuals during the UMIIT, or (b) their attentional

processing of emotion. This suggests that individual differences in the spontaneous tendency to focus on internal states when describing a significant other are not driven by underlying differences in attention to or processing of emotional expressions, or to one's general tendency to invoke internal state language when interpreting others' behaviour.

The present study replicated previous findings of a positive association between mind-minded descriptions of friends and partners (Meins et al., 2008, 2014). The present study also found initial support for previous findings by Thompson-Booth et al. (2014b) that parents showed longer reaction times with infant faces as distractors than with adult faces compared to non-parents, but contrary to Thompson-Booth et al.'s findings, this difference was not maintained when adjusting for age. This discrepancy may be due to the fact that parents in Thompson-Booth et al.'s sample were notably younger ( $M = 28.68$  years old,  $SD = 4.7$ ,  $n = 31$ ) than parents in the current study ( $M = 42.41$  years old,  $SD = 8.98$ ,  $n = 26$ ). Additionally there was not as large a difference in age between parents and non-parents in Thompson et al.'s study (non-parents  $M = 30.59$  years,  $SD = 5.03$ ) as in the current study ( $M = 29.07$ ,  $SD = 10.27$ ), which may have kept any age-related effects to a minimum.

The UMIIT, used for the first time in the current study, successfully elicited good variance in internal state interpretations, with the different types of clip producing different levels of internal state interpretations: internal state language was more likely to occur when the mother misread or behaved in a way that was at odds with the infant's internal state than in clips where mothers commented appropriately on the infant's internal state or used no internal state language. These findings suggest that the observed null associations with mind-mindedness are unlikely to have arisen due to experimenter error in administering the tasks, lack of variance in

internal state language during the UMIIT, or because the sample was non-representative.

In contrast to the lack of association with mind-mindedness, participants' tendency to use internal state interpretations during the UMIIT was related to their performance on the attentional emotion processing task, but only if they were parents. Parents' greater use of internal state language when interpreting the behaviour of unknown mothers and infants was associated with faster reaction times for both infant and adult faces, regardless of whether the facial expression was neutral or emotional. The fact that significant associations were detected for these analyses suggests that the null effects for performance on these two tasks and relations with mind-mindedness were not due to lack of statistical power.

The negative associations observed between parents' internal state interpretations during the UMIIT and performance on the attentional emotion processing task held for both adult and infant faces across all types of emotional expression. This observed negative association suggests that internal state interpretations are linked to faster facial and emotion processing in general, which may at first seem somewhat counterintuitive. However, a negative association would be predicted if a lack of bias towards particular faces or emotions related to higher levels of attunement to the range of thoughts and feelings of the people being observed. Although faster reaction times have been regarded as evidence for an avoidance of the emotional expression (Pearson et al., 2010), it could be that faster reaction times on the attentional emotion processing task are associated with more rapid identification of the facial expression. It is important to note that the faces in this task act as distractors, and so face and emotion processing is not assessed directly. Future research could explore how internal state interpretations during the

UMIIT relate to direct measures of facial and emotion recognition, such as the Brief Affect Recognition Task (Ekman & Friesen, 1974) or the Diagnostic Analysis of Nonverbal Accuracy (Nowicki & Carton, 1993). If the negative association between reaction time and internal state interpretations observed in the present study is indeed due to more rapid facial and emotion recognition, the same negative association should be seen when recognition is assessed directly.

Before drawing definitive conclusions about the construct of mind-mindedness from the present study's results, future research should investigate how the observational measure of mind-mindedness relates to internal state interpretations during the UMIIT and performance on the attentional emotion processing task. As discussed in the Introduction to this chapter, there are two methods for assessing mind-mindedness: the description measure used in the present study (Meins et al., 1998, 2008, 2014) and the infant-caregiver observation-based measure (Meins et al., 2001, 2012). We chose the description measure, focusing on descriptions of participants' friends and romantic partners rather children, because one aim was to investigate whether experience of parenthood moderated any observed associations. Future research should measure mind-mindedness in parents using the observational method that assesses mind-mindedness in terms of caregivers' use of appropriate and non-attuned mind-related comments. It may be the case that parents' mind-minded interpretations of their own infants' behaviour will be associated with their use of internal state language during the UMIIT. In contrast, if null findings between mind-mindedness and UMIIT performance were still obtained when observational measures of mind-mindedness were used, this would provide strong support for the notion that mind-mindedness is a relational construct.

