Interactional Mind-Mindedness: Measurement in Caregiver-Preschooler Dyads

Before and After the Circle of Security 20-week Intervention

Anne-Marie Maxwell

Bachelor of Education (Early Childhood)

Master of Education

Submitted in partial fulfilment of the requirements for the degree of

Master of Research (Human Sciences)

Department of Psychology, Macquarie University

10th October 2016

Table of Contents

List of Tables

List of Figures

iv

Abstract

This study had two related aims: to explore the validity of the interactional mind-mindedness measure for use with caregiver-preschooler dyads in an attachment-activating context; and to investigate whether mind-mindedness changed following the Circle of Security 20-week intervention. This involved measuring interactional mind-mindedness in 55 caregivers of preschool children (reported only once previously) using archived footage of the Strange Situation Procedure (not reported previously). Baseline scores for appropriate mind-related comments were significantly correlated with attachment security, caregiver reflective functioning and positive caregiving representations, and there was a significant negative correlation with attachment disorganisation. While most caregivers did not make non-attuned mind-related comments, the proportions were notably higher than in previous research. Baseline mind-mindedness scores did not differ significantly by demographic variables, but there were significant differences in proportions of appropriate mind-related comments according to psychosocial risk factors.

Findings support the validity of the interactional mind-mindedness measure for use with caregivers of preschoolers in an attachment-activating context. They further suggest that mind-mindedness can be a useful construct when exploring the effects of attachment-based interventions. Results of pre-post analyses indicated no significant change in mind-mindedness scores after the intervention for the whole sample, but a significant interaction effect, whereby those with low mind-mindedness prior to the intervention made significant improvements. Results are discussed in relation to implications for the assessment of mind-mindedness in older children, the potential to change mind-mindedness using attachment-based interventions, and the need for further research to explore whether mind-mindedness may be one pathway through which the Circle of Security intervention may bring about changes in parenting and thereby child attachment.

Certification by Candidate

I certify that the work contained in this thesis has not been submitted for a higher degree to any other university or institution.

I further certify that this thesis is my own original work. Any assistance I have received in my research work and the preparation of the thesis itself, and all information sources used, are duly acknowledged within this document.

Ethics approval for this study was granted in three stages. Original ethics approval was granted for evaluation of the COS 20-week intervention (Ref: 5201300043). The current study forms part of this evaluation. Two amendments added personnel to the research team. All ethics documentation is included in Appendix A.

AM Maxwell

Anne-Marie Maxwell

Chapter 1 Overview

This study follows a series of studies examining the effectiveness of the Circle of Security (COS) attachment-based intervention (Powell, Cooper, Hoffman, & Marvin, 2014) in an Australian clinical sample (Huber, McMahon, & Sweller, 2015a; 2015b; 2016). Findings of the first of these studies indicated that the COS intervention led to positive caregiver-child relationship change, as evidenced by improvements in caregiver reflective functioning, caregiving representations, and indices of child attachment security (Huber et al., 2015a). A key question raised by that initial study surrounded the mechanisms of this change.

The construct of mind-mindedness was introduced in 1997, in an endeavor to answer exactly this type of question. Mind-mindedness is defined as a caregiver's capacity to treat their child "as a mental agent and attribute intentionality to his or her behaviour" (Meins, 1997, p.37). The construct is grounded in attachment theory and was first introduced in response to the announcement of a "transmission gap" (van IJzendoorn, 1995) in our collective understanding of the mechanisms involved in the intergenerational transmission of attachment.

Twenty years later, the transmission gap remains a central challenge within attachment theory and research (Verhage et al., 2016) – and mind-mindedness has been the focus of more than 50 published studies. There is substantial consensus that mind-mindedness is a construct worthy of investigation. Many other attachment-related measures involve complicated global judgements about multimodal maternal and child behaviours. In contrast mind-mindedness, with its exclusive focus on caregiver language, is relatively simple to quantify and coders can be easily trained to use the manual (Meins, 2013). Empirical findings are promising; however they are also mixed, and further investigation is needed regarding the utility of the construct in the context of the caregiver-child attachment relationship.

For the current research, when setting out to explore mechanisms of the change reported in Huber and colleagues' first study (2015a), mind-mindedness was a logical starting point.

Did mind-mindedness change following the COS intervention? Could mind-mindedness be part of explaining how changes internal to the caregiver became part of the child's experience of the relationship such that the child's attachment security increased? The available archived data from this study, however, presented a number of challenges – which also constituted opportunities. The majority of children included in the initial study were of preschool age; mind-mindedness interviews had not been undertaken with the caregivers during the original study, so the representational mind-mindedness measure, developed for this age group, could not be used. Mind-mindedness would have to be measured during caregiver-child interactions, using the tool developed for caregivers of infants. In addition, the videotaped caregiver-child interactions that were available for coding comprised footage of caregiver-child dyads in a modified Strange Situation Procedure (SSP; Ainsworth, Blehar, Waters, & Wall, 1978). The SSP, by design, is an attachment-activating procedure; the interactional mind-mindedness measure was expressly developed for use in free-play settings (Meins, Fernyhough, Fradley, & Tuckey, 2001).

These limitations therefore provided opportunities to extend other aspects of mind-mindedness research, whilst exploring the effect of the intervention on mind-mindedness. Recently, several researchers have begun to investigate the use of the interactive mind-mindedness measure with caregivers of older children (Illingworth, MacLean, & Wiggs, 2015; Lundy, 2013; Lundy & Fyfe, 2015). The current study could extend that exploration. Secondly, the study could make a novel contribution to the field by applying the interactional mind-mindedness measure in an attachment-activating context; a development anticipated by two recent studies (Bigelow, Power, Bulmer, & Gerrior, 2015; Milligan, Khoury, Benoit, & Atkinson, 2015).

Clearly investigation of the impact of the COS intervention on mind-mindedness could only be explored with any reliability using a measure appropriate for the context. Therefore, the questions relating to the validity of the interactional mind-mindedness measure in the preschool age group and in an attachment-activating context, had to be addressed first. This

necessity determined the structure of the study, which is reflected in the structure of this thesis.

The next chapter reports a review of the literature relevant to the current study, with a focus on caregiver mind-mindedness as an index of caregiver-child relationship quality. Chapter 3 presents the study methodology and Chapters 4 and 5 report results, including a short case study. The final chapter provides a discussion of the study findings, limitations, and implications for future research.

Chapter 2 Literature Review

This chapter begins with a focus on mind-mindedness, exploring the theoretical underpinnings of the construct, how it is operationalised and measured, and the related empirical evidence to date. The focus then moves to attachment-based interventions, their theoretical foundation, the main categories of interventions and related empirical findings. The review ends with a discussion of gaps in both bodies of literature, which provide the context for this study.

Mind-Mindedness

Elizabeth Meins first introduced the concept of mind-mindedness in 1997, in a book exploring the relationship between security of attachment and cognition. The construct was an attempt to encapsulate "caregivers' tendency to treat their young children as individuals with minds of their own" (Meins, 2013, p. 530), believed to facilitate attunement to what their children might be thinking and feeling. In turn, this was thought to facilitate the capacity of caregivers to both understand the child's perspective and accurately read the child's cues (Hawkins, Madigan, Moran, & Pederson, 2015) – both essential components of sensitive responsiveness. Caregiver sensitivity is a central concept in attachment theory (Bretherton, 2013), the theory in which mind-mindedness has its roots.

  Theoretical underpinnings.

Attachment theory was jointly developed by John Bowlby and Mary Ainsworth, through a long collaboration beginning early in the 1950s (Bretherton, 1992). Drawing concepts from ethology, cybernetics, information processing, developmental psychology, and psychoanalysis, Bowlby delivered the first formal statements about attachment theory in the late 1950s (e.g. Bowlby 1958). Ainsworth's extensive observational studies of mother-infant dyads in Uganda in the 1950s (Ainsworth, 1963) and Baltimore in the 1960s (Ainsworth, Bell & Stayton, 1972; Ainsworth et al., 1978) built on Bowlby's theory base, concurrently pioneering empirical studies of attachment and further developing the theory itself (Bowlby,

1988). This collaboration built the foundation for a theory that has become one of the most influential (Holmes, 1993) and heavily researched (Mikulincer & Shaver, 2016) conceptual and empirical frameworks in modern psychology.

Beginning with the premise that infants are "social from the beginning" (Ainsworth et al., 1972, p. 99), attachment theory proposes that infants are biologically programmed to seek proximity to and contact with their primary caregiver. This predisposition can be traced back to the evolutionary need for vulnerable infants to be protected from predators (Bowlby, 1969). Infants are thus born with the capacity to enact attachment behaviours designed to promote proximity and contact, which in turn elicit biologically programmed caregiving behaviours. Over time, the interplay between an infant's attachment behaviours, and the repeated pattern of responses from his or her primary caregiver, determines the nature of the attachment relationship between the two (Ainsworth, Bell, & Stayton, 1974).

Measurement and patterns of attachment. In seminal early studies, using their laboratory-based Strange Situation Procedure (SSP), Ainsworth and colleagues identified three patterns of infant attachment. When an infant was securely attached to the caregiver, that infant was able to flexibly use the caregiver as both a "secure base" (Salter, 1940, as cited in Ainsworth, Bell, & Stayton, 1971, p.17) from which to explore the environment, and a "haven of safety" (Bowlby, 1969, p. 302) to which to return when needy or dysregulated. This balance of exploratory and attachment behaviours differentiated infants in the two insecure categories identified. Avoidant infants appeared more focused on exploration and avoided proximity to or contact with the caregiver. Resistant (or ambivalent) infants seemed preoccupied with the availability of the caregiver and showed a combination of contact-seeking and contact-resisting behaviour, and relatively limited exploratory behaviour. A fourth pattern – disorganised attachment - was identified later, by Main and Solomon (1986), following their study of 55 infants who had been unclassifiable in earlier studies using the three-category system. Disorganised infants showed a range of unusual, disordered, sometimes contradictory behaviours when relating to the caregiver.

The SSP and its four-way classification system are still extensively used, in a number of different forms, in attachment research today. Originally developed (and extensively validated) to measure attachment in infants, the separation-reunion component of the SSP, and its coding system, have subsequently been modified to measure attachment in older children. The Preschool Attachment Classification System (PACS; Cassidy, Marvin, & the MacArthur Working Group on Attachment, 1992) is one example. Modification was necessary because increased cognitive and language capacities give rise to a different expression of attachment behaviours in preschoolers (Meins, Bureau, & Fernyhough, in press; Moss, Cyr, Bureau, Tarabulsy, and Dubios-Comtois, 2005) and older children (Easterbrooks, Bureau, & Lyons-Ruth, 2012; Graham & Easterbrooks, 2000). In a recent extension of the SSP and related coding, Moss and colleagues have developed and validated dimensional rating scales for use with the SSP (Moss, Lecompte, & Bureau, 2015), to complement the categorical classifications.

The other leading measure of child attachment is the Attachment Q Sort (AQS; Waters & Deane, 1985). Of the two variants of the AQS – parent-report and observer – only the observer AQS was found to have strong validity in a 2004 meta-analysis (van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven), The AQS avoids a number of limitations of the SSP. Firstly, it enables measurement of infant attachment in naturalistic settings, where the attachment relationship actually develops (Tarabulsy, Avgoustis, Phillips, Pederson, & Moran, 1997), avoiding the concerns about ecological validity that have been raised with regard to the laboratory-based SSP measure (van IJzendoorn et al., 2004). In addition, the AQS results in a dimensional security score, rather than an attachment classification, addressing concerns that have been raised about the limitations of categorical measures (e.g. Fraley & Spieker, 2003; Gardner, Lamb, Thompson, & Sagi, 1986). The flexibility of the dimensional measure, and the absence of a categorical secure/insecure division, allow researchers to capture more of the complexity inherent in human behaviour. However, the AQS does not enable reliable distinctions to be made among the three different

insecure groups identified using the SSP, and the data linking AQS security ratings with SSP security ratings are less convincing in the preschool period than in infancy (Solomon & George, 2016).

Attachment antecedents. Early attachment theorists proposed that the quality of the infant-caregiver attachment relationship was determined predominantly by the responsiveness of the caregiver (Ainsworth et al, 1974; Bowlby, 1969). Ainsworth's influential and extensively detailed home observations identified specific caregiver behaviours associated with the different attachment patterns. Mothers of securely attached infants were more "sensitive, accepting, cooperative, and psychologically accessible to their babies" (Ainsworth et al., 1978, p146) than mothers of insecure infants. Mothers of babies classified as avoidant were especially rejecting, often showing an aversion to physical contact, while mothers of resistant infants were inconsistent in their responses when the child's attachment system was activated. Disorganised attachment, the pattern identified subsequent to Ainsworth's initial studies, has been associated with more extreme abuse and neglect, including the caregiver's psychological unavailability and frightening or frightened behaviour (Lyons-Ruth & Jacobvitz, 2016; Sroufe, 2005).

Attachment sequelae. Attachment theory is a lifespan theory, with relevance for human development and relationship "from the cradle to the grave" (Bowlby, 1979, p. 129). While attachment theory does not claim that early attachment relationships lead to inevitable, unchangeable outcomes (Sroufe, 2005), the proposal that the quality of early attachment relationships influences later development is central to the theory (Bowlby, 1973). There is also empirical evidence supporting this claim. The longitudinal Minnesota study has confirmed significant links between secure attachment in infancy and measures of social competence in later childhood and adulthood (Sroufe, 2005). Three recent meta-analyses have found significant associations between insecure attachment and behavioural and emotional problems in children (Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Groh, Roisman, van IJzendorrn, Bakermans-Kranenburg, & Fearon, 2012; Madigan,

Brumariu, Villani, Atkinson, & Lyons-Ruth, 2016). Disorganised attachment in infancy and middle childhood has been correlated with psychopathology in later life (Lyons-Ruth & Jacobvitz, 2016; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999).

Internal working models. Fundamental to the lifespan perspective of attachment theory is the understanding that the foundational attachment relationships a child develops with his or her primary caregivers form the basis of that child's orientation towards and capacity for relationships throughout life. Bowlby (1973, 1980, 1988) proposed that patterns of attachment become internalised, through the development within the child of internal "working models" (Bowlby, 1988, p. 129). Working models are mental representations of the child, the caregiver(s) and close relationships, particularly in terms of the child's sense of his or her own worthiness of love, respect and care. Attachment theory proposes that these internalised mental representations of attachment, which may be altered through life experiences following the foundational first year of life, contribute to expectations about close relationships as the child develops (Bretherton & Munholland, 2016). These representations are also believed to exert a powerful influence when that child becomes a parent in turn, determining a significant portion of how that parent relates to her or his own child (Madigan, Hawkins, Plamondon, Moran, & Benoit, 2015).

This concept of intergenerational transmission of attachment has been thoroughly investigated and its veracity confirmed (Bernier, Matte-Gagné, Bélanger, & Whipple, 2014; van IJzendoorn, 1995), following the introduction of the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1984-1996), which opened a window onto the attachment representations of adults. The AAI was designed to capture unconscious mental representations of attachment, by probing adults' memories of their early relationships and attachment-related events, and the meaning the individual ascribes to both their parents' behaviour and the impact of these early experiences on the development of their adult self (Crowell, Fraley, & Roisman, 2016). Importantly, in scoring the AAI, it is the *coherence* rather than the *content* of the interviewee's narrative that reveals their attachment state of

mind (Main, Kaplan, & Cassidy, 1985). While effect sizes in more recent studies are smaller than in the initial research, authors of the most recent meta-analysis conclude that caregiver attachment representations remain the strongest known predictor of child attachment security (Verhage et al., 2016).

The transmission gap. The mechanisms through which this intergenerational transmission of attachment is effected, however, have proven much more difficult to identify. Early in the development of attachment theory, Ainsworth and her colleagues concluded that the linking mechanism, and the primary determinant of attachment security, was a mother's sensitivity to her infant's signals (Ainsworth et al., 1971). This idea was widely accepted within the field, until a series of meta-analyses (Goldsmith & Alansky, 1987; De Wolff & van IJzendoorn, 1997; van IJzendoorn, 1995) revealed a weaker association between sensitivity and attachment than that reported by Ainsworth. Van IJzendoorn used the label "transmission gap" (1995, p. 400) to refer to the portion of the association between adult attachment representations and child attachment *not* accounted for by sensitivity, proposing this gap as a key challenge for attachment theorists and researchers.