It would also be interesting to investigate how the observational measure of mind-mindedness relates to emotion processing. For example, while it is sometimes possible to comment appropriately on the infant's internal state without attending to the infant's facial expression (e.g., commenting that the infant wants an object if he or she reaches out or gestures towards it), facial cues are essential for accurately establishing the infant's internal state in the vast majority of cases. Consequently, it may be that facial and emotion processing or recognition may be associated with observation-based mind-mindedness, and future research should explore this possibility. This line of research could be particularly illuminating in mothers with mental health difficulties, as Pearson et al. (2010) found mothers with depressive symptoms were quicker to disengage their attention from pictures of distressed infants. If links were found between mind-mindedness, mental health, and emotion processing, it might suggest that mother–infant interaction difficulties sometimes observed in mothers with mental health problems may be due to difficulty sustaining attention to infant distress, which may thus impede mind-mindedness and sensitive responsiveness.

In summary, the results of the present study are consistent with the proposal that mind-mindedness is a relational construct. Underlying individual differences in emotion processing and the tendency to interpret unknown people's behaviour with reference to internal states were both unrelated to participants' mind-minded descriptions of individuals with whom they had close personal relationships. Future research exploring how observational measures of mind-mindedness relate to performance on the UMIIT will shed further light on mind-mindedness as a relational construct.

## CHAPTER 5

### General Discussion

#### 5.1 Summary of findings

The studies in this thesis addressed several questions within the broad topic of mind-mindedness, further elucidating the nature of mind-mindedness as a relational construct and links to complex psychological processes. Study 1 explored how severe maternal mental illness relates to maternal mind-mindedness with infants in the first year of life and whether maternal mind-mindedness can be increased in mothers with SMI via a video feedback intervention. Study 2 examined the longer-term effects of a mind-mindedness intervention in terms of security of attachment, as well as the relation between attachment and severe maternal mental illness. Study 3 examined links between mind-mindedness and attentional processing of emotion, and also explored consistency of mind-mindedness across relational contexts. The results outlined below add to the fairly limited literature around mind-mindedness and mental illness, and mental illness and attachment, and suggest a possible avenue for intervening to increase mind-mindedness in mothers with SMI. They also suggest further avenues of exploration around mind-mindedness and emotion processing.

##### **5.1.1 Mind-mindedness in mothers with SMI: assessment and intervention**

Study 1 had two aims: to compare levels of mind-mindedness in mothers with SMI to those of psychologically health controls, and to design and evaluate a video feedback intervention to facilitate mind-mindedness in a sample of mothers hospitalised for treatment of SMI. There is very little research on mind-mindedness

in relation to mental health, and only one study exists (Pawlby et al., 2010) that has examined mind-mindedness in mothers with SMI. Additionally, though maternal mentalization has been highlighted as an important facet of sensitive mother–infant interactions and secure attachment relationships (Fonagy & Target, 1997; Meins et al., 2001), there is little research on mentalization-focused interventions in mothers with SMI and their infants, even though symptoms of SMI have been proposed to impede sensitive mother–infant interaction (Murray et al., 2003).

In terms of the first aim, results for this study showed that, on admission to the MBU, mothers in the mind-mindedness intervention group made high levels of non-attuned mind-related comments relative to a group of psychologically well mothers, while mothers who received the standard care video feedback intervention made few appropriate mind-related comments compared with psychologically well mothers. The findings suggest that SMI may impact mothers in one of two ways: they may fail to comment on their infants' internal states, or they may make frequent misattributions about their infants' internal states.

In terms of the second aim, results suggested that the mind-mindedness intervention was successful in reducing non-attuned mind-related comments, as mothers who participated in this intervention showed a significant decrease from high levels of non-attuned comments at admission to levels no different from those of psychologically well mothers at discharge. Mothers who participated in the standard care intervention, by contrast, showed lower levels of both appropriate and non-attuned mind-related comments at discharge relative to intervention-group and well mothers, and no significant change from levels at admission. As was its aim, the standard care intervention did result in a significant increase in maternal sensitivity and unresponsiveness, and thus appeared to have effects distinct from the mind-

mindedness intervention. However, as the mind-mindedness intervention also resulted in improvements in maternal sensitivity and controlling behaviour between admission and discharge, and as levels of sensitivity were higher in the intervention than standard care group at discharge, it could be suggested that the mind-mindedness intervention was more effective than the standard care intervention at increasing maternal sensitivity.

### **5.1.2 Long-term effects of the mind-mindedness intervention on attachment**

The aim of Study 2 was to investigate whether participation in the mind-mindedness intervention on the MBU had an impact on attachment quality in the second year of life. This study also sought to add to the limited data on attachment security in the context of maternal mental illness, and to attempt to delineate factors that may influence attachment security in this context, such as nature, chronicity, and duration of illness.

Results showed that mothers who participated in the mind-mindedness video feedback intervention on the MBU were significantly more likely to have infants classified as secure and as organised than mothers who received the standard care video feedback intervention. Across the entire sample, there was a high rate of disorganised attachment (59%) and a low rate of secure attachment (31%) relative to previously published research with both normative and clinical samples, although there was some similarity to attachment distributions found with maltreating and substance-abusing parents reported by van IJzendoorn et al. (1999). Attachment security and organisation were unrelated to the nature, chronicity, or duration of mothers' illnesses, or to the majority of demographic variables for which data were

available, including maternal education, maternal age, maternal ethnicity, infant gender, infant age, and infant birth order. The only demographic variable that differentiated attachment groups was that infants in full-time child care ( $n = 3$ ) were more likely to be classified as securely attached than infants in part-time or no child care. There was no relation between experience of child care and infant attachment organisation, however. The finding that experience of full-time child care was related to secure attachment needs to be treated with caution given the small number of infants in full-time care relative to the entire sample. It is also at odds with the general finding that insensitive mothering rather than experience of child care predicts attachment security, and that insensitive mothering is a particular risk factor for insecure attachment in children who spend more than 10 hours per week in child care, regardless of quality (NICHD, 1997).

### **5.1.3 Mind-mindedness as a relational construct**

Study 3 attempted to explore the relational nature of mind-mindedness, testing whether it is specific to close relationships or applies equally to individuals about whom one has no prior knowledge. It also attempted to clarify whether a propensity to be mind-minded relates to processing of emotion at an implicit level. These questions were of interest given that mind-mindedness has been found to vary across individuals, but is unrelated to specific demographic factors such as age, education, or SES, or infant characteristics such as temperament, birth order, or cognitive ability (Meins et al., 2001; Meins et al., 2011). There is little research on mind-mindedness in the context of maternal mental illness, but it seems plausible that emotional distress may interfere with a mother's ability to be mind-minded with her infant. In a similar vein, a recent study by Pearson et al. (2010) found that

women who reported symptoms of depression in pregnancy disengaged their attention from pictures of distressed infants more quickly than non-depressed women, which suggested that depression may interfere at an implicit level with a mother's ability to engage with her infant's distress. Study 3 attempted to test whether a tendency to be mind-minded about significant others and unknown mothers and infants was similarly related to implicit engagement with faces displaying different emotions.

Similar to findings by Meins et al. (2014), there was no relation between participants' mind-mindedness when describing friends and partners and their tendency to use internal state interpretations when commenting on the behaviour of unknown mothers and infants. This provides further support for the proposal that mind-mindedness is not trait-like, but a quality of close relationships. There was also no relation between mind-minded descriptions of friends and partners and individuals' attentional processing of emotion, suggesting that mind-mindedness is not necessarily driven by an implicit attention to or avoidance of various emotional expressions.

## **5.2 Study limitations**

As noted earlier, confidence in the findings of Study 1 and Study 2 is limited by small numbers of participants, making it difficult to draw meaningful conclusions about the nature of mind-mindedness in the context of maternal SMI in relation to attachment in mothers with SMI. The small numbers of participants also made it difficult to meaningfully assess how different types of SMI might relate to attachment, mind-mindedness, and changes in mind-mindedness following participation in the mind-mindedness video feedback intervention.