Mind-mindedness: A response to the transmission gap. Meins was one of a number of researchers who defended the importance of maternal sensitivity in the wake of these findings, proposing that the construct's weaker-than-expected link with attachment security was most likely a function of the way it had been operationalised. Meins (1999) pointed out that Ainsworth et al.'s (1971) original measure of sensitivity did not specify particular behavioural indicators of sensitivity. She argued that, as a result, very different behaviours had been included as indicators of sensitivity in subsequent studies, leading to potentially misleading variations in results and making comparisons among studies difficult. Confirming this, a more recent systematic review by Mesman and Emmen (2013) unearthed no fewer than 50 different instruments purporting to measure caregiver sensitivity! In addition, Meins (1999) argued that much research claiming to measure sensitivity has ignored one of the fundamental premises of the construct – that sensitive responses must be *appropriate*, not just

prompt or contingent on the infant's action. Her development of the construct of mind-mindedness was an attempt to recapture this essential component of Ainsworth's original concept of maternal sensitivity.

In addition to this focus on appropriateness, Meins sought to emphasise other components of "the complexity and dyadic nature of sensitivity" (Meins, 2013, p. 529), as originally conceived by Ainsworth, which she believed had not been translated effectively into Ainsworth et al.'s (1971) single item sensitivity scale. Further, Meins and colleagues argued that the construct of mind-mindedness enabled an important distinction between caregivers' general sensitivity to the child's physical needs and a more specific sensitivity to the child's internal states (Meins et al., 2001). Mind-mindedness could, it was argued, help bridge the transmission gap, by revealing the manifestation of caregiver representations of the child's mind in the language they use in interaction with their infants (Meins et al., 2001).

While firmly rooted in attachment theory, Meins also framed the development of mind-mindedness in relation to the work of Vygotsky. Particularly salient for Meins were Vygotsky's emphasis on the role of interpersonal interaction in cognitive development (Meins, 1997), and his concept of the "zone of proximal development" (ZPD; Vygotsky, 1978, p. 84). The ZPD referred to the distance between a child's actual developmental level, indexed by what the child could accomplish independently, and the level of development she or he could reach with the guidance or collaboration of an adult or more capable peer (Vygotsky, 1978). As Meins developed the mind-mindedness construct, she proposed that a mind-minded caregiver would be likely to operate within the child's ZPD, pitching their interactions in a manner appropriate to the child's level of development, because of their attunement to the child's mental states and interests.

Operationalising mind-mindedness.

Representational mind-mindedness. Mind-mindedness was first operationalised using a parent interview to probe the mental representations parents had of their preschool-aged children (Meins, Fernyhough, Russell, & Clark-Carter, 1998). The first (and sometimes only)

question asked in the mind-mindedness interview is, *"can you describe [child's name] for me?"* (Meins & Fernyhough, 2010, 2015). In order to control for verbosity, a proportional score is calculated by dividing the number of mental-state attributes by the total number of attributes named by the caregiver when describing the child. A frequency score can also be used, if controlling for verbosity in analyses.

Interactional mind-mindedness. Later, an interactional measure of mind-mindedness was developed for use with parents of infants (Meins et al., 2001). Interactional MM is usually assessed using a videotaped free play session, with the only instruction given to the parent: *"play with your baby as you would do if you had some free time together at home"* (Meins & Fernyhough, 2010, 2015). The videotaped interaction is transcribed verbatim and the transcript is then used to identify all caregiver comments that refer to the child's internal states through a specific mental state term (expressing desires or preferences, cognitions, emotions or epistemic states) or speaking as if talking on the infant's behalf.

Following this initial linguistic identification of mind-related comments, the transcript is reviewed together with the video footage, and comments identified as mind-minded are dichotomously coded as appropriate or non-attuned (Meins & Fernyhough, 2010, 2015), depending on whether or not the coder views the comments as accurate reflections of the child's mental states. Meins observed that non-attuned mind-related comments can "index subtle failures in caregivers' attunement to their infants' internal states" (Meins, 2013, p. 533), which might be missed by coding schemes that assess more overt manifestations of caregiver insensitivity. As with the representational measure, interactional mind-mindedness scores can be reported as a proportion of total speech (recommended in the coding manual) or as frequency counts, if controlling for overall verbosity in analyses. A high proportion/frequency of appropriate mind-related comments together with a low proportion/frequency of non-attuned mind-related comments is indicative of high mind-mindedness

Developmental guidelines. The Mind-Mindedness Coding Manual does not contain explicit developmental guidelines for the use of the two measures, however it does state that the interactional measure of mind-mindedness is appropriate for use with caregivers of infants aged 12 months and younger, while the representational measure has most commonly be used for assessment of mind-mindedness in relation to older children and adults (Meins & Fernyhough, 2010, 2015). The exclusive reliance on a representational measure of mind-mindedness in the preschool years has been questioned, however, including by the originator of the construct (Meins et al., 2003; Meins, Bureau, & Fernyhough, in press).

Empirical findings. As befits the original introduction of mind-mindedness (Meins, 1997), research into the construct has followed two main themes: the relationship between mind-mindedness and children's cognitive development, particularly their development of theory of mind, and the relationship between mind-mindedness and other attachment constructs. Some studies have woven these two threads together (e.g. Laranjo, Bernier, Meins, & Carlson, 2010; Meins et al., 2003). The following section on empirical findings will first focus on research regarding the nature and stability of the construct. As the current study relates to mind-mindedness in its attachment context, research relating to mind-mindedness and cognitive development will be briefly reviewed, followed by a more detailed overview of empirical evidence regarding mind-mindedness as an indicator of the parent-child relationship.

The nature of the construct, consistency across measures and stability over time. Focused empirical attention has only recently been directed to the nature of the mind-mindedness construct, however this is a logical place to begin a review. Mind-mindedness has been described as both a relational construct (Arnott & Meins, 2007; Meins, Fernyhough, Arnott, Turner, & Leekham, 2011) and a cognitive-behavioural trait (Meins et al., 2011), however recent study findings have been mixed. Meins and her team, recently concluded that mind-mindedness was best viewed as a relational construct (Meins, Fernyhough, & Harris-Waller, 2014). Two subsequent studies (Illingworth et al., 2015; Hill & McMahon, 2015)

12

provided evidence that mind-mindedness might actually be both: a trait-like construct, but one that is specific to close relationships.

Investigation of whether the two mind-mindedness measures capture the same construct, and whether mind-mindedness is consistent over time, has been constrained by the fact that the two measures were developed for use with caregivers of children in different age groups. Representational mind-mindedness has been measured across age groups (and even prenatally; Arnott & Meins, 2008), however this measure was developed for caregivers of preschoolers, and concerns have been raised about whether it is actually appropriate for use with caregivers of infants (Bernier & Dozier, 2003; Farrow & Blissett, 2014). The interactional measure was specifically developed for use with caregivers of infants aged 12 months and under, and is only recommended for use in this age group in the coding manual (Meins & Fernyhough, 2010, 2015).

The few studies exploring consistency across measures have reported conflicting findings. Meins and colleagues (2003) found that representational mind-mindedness measured at 48 months old was predicted by scores for (interactional) appropriate ($r = .40$) and non-attuned ($r = -.44$) mind-related comments, measured at 6 months, giving an early indication of the convergent validity of the two measures. A more recent Australian study (McMahon, Camberis, Berry, & Gibson, 2016) found some consistency across measures, with appropriate mind-related comments (interactional) measured when children were 7 and 19 months correlating with representational mind-mindedness measured at 19 months – but only for frequency counts, not for proportional scores, and effect sizes were very small. Easterbrooks, Miranda-Julian, Raskin, and Chaudhuri (2013), on the other hand, reported a lack of concordance between interactional mind-mindedness measured at 12 months (albeit using a very short observation period) and representational mind-mindedness measured at 24 months in a sample of 393 adolescent mothers. Similarly, in their study with older children (utilising an adapted version of the interactional measure), Illingworth et al. (2015) found that

the two different indices of mind-mindedness were unrelated, both concurrently and across time.

There is some evidence of temporal stability (whether the tendency to make or not make mind-minded comments is consistent over time). In studies testing stability by repeated use of the same measure, Meins and colleagues (2011) found temporal stability in interactive mind-mindedness measured in caregivers of infants at 3 months and again at 7 months. In their study of caregivers with two children, Illingworth and colleagues (2015) reported temporal stability of representational mind-mindedness for caregivers with their older (school-aged) child, but only a trend towards significance in the case of their younger (mostly preschool-aged) child, both measured 9 months apart. Temporal stability for interactional mind-mindedness was strong, however, for children in both age groups. Kirk et al. (2015) measured interactional mind-mindedness in a very small sample of caregivers, when their children were 10, 12, 16 and 20 months of age. They reported significant correlations between appropriate mind-related comments measured at 10 and 12 months ($r = .51$), 10 and 20 months ($r = .53$), and 12 and 16 months ($r = .48$), and between non-attuned mind-related comments only at 12 and 16 months ($r = .86$), providing further evidence for temporal stability, particularly with regard to appropriate mind-related comments.

In summary, while evidence relating to the nature of the construct seem to be converging and there is evidence of temporal stability, findings across studies comparing the two measures are inconsistent. This, together with the absence of an interactional measure of mind-mindedness endorsed for use with caregivers of children older than 12 months, and the questions raised about the suitability of the representational measure for caregivers of infants, highlight important developmental issues which require further investigation and form an important part of the context of the current study.

Mind-mindedness and theory of mind. The earliest research on mind-mindedness explored the relationship between the construct and children's social cognition, particularly the development of children's theory of mind. Theory of mind refers to the understanding that

mental states such as beliefs, desires, and intentions govern human behaviour (Hughes et al., 2005). A number of studies have found either a correlation or a predictive link between caregiver mind-mindedness in infancy and/or early childhood and children's later performance on theory of mind tasks (Kirk et al., 2015; Laranjo et al., 2010; Meins et al., 1998; Meins et al., 2002; Meins et al., 2003).

Recently, Lundy and Fyfe (2015) reported a concurrent association between maternal and paternal mind-mindedness (measured using both the representational measure and a variant of the interactional measure) and their preschool children's theory of mind performance. In another recent study, caregiver mind-mindedness in infancy was related to children's overall cognitive school readiness in kindergarten, through a sequential mediation model that included child language capacity at two years and child executive function capacities at three and four years of age (Bernier, McMahon, & Perrier, in press). There have, however, also been null findings in studies exploring mind-mindedness and children's cognitive development (e.g. Dore & Lillard, 2014; Meins, et al., 2003). However, on balance, the evidence supports a relationship between caregiver mind-mindedness and children's social cognitive development, in particular their development of theory of mind.

Mind-mindedness and attachment-related constructs. Research exploring the relationship between mind-mindedness and other attachment-related constructs, particularly caregiver sensitivity, caregiver representations and child attachment security, is central to the current research.

Mind-mindedness and sensitivity. Mind-mindedness has been correlated with maternal sensitivity in a number of studies, with small to moderate effect sizes. Meins and colleagues (2001; 2003) found a correlation between maternal sensitivity (measured using Ainsworth's 9-point scale) and mind-mindedness (interactional) in two studies, with rs ≈ .40. Laranjo, Bernier, and Meins (2008) reported a smaller, but still significant correlation, $r = .28$, measuring maternal sensitivity with the Maternal Behavior Q-sort (MBQS; Pederson et al., 1990) and using the interactional mind-mindedness measure. It should be noted that this study

scored mind-mindedness and sensitivity from different play samples, while both were scored from the same play episode in the research by Meins and colleagues. Licata et al. (2014) found a strong correlation ($r = .48$) between interactional mind-mindedness and sensitivity in caregivers of 7-month-old infants, measured using the Emotional Availability Scales (EAS; Biringen, 2008; Easterbrooks & Biringen, 2009).

There is limited evidence that mind-related descriptors of the child assessed using the representational measure are related to sensitivity. There was no relationship between mind-mindedness (representational) and sensitivity measured using the EAS (Lok & McMahon, 2006) in a sample of caregivers of preschoolers, while other studies have found that only *positive* mind-related descriptors were related to sensitivity assessed using the EAS (McMahon & Meins, 2012) and the MBQS (Demers, Bernier, Tarabulsy, & Provost, 2010b) or that the correlation was significant for adult mothers but not adolescent mothers (Demers, Bernier, Tarabulsy, & Provost, 2010a - MBQS). Some of this variation in findings may be due to the different measures of both mind-mindedness and sensitivity and the different ages of the children in the various studies. Interactional mind-mindedness scores tend to be more strongly related to maternal sensitivity scores than representational scores. Measures of maternal sensitivity differ, too, in their specific emphasis on the caregiver accurately reading child cues; a core component of mind-mindedness. There is also lack of clarity around whether mind-mindedness is a *component* of sensitivity (in which case correlations are hardly surprising) or a *pre-requisite* for sensitivity, as Meins and colleagues (2001) proposed. This will be considered further in the next section.

Mind-mindedness and attachment security. Given that mind-mindedness is an attachment construct, there are surprisingly few studies examining the relationship between mind-mindedness and attachment security. In one early study, representational mind-mindedness measured at 37 months was correlated with attachment security (SSP) measured at 11-13 months ($r = .42$, Meins et al., 1998). Bernier and Dozier (2003), in a surprise finding, found a *negative* relationship between representational mind-mindedness and security of

attachment. In this study of foster dyads, high caregiver mind-mindedness scores (assessed when children were between 6 and 30 months) were correlated with *in*secure child attachment (assessed with the SSP at 12-24 months). The authors speculated that the representational measure might not be developmentally appropriate with respect to young infants, and also noted the inability of this measure to distinguish between appropriate and inaccurate mind-related descriptors, advocating future use of the interactional measure.

Indeed stronger and more consistent evidence for a link between mind-mindedness and attachment security comes from studies ultilising the interactional measure. In one influential study, appropriate mind-related comments measured at 6 months predicted 12.7% of the variance in attachment security (SSP) measured at 12 months – a higher percentage than predicted by sensitivity (6.5%), measured using the Ainsworth scale (Meins et al, 2001). Meins and colleagues concluded that appropriate mind-mindedness was superior to sensitivity as a predictor of child attachment security. Two further studies confirmed the correlation between appropriate mind-related comments and sensitivity, measured in terms of interactional synchrony (Lundy, 2003) and using the MBQS (Laranjo et al., 2008), and the capacity of appropriate mind-related comments to predict attachment scores (measured using the AQS in both studies). In contrast to the findings of Meins et al., (2001), however, the findings of these studies indicated that mind-mindedness was not a better predictor of attachment security than sensitivity, and indeed was no longer significant when both variables were included in regression models. The authors of both studies proposed, as a result, that mind-mindedness might be a *pre-requisite* to maternal sensitivity, as Meins had first hypothesised in 1997.

Demers et al., (2010a) found that appropriate mind-minded comments when children were 18 months were related to sensitivity (MBQS, at 18 months) attachment security (SSP, also at 18 months) in adult mothers but not adolescent mothers. This study was the first to code valence of comments, noting positive and negative mind-related comments, in addition to the usual appropriate and non-attuned categories. The results of this study did not indicate a

mediation effect for sensitivity. In an unusual finding for a study using the interactional measure, Arnott and Meins (2007) did not find a statistically significant relationship between appropriate mind-related comments in mothers or fathers, measured when children were 6 months, and child-parent attachment security measured with the SSP at 12 months.

Meins and colleagues replicated and extended their 2001 findings in 2012, with a different sample. In this study, they found interactional mind-mindedness, comprising appropriate and non-attuned comments, measured when children were 8 months, predicted "unique variance in attachment security (SSP) at ABC, organized∕disorganized, four-way, and secure∕insecure levels" (Meins et al., 2012, p. 407) when children were 15 months– a feat that maternal sensitivity had not achieved, even when measured as accurately and thoroughly as in Ainsworth's original study. This led Meins to suggest that mind-mindedness should be characterised as a multidimensional construct, with appropriate and non-attuned comments both providing important information about the caregiver-child relationship. A more recent follow-up of this sample (Meins, Bureau, & Fernyhough, in press) extended these findings by showing that non-attuned mind-related comments (measured when children were 8 months) predicted attachment security in the preschool years (measured with the SSP at 41 and 55 months).