The fact that many participants' MBU video observations were missing, corrupted, or not in English also limits generalizability of the already small amount of mind-mindedness data. There may have been systematic differences between mothers who were discharged from the MBU before a final observation could be recorded and those who did film a final observation; for instance, these mothers who did not film discharge videos may have been less severely ill, or they may have been less keen to receive treatment on the MBU and more insistent on being discharged as soon as possible, both of which could conceivably relate to mind-mindedness and relationships with their infants. It is also not known how mothers who speak other languages might differ in mind-mindedness from native English speakers. Though there were no differences between ethnic groups in terms of mind-mindedness or attachment, the exclusion of women who did not speak English and were thus presumably newer to the UK, less well-integrated, and potentially less well-educated may have biased this finding. Including these women in a future study would allow an examination of how this particular type of profile might relate to mind-mindedness.

There was also a significant rate of refusal and non-participation in Study 2, and it is not known how this might bias the results reported. Though participants were not different from non-participants in terms of basic demographic variables, it may be that mothers who refused to participate in this study are less mind-minded or are more likely to have insecure attachments. The same might be true of mothers who were discharged before consent for future research contact could be obtained, for the reasons outlined in the previous paragraph. It may also be that mothers who did not participate represent a group for whom time on the MBU was traumatic or stressful, and something they wished to distance themselves from as quickly as

possible. Having unpleasant or traumatic memories of the post-partum period and hospitalisation during this time would also conceivably affect a mother's developing relationship with her infant. Had this group of mothers agreed to participate, an entirely different pattern of mind-mindedness and attachment may have ensued.

In terms of Study 3, confidence in the results would increase had there been less of an imbalance in terms of participant gender and parent status. There were relatively few men and few parents in the sample, and parents were also significantly older than non-parents, which appears to have been a critical factor in performance on the attentional processing of emotion task. Having a more balanced sample in terms of age, parent status, and gender may have affected some of the findings which showed trends towards significance – e.g. comments on the UMIIT in relation to gender and age, and reaction times to infant faces in relation to parent status.

### **5.3 Theoretical implications**

The results of this thesis add to the growing picture of a complex relation between mind-mindedness and maternal mental illness. Though Study 1 suggests that maternal SMI may have a detrimental effect on mind-mindedness, mothers did not show a uniform pattern in their tendency to comment on their infants' putative mental states on admission to the MBU, when they were unwell, with one group making very high levels of non-attuned mental state comments on admission relative to psychologically well mothers, and another showing low levels of both appropriate and non-attuned comments on admission relative to well mothers.

The picture remained complex when diagnoses were combined into three broad categories (mood, psychosis, and bipolar). Means for mind-mindedness indicated that mothers with psychosis commented more frequently on their infants'

mental states, both appropriately and in a non-attuned manner, than mothers with mood or bipolar illnesses at both admission and discharge. Though mothers with mood disorders in the standard care group showed relatively low levels of appropriate and non-attuned mind-related comments at both admission and discharge, intervention group mothers with mood disorders showed high levels of non-attuned comments and low levels of appropriate comments when they were ill at admission, and the reverse pattern at discharge when their symptoms had remitted. Standard care mothers with bipolar illness also showed low levels of mind-related comments at admission and discharge, but intervention group mothers with bipolar illness showed high levels of non-attuned comments at admission and a large decrease in non-attuned comments at discharge, following recovery. These findings provide some theoretical support for previous empirical and clinical suggestions that depression and psychotic/manic illnesses can be associated with a failure to recognise the infant's cues, perhaps leading to high levels of non-attuned mind-related comments (Murray et al., 2003). However, the relatively high mean scores for mind-mindedness in mothers with psychosis do not support suggestions that mothers with schizophrenia are less sensitive and more remote than mothers with other illnesses (Riordan et al., 1999; Wan et al., 2007) and have difficulty tuning into their infants (Murray et al., 2003). As Pawlby et al. (2010) also observed in their sample of mothers with SMI that mothers with schizophrenia showed levels of mind-mindedness and behavioural sensitivity that were in line with psychologically healthy controls, it may be that the recent theory that mothers with schizophrenia are less sensitive, more remote and more intrusive with their infants (Riordan et al., 1999; Wan et al., 2007), which has been largely constructed on the basis of studies with very small samples, needs to be reconsidered. It may also be however, as

suggested earlier in this thesis, and as suggested by Pawlby et al., that the mind-mindedness coding scheme is not sufficiently sensitive to elucidate the problematic aspects of mother-infant interaction in mothers with SMI that lead to the poorer longer-term outcomes generally cited in the literature (e.g. Stein et al., 2014). Pawlby et al. suggested some amendments to the coding scheme on the basis of their findings in order to capture some of the unique ways in which mothers with SMI relate to their infants that were not seen in normative populations – for instance, using an irritated tone of voice or making requests of the infant that were far beyond their developmental level. This type of addition, plus the use of additional measures that capture significant disruptions and distorted communication in mother-infant interactions is necessary in future studies with this population.

The finding that the mind-mindedness video feedback intervention was successful in decreasing non-attuned mind-related comments between admission and discharge whereas participants in the standard care video feedback intervention showed an increase in behavioural sensitivity by discharge but no significant change from low levels of mind-mindedness at admission suggests that the mind-mindedness intervention may have worked, as intended, by drawing attention to infants' mental states. This is in line with the hypothesis that video feedback works by allowing mothers to pause and consider interactions between them and their infants when felt emotion from the situation has decreased, allowing more awareness of the infant's perspective (Beebe, 2010). When the standard care feedback focused mothers' attention on their infants' behavioural cues and the contingency of their own responses on video, mothers appeared to become more behaviourally sensitive by the time they were filmed again prior to discharge. When the feedback focused mothers' attention specifically on what their infants may be thinking, feeling, experiencing,

needing, or preferring, this may have provoked mothers to be more sensitive to their infants' mental lives outside of the videotaped interaction, thus becoming more mind-minded.

Findings from Study 2 add to the limited data on attachment in the context of severe maternal mental illness, and suggest that attachment in this population may be influenced by factors not identified in the current study given the lack of relation between attachment security and any demographic or mental health variables. The attachment distributions reported here are not in line with those reported in van IJzendoorn et al. (1999)'s meta analysis for normative mothers or mothers with depression, but are more similar to rates reported for mothers with alcohol and drug abuse. Though individual and small group variations in depression are lost in a meta analysis, it could be hypothesised that mothers with SMI have a unique profile of attachment relationships which should be studied further and, as a group, they should be delineated from common mental illnesses in future analyses.

The findings from this study are also not in line with the results of a smaller study conducted with mothers from the same MBU 15 years earlier by Hipwell et al. (2000), which found a higher proportion of secure attachment and lower proportion of disorganised attachment. As discussed in Chapter 3, this may be due to the fact that Hipwell et al. conducted the Strange Situation at 12 months, when infants had not long been home from hospital, while the current study assessed security between 15-23 months, when infants would have had greater exposure to any mental health symptomatology and caretaking deficits of their mothers, which might have been mediated in the first year by care provided by staff on the MBU.

The disparity between security and organisation at 12 months versus 15-23 months is also in line with suggestions of a deterioration in the mother-infant

attachment relationship between 12 and 18 months in clinical groups (Egeland & Sroufe, 1981; Gaensbauer, Harmon, Cytryn, & McKnew, 1984; Schneider-Rosen, Braunwald, Carlson, & Cicchetti, 1985). Stern (1985) notes that over the end of the first year of life, infants become more autonomous, better able to monitor adult affect, and seek more contact with the mother when she is angry or distressed. It thus can be hypothesised that, in this sample, infants' heightened sensitivity to affect and increasing contact-seeking with mothers who may have been manic, psychotic, or depressed and unavailable may have resulted in the high levels of disorganised attachment seen in this sample, as disorganisation is thought to result when the potentially protective parent is also a source of fear (Main & Hesse, 1990).

The aim of Study 3 was to explore factors that might contribute to one's propensity to be mind-minded. It was hypothesised that mind-mindedness may relate to attentional processing of emotion at an implicit level, such that individuals who were more distracted by emotion, particularly distressed faces, and/or by infant faces in a computer task, may also show a greater propensity to be mind-minded about their friends, partners, and unknown mothers and infants. This was not the case, however; there was no relation between attentional processing of emotion, mind-minded descriptions of friends and partners, or use of mental state comments to describe interactions between unknown mothers and infants. This suggests that in a normative group, the propensity to be mind-minded may not be driven by implicit processing of emotion. It is unknown how results might differ in a clinical sample, and this would be worth exploring further given Pearson et al. (2010)'s findings of faster disengagement with distressed infant faces in pregnant women with symptoms of depression.

These findings do not address, however, the question of whether online mind-

mindfulness – for example, with one’s own infant – might relate to attentional processing of emotion. It is also not currently known how adults’ descriptions of friends and partners relates to online mind-mindedness, as the descriptive and online measures have so far only been correlated in mothers’ descriptions of and interactions with their young children (Meins et al., 2003). It may be that a different pattern of findings would have emerged if mind-mindedness had been measured in a real-life interaction.