Findings that suggest non-attuned mind-related comments can predict attachment classifications have not been replicated in different samples, and few researchers outside of Meins's laboratory have reported significant findings relating to non-attuned comments. Indeed, in most studies, the proportion of caregivers making any non-attuned mind-related comments at all is very low and the distribution often highly skewed, leading some researchers to leave non-attuned mind-related comments out of their analyses altogether (e.g. Bernier et al., in press; Illingworth et al., 2015; McMahon et al., 2016.)

Mind-mindedness and adult attachment representations. Given the introduction of the construct as a potential bridge for the attachment transmission gap, there are also surprisingly few studies exploring the relationships between mind-mindedness and adult attachment

representations, as measured by the AAI. Only four studies to date have set out to test this link. In the first study, Bernier and Dozier (2003) found a surprising negative correlation, in a sample of foster parents, between representational mind-mindedness and coherence in the AAI (r = -.33). Demers et al., (2010b), found that higher coherence on the AAI predicted more positive and rich mental state descriptors, but not overall mind-mindedness.

In the single study using the usual interactional measure, Arnott and Meins (2007) found no differences in either appropriate or non-attuned mind-related comments (interactional) between autonomous and non-autonomous mothers in their small sample, while autonomous fathers made more appropriate mind-related comments than non-autonomous fathers. In a novel study using an attachment-activating prime and a simulated mother-child interaction, Milligan et al. (2015), found that interactional mind-mindedness (emotion words specifically) was *negatively* correlated with coherence scores on the AAI (similar to Bernier and Dozier's findings) and mothers classified as unresolved on the AAI scored higher for mind-mindedness (emotion words again) than mothers classified as autonomous.

This combination of counter-intuitive negative correlations in two studies, and predominantly null findings in the other two, does not support the initial proposal that mind-mindedness might help bridge the transmission gap (Meins, 1999) and flags this as an area requiring further investigation. Perhaps future studies that utilise the more strongly validated interactional measure will bring more clarity? Or perhaps mind-mindedness does not help bridge the transmission gap, in the strict sense of explaining the transmission of caregivers' attachment representations to their children.

Furthermore, there is a second component of adult representations believed to drive caregiving behaviour, in addition to attachment representations: adult *caregiving* representations (George & Solomon, 1996). Meins noted in 2013 that no study had yet explored the relationship between mind-mindedness and these caregiving representations – a relationship that would be expected, given that both involve the caregiver's mental

representations of the child. A recent Danish/UK study involving a very small sample of father-child dyads has now begun this exploration (Tharner, Altman, & Vaever, 2016), but further research is needed to develop a thorough understanding of this relationship.

In summary, the empirical data linking mind-mindedness with other attachment constructs is strongest for the interactional measure. Very little evidence of associations has been gathered using the representational measure. The exact nature of the relationship between mind-mindedness and sensitivity is still unclear and requires further investigation. There are surprisingly few studies examining the relationship between caregiver mind-mindedness and both child attachment security, and caregiver representations (attachment and caregiving). While there is some compelling support for the relationship between mind-mindedness and attachment security, findings are again mixed, particularly in relation to the utility of the non-attuned category of mind-related comments. Important to the current research are questions regarding how mind-mindedness beyond infancy might relate to indices of the quality of the parent-child relationship.

Mind-mindedness and other approaches to assessing mentalising capacity. Mind-mindedness is one of two leading empirical measures of caregiver mentalisation; a key construct within attachment theory. Mentalisation encompasses both the cognitive process of perspective taking and the emotional process of being able to "hold, regulate, and fully experience one's own and others' emotions in a non-defensive way without becoming overwhelmed or shutting down" (Sharp & Fonagy, 2008, p. 740).

Mind-mindedness and reflective functioning. The first attachment-specific operationalisation of mentalisation was reflective functioning (Fonagy, Steele, Steele, Moran, & Higgit, 1991). Reflective functioning encompasses the above definition of mentalisation, applied in the specific context of attachment relationships (Schiborr, Lotzin, Romer, Schulte-Markwort, & Ramsauer, 2013). Reflective functioning is most commonly measured using the Reflective Functioning scale (RF scale; Fonagy, Target, Steele, & Steele, 1998), originally developed for use with the AAI and later adapted for use with narrative interviews designed

to capture parent representations of their relationship with their child, such as the Parent Development Interview (PDI; Slade, 2005) and the Working Model of the Child Interview (WMCI; Zeanah, Benoit, & Barton, 1995).

Surprisingly, despite the conceptual similarities between mind-mindedness and reflective functioning, only two published studies have formally explored this link. Arnott and Meins (2007) studied 25 mother-father-infant triads and three mother-infant dyads, measuring maternal and paternal attachment representations and reflective function antenatally (both using the AAI) and mind-mindedness (interactional) and infant attachment security (SSP) after the child was born. Mothers' reflective function scores were not correlated with their use of appropriate mind-related comments, but were negatively correlated with their use of non-attuned mind-related comments ($r = -.41$). Fathers' reflective function scores were correlated with their scores for appropriate mind-related comments ($r = .50$), but the negative correlation between fathers' reflective functioning and non-attuned mind-related comments was non-significant.

In their study of 95 mother-infant dyads, Rosenblum and colleagues (2008) found a correlation ($r = .39$) between mind-mindedness (interactional) and reflective functioning (measured using the WMCI). Hierarchical multiple regression analyses indicated that mind-mindedness did not explain variance in caregiver behaviour beyond that explained by reflective functioning. However, the authors emphasised the importance of further research into mind-mindedness, due to the fact that mind-minded comments are one of "the characteristics that more proximally surround the young child's experience" (Rosenblum et al., 2008, p. 373) and therefore may mediate the relationship between caregiver reflective function and child outcomes. Indeed interactional mind-mindedness holds a unique position among measures of mentalisation, in that it captures online mentalising during real-time interactions in the dyadic context in which the attachment relationship actually develops. Shai and Belsky's (2011) concept of embodied mentalising –a non-verbal expression of

mentalisation, also more proximal to the child than reflective function – may provide a context for exploring this relationship further (Meins, 2013).

A recent study by Barreto, Fearon, Osorio, Meins, and Martins (2016) explored the relationship between mind-mindedness and mentalisation more broadly. The authors reported no significant correlation between mentalisation capacity, assessed in a laboratory with a joke task, and representational mind-mindedness, and argued that this supported the view that mentalisation and mind-mindedness are two distinct constructs. Barreto and colleagues noted that there may be a distinction between a capacity to mentalise and the tendency to do so spontaneously when invited to describe or when interacting with one's child.

Measuring mind-mindedness in clinical samples. The bulk of mind-mindedness research has been undertaken with non-clinical samples, which is the population for whom the mind-mindedness measures were developed. However, another line of enquiry has emerged recently, exploring whether caregivers with psychopathology, particularly disorders associated with impaired mentalising capacity, might be lower in mind-mindedness. Pawlby et al. (2010) measured interactional mind-mindedness in a sample of inpatients in a mother-baby unit. The mothers had diagnoses of schizophrenia, or depressive or manic mood disorders, with or without psychosis, and their mind-mindedness scores were compared with those of a psychologically well control group. Surprisingly, no significant differences in mind-mindedness scores were found.

Work with clinical samples raises the potential that mind-mindedness might be amenable to clinical interventions. Hawkins and colleagues (2015) have emphasised the potential benefits of including a focus on recognising and understanding infants' internal states in interventions designed to improve caregiver-child attachment relationships. The first paper to report on an intervention targeted at specifically increasing mind-mindedness builds on the study by Pawlby and colleagues (2010) described above. A single-session intervention utilising video feedback to promote mind-mindedness was conducted with 22 inpatient mothers. Results indicated a marginally significant increase in appropriate mind-related

comments and a significant decrease in non-attuned mind-related comments. As a follow-up, mother-infant attachment for nine of the original 22 mothers in the intervention group was compared with a control group of 30 mothers who had been similarly hospitalised but had received standard care. Results indicated that mothers who had received the mind-mindedness intervention were more likely to have infants whose attachment was classified as secure and less likely to have infants whose attachment was classified as insecure-disorganised, than those in the control group (Schacht et al., in press).

These results should be interpreted with some caution, considering the very small sample size and the difference between the two groups in terms of psychopathology (more mothers in the comparison group had psychotic disorders). Nonetheless, findings suggest a promising beginning for mind-mindedness interventions.

Gaps in emprical findings relevant to the current study. Several unanswered questions emerge from this review. Firstly, the variation in findings with regard to the consistency of the two mind-mindedness measures demands further investigation, as do questions about the suitability of each measure for use with caregivers of children at different stages of development. Are both tools measuring the same construct? Is the interactional measure simply a better measure of the construct than the representational measure? Evidence at this stage seems to point to the latter – in which case, the absence of an interactional measure endorsed for use with caregivers of children older than 12 months limits utility of the construct.

Empirical research exploring the relationship between mind-mindedness and indices of attachment is surprisingly limited and there is almost no research exploring relations between mind-mindedness and caregiving representations. The related question regarding how mind-mindedness is located within the broader construct of mentalisation, including reflective functioning, has also not yet been answered by the few studies that have explored this area. Finally, research exploring mind-mindedness in clinical samples is relatively new and invites further investigation. Research focusing on mind-mindedness as a target of

intervention is in its infancy. While there is still much to be explored with regard to interventions targeting mind-mindedness, such exploration can be undertaken in the context of a well-established body of research focusing on attachment-based interventions more broadly.

Attachment-Based Interventions

Attachment theory and research provide clear opportunities for intervention (Berlin, Zeanah, & Lieberman, 2016). Attachment-based interventions seek to improve the quality of the caregiver-child relationship and thus to improve the child's developmental trajectory. Such interventions can be offered as a preventative measure, for dyads at increased demographic or psychosocial risk of relationship dysfunction and disrupted development (Letourneau et al., 2015), or (less frequently) as treatment for dyads in which problematic relationship patterns have already been established (e.g., Moss et al., 2011). In addition to the beneficial outcomes for participants, attachment interventions (and related research, in particular) are important from a theoretical perspective. Carefully designed intervention studies have the potential to provide empirical evidence for cause-effect relationships (van IJzendoorn, Juffer, & Duyvesteyn, 1995), which have proven so difficult to establish thus far within attachment theory.

Theoretical underpinnings. A number of specific elements of attachment theory inform attachment-based interventions. The developmental importance and potentially lifelong influence of a child's first attachment relationship/s clearly provide impetus for intervention (Cassidy, Jones, & Shaver, 2013). The targets of attachment interventions also derive directly from the theory. An early review of attachment-based interventions (van IJzendoorn et al., 1995) identified two types of interventions, distinguished from one another on the basis of the specific vehicle through which they aimed to improve children's attachment security: interventions directed at increasing caregiver sensitivity (behavioural); and interventions directed at changing caregivers' mental attachment representations (representational). In their recent review of the field, Berlin and colleagues (2016) endorsed

24

these two points of intervention, viewing them in relation to IJzendoorn's (1995) attachment transmission model. To these they added a third component of attachment interventions: the therapeutic relationship between practitioner and caregiver.

Targeting caregiver sensitive responsiveness. As outlined previously, in the early years of attachment theory, sensitive, responsive caregiving behaviour was understood to be the primary proximal determinant of infant attachment security (Bretherton, 2013). Also noted earlier, successive meta-analyses (Goldsmith & Alansky, 1987; van IJzendoorn, 1995; De Wolff & van IJzendoorn, 1997) questioned and then fundamentally challenged the role of caregiver sensitivity in the development of attachment. This has led to researchers exploring other constructs, as well as measurement issues related to sensitivity, in an attempt to explain the transmission gap.

Nonetheless, caregiver sensitive responsiveness to the child's cues is still understood as central to the development of secure attachment (Verhage et al, 2016), particularly when viewed from Ainsworth's original dyadic perspective (Bretherton, 2013; Meins, 2013; Pederson, Bailey, Tarabulsy, Bento, & Moran, 2014). Furthermore, the focus on caregiver sensitivity has been reframed by some theorists. Thompson (1997) argued that sensitivity shown when a child is dysregulated might be more powerful in building attachment security than sensitivity expressed during non-stressful periods of play or routine care. While maternal sensitivity is generally assessed in free play contexts, Lyons-Ruth, Bronfman, and Parsons (1999) have argued that the Strange Situation Procedure, the gold standard for assessing child attachment security, might also provide an optimal opportunity to observe caregiver behaviour in an attachment-activating context. Several subsequent studies have empirically endorsed Thompson's idea that sensitive responsiveness to child distress may be particularly informative (Leerkes, 2011; McElwain & Booth-LaForce, 2006). Overall, caregiver sensitive responsiveness is currently viewed as at least one of the primary determinants of attachment security – and is one of the two primary targets of attachment-based interventions.

Targeting caregiver representations and mentalisation. Bowlby's concept of internal working models, introduced earlier, provides the context for the other primary target of attachment-based interventions: caregiver representations and mentalisation capacity. Whereas the target of attachment interventions outlined above is observable caregiver behaviour, this intervention target concerns constructs internal to the caregiver. As already noted, George and Solomon (1996) distinguished between two types of caregiver representations that drive caregiving behaviour: *attachment* representations and *caregiving* representations. Empirical data confirm both concordance between these two distinct components of caregiver representations and their relationship with child attachment security (George & Solomon, 1996; Madigan et al., 2015). Both attachment and caregiving representations can be the focus of attachment-based interventions.

Mental *processes* that drive behaviour have been the focus of much recent research, and are another internal target of attachment interventions. Caregiver mentalisation, introduced previously in relation to mind-mindedness, is of interest here, too. Attachment interventions that focus on caregiver mental states often seek to *in*directly influence caregiver behaviour by directly working with the caregivers' representations and capacity for mentalisation.

The therapeutic relationship. Bowlby (1988) proposed that one of the most powerful factors in altering established internal working models was experience of additional close relationships and new attachments. This proposition forms the basis of the focus on the therapeutic relationship between practitioner and caregiver in many attachment-based interventions (Berlin, et al., 2016), echoing the "corrective attachment relationship" (Lieberman, Weston, & Pawl, 1991) between therapist and client in attachment-informed psychotherapy (Grienenberger, Kelly, & Slade, 2005; Mallinckrodt, 2010; Mikulincer & Shaver, 2016).

Interventions targeting sensitive responsiveness. Attachment interventions often combine behavioural and representational targets, however they generally have a principal

focus on one or another. Thus, interventions will be categorised for this brief review in terms of their principal focus, whilst acknowledging overlap. Attachment-based interventions that target caregiver sensitivity often involve working with the caregiver and child together, with a practitioner coaching the caregiver using video feedback to facilitate learning (Berlin et al., 2016). Two meta-analyses have indicated that short-term interventions with a clear behavioural focus on caregiver sensitivity are effective in enhancing caregiver sensitivity and promoting children's attachment security (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003; van IJzendoorn et al., 1995), with the more recent of these indicating that such interventions are more effective than longer-term interventions which also target caregiver representations. Questions remain, however, regarding whether these brief interventions are effective in more high-risk mother-child dyads and about whether the absence of change in caregiver representations compromises the longevity of the improvement in sensitive behaviour and attachment security – or whether, perhaps, enhanced sensitive behaviour and attachment security eventually lead to a change in caregiver representations (van IJzendoorn et al., 1995).

Two interventions with a growing base of empirical support that target caregiver sensitivity are Attachment and Biobehavioral Catch-up (ABC; Dozier, Lindheim, & Ackerman, 2005) and Video Feedback Intervention to Promote Positive Parenting (VIPP; Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2008). Randomised trials have provided evidence of the efficacy of both programs (Berlin et al., 2016). Interaction Guidance (McDonough, 2000; 2004) is a similar approach, and a modified version has shown promise in reducing disrupted caregiver behaviour (Benoit, Madigan, Lecce, Shea, & Goldberg, 2001; Madigan, Hawkins, Goldberg, & Benoit, 2006). While interventions targeting sensitivity alone have shown impressive efficacy in both single studies and meta-analyses, the authors of a recent longitudinal study (Hawkins et al., 2015) emphasised the benefits of interventions that have the dual focus of improving caregiver sensitivity whilst also helping parents recognise and understand their children's internal states.

Interventions targeting representations and mentalisation. Attachment-based interventions that directly target caregiver representations often follow a psychotherapeutic model. Infant-parent psychotherapy (Fraiberg, Shapiro, & Cherniss, 1980) and Child-Parent Psychotherapy (CPP; Van Horn & Lieberman, 2009) are two examples, both of which are dyadic interventions, as their respective titles suggest. A recent systematic review of parent-infant psychotherapy studies indicated the effectiveness of these interventions in increasing child attachment security in high-risk families, but concluded that there was no significant difference in their impact on other child and parent outcomes compared with control groups (Barlow, Bennett, Midgley, Larkin, & Wei, 2015). Psychotherapy approaches require extensive resources, due to their duration (e.g., 12 months for CPP) and the level of staff training and supervision required.