Contrary to initial hypotheses, the results showed that parents in the sample who used more mental state terms in the UMIIT were faster to disengage from both infant and adult faces regardless of their emotional expression. The finding that parents who were more attuned to emotions and thoughts of unknown parents and infants were quicker to disengage from emotional faces in the attention task seems at odds with Pearson et al. (2000)’s suggestion that quicker disengagement is synonymous with emotional avoidance. This warrants further exploration, again perhaps coupling the attention task with a measurement of online mind-mindedness with parents’ own children.

#### **5.4 Clinical implications**

Results from Study 2 raise the possibility that mother–infant treatment on the MBU in the first year postpartum does not result in rates of mother-infant attachment security and organisation in the infant’s second year of life that are comparable to community samples of mothers with mental health problems or psychologically well mothers. This is despite the fact that one rationale frequently cited when admitting mothers and infants to the MBU is to assist with “bonding” and to improve the attachment relationship between mother and baby. As stated earlier, the findings

from Study 2 must be treated with extreme caution due to the small sample size and the findings' variation from previously published research. In addition, as there was no control group of mothers with SMI who did not receive inpatient treatment in the first year post-partum, it is not known whether attachment insecurity and disorganisation in this sample would have been even higher without treatment. However, if the findings were to be replicated in a subsequent study with this population, this might suggest that over the course of a mother's admission, more attention needs to be paid to the mother–infant relationship rather than just the mother's illness given the negative consequences of disorganised attachment in particular (Hayes et al., 2013). From time I spent on the unit, it seemed that the MBU staff's understanding of attachment was very different from Bowlby's theory and Ainsworth's operationalisation of patterns of attachment; for instance, in ward rounds, it was sometimes cited as evidence of attachment if a mother held her baby, or if a baby looked at his/her mother during an interaction. Very little attention, however, seemed to be paid to the manner in which mothers responded to infant distress, or to the extent to which mothers encouraged appropriate exploration of the environment as infants developed. This may indicate a need for more thorough education on attachment for MBU staff, and indeed in the professions of perinatal psychiatry and nursing generally. Additionally, apart from the recent efforts of this thesis, there seems to have been relatively little attention given to helping mothers understand their infants as individuals with minds (i.e., mind-mindedness) relative to the amount of support given around the infants' behavioural needs. The finding that mothers who received a video feedback intervention focusing on mind-mindedness had increased rates of behavioural sensitivity and secure attachment relative to mothers who participated in the standard care intervention supports the importance

of a focus on mind-mindedness in treatment for SMI.

Findings from Study 1 and Study 2 thus suggest value in continuing with a mind-mindedness focus in the mother–infant video feedback work on the MBU. The findings also suggest that mind-mindedness or mentalization may be a useful focus for other mother–infant interventions, which, as outlined in the introduction to Study 1, often have a multifaceted approach incorporating both behavioural and representational work. For instance, as discussed in Study 1, Bilszta et al. (2012) found that a multi-session video feedback intervention with mothers and infants on a psychiatric inpatient unit focusing both on behavioural sensitivity and attachment representations had little effect on maternal confidence and perceptions of infant behaviour relative to standard inpatient care. Study 1, however, suggested that a single session video feedback intervention focusing on mind-mindedness can be effective in helping mothers to be more accurate in their perceptions of their infants' internal states. It may be that a brief intervention with a very specific focus is easier for mothers experiencing SMI to absorb. As accurate maternal mentalization may be the key element underlying sensitive mother-infant interaction and secure attachment (Fonagy & Target, 1997; Meins et al., 2001), this may thus be a highly valuable singular focus for mother-infant interventions.

Findings from Study 3 lead to a tentative hypothesis that mind-mindedness is not associated with attentional processing of emotion. If this finding were to be replicated in subsequent research with an online measurement of mind-mindedness, it might suggest that maternal mind-mindedness is not driven by an implicit bias towards or avoidance of emotion, but by other factors affecting attunement to one's infant. Therefore, interventions that aim to increase levels of mind-mindedness or RF in parents may not need to directly target functioning at this implicit level.