Minding the Baby (MTB; Sadler, Slade, & Mayes, 2006) is one example of an attachment-based home visiting intervention, which targets caregiver mentalisation as well as a number of broad health outcomes. Built on a psychotherapeutic foundation, this intervention includes a specific focus on developing a reflective orientation in caregivers (Slade, 2007). Initial findings from a pilot-phase randomised control trial of MTB indicated that infants in the intervention group were more likely to be securely attached and less likely to have disorganised attachment than control group infants (Sadler et al., 2013). Interestingly, considering the specific focus on developing caregiver reflective function, there was no significant difference between the increase in reflective function scores for intervention and control group caregivers by the end of the intervention period. There was a significant intervention effect on reflective function only for caregivers who had been particularly low in reflective function when it was first measured during pregnancy (Sadler et al., 2013).

It can be argued that most, if not all attachment-based interventions promote the development of mentalisation, whether by design or not. All attachment-based interventions, even those primarily targeting caregiver behaviour, include an element of focus on the needs

and experience of the infant or child. An awareness of the child's perspective is at the heart of mentalisation.

The Circle of Security intervention. One attachment-based intervention that aims to improve the quality of caregiver-child relationships by facilitating change in caregivers' sensitive responsiveness to their child's needs, as well as in caregivers' reflective functioning and caregiving representations, is the Circle of Security (COS; Powell et al., 2014). COS is one of the four promising attachment-based interventions selected by Berlin and colleagues (2016) for their most recent review of the field. The COS approach has been enthusiastically adopted internationally (Powell et al., 2014), with a particularly strong uptake in Australia. While a number of different versions of COS have been developed, it is predominantly offered as a 20-week intensive intervention utilising video feedback (COS intervention) or as an 8-week DVD-based parenting program using archived video footage (COS-P).

Figure 1. The Circle of Security graphic

Although the COS intervention has much in common with other attachment-based interventions (e.g. a focus on the therapeutic relationship between the practitioner and caregiver, and the use of video feedback), there are also some clear differences. Many similar interventions involve working with the caregiver-child dyad, whereas COS facilitators work only with caregivers, who are understood to play the dominant role in establishing the quality of the caregiver-child relationship (Meins, 1999; Powell, et al., 2014). It has been suggested that the COS approach, of all attachment-based interventions, "derives most directly from attachment theory" (Berlin et al., 2016, p.747), because of its explicit focus on one of the fundamental concepts in attachment theory: the caregiver's role as secure base and safe haven. A simple graphic (Figure 1) forms the centerpiece of all versions of the program and captures the core dynamic at the heart of the theory, with regard to children's need for both connection and exploration, and the caregiving behaviors that support these needs (Hoffman, Marvin, Cooper, & Powell, 2006).

COS expressly teaches participants about psychological defenses they may have developed, which influence their response to their child's attachment and exploration needs ("shark music"; Powell et al., 2014). The intervention also teaches parents to recognise child cues regarding their attachment and exploration needs. The COS approach proposes that, just as caregivers may have acquired defenses, children may also hide their attachment and exploratory needs with contradictory behaviours, and thus "miscue" their caregivers (Powell et al., 2014).

The current state of COS research. Berlin and colleagues (2016) note that COS dissemination has dramatically outpaced evaluation. The authors of a recent meta-analysis of COS studies (Yaholkosi, Hurl, & Theule, 2016) found ten studies that met their criteria for inclusion, only five of which had been published. They calculated medium combined effect sizes for COS programs with respect to improving secure attachment and quality of caregiving. However the meta-analysis contained substantial limitations. Heterogeneous studies, which incorporated any one of five different versions of COS (ranging from 4-20

weeks in duration) were compared, a range of different measurement tools and outcomes was reported, and there were no comparison groups in most of the studies included, making it very difficult to draw convincing conclusions.

The most influential COS intervention study to date was undertaken by the originators of the COS model (Hoffman et al., 2006). The results of this study indicated that the 20-week intensive COS intervention led to a positive shift, whereby more children of participants (parents involved in the Headstart program) were securely attached, and fewer were classified as disorganised post-intervention. This study provided encouraging preliminary evidence that the COS intervention is effective in improving children's attachment security, although it lacked a control group against which to compare these changes.

More recently, Huber and colleagues were able to partially replicate and extend these findings in an Australian clinical setting (Huber et al., 2015a). Working with a sample of 83 clinically referred caregiver-child dyads (the children ranged in age from 13 – 88 months), these researchers found that the 20-week COS intervention led to significant improvements in the caregiver-child relationship. While there was no significant change in children's attachment classifications, dimensional measures of attachment behaviours indicated an overall post-intervention increase in the level of attachment security and reduction in indicators of disorganisation. Importantly, in both cases the effects were most marked for those who showed most problematic attachment prior to the intervention. This study also found a post-intervention improvement in both caregiver reflective functioning and caregiving representations (both assessed independently from a narrative interview with the caregiver). Again the greatest improvements occurred for those caregivers who had scored lowest on these scales pre-intervention (Huber, et al., 2015a), and those with low education levels. Interestingly, there was no association between the change in reflective functioning and observed changes in child attachment.

Separate papers addressing different aspects of the impact of the COS 20-week intervention on this cohort showed improved child behavior and emotional functioning

(Huber et al., 2015b) and improved parental emotional functioning, including mood symptoms and parenting stress (Huber et al., 2016) following the intervention. In all cases, improvements were greatest for those with least optimal scores prior to the intervention.

While these studies have added substantially to the slowly growing body of evidence in support of the effectiveness of the COS 20-week intervention, the lack of a control group was a considerable limitation; however the effect sizes were moderate to large. There are also important questions that remain unanswered, in particular regarding the mechanisms by which these improvements were effected.

The Current Study

Almost 20 years have passed since the construct of mind-mindedness was introduced, during which it has been widely researched. While associations between interactional mind-mindedness and maternal sensitivity have been consistently found, there are surprisingly few studies that have examined relations with attachment security. Further, despite a shared theoretical focus on parent mentalising, very little empirical attention has been focused on the relationship between mind-mindedness and reflective functioning. The current study provided an opportunity both to contribute to knowledge about these associations with attachment quality and also to establish whether mind-mindedness changed in response to an attachment-based intervention. Given the development of mind-mindedness as a proxy for caregiver sensitivity, and given the focus of the COS intervention on understanding the child's perspective, on reading child behavioural cues and miscues, and on increasing caregiver sensitive responsiveness, it is reasonable to expect that the COS intervention might lead to an increase in caregiver mind-mindedness.

Two specific limitations to our understanding of mind-mindedness impacted directly on the development of the current study. The representational mind-mindedness measure, which is reflective and retrospective, is considered to be a less accurate indicator of mind-mindedness than the interactional measure (Meins, 2013). Indeed it is only the interactional measure, categorised as "online", compared to the "off-line" representational measure (Sharp

& Fonagy, 2008, p. 744), that provides a picture of how a caregiver's mind-mindedness becomes part of the experience of the child, which is surely of most interest when exploring the contribution of mind-mindedness to attachment security. The fact that the interactional measure is currently recommended only for use with caregivers of infants under 12 months of age substantially limits the scope of mind-mindedness research. And, given that the children in Huber's original study were predominantly of preschool age, this limitation was a particular challenge for the current research. Recent work by Lundy and Fyfe (2015) and Illingworth et al. (2015) has begun to address this issue. The current study provided an opportunity to extend this work by exploring whether the interactional measure of mind-mindedness applied to caregivers of preschool children could provide information about a) associations between caregiver focus on child mental states and indices of the caregiver child attachment relationship in this age group, and b) whether there was a change in mind-mindedness following the COS intervention.

Another limitation was related to the context in which mind-mindedness is measured. It is somewhat surprising, given its location within attachment theory, that interactional mind-mindedness has so far been measured only in free-play contexts. Indeed, the interactional measure was expressly developed for use in free-play settings, which were believed to provide the ideal context in which the caregiver's reading of the child's mental states could be "unconstrained by the requirements of caregiving" (Meins et al., 2001, p. 639). Bearing in mind Thompson's (1997) contention that expressions of parental sensitivity might be more meaningful when the child is dysregulated, this study explored whether coding mind-mindedness during the SSP, a procedure specifically designed to activate the child's attachment system, might be particularly informative. Two recent mind-mindedness studies (Bigelow et al, 2015; Milligan et al., 2015) have begun to explore this territory, however neither goes so far as to measure interactive mind-mindedness in a genuine caregiver-child online interaction in an attachment-activating context. The current study provided an opportunity to take this next step.

Aims and hypotheses. These two specific limitations in mind-mindedness research intersected with the imperative to further explore the efficacy of the COS intervention, to provide the context and impetus for this study. The study had two related aims. The first was to explore the validity of the interactional mind-mindedness measure a) with caregivers of preschool-aged children, and b) in an attachment-activating context. While this aim was exploratory in nature, it was hypothesised that mind-mindedness measured under these conditions would be correlated with other attachment constructs that had been measured in Huber's study (namely caregiver reflective functioning, caregiving representations and dimensional indices of attachment security and disorganisation). The second aim was to explore whether caregiver mind-mindedness changed following completion of the COS 20-week intervention. It was hypothesised that a) the proportion of appropriate mind-related comments would increase, and b) the proportion of non-attuned mind-related comments would decrease, post-intervention.

Chapter 3 Method

Participants

Study participants were 55 of 95 caregiver-child dyads referred to a community-based mental health service for infants and young children. The referrals were made on the basis of concerns about the caregiver-child relationship and/or child behavioral or emotional difficulties. All referred dyads who were willing and able to commit to a 20-week treatment program were offered the COS intervention. Dyads who completed the intervention and whose children were ≤ 60 months at baseline ($n = 55$) were included in this study, as Strange Situation observational data were not available for the older children. Full demographic data are reported in Chapter 4.

Ethics

Ethics approval for this study was undertaken in four stages. In the first stage, clients gave consent for their clinical data to be stored and included in any future research evaluating the intervention. Subsequently, the mental health service that had collected and stored this data, gave consent for this archived data to be used in a university research project to evaluate the COS intervention. The university Ethics Committee gave approval for evaluation of the intervention and, for the current study, approval was granted for the researcher and coders to have access to the archived videotaped data for transcription and coding of mind-mindedness (see Appendix A).

Procedure

The clinical component of the study procedure has been documented fully by Huber et al. (2015a). In summary, the 55 caregiver-child dyads were drawn from 18 groups, each comprising 4 to 6 caregivers, who undertook the COS 20-week intervention in a clinical setting over a 6-year period. Participant dyads underwent an initial assessment no more than 6-weeks prior to commencing the intervention. This assessment included a 30- to 45-minute

videotaped caregiver-child interaction and a videotaped caregiver interview – the COS Interview (COSI: Cooper, Hoffman, Marvin, & Powell, 1999; Powell et al., 2014). For the 55 dyads in this study, the caregiver-child interaction used for the initial assessment was the COS adaptation (Powell, et al., 2014) of the SSP. Information on demographics and psychosocial risk was obtained from questionnaires and clinic intake data.

Caregivers then participated in the 20-week COS intervention, administered according to the protocol detailed in the COS intervention facilitator's manual (Cooper, Hoffman, Marvin, & Powell, 2000). As is standard with COS programs, children did not participate in the actual COS sessions.

Post-intervention assessments, including repeat SSP sessions with the cohort that is the focus of this study, and repeat COS Interviews, were conducted following the final COS session. The majority of post-assessments were conducted within two weeks, and all were completed within six weeks, of the final intervention session.

Measures

This study involved measurement of mind-mindedness and comparison of this data with data collected using measures specific to the study described by Huber and colleagues (2015a). The measures unique to this study are described first, followed by a summary of the relevant measures used in Huber's study. All coders were provided with the child's gender and age in months, but were blind to all other demographic details and the intervention pre-post status.

The Strange Situation Procedure. Archived SSP footage provided the interactive context for this study. As outlined above, an augmented version of the SSP was used in pre- and post-assessment of the caregiver-child dyads, in line with the COS protocol (Powell, et al., 2014). The additions were a book reading and a pack up task, following the second reunion. The videotapes of these SSP sessions were used to code interactional mind-mindedness.

De-identified and dummy coded videotapes were assigned to four 4th year Psychology students for verbatim transcription of all caregiver-child and child-caregiver language, from the specific episodes within the SSP that included both caregiver and child (see Table 1). The additional pack-up task was also transcribed. Episode numbers specific to this study were assigned to the transcribed episodes, replacing the episode numbers in the original SSP protocol. This is also detailed in Table 1. For both transcription and coding, tapes were allocated so that each transcriber/coder received a mixture of pre/post tapes from different dyads, but never the pre/post tape for the same dyad. The videotaped transcripts then underwent a two-stage coding process for mind-mindedness. Inter-rater reliability (IRR) scores are detailed in the relevant sections below.

Table 1
SSP (+ Pack Up) Episodes Transcribed for This Study

Original SSP episode number	*Description (duration)*	*Study-specific episode number*
Episode 2	Caregiver and child (3 minutes)	Episode 1
Episode 3	Stranger, caregiver & child (3 minutes) - *Includes first separation*	Episode 2
Episode 5	Caregiver & child (3 minutes) - *Includes first reunion, departure of stranger and second separation*	Episode 3
Episode 8	Caregiver & child (3 minutes) – *Includes second reunion & departure of stranger*	Episode 4
	Pack-up task (3 minutes)	Episode 5

Note: Times above are according to the procedure protocol. Actual duration of observations varied in some cases due to extra time taken with separations or the pack-up task.

Interactional mind-mindedness. Interactional mind-mindedness was coded according to the Mind-Mindedness Coding Manual (Meins & Fernyhough, 2010, 2015). Transcripts were used to identify all comments that focused on the child's internal states and which either used a specific mental state term (expressing desires or preferences, cognitions, emotions or

epistemic states) or which were spoken as if talking on the child's behalf. Due to the age range of the children in this sample (13 - 60 months at pre-assessment) an extension to the original coding system, recently developed for use with older children (Illingworth, 2014; Illingworth et al., 2015), was also used. Endorsement for using this extension of the original manual for the current study was received from Elizabeth Meins (personal communication, May, 2016). Full details of both Illingworth's changes to the original coding system, and variations used in the current study, are located in Appendix B.

The initial coding of de-identified transcripts (Coding Stage 1) was undertaken by a single coder (the lead researcher). A second coder independently coded 20 transcripts (18%) to establish IRR. Agreement regarding classification of comments from transcripts as mind-related or not was $\kappa = .98$, indicating near perfect agreement (Landis & Koch, 1977).

For Coding Stage 2, pre-coded transcripts were divided among four coders (the lead researcher and three 4th year Psychology students trained in mind-mindedness coding) for dichotomous coding of mind-related comments into appropriate and non-attuned categories, with reference to the videotaped interactions. Following the Mind-Mindedness Coding Manual (Meins & Fernyhough, 2010, 2015), mind-related comments were coded as appropriate if they met any of the following criteria: a) the coder agreed with the caregiver's reading of the child's internal state; b) the comment linked the current activity with similar activities or events in the past or future; or c) the comment suggested how to proceed after a lull in the interaction. Scores for both appropriate and non-attuned mind-related comments were calculated as proportions of total adult speech.

Twenty-two transcripts (20%), including transcripts from all four Stage 2 coders, were coded independently, to establish IRR. Agreement regarding dichotomous classification of mind-related comments as appropriate or non-attuned from transcripts and videos was high ($\kappa = .82$).

Child attachment. SSP videotapes, used above to measure mind-mindedness, were coded in the study by Huber et al. (2015a) for child attachment. The coding process is

described fully in Huber's paper, as is justification for the use of the SSP (originally developed for use in infancy) to measure attachment in the study age group. In summary, attachment was coded from both pre- and post-intervention videotapes of the SSP. Videotapes were coded for attachment using the Ainsworth coding system (Ainsworth, et al. 1978) for children under 24 months of age ($n = 8$) and the Preschool Attachment Classification System (PACS: Cassidy, Marvin, & the MacArthur Working Group on Attachment, 1992) for children aged 24-60 months ($n = 47$) at pre-assessment. Coding was undertaken in Ellen Moss's laboratory in Montreal, Canada, by two independent coders (Ellen Moss and her PhD student), both of whom were experienced in both coding systems. Attachment was coded categorically (with each dyad assigned to one of the following categories: Secure; Insecure/Avoidant; Insecure/Ambivalent; Insecure/Disorganised) and dimensionally, with each dyad receiving a rating of 1-9 on each of the following four scales: Security, Avoidance, Ambivalence and Disorganisation (Moss et al., 2015). Data related to the SSP categories, and the Security and Disorganisation scales, are used in the current study.

A second coder scored a random 21 tapes (19%). Coder agreement on the assignment of one of the four primary attachment classifications (ABCD) was $\kappa = .78$, indicating substantial agreement. The intra-class correlations for dimensional scores indicated strong agreement, ICC single = .86 for security level and ICC single = .85 for disorganisation level.

The Circle of Security interview (COSI). The COSI was administered as part of both the pre- and post-intervention assessment process. An earlier (1999) version of the COSI described fully by Powell et al. (2014) was used for Huber's study, as detailed in Huber et al. (2015a). This version comprises three parts, incorporating six questions relating to the caregiver's perception of their own and their child's experience of the SSP, 13 questions relating to the caregiver's perception of him or herself as a parent and of the relationship with the target child (adapted from the PDI - Revised; Slade et al., 2004), and nine questions exploring the caregiver's relationship with his or her own attachment figures and how this

may affect their own parenting (adapted from the AAI). The final question asks the caregiver what he or she hopes the child will learn from the experience of being parented.

The videotapes of the COSI were de-identified and converted to audiotape, then transcribed verbatim. The transcripts were coded by two independent teams of coders, to assess caregiver reflective functioning, and caregivers' representations of themselves as caregiver and of their child, respectively. IRR data provided by both coding laboratories (detailed below) relates to Huber et al.'s (2015a) full sample.

Caregiver reflective functioning. Caregiver reflective functioning was coded using the Reflective Functioning Coding Scale. Three independent coders from the Anna Freud Centre in London, all certified as reliable in coding reflective functioning, coded the transcripts, assigning a score of 1-9, with scores of 5 and above indicating definite reflective functioning. Twenty-five interviews (17%) were coded independently by the three coders, in two sets, to establish IRR. Reliability was high for both sets of interviews (ICC, single = .83; ICC, single = .88).

Caregiving representations. The same COSI interview transcripts were coded independently to measure caregiving representations, using a new scale (Appendix B) developed for Huber's study. Both the approach to coding and the actual scale were based on other approaches using multiple caregiver dimensions, including the EAS, the PDI-R, and the Caregiving Interview (George & Solomon, 1989). This scale comprised two affect dimensions (hostility and joy) and six dimensions reflecting perceptions of self as caregiver, named in alignment with language used in the COS intervention (bigger/stronger, kind, mean, weak, gone, role reversed).

A continuous score was assigned for each of the above scales (1 = no statements/indicators; 3 = a few indicators or partial indicators; and 5 = definite and/or frequent indicators). A subset of 30 interviews (20%) was independently coded by a second coder. Correlations between the two coders on the eight dimensions ranged from $r = .72$ (gone) to $r = .92$ (hostility). A composite "positive" caregiving representations score was used

for the present study, derived from the mean scores of the eight dimensions (with negative dimensions reverse-coded).

Approach to Statistical Analysis

All analyses were conducted with SPSS version 23.0 (IBM, 2015). Preliminary analyses were carried out to explore means, standard deviations, skewness and kurtosis statistics for all continuous variables, and to generate histograms. Thereafter, parametric analyses (normally distributed variables) and non-parametric analyses (skewed variables) were used as appropriate.

Preliminary analyses were undertaken to test whether mind-mindedness scores at baseline differed according to demographic variables and psychosocial risk factors. Differences in scores for mind-mindedness across the five transcribed episodes of the modified SSP were examined using a one-way repeated measures analysis of variance (ANOVA) and the Friedman Test. Differences between mind-mindedness scores in the first episode of the SSP and those in the most attachment-activating episodes (separations/reunions) of the SSP were examined using a paired-samples t-test and a Wilcoxon Signed Ranks Test.

Correlation analyses were undertaken to explore the bivariate relationships between caregiver mind-mindedness scores and dyadic scores for attachment security and disorganisation, caregiver reflective functioning, and caregiving representations, reported by Huber and colleagues (2015a), using data from that study. Variation in caregiver mind-mindedness scores by child attachment classification at baseline were examined by conducting a one-way between-groups ANOVA and a Kruskal-Wallis Test.

A paired samples t-test and a Wilcoxon Signed Ranks Test were conducted to examine change pre- to post-intervention for appropriate and non-attuned mind-related comments respectively. Hypotheses regarding change in mind-mindedness were tested using a series of mixed-design ANOVAs, including appropriate covariates. Significant interactions were investigated using paired-samples t-tests and Wilcoxon Signed Ranks Tests. Correlation

analyses were repeated to explore any post-intervention change in relationships among mind-mindedness variables and the four attachment-related variables from Huber's study.

Chapter 4 Results

Sample Description

Children in the study were 25 girls (45.5%) and 30 boys (54.5%). Caregivers were 51 biological parents (93%), 3 foster/adoptive parents (5%) and 1 kinship carer (2%). Caregivers were predominantly female ($n = 50$, 91%) and most had post-secondary school education ($n = 36$, 66%). Two families (4%) identified as Aboriginal or Torres Strait Islander and 16 (29%) identified as coming from another culturally and linguistically diverse background.

Family psychosocial risk factors included parent separation or divorce since the birth of the study child ($n = 21$, 38%), current single parent status ($n = 18$, 33%) caregiver's prior or current experience of mental illness, self-reported ($n = 48$, 87%) and substance abuse by a family member ($n = 16$, 29%). Eighteen children (33%) had experienced family violence and 11 (20%) had experienced substantiated abuse or neglect.

Preliminary Analyses

Table 2 shows descriptive statistics for child age, mind-mindedness variables and the four attachment-related variables from Huber et al. (2015a): security level, disorganisation level, reflective functioning, and positive caregiving representations. All continuous variables at baseline were normally distributed, with the exception of indices of non-attuned mind-mindedness (41/55 caregivers, 75%, made no non-attuned comments) and disorganisation (34/55 dyads, 62%, showed no disorganisation). Attachment classifications were as follows: 5 dyads (9%) classified avoidant; 31 dyads (56%) classified secure; 6 dyads (11%) classified ambivalent; and 13 dyads (24%) classified disorganised. At baseline, 37 children (67%) were of preschool age (36-60 months), with the remainder ($n = 18$, 33%) aged between 13 and 35 months.

Table 2

Continuous Variables at Baseline

	Mean	SD	Range
Child age (months)	37.95	10.75	13-60
Total adult comments	225.20	75.55	104-503
Total mind-related comments	15.45	8.46	1-39
Appropriate mind-related comments (F)	15.00	8.58	1-39
Appropriate mind-related comments (P)	.07	.04	0-.18
Non-attuned mind-related comments (F)	.45	.96	0-5
Non-attuned mind-related comments (P)	.00	.01	0-.03
Security scale*	4.70	1.54	1-9
Disorganisation scale*	2.41	2.21	1-9
Reflective functioning*	4.25	1.50	0-7
Positive caregiving representations*	2.96	.62	1.75-4.75

F = Frequency; P = Proportion of total adult speech.
* Attachment-related variables scored from observations and narrative interview, reported in Huber et al. (2015a).

Proportional mind-mindedness scores (calculated as proportions of total adult speech) were used for all analyses, as recommended in the coding manual (Meins & Fernyhough, 2010, 2015). Using proportional scores also enabled comparison between scores in this study and those found by Illingworth and colleagues (2015), who used the same interactional measure with caregivers of children in a similar age group, but in a free-play context, albeit of similar duration. Figure 2 shows distributions of mind-mindedness scores at baseline.

Figure 2. Distributions of appropriate and non-attuned mind-related comments at baseline

Independent samples t-tests (appropriate mind-related comments) and Mann-Whitney U Tests (non-attuned mind-related comments) were conducted to determine whether these indices of mind-mindedness differed by child gender, caregiver education level (coded dichotomously as no post-secondary education/post-secondary education) or single parent status. A correlation analysis explored associations between mind-mindedness scores and child age. No significant associations were found, all *p*s >.05.

A second series of analyses was conducted to explore whether caregivers' baseline mind-mindedness scored differed according to psychosocial risk factors. Results of the Mann-Whitney U Tests indicated no significant differences in proportions of non-attuned mind-related comments according to any reported psychosocial risk factor, *p*s > .05. Results of the independent samples t-tests showed a number of significant associations, which are detailed in Table 3. Proportions of appropriate mind-related comments were significantly lower in caregivers who had separated or divorced during the study child's life, caregivers with a family history of substance abuse, caregivers who reported that the study child had been exposed to family violence, and caregivers whose child had experienced substantiated abuse or neglect, than for caregivers not reporting these risk factors. There was no significant

difference in appropriate mind-related comments for single parents or caregivers disclosing prior or current mental illness.

Table 3
Appropriate Mind-Related Comments (Proportions) at Baseline by Psychosocial Risk Factor

Risk Factor	Present Mean (SD)	Absent Mean (SD)	t(df)
Separation or divorce during child's life ($n = 21$)	.05 (.03)	.08 (.04)	(53) 2.54*
Currently single parent ($n = 18$)	.06 (.03)	.07 (.04)	(53) 1.50
Family history of substance abuse ($n = 16$)	.05 (.02)	.08 (.04)	(49) 4.08***
Child exposed to family violence ($n = 18$)	.05 (.02)	.08 (.04)	(50) 2.99**
Substantiated child abuse or neglect ($n = 11$)	.05 (.02)	.07 (.04)	(53) 2.18*
Current or prior mental illness ($n = 48$)	.07 (.04)	.08 (.03)	(53) .76

* Significant at the 0.05 level (two tailed)
** Significant at the 0.01 level (two tailed)
*** Significant at the 0.001 level (two tailed)

Research Question 1: Validity of the Interactional Mind-Mindedness Measure

A series of analyses was conducted to explore the validity of the interactional mind-mindedness measure with caregivers of preschool-aged children in an attachment-activating context. First, data were compared with data from a study reporting mind-mindedness scores for caregivers of children in a similar age group. There were no explicit hypotheses, but it was anticipated that if the measure was valid in this age group, similar scores might be expected. Next, because the context differed from the comparison study (and from most other mind-mindedness research, in which the construct is measured in free play contexts), differences in mind-mindedness scores across the different SSP episodes were examined. Finally, associations between the two indices of mind-mindedness, and attachment variables from Huber et al. (2015a), were examined.

Comparison with mind-mindedness scores in the Illingworth et al. (2015) study.
Baseline means, standard deviations and ranges for appropriate and non-attuned mind-related

comments were compared with those reported by Illingworth and colleagues (2015). The "younger siblings" cohort in that study ($n = 32$) comprised children aged from 2.7 to 6.4 years ($M = 4$ years), comparable in age with the majority of children in the current study. The duration of the observation period was also comparable: The study by Illingworth and colleagues involved fifteen-minute observation periods; the current study measured mind-mindedness over five 3-minute episodes within a longer 25-minute session. Comparable observation periods are not so critical, however, when proportional scores are used. The mind mindedness scores (expressed as percentages of total adult comments in the study by Illingworth et al.) were strikingly similar for appropriate comments (Current study: $M = 6.74\%$; $SD = 3.56$; Range = 0-18%; Comparison study: $M = 6.54\%$; $SD = 3.11$; Range = 2.04-12.70%), but the proportion of non-attuned comments was quite different (Current study: $M = .23\%$; $SD = .51$; Range = 0-3%; Comparison study: $M = .07\%$; $SD = .17$; Range = 0-.53%.).

Comparing mind-mindedness scores across SSP episodes. A series of analyses was conducted to investigate whether the increased prevalence of non-attuned mind-minded comments in the current study might be a function of the difference in observation contexts, in particular the activation of the attachment system in the current study. Results of a one-way repeated-measures ANOVA, exploring difference in appropriate mind-mindedness scores across the five episodes of the modified SSP, indicated a significant effect for episode, Wilks' Lambda = .63, F (4, 51), $p = <.001$, partial $\eta^2 = .37$. Pairwise comparisons, using Bonferroni adjustments for multiple comparisons, indicated significant differences in mean scores between Episode 1 and Episode 5 ($p = .00$), between Episode 3 and Episode 5 ($p = .04$), and between Episode 4 and Episode 5 ($p = .03$). See Table 1 for episode details.

The results of the Friedman Test exploring difference in non-attuned mind-mindedness scores across the five episodes also indicated a statistically significant difference in non-attuned mind-mindedness scores across the five episodes, χ^2 (4, $n = 55$) = 10.84, p <.05. Follow up inspection of the median values, however, showed no difference across episodes (medians all .00). Inspection of the mean values showed higher levels of non-attuned

mind-related comments in episodes 3 ($M = .0043$) and 4 ($M = .0032$) compared with all other episodes (Episode 1, $M = .0019$; Episode 2, $M = .0014$; Episode 5, $M = .0000$). Differences in mean scores for both appropriate and non-attuned comments by episode are shown in Figure 3. This also illustrates the striking predominance of appropriate compared with non-attuned comments throughout.

Figure 3. Mean scores for mind-mindedness appropriate and non-attuned by episode.

Given that episodes 3 and 4 are designed to have an attachment-activating effect (see Table 1), whereas Episode 1 is more akin to a free-play session (caregiver and child alone in the room with toys) and Episode 5 was specifically task-orientated, these results suggest that the difference in non-attuned scores in the two studies may be accounted for by the attachment-activating components of the SSP context in the current study.

Difference in mind-mindedness scores for free-play-like and attachment-activating episodes. To further explore whether mind-mindedness scores differed in the most free-play-like episode of the SSP, from those in the most attachment-activating episodes of the SSP, a composite score for Episodes 3 and 4 was first calculated by averaging the scores for the two episodes. (While Episode 2 is also designed to activate the child's attachment system, with

48

the introduction of the stranger, it is the only episode containing three-way interaction between caregiver, child, and stranger, so was excluded to avoid possible contamination.) Analyses were undertaken to examine variation in appropriate (a paired-samples t-test) and non-attuned (a Wilcoxon Signed Ranks Test) mind-mindedness scores between Episode 1 and Episode 3/4.

Results of the paired-samples t-test indicated a statistically significant difference in appropriate mind-mindedness scores for Episode 1 (free play $M = .10$, $SD = .08$) and Episode 3/4 (attachment-activating $M = .07$, $SD = .05$), $t (54) = 2.16$, $p < .01$ (two-tailed). Thus, appropriate mind-minded comments were significantly more prevalent in Episode 1 than in Episode 3/4, as can be seen clearly in Figure 3.

Despite the significant Friedman Test (analysing differences across all episodes), the Wilcoxon Signed Ranks Test indicated no statistically significant difference between non-attuned mind-mindedness scores for Episode 1 and Episode 3/4, $z = -1.22$ (based on negative ranks), $p = .22$. Therefore, the higher levels of non-attuned mind-mindedness scores evident in attachment-activating Episode 3/4, were not significantly higher than those in the free-play-like Episode 1, but rather in relation to other episodes (most likely Episode 5, in which no non-attuned comments were made).

Associations with other attachment-related variables. Mind-mindedness scores were examined in relation to previously coded indices of the parent-child attachment relationship and parent mentalising, using correlations for continuous variables and analysis of variance for categorical variables. While these analyses were exploratory, it was hypothesised on theoretical grounds that: a) appropriate mind-related comments would be positively associated with attachment security, reflective functioning and positive caregiving representations, and negatively associated with indices of attachment disorganisation; and b) non-attuned mind-related comments would be negatively associated with attachment security, reflective functioning and positive representations, and positively associated with indices of disorganisation.

For this stage of analysis only, correlations were run on both mind-mindedness frequency and proportional scores, to enable maximum comparability with other mind-mindedness studies. Correlations are presented in Table 3. As predicted, proportional scores for appropriate mind-related comments were moderately positively correlated with security level and moderately negatively correlated with disorganisation level. Frequency scores for appropriate mind-related comments showed a slightly weaker but significant correlation with security level, and were not significantly correlated with disorganisation level. This pattern is somewhat reversed with regard to reflective functioning and positive caregiving representations. As predicted, both indices of appropriate comments correlated significantly with these measures, with the frequency scores correlating more strongly than the proportional measures in both instances. Contrary to prediction, non-attuned comments were not significantly correlated with any of the four attachment-related variables.