## 5.5 Suggested directions for future research

As noted above, future research should investigate how the observational measure of mind-mindedness that assesses caregivers' use of appropriate and non-attuned mind-related comments with their own infants relates to internal state interpretations during the UMIIT and performance on the attentional emotion processing task. This would allow an exploration of any differences between the mind-mindedness measure's relation to use of internal state language during the UMIIT. It would also be useful to explore how performance on the UMIIT specifically relates to appropriate and non-attuned mind-related comments in online interactions.

It would also be interesting to investigate how the observational measure of mind-mindedness relates to speed of disengagement from emotional infant and adult faces, as facial cues are essential for accurately establishing the infant's internal state in the vast majority of cases and thus the observational measure of mind-mindedness might be more closely related to performance on the attentional processing of emotion task than the descriptive measure of mind-mindedness.

This line of research should be further explored with mothers with mental health difficulties due to Pearson et al.'s (2010) finding that mothers with depressive symptoms were quicker to disengage their attention from pictures of distressed infants. This would allow further clarity as to whether the mother–infant interaction difficulties sometimes observed in mothers with mental health problems is due to difficulty sustaining attention to infant distress, and whether attentional disengagement from emotion may also impede mind-mindedness.

In terms of mentalization and attachment research with mothers with SMI, it

would be useful to conduct a replication of both Study 1 and Study 2, given the small sample sizes and the complex picture of mind-mindedness that emerged in relation to SMI. It would also be useful to further explore the nature of mother-infant attachment patterns in the context of maternal SMI given that Study 2's results were strikingly different to published attachment distributions in mothers with mental health difficulties, though in line with theoretical suggestions about the increasingly deleterious effect of SMI on the attachment relationship over the second year of life. Further research would help validate these suggestions or clarify whether these were erroneous findings.

Given the lack of relations between mother-infant attachment classifications and nearly every other variable measured, apart from participation in the mind-mindedness video feedback intervention, it would be useful to conduct further research on this topic using additional psychological and behavioural measures that could help make sense of this picture of findings. The AAI and resulting information about mother's internal representations of attachment, for instance, could be a useful measure to add to a study of SMI, mind-mindedness, and mother-infant attachment; it may be that the extent to which mothers' past attachment experiences were integrated and resolved would correspond more closely to infant attachment than the presence, absence, or history of maternal SMI.

The Atypical Maternal Behaviour Instrument for Assessment and Classification (AMBIANCE; Bronfman, Parsons, & Lyons-Ruth, 1992-2004) would be another useful measure to include in a future study, or to rate maternal behaviour in the current studies. The AMBIANCE assesses mothers on five dimensions of disrupted affective behaviour with their children: affective communication errors (contradictory verbal and non-verbal messages); role/boundary confusion (treating

the child as sexual/spousal partner or as more powerful than the mother); fearful/disorientated behaviour (appearing frightened in relation to the child); intrusive/negative behaviour (behaving aggressively or critically toward the child); and withdrawal behaviour (maintaining interaction at a distance from the child). The AMBIANCE is generally rated from maternal behaviour in the Strange Situation, although it has been used with other mother-child free play interactions that involve some type of mild stressor.

Maternal disrupted behaviour as measured by the AMBIANCE has been found to relate closely to infant attachment disorganisation in high-risk samples (Goldberg, Benoit, Blokland, & Madigan, 2003; Grienemberger, Kelly, & Slade, 2005; Lyons-Ruth et al., 1999; Madigan, Moran, & Pederson, 2006), suggesting it would be an informative addition to the current research with a diverse, generally high-risk group of mothers with SMI who showed high levels of disorganised attachment. AMBIANCE ratings might be found to have a more meaningful relation to attachment classification than any of the variables assessed in Study 2. It is not yet known how AMBIANCE ratings correspond to RF or mind-mindedness, although it would seem that ratings on several of the AMBIANCE dimensions may correspond to levels of non-attuned mind-related comments; this would also be an interesting line of enquiry in mothers with SMI.

## **5.6 Summary**

The three studies reported in this thesis suggest a complex relation between SMI, mind-mindedness, and attachment. They also support the notion that mind-mindedness is specific to close relationships, and may not relate to processing of emotion at a more implicit level. Many questions remain however, and several

potentially fruitful directions for future research have been proposed to help clarify the links between mind-mindedness, maternal mental health, relational correlates, and response to clinical intervention.

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