Variation in caregiver mind-mindedness scores by child attachment classification at baseline. A one-way between-groups ANOVA was conducted to explore variation in caregiver appropriate mind-mindedness scores by child attachment classification at baseline. A Kruskal-Wallis Test was conducted with the non-attuned category. Results from the ANOVA indicated a statistically significant difference at the $p < .05$ level in caregiver appropriate mind-mindedness scores according to child attachment classification: $F(3, 51) = 3.98$, $p = .01$. Post-hoc comparisons using the Tukey HSD test indicated that the significant differences in each case occurred between caregivers whose children had been classified as secure and those whose children had been classified as disorganised. ANOVA results are presented in the form of a means plot in Figure 4. A means plot was also generated for non-attuned comments. While the graph of means suggests more non-attuned comments in dyads classified disorganised, the Kruskall-Wallis test indicated no significant difference in caregiver non-attuned scores according to child attachment classification.

Figure 4. Appropriate (MMApp) and non-attuned (MMNA) mind-mindedness scores by dyad attachment classification

Table 4

Bivariate Correlations Between Mind-Mindedness Frequencies (F) and Proportions (P) and Other Attachment Variables at Baseline

	1	2	3	4	5	6	7	8
1. Appropriate mind-related comments (F)	-							
2. Appropriate mind-related comments (P)	-.84**	-						
3. Non-attuned mind-related comments (F)	-.11[a]	-.17[a]	-					
4. Non-attuned mind-related comments (P)	-.12[a]	-.16[a]	.99[a]**	-				
5. Security scale	**.31***	**.36****	-.22[a]	-.21[a]	-			
6. Disorganisation scale	-.24[a]	**-.34[a]****	.22[a]	.21[a]	-.63[a]**	-		
7. Reflective functioning	**.38****	**.28***	-.17	-.17[a]	.21	-.05[a]	-	
8. Positive caregiving representations	**.40****	**.29***	-.13	-.13[a]	.14	-.20[a]	.21	-

[a] Denotes Spearman's ρ for variables with non-normal distributions (3, 4 and 6); all other correlations are Pearson's.
*Correlation is significant at the 0.05 level (two tailed)
** Correlation is significant at the 0.01 level (two tailed

Research Question 2: Does Mind-Mindedness Change Following the COS 20-Week Intervention?

First, a paired samples t-test and a Wilcoxon Signed Rank Test were conducted to examine pre-post changes. T-test results indicated no significant difference in proportions of appropriate mind-related comments before and after the intervention, $p > .05$. Results of the Wilcoxon Signed Rank Test indicated no significant difference in proportions of non-attuned mind-related comments before and after the intervention, $p > .05$. Investigation of the frequency of increases, decreases, and no change for both variables indicated a) a post-intervention increase in the proportion of appropriate mind-related comments for 29 caregivers, a decrease for 22, and no change for four caregivers, and b) a post-intervention decrease in the proportion of non-attuned comments for eight caregivers, an increase for seven, and no change for 40 caregivers. A correlation analysis of post-intervention scores indicated no significant relationships between indices of mind-mindedness and the four attachment-related variables from Huber et al.'s (2015a) study, all $ps > .05$, in strong contrast with the findings at baseline.

Hypotheses regarding change in mind-mindedness were then tested using a series of mixed-design analyses of variance (ANOVA). The within-subjects variable in each case was "time". In the first stage of testing, demographic variables (child gender, child age and caregiver education) were tested one by one as between-subjects variables. (While none of these variables showed any association with baseline mind-mindedness scores in the current study, theory and prior research indicated it was appropriate to include them.) These initial tests indicated no main effect for time, but a significant interaction effect for time x caregiver education, Wilks' Lambda = .91, $F(1, 53) = 5.37$, $p = .02$, partial $\eta^2 = .09$.

Given that Huber et al., (2015a) had found that intervention effects were moderated by baseline scores, with change greatest for those with lowest scores on each variable at baseline, the second stage of mixed-design ANOVA testing introduced dichotomous Time 1 threshold groups for mind-mindedness and attachment variables: Time 1 proportion of appropriate

53

mind-related comments < .05 or ≥ .05 (.05 was the modal score, see Figure 2); Time 1 non-attuned comments present or absent; Time 1 security score < 5 or ≥ 5; and Time 1 disorganisation score ≥ 5 or < 5. The latter categorical splits were based on recommendations by Moss et al. (2015) and were used in analyses by Huber et al. (2015a). Again, these threshold group variables were tested as between-groups variables one by one. Results indicated a time x threshold group interaction effect for only one of these group variables: Time 1 appropriate mind-mindedness scores < .05 or ≥ .05, Wilks' Lambda = .89, F (1, 53) = 6.38, p = .015, partial η^2 = .11. Figure 5 shows means plots illustrating both this significant interaction, and that detailed in the previous paragraph.

In the final stage of hypothesis testing, the two between-subjects variables that had shown significant interaction effects with time (caregiver education and low/mid-high proportions of appropriate mind-related comments at baseline) were included in a single mixed-design ANOVA, enabling testing of combined effects. With both variables in the model, there was still no main effect for time, although the results were marginally significant, Wilks' Lambda = .93, F (1, 51) = 3.63, p = .06, and there was no longer a significant time x caregiver education interaction (although this result was also marginally significant), Wilks' Lambda = .93, F (1, 51) = 3.91, p = .05. However, there was a significant time x threshold group interaction effect, for the variable relating to mind-mindedness scores at baseline, Wilks' Lambda = .92, F (1, 51) = 4.60, p = .037, partial η^2 = .08 (moderate effect size). Inspection of pre- and post-intervention means indicated that there had been a significant increase in appropriate mind-related comments post-intervention for the group of caregivers who had received the lowest mind-mindedness scores at baseline, but no change for the group that had received mid-high mind-mindedness scores at baseline.

Figure 5. Means plots for pre-post-intervention change in proportion of appropriate mind-minded comments by Time 1 threshold group and caregiver education

Further investigation of this result was undertaken using the Split File function within SPSS. Paired-samples t-tests and Wilcoxon Signed Ranks Tests were conducted to explore pre-post-intervention change in the two indices of mind-mindedness and the four attachment indices from Huber et al. (2015a), for the low baseline mind-mindedness group, in comparison with that for the mid-high baseline mind-mindedness group. T-test results (detailed in Table 5) indicated statistically significant increases in appropriate mind-related comments (d = 0.80), security (d = 1.23), and caregiver positive representations (d = 1.32), and a statistically significant decrease in disorganisation (d = 1.17), for the low mind-mindedness group post-intervention. Results indicated significant increases in reflective functioning and caregiver positive representations for the mid-high baseline mind-mindedness group. Wilcoxon Signed Ranks Tests were then conducted on all variables. This was required for the two non-normally distributed variables and was considered reasonable follow-up for the other variables. Test results for all variables confirmed the pattern indicated by t-test results, adding robustness to the findings. All results need to be interpreted with caution, however, due to the small numbers in each threshold group, and the skewed distributions for both non-attuned comments and disorganisation scores.

Table 5

T-test Results by Threshold Group: Low/Mid-High Proportion of Appropriate Mind-Related Comments (MRC) at Baseline

	Low Appropriate MRC (*n* = 17)			Mid-High Appropriate MRC (*n* = 38)		
Variable	T1 Mean (SD)	T2 Mean (SD)	*t*(df)	T1 Mean (SD)	T2 Mean (SD)	*t*(df)
Appropriate MRC	.03 (.01)	.06 (.05)	(16) 2.38*	.08 (.03)	.08 (.03)	(37) .68
Non-attuned MRC	.01 (.01)	.00 (.01)	(16) 1.24	.00 (.00)	.00 (.02)	(37) 1.30
Security score	3.85 (1.64)	5.65 (.91)	(16) 4.71***	5.08 (1.36)	4.80 (1.49)	(37) 1.20
Disorganisation score	3.50 (2.82)	1.53 (1.12)	(16) 3.04**	1.92 (1.70)	2.33 (1.80)	(37) 1.31
Reflective functioning	3.54 (1.51)	4.38 (1.85)	(12) 1.77	4.50 (1.43)	5.16 (1.13)	(37) 2.56*
Caregiving representations	2.78 (.67)	3.81 (.41)	(12) 4.65**	3.02 (.60)	3.79 (.52)	(37) 7.12***

* Significant at the 0.05 level (two tailed)
** Significant at the 0.01 level (two tailed)
*** Significant at the 0.001 level (two tailed)

Study design and small numbers precluded explanatory analyses, however the patterns of change for the group that was low in mind-mindedness at baseline suggest a relationship between the increase in appropriate mind-related comments for this subgroup and the concurrent improvements in subgroup scores in three of the attachment-related indices (increase in security, decrease in disorganisation, increase in positive caregiving representations). Follow-up correlation analyses, however, indicated no significant correlations between change scores for appropriate mind-mindedness and those for any of these indices, all $ps > .05$.

All hypotheses testing and follow-up analyses were repeated excluding the case that was an extreme outlier for non-attuned comments post-intervention (the caregiver in the case study), with no change to results.

Chapter 5 Case Study

Exploring one manifestation of non-attunement

One videotaped interaction stood out during the coding process. The tape had been chosen at random to act as a training case for one of the video coders, so was being watched simultaneously by three members of the research team. All three were struck by the high number of non-attuned comments made by the mother in this interaction - 16 in total, in this 15-minute transcribed portion of the overall SSP – an unexpectedly high number, based on previous mind-mindedness research.

Once the coding process had been completed, initial analysis revealed that this case was indeed an outlier. Removal of the pre-post blindness requirement revealed that this was a post-intervention interaction. On investigation, the contrast between the pre- and post-intervention tapes for this mother-child dyad was striking. In the pre-intervention SSP, the engagement between mother and child appears both enthusiastic and comfortable for both. The mother structures both separations clearly and simply, explaining that she needs to go to the toilet and checking that the child is comfortable staying with the stranger on the first separation, and staying alone on the second separation, before leaving. The child does not seem concerned by either separation, and the reengagement on the mother's return is immediate and appears both natural and reciprocal. The mother makes no reference to the child's emotions surrounding the separations and reunions (the child shows no negative affect) and makes no mind-related comments that were coded non-attuned.

The post-intervention SSP is strikingly different. Very soon after entering the room, the child asks her mother to sit on the couch, rather than on the floor with her. The child initiates talk about her mother leaving the room and how she will make "a big hole" while her mother is out. The child returns to this theme a number of times – possibly indicating some concern about the forthcoming separations. At the entry of the stranger, the preparation for both separations, and both reunions, the mother initially enquires about whether the child was

feeling "nervous"/"scared"/"worried" - all coded as appropriate. The mother follows this with persistent probing about negative emotions, coming in very close (face-to-face) with her child. On two occasions the mother turns her child's face to look at hers, and on two occasions she tells the child that she knows the child is feeling worried/scared, when the child has said she isn't, consistent with her demeanor. On two occasions, the child returns to talking about the toys, and the mother brings her back to the conversation about emotions. Following these interactions on both reunions, the child asks her mother again to go and sit on the couch. Below are extracts from the transcript, illustrating two of these exchanges.

First reunion

Mother*: How did you go? Were you nervous a little bit by yourself?*

Child*:* (Whispers to mum – inaudible)

Mother*: I know, I always leave and come back and it must make you feel a little bit nervous.*

Child*: No. Can you sit down?*

Mother*: Were you a little bit nervous? A little bit nervous?*

Child*: Alright…Yes! Yes! Yes!*

Mother*: I know. You did very well. I'm very proud of you. What would you like me to do?*

Child*: I would like you to sit on the couch.*

Second separation

Mother: *Does it feel a bit scary?*

Child: *No.*

Mother: *Look at me.* (Turns child's face to look at hers) *It IS a bit scary.*

Considering the focus on understanding children's cues and miscues within the COS model, it seems plausible (even likely) that the strangely elevated number of non-attuned mind-related comments in this post-intervention interaction was a genuine intervention effect. The mother was working hard to acknowledge the potentially stressful nature of the SSP for her child, and the difficult emotions the procedure may evoke – in the absence of any clear indication from the child that she was finding the process particularly difficult. This becomes

understandable if the caregiver believed the child's calmness was a miscue. Using the mind-mindedness coding system, we had no choice but to code these utterances as non-attuned, as all three coders judged the mother's reading of the child's mental states to be inaccurate.

The concept of cueing and miscueing is an important one in the COS model, and a feature of both the 20-week COS intervention and the 8-week COS-P DVD-based program. Further, it is a central component of learning to read children's behaviour, particularly when defensive behaviour patterns have been established. But learning to read children's cues and miscues can be very difficult – and it is not surprising that caregivers would misread cues as miscues, and vice-versa, particularly in the early stages of trying to apply the concept.

Perhaps this case showed a caregiver in a process of recalibration following completion of the COS Intervention? Huber et al.'s (2015a) recommended additional follow-up, six months post-intervention, would give an opportunity to investigate this question in cases such as this. This case may also represent a cautionary example for clinicians regarding the challenge of learning about children's miscues.

Chapter 6 Discussion

The present study had two related aims: to investigate the validity of the interactional mind-mindedness measure with caregivers of pre-school-aged children in an attachment-activating context, and to explore whether mind-mindedness changed in response to an attachment-based intervention in a referred clinical sample. Mind-mindedness has its origins in attachment theory, and empirical evidence indicates that mind-mindedness in caregivers of infants is related to caregiver sensitivity, and that it may predict attachment. The current study makes a novel contribution in demonstrating theoretically expected concurrent associations in the preschool years between caregiver mind-mindedness and indices of attachment security and disorganisation, and also with caregiver reflective functioning and caregiving representations elicited in a narrative interview. Further, results suggest that a caregiver's tendency to use mind-minded language may be enhanced by the Circle of Security 20-week intervention. This effect was only observed for caregivers who had low mind-mindedness prior to the intervention, suggesting that the therapeutic benefits may be specific to those most in need.

Validity of the Interactional Mind-Mindedness Measure

Drawing on both the theoretical origins of mind-mindedness in attachment theory, and prior research linking mind-mindedness to sensitivity and attachment in infancy, mind-mindedness was expected to correlate with other indices of the caregiver-child relationship in the current study. Appropriate mind-related comments were significantly correlated in the expected directions with indices of child attachment security and disorganisation, and with caregiver reflective functioning and positive caregiving representations; all four constructs having been coded blind in four different labs, located in Sydney, London, Montreal and Canberra. Thus, what caregivers *said* to their children was significantly related to independent observations of dyadic attachment, which focus primarily on the child's behaviour in relation to the caregiver. Furthermore, what caregivers said to their children during live interaction

was associated with how caregivers think about a) themselves in the caregiving role, b) their child, and c) the caregiver-child relationship. These concurrent associations provide evidence for the validity of the interactive mind-mindedness measure as an approach to capturing individual differences in relationship quality in caregivers of preschool aged children in an attachment-activating context.

Although Meins and colleagues have reported that non-attuned comments in infancy predict attachment at 12 months (2012) and in the preschool years (in press), non-attuned comments in this study were not significantly correlated with any other attachment variable. Non-attuned comments showed an interesting pattern of distribution among the four attachment *classifications* in the current study, with prevalence in disorganised dyads noticeably higher, however this pattern did not reach statistical significance. The significant difference in proportions of appropriate mind-related comments for dyads classified secure and disorganised endorsed the correlational results.

The correlations between mind-mindedness and both reflective functioning and positive caregiving representations deserve particular attention. Very few prior studies have explored the relationships between mind-mindedness and either of these constructs. The relationship between appropriate mind-related comments and reflective functioning in this study is not surprising, considering the conceptual similarities between the two constructs. Barreto et al. (2016) recently suggested that there may be a distinction, however, between the capacity to mentalise and the tendency to do so in interaction with one's child. The correlation between mind-mindedness and reflective functioning in the current study indicates that, in some cases at least, both the capacity and the tendency to enact it may go hand-in-hand.

The correlation between appropriate mind-related comments and positive caregiving representations found in the current study provides one of the first empirical indications that these constructs may be related. It also provides further validation for the representations measure developed for the study by Huber et al. (2015a). The relationship between these two constructs indicates that the representations measure is capturing something of what is inside

the caregiver's head with regard to their child and caregiving, which is also being expressed in the language the caregiver uses with their child.

Comparisons between mind-mindedness scores in the current study and those found by Illingworth et al. (2015), with caregivers of children in a similar age group, showed striking similarity in overall proportions of appropriate mind-related comments, despite the different observation contexts. The comparison showed clear differences in proportions of non-attuned comments, with both means and ranges much higher in the current study. The similarity between scores for appropriate mind-related comments in the two studies suggests validity of the measure across the two observational contexts (free play and attachment-activating). The sample difference in scores for non-attuned mind-related comments raises interesting questions. There is limited empirical evidence to date, and thus limited understanding, relating to non-attuned mind-related comments. Meins's work (2012; in press) linking non-attuned comments to attachment is compelling, but has not been replicated. Many studies do not report on non-attuned comments at all, and those that do report that less than 10% of caregivers make non-attuned comments (e.g. Bernier et al., in press; McMahon et al., 2016). The higher prevalence noted in this study could be related to either measurement of mind-mindedness in a clinical sample (c.f., the elevated baseline non-attuned scores of mothers with severe mental illness in Schacht et al., in press) or measurement in an attachment-activating context. Further research is needed to advance knowledge in this area.

Results of analyses comparing mind-mindedness scores across SSP episodes showed significantly higher rates of appropriate mind-related comments in free-play compared with attachment-activating episodes and, conversely, more non-attuned mind-related comments (albeit not significant) during attachment-activating episodes. These findings are consistent with Meins's assertion that interactional mind-mindedness can be best measured in a free-play context in which the caregiver's reading of the child's mental states can be largely "unconstrained by the requirements of caregiving" (Meins et al., 2001, p. 639), making non-

attuned comments less likely and therefore potentially more meaningful when they do occur (Meins et al., 2012).

Findings also suggest, however, that attachment activating contexts may be useful for researchers interested in exploring non-attuned comments in particular. A number of researchers (e.g., Milligan et al., 2015; Thompson 1997) have advocated the use of attachment activating contexts, and there is some evidence (Leerkes 2011; McElwain & Booth-LaForce, 2006; Milligan et al., 2015) for the proposal that sensitivity (including mind-mindedness) shown when a child is distressed may be particularly informative about both caregivers' attachment states of mind, and child attachment security. Results of the current study suggest that measurement of interactive mind-mindedness in an attachment-activating context provides meaningful information about the caregiver-child relationship and that this tool could therefore be utilised in future research exploring this phenomenon.

The difference between correlations for frequency and proportional scores for appropriate mind-related comments is interesting. While proportional scores correlated more strongly with attachment security and disorganisation (negative correlation), frequency scores correlated more strongly with reflective functioning and caregiving representations. The meaning of these differences is not immediately apparent and invites further investigation, particularly in the current research context in which a number of researchers are commending the value of frequency scores. Bernier and colleagues have reported meaningful findings related to mind-mindedness frequency scores in all of their studies (e.g. Bernier & Dozier 2003; Bernier et al., 2010; Bernier et al., in press). McMahon and colleagues (2016) argued recently that each mind-minded comment is received by the child as a validation of his or her mental state, irrespective of how many other general comments their caregiver makes. That the increased strength of correlation for the frequency measures in the current study was with variables internal to the caregiver (reflective functioning and caregiving representations), rather than with the two attachment variables directly related to the child, is interesting and invites further investigation.

Exploration of the relationship between mind-mindedness and a number of caregiver and child demographic variables in the current study indicated no significant relationship between mind-mindedness and caregiver education level, single parent status, child age or child gender. Meins proposed that mind-mindedness would be independent of dyadic demographic variables (Meins et al., 2011), but empirical findings have been mixed and most studies control for at least some of these variables. The findings of this study support Meins's proposition.

Few prior studies (Pawlby et al., 2010; Schacht et al., in press; Schacht, Hammond, Marks, Wood, & Conroy, 2013; Walker et al., 2012) have investigated mind-mindedness in clinical populations. The current study provides the first report of relationships between mind-mindedness variables and a number of psychosocial risk factors. The significantly lower scores for appropriate mind-related comments at baseline for caregivers a) who separated or divorced during the study child's lifetime, b) with a family history of substance abuse, c) whose children had experienced family violence, and d) whose children had experienced substantiated abuse or neglect, provide new information that could guide targeting of future mind-mindedness interventions. These findings should be interpreted with caution, however, given the very small numbers in these subgroups.

Change in Mind-Mindedness Following the COS 20-week Intervention

Although there was no main effect for the sample as a whole, this study provides the first evidence that the COS 20-week intervention may facilitate an increase in mind-mindedness for caregivers whose baseline scores for appropriate mind-related comments are low. While the sample size for this subgroup was small ($n = 17$), the intervention effect with regard to increase in appropriate mind-related comments was significant. The associated significant increases in dyadic security and caregiver positive representations, and significant decrease in indices of dyadic disorganisation, for the same subgroup are compelling, even though the follow-up analyses that were possible, considering the nature of the data, indicated no direct relationship between these improvements. Indeed, for the group that was lowest in

mind-mindedness at baseline, security scores are higher at follow up than those for the group that were mid-high in mind-mindedness at baseline, and disorganisation scores are lower. This suggests that changing the way caregivers interact with their children results in shifts in children's behaviour. However, the study design precludes confirmation of causality, so such claims must remain speculative.

Results indicate that mind-mindedness can be enhanced by an attachment-based intervention, even one that does not explicitly teach the construct, in those caregivers least likely to spontaneously refer to their child's internal states in interactions. Considering extant evidence for the link between mind-mindedness and attachment security, the well-substantiated potential long-term benefits of secure attachment, as well as links between mind-mindedness and a number of other positive child outcomes, this intervention effect warrants further investigation. Exploration of both the longevity and clinical significance of the change in mind-mindedness in this subgroup would be an important component of future studies. Studies with larger samples and prospective designs could employ longitudinal data analysis techniques to elucidate whether changes in mind-mindedness directly contribute to changes in attachment behaviours.

The post-intervention increase in reflective functioning only for the subgroup with mid-high proportions of mind-related comments at baseline is puzzling, and is perhaps indicative of the unclear relationship between the two constructs that has emerged from the few studies exploring it. In fact, even across a number of intervention studies, findings regarding changes to reflective functioning through attachment-based interventions have been mixed, and researchers have not been able to empirically demonstrate that changes in reflective functioning explained any improvement in the parent-child relationship (Huber et al., 2015a). Further investigation is required to understand both the role reflective functioning plays in the development of the caregiver-child relationship, and how best to measure it.

In contrast to the findings related to the low baseline mind-mindedness subgroup, results for the overall sample of caregivers showed post-intervention disruption to mind-

66

mindedness scores, evidenced by a combination of increases and decreases in both indices of mind-mindedness (effectively cancelling one another out to lead to the non-significant findings regarding the intervention effect), and non-significant post-intervention correlations among mind-mindedness scores and Huber et al.'s (2015a) four attachment-related variables. The case study illustrates one possible explanation for this disruption in one caregiver, and there are likely to be many more individual stories among this sample capable of further explaining this phenomenon. The case study also provides evidence that the intensive COS 20-week intervention may not be suitable for some caregivers. In cases in which dyadic security levels and caregiver reflective functioning are high at baseline, an intense clinical intervention is likely to be unnecessary - and may even be inappropriate.

The mixed effect of the COS intervention on mind-mindedness for the majority of caregivers in the sample is perhaps comparable to the immediate post-intervention attachment disorganisation observed in a small sample of preschoolers whose parents had completed a shorter COS intervention (Rosenblum, Muzik, Marcus, Marvin, & Whelan, 2010). In that study, the post-intervention disorganisation had resolved into secure attachment when reassessed 6-months later. In the current study using archived data, no such follow-up assessment was undertaken, leaving future research to investigate whether caregiver mind-mindedness undergoes a similar post-intervention process of recalibration and resolution.

Together, these findings add to the small but growing body of evidence regarding the effectiveness of the COS 20-week intervention in improving parent-child relationships (e.g. Hoffman et al., 2006; Huber et al., 2015a). They also make a small but not insubstantial contribution towards addressing the important question of "what works for whom" (Belsky & van IJzendoorn, 2015; Berlin et al., 2016)? Consistent with the findings by Huber et al. (2015a) that greatest improvements in attachment were seen in those with the most problematic relationships at presentation, current results suggest that the COS intervention shows promise for enhancing mind-mindedness in those caregivers who need it most.

Mind-Mindedness as a Multi-Dimensional Construct

The findings of the current study contribute to evidence about the utility and predictive power of the non-attuned category in a number of ways. As noted earlier, Meins and colleagues have reported significant findings indicating the unique contribution of the non-attuned category in predicting different categories of attachment (Meins et al., 2012; Meins et al., in press). However, to date, researchers in other labs have neither replicated these findings, nor even really engaged in the debate, often finding non-attuned comments to be so infrequent as to be unusable in analyses. As already noted, scores for non-attuned mind-related comments in the current study were conspicuously higher than for caregivers in the community sample studied by Illingworth and colleagues (2015). Nonetheless, only a relatively small percentage (25%) of caregivers in the current sample made any non-attuned mind-related comments at all at baseline, giving a highly skewed distribution. Results of the requisite simpler non-parametric analyses conducted indicated a difference in non-attuned comments by SSP episode (with highest rates in attachment-activating episodes), but no significant relationship with psychosocial risk factors or attachment-related variables. Appropriate and non-attuned comments were not significantly related in this sample, replicating the findings by Meins and colleagues (2001, 2003, 2012), which were part of the justification for Meins' assertion that mind-mindedness should be viewed as a multi-dimensional construct (Meins et al., 2012).

While not reaching statistical significance in the current study, the pattern of non-attuned comments (with the highest proportions in disorganised dyads) is consistent with the findings of Meins et al. (2012). In addition, the case study presents an example of how non-attuned mind-related comments may be indicative of an attempt to read child cues and miscues, rather than a straightforward lack of attunement. In combination, these findings emphasise the potential relevance of the non-attuned category in clinical populations and in relation to clinical interventions.

Strengths, Limitations and Directions for Future Research

This study makes a number of novel contributions to extant research on both mind-mindedness and the efficacy of the Circle of Security 20-week intervention. It is the first study to report on the use of the interactive mind-mindedness measure in an attachment-activating context, and builds on the prior work of Illingworth and colleagues (2015), and the exploration of Lundy and Fyfe (2015), in measuring interactive mind-mindedness in caregivers of older children. Further, the study is one of one of the first to a) examine and show associations between mind-mindedness and caregiving representations, and b) test the effect of an intervention on mind-mindedness, and one of a small number of studies to date to a) examine mind-mindedness in a clinical sample, and b) examine and show associations between mind-mindedness and reflective functioning. In addition, the correlational findings of this study are likely to be particularly robust, given that the coding for the four variables considered (mind-mindedness, attachment, reflective functioning and caregiving representations) was undertaken by four independent teams in four different cities, all blind to other study measures.

However, there are several limitations to this study that need to be acknowledged. Firstly, the lack of a control group is a disadvantage in any intervention study, and the fact that this study relied on archived data meant that inclusion of a control group was not possible. Secondly, the sample size was relatively small, which both constrained the analysis of data and limits the scope for generalising the findings. Subgroup sizes were very small, in most cases, which limited power to detect small effect sizes. Also, the concurrent nature of the data and the fact that there was no main effect for the intervention, meant that it was not possible to explore explanatory mechanisms for changes in attachment security.

In addition, while every effort was taken to ensure coders were blind to the pre-post status of each videotaped interaction, there were sometimes indications of pre-post status in the dialogue (e.g. caregivers asking the child whether they remembered the toys), which may have introduced an element of bias. The largely objective nature of the mind-mindedness

measure, and the non-significant findings regarding a main effect for the intervention, both make this appear less likely, however the possibility must still be acknowledged.

Another limitation was the wide age range of the children in the sample. While all were older than the upper age recommended for the interactional measure (12 months), and therefore eligible for inclusion in a study investigating use of the measure with caregivers of older children, it is possible that there are different components of mind-mindedness that are more or less relevant to children at different ages (Lundy & Fyfe, 2015; Meins et al., in press). Research involving caregivers of more focused age groups (e.g., toddlers and preschoolers separately) would enable investigation of this question.

A further limitation relates to the issue of shared method variance. Madigan and colleagues (2006) cautioned against this possibility in measuring both caregiver behaviour and child attachment in the same attachment-activating interaction. They did, however, go on to concede that this concern was not borne out in the results of their own meta-analysis. In the current study, mind-mindedness and child attachment were coded from the same interaction (the SSP). The clear guidelines in the mind-mindedness coding manual, together with the fact that initial coding is done from the transcript alone, were considered to be protections against this potential contamination. In addition, the coding of maternal verbal behaviour (expressing mind-mindedness) in the current study was undertaken by coders not trained in coding attachment in the SSP. These factors make it very unlikely that the assessment of maternal verbal behaviour was compromised in this study by its observation in the same context as the child behaviour used to assess child attachment security. However it is important to acknowledge the possibility.

The timing of the post-intervention follow-up assessment, which in most cases was undertaken within two weeks of the caregiver completing the intervention, was another limitation. Huber et al. (2015a) have already noted the impact this may have had on the findings in their study, and recommended a further follow-up assessment six months after completion to determine whether intervention effects were sustained. Both Bakermans-

Kranenburg et al. (2003) and Rosenblum et al. (2010) also motivate for longer-term follow up studies, noting the likelihood of "sleeper effects" (Bakermans-Kranenburg et al., 2003, p. 211) related to more complex post-intervention changes. Given the disruption to mind-mindedness scores for the majority of caregivers at the completion of the COS intervention in the current study, a longer-term follow-up assessment may provide a more accurate picture of potential long-term changes in mind-mindedness, once any initial recalibration has been completed.

The use of a clinical sample in this study was appropriate, since the COS 20-week program was designed as a clinical intervention. However, the use of such a sample limits the applicability of these findings to the broader community. Studies on the efficacy of the COS-P DVD-based program would be more suitable for a community sample, and would be valuable in continuing to explore the question of what works for whom.

Finally, further information about the relative value of measuring interactional mind-mindedness in free-play and attachment-activating contexts would be gained from future studies measuring the same sample of caregivers in independent free-play as well as attachment-activating interactions.

Conclusion

This study of mind-mindedness before and after completion of the 20-week COS intervention provided evidence of the validity of the interactional mind-mindedness measure for use with caregivers of preschoolers in an attachment-activating context, and for the efficacy of the COS intervention in enhancing mind-mindedness in those caregivers who were least mind-minded at baseline. Both study findings and acknowledged limitations suggest many directions for future research. Measurement of mind-mindedness in an attachment-activating context provided new opportunities to learn from the construct, and also highlighted some of its limitations. In watching the SSP interactions, there were components of caregiver language (particularly empathic language, e.g., "I know, you had a hard day today", and language scaffolding separations) not captured by mind-mindedness, but which

nonetheless seemed to contribute to conspicuous differences in the quality of the interactions. Future exploration of these components of caregiver language would be interesting, perhaps as part of exploring the question related to the different expressions or components of mind-mindedness that are relevant for different age groups.

Study design, whereby all post-intervention data was concurrent and sample size was small, meant path analyses testing explanatory models could not be conducted. However, while not fully explaining *how* the COS intervention resulted in changes in child attachment, the study findings support the place of mind-mindedness as one promising component of the complex interplay of factors that shape attachment relationships, and one that is indicative of relationship quality and amenable to intervention.

References

Ainsworth, M. D. (1963). The development of infant-mother interaction among the Ganda. In B. M. Foss (Ed.), *Determinants of infant behavior: Procedings of the second Tavistock seminar on mother-infant interaction* (Vol. 2, pp. 67-112). London, England: Methuen.

Ainsworth, M. D. S., Bell, S. M., & Stayton, D. J. (1972). Individual differences in the development of some attachment behaviors. *Merrill-Palmer Quarterly of Behavior and Development*, *18*(2), 123-143.

Ainsworth, M. D. S., Bell, S. M., & Stayton, D. J. (1974). Infant-mother attachment and social development: Socialisation as a product of reciprocal responsiveness to signals. In M. P. M. Richards (Ed.), *The integration of a child into a social world*. London, UK: Cambridge University Press.

Ainsworth, M. D. S., Bell, S. M. V., & Stayton, D. J. (1971). Individual differences in Strange-Situation behaviour of one-year-olds. In H. R. Schaffer (Ed.), *The origins of human social relations*. London: Academic Press.

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment: A psychological study of the strange situation*. Hillsdale, NJ.: Lawrence Earlbaum.

Arnott, B., & Meins, E. (2007). Links among antenatal attachment representations, postnatal mind-mindedness, and infant attachment security: A preliminary study of mothers and fathers. *Bulletin of the Menninger Clinic*, *71*(2), 132.

Arnott, B., & Meins, E. (2008). Continuity in mind-mindedness from pregnancy to the first year of life. *Infant Behavior and Development*, *31*(4), 647-654.

Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2003). Less is more: meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin, 129*(2), 195.

Barlow, J., Bennett, C., Midgley, N., Larkin, S., & Wei, Y. (2015). Parent-infant psychotherapy for improving parental and infant mental health: a systematic review. *Campbell Systematic Reviews*, *11*(6).

Barreto, A. L., Fearon, R. P., Osório, A., Meins, E., & Martins, C. (2016). Are adult mentalizing abilities associated with mind-mindedness? *International Journal of Behavioral Development*, *40*(4), 296-301.

Belsky, J., & van IJzendoorn, M. H. (2015). What works for whom? Genetic moderation of intervention efficacy. *Development and psychopathology, 27*(01), 1-6.

Benoit, D., Madigan, S., Lecce, S., Shea, B., & Goldberg, S. (2001). Atypical maternal behavior toward feeding-disordered infants before and after intervention. *Infant Mental Health Journal*, *22*(6), 611-626.

Berlin, L. J., Zeanah, C. H., & Lieberman, A. F. (2016). Prevention and intervention programs to support early attachment security: A move to the level of the community. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of Attachment* (3rd ed.). New York, NY: Guilford Press.

Bernier, A., & Dozier, M. (2003). Bridging the attachment transmission gap: The role of maternal mind-mindedness. *International Journal of Behavioral Development*, *27*(4), 355-365. doi:10.1080/01650250244000399

Bernier, A., Matte-Gagné, C., Bélanger, M. È., & Whipple, N. (2014). Taking stock of two decades of attachment transmission gap: Broadening the assessment of maternal behavior. *Child Development*, *85*(5), 1852-1865.

Bernier, A., McMahon, C., & Perrier, R. (in press). Maternal mind-mindedness and children's school readiness: A longitudinal study of developmental processes. *Developmental Psychology*.

Bigelow, A. E., Power, M., Bulmer, M., & Gerrior, K. (2015). The Relation between mothers' mirroring of infants' behavior and maternal mind-mindedness. *Infancy*, *20*(3), 263-282.

Biringen, Z. (2008). *The Emotional Availability (EA) Scales*. (4th ed.). Boulder, CO.: International Centre for Excellence in Emotional Availability.

Bowlby, J. (1958). The nature of the child's tie to his mother. *The International journal of psycho-analysis, 39*, 350.

Bowlby, J. (1969). *Attachment and loss Volume I: Attachment*. New York, N.Y.: Basic Books.

Bowlby, J. (1973). *Attachment and loss Volume II: Separation*. London: The Hogarth Press.

Bowlby, J. (1979). *The making and breaking of affectional bonds*. London, England: Tavistock Publications.

Bowlby, J. (1980). *Attachment and loss Volume III: Loss, sadness and depression*. New York, NY: Basic Books.

Bowlby, J. (1988). *A secure base : Parent-child attachment and healthy human development* New York: New York : Basic Books.

Bretherton, I. (1992). The origins of attachment theory: John Bowlby and Mary Ainsworth. *Developmental Psychology, 28*(5), 759.

Bretherton, I. (2013). Revisiting Mary Ainsworth's conceptualization and assessments of maternal sensitivity-insensitivity. *Attachment & Human Development, 15*(5-6), 460-484.

Bretherton, I., & Munholland, K. A. (2016). The internal working model construct in light of contemporary neuroimaging research. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (Third ed.). New York, NY: The Guilford Press.

Cassidy, J., Jones, J. D., & Shaver, P. R. (2013). Contributions of attachment theory and research: A framework for future research, translation, and policy. *Development and Psychopathology, 25*, 1415-1434.

Cassidy, J., Marvin, R. S., & the MacArthur Working Group on Attachment, (1992).

    Attachment organization in preschool children: Coding guidelines (4th ed.).

    University of Virginia. Charlottesville.

Cooper, G., Hoffman, K., Marvin, R., & Powell, B. (1999). *Circle of Security Interview.*

    Circle of Security Facilitator's Manual. Unpublished manuscript.

Crowell, J. A., Fraley, R. C., & Roisman, G. I. (2016). Measurement of individual differences

    in adult attachment. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment:*

    Theory, research, and clinical applications (3rd ed.). New York, NY: The Guilford

    Press.

De Wolff, M. S., & van IJzendoorn, M. H. (1997). Sensitivity and attachment: A

    meta-analysis on parental antecedents of infant attachment. *Child Development, 68*(4),

    571-591.

Demers, I., Bernier, A., Tarabulsy, G. M., & Provost, M. A. (2010a). Maternal and child

    characteristics as antecedents of maternal mind-mindedness. *Infant Mental Health*

    Journal, 31(1), 94-112.

Demers, I., Bernier, A., Tarabulsy, G. M., & Provost, M. A. (2010b). Mind-mindedness in

    adult and adolescent mothers: Relations to maternal sensitivity and infant attachment.

    International Journal of Behavioral Development, 34(6), 529-537.

Dore, R. A., & Lillard, A. S. (2014). Do children prefer mentalistic descriptions? *The Journal*

    of genetic psychology, 175(1), 1-15.

Dozier, M., Lindheim, O., & Ackerman, J. P. (2005). Attachment and biobehavioural catch-

    up. In L. J. Berlin, Y. Ziv, L. Amaya-Jackson, & M. T. Greenberg (Eds.), *Enhancing*

    early attachments: Theory, research, intervention and policy. New York, NY:

    Guilford Press.

Easterbrooks, M. A., & Biringen, Z. (2009). Introduction to the special issue: Emotional

    availability across contexts. *Parenting: Science and Practice, 9*(3-4), 179-182.

Easterbrooks, M. A., Bureau, J.-F., & Lyons-Ruth, K. (2012). Developmental correlates and

    predictors of emotional availability in mother–child interaction: A longitudinal study

    from infancy to middle childhood. *Development and psychopathology, 24*(01), 65-78.

Easterbrooks, M. A., Miranda-Julian, C., Raskin, M., & Chaudhuri, H. H. (2013). *The*

    psychosocial context of mind-mindedness among adolescent mothers at high social

    risk. Paper presented at the Society for Research in Child Development, Seattle, USA.

Farrow, C., & Blissett, J. (2014). Maternal mind-mindedness during infancy, general

    parenting sensitivity and observed child feeding behavior: a longitudinal study.

    Attachment & Human Development, 16(3), 230-241.

Fearon, R., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Lapsley, A. M., &

    Roisman, G. I. (2010). The significance of insecure attachment and disorganization in

    the development of children's externalizing behavior: a meta-analytic study. *Child*

    Development, 81(2), 435-456.

Fonagy, P., Steele, M., Steele, H., Moran, G. S., & Higgitt, A. C. (1991). The capacity for

    understanding mental states: The reflective self in parent and child and its significance

    for security of attachment. *Infant Mental Health Journal, 12*(3), 201-218.

Fonagy, P., Target, M., Steele, H., & Steele, M. (1998). *Reflective-functioning manual,*

    version 5.0, for application to Adult attachment interviews. London: University

    College London.

Fraiberg, S., Shapiro, V., & Cherniss, D. S. (1980). Treatment modalities. In S. Fraiberg

    (Ed.), *Clinical studies in infant mental health: The first year of life*. London, UK:

    Tavistock Publications.

Fraley, R. C., & Spieker, S. J. (2003). Are infant attachment patterns continuously or

    categorically distributed? A taxometric analysis of strange situation behavior.

    Developmental Psychology, 39(3), 387.

Gardner, W., Lamb, M. E., Thompson, R. A., & Sagi, A. (1986). On individual differences in

    strange situation behavior: Categorical and continuous measurement systems in a

    cross-cultural data set. *Infant Behavior and Development*, *9*(3), 355-375.

George, C., Kaplan, N., & Main, M. (1984-1996). *Adult Attachment Interview protocol*.

    Unpublished manuscript. University of California. Berkley.

George, C., & Solomon, J. (1989). Internal working models of caregiving and security of

    attachment at age six. *Infant Mental Health Journal*, *10*(3), 222-237.

Goldsmith, H., & Alansky, J. A. (1987). Maternal and infant temperamental predictors of

    attachment: A meta-analytic review. *Journal of consulting and clinical psychology*,

    55(6), 805.

Graham, C. A., & Easterbrooks, M. A. (2000). School-aged children's vulnerability to

    depressive symptomatology: The role of attachment security, maternal depressive

    symptomatology, and economic risk. *Development and psychopathology*, *12*(02), 201-

    213.

Grienenberger, J. F., Kelly, K., & Slade, A. (2005). Maternal reflective functioning, mother–

    infant affective communication, and infant attachment: Exploring the link between

    mental states and observed caregiving behavior in the intergenerational transmission

    of attachment. *Attachment & Human Development*, *7*(3), 299-311.

    doi:10.1080/14616730500245963

Groh, A. M., Roisman, G. I., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., &

    Fearon, R. (2012). The significance of insecure and disorganized attachment for

    children's internalizing symptoms: A meta-analytic study. *Child Development*, *83*(2),

    591-610.

Hawkins, E., Madigan, S., Moran, G., & Pederson, D. R. (2015). Mediating and moderating

    processes underlying the association between maternal cognition and infant

    attachment. *Journal of Applied Developmental Psychology*, *39*, 24-33.

Hill, S., & McMahon, C. (2015). Maternal Mind-Mindedness: Stability Across Relationships

and Associations with Attachment Style and Psychological Mindedness. *Infant and

Child Development*.

Hoffman, K. T., Marvin, R. S., Cooper, G., & Powell, B. (2006). Changing toddlers' and

preschoolers' attachment classifications: the Circle of Security intervention. *Journal of

consulting and clinical psychology, 74*(6), 1017.

Holmes, J. (1993). *John Bowlby and attachment theory*. London: Routledge.

Huber, A., McMahon, C., & Sweller, N. (2016). Improved parental emotional functioning

after Circle of Security 20-week parent–child relationship intervention. *Journal of

Child and Family Studies*, 1-15. doi:10.1007/s10826-016-0426-5

Huber, A., McMahon, C. A., & Sweller, N. (2015a). Efficacy of the 20-week circle of

security intervention: Changes in caregiver reflective functioning, representations, and

child attachment in an Australian clinical sample. *Infant Mental Health Journal*,

36(6), 556-574. doi:10.1002/imhj.21540

Huber, A., McMahon, C. A., & Sweller, N. (2015b). Improved child behavioural and

emotional functioning after Circle of Security 20-week intervention. *Attachment &

Human Development*. doi:10.1080/14616734.2015.1086395

Hughes, C., Jaffee, S. R., Happé, F., Taylor. A., Caspi, A., & Moffitt, T. E. (2005). Origins of

individual differences in theory of mind: from nature to nurture? *Child Development*,

76(2), 356-370.

IBM. (2015). Statistical package for the social sciences (Version 23.0).

Illingworth, G. (2014). *Maternal mind-mindedness: A cognitive-behavioural trait or a

relational construct?* , Oxford Brookes, Oxford.

Illingworth, G., MacLean, M., & Wiggs, L. (2015). Maternal mind-mindedness: Stability over

time and consistency across relationships. *European Journal of Developmental

Psychology*. doi:10.1080/17405629.2015.1115342

Juffer, F., Bakermans-Kranenburg, M. J., & van Ijzendoorn, M. H. (2008). *Promoting positive parenting: An attachment-based intervention*. Mahwah, NJ: Erlbaum.

Kirk, E., Pine, K., Wheatley, L., Howlett, N., Schultz, J., & Fletcher, B. C. (2015). A longitudinal investigation of the relationship between maternal mind-mindedness and theory of mind. *British Journal of Developmental Psychology, 33*, 434-445.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *biometrics*, 159-174.

Laranjo, J., Bernier, A., & Meins, E. (2008). Associations between maternal mind-mindedness and infant attachment security: Investigating the mediating role of maternal sensitivity. *Infant Behavior and Development, 31*(4), 688-695.

Laranjo, J., Bernier, A., Meins, E., & Carlson, S. M. (2010). Early Manifestations of Children's Theory of Mind: The Roles of Maternal Mind-Mindedness and Infant Security of Attachment. *Infancy, 15*(3), 300-323.

Leerkes, E. M. (2011). Maternal sensitivity during distressing tasks: A unique predictor of attachment security. *Infant Behavior and Development, 34*(3), 443-446.

Letourneau, N., Tryphonopoulos, P., Giesbrecht, G., Dennis, C. L., Bhogal, S., & Watson, B. (2015). Narrative and meta-analytic review of interventions aiming to improve maternal–child attachment security. *Infant Mental Health Journal, 36*(4), 366-387.

Licata, M., Paulus, M., Thoermer, C., Kristen, S., Woodward, A. L., & Sodian, B. (2014). Mother–infant Interaction Quality and Infants' Ability to Encode Actions as Goal-directed. *Social Development, 23*(2), 340-356.

Lieberman, A. F., Weston, D. R., & Pawl, J. H. (1991). Preventive intervention and outcome with anxiously attached dyads. *Child Development, 62*(1), 199-209.

Lok, S. M., & McMahon, C. A. (2006). Mothers' thoughts about their children: Links between mind-mindedness and emotional availability. *British Journal of Developmental Psychology, 24*(3), 477-488.

Lundy, B. L. (2003). Father- and mother-infant face-to-face interactions: Differences in mind-related comments and infant attachment? *Infant Behaviour and Development, 26*(2), 200-212.

Lundy, B. L. (2013). Paternal and maternal mind-mindedness and preschoolers' theory of mind: The mediating role of interactional attunement. *Social Development, 22*(1), 58-74. doi:10.1111/sode.12009

Lundy, B. L., & Fyfe, G. (2015). Preschoolers' mind-related comments during collaborative problem solving: Parental contributions and developmental outcomes. *Social Development*. doi:10.1111/sode.12176

Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999). Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the society for research in child development*, 67-96.

Lyons-Ruth, K., & Jacobvitz, D. (2016). Attachment disorganization from infancy to adulthood. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (3rd ed.). New York, NY.: The Guilford Press.

Madigan, S., Bakermans-Kranenburg, M. J., Van Ijzendoorn, M. H., Moran, G., Pederson, D. R., & Benoit, D. (2006). Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment & Human Development, 8*(2), 89-111. doi:10.1080/14616730600774458

Madigan, S., Brumariu, L. E., Villani, V., Atkinson, L., & Lyons-Ruth, K. (2016). Representational and questionnaire measures of attachment: A meta-analysis of relations to child internalizing and externalizing problems. *Psychological Bulletin, 142*(4), 367-399.

Madigan, S., Hawkins, E., Goldberg, S., & Benoit, D. (2006). Reduction of disrupted

    caregiver behavior using modified interaction guidance. *Infant Mental Health Journal*,

    27(5), 509-527.

Madigan, S., Hawkins, E., Plamondon, A., Moran, G., & Benoit, D. (2015). Maternal

    representations and infant attachment: An examination of the prototype hypothesis.

    Infant Mental Health Journal, *36*(5), 459-468.

Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A

    move to the level of representation. *Monographs of the society for research in child

    development*, 66-104.

Main, M., & Solomon, J. (1986). Discovery of an insecure-disorganized/disoriented

    attachment pattern. In T. B. Brazelton & M. W. Yogman (Eds.), *Affective development

    in infancy*. Norwood, N.J.: Ablex.

Mallinckrodt, B. (2010). The psychotherapy relationship as attachment: Evidence and

    implications. *Journal of Social and Personal Relationships*, *27*(2), 262-270.

McDonough, S. (2004). Interaction guidance. In A. J. Sameroff, S. McDonough, & K. L.

    Rosenblum (Eds.), *Treating parent-infant relationship problems: Strategies for

    intervention* (pp. 79-86). New York, NY: The Guilford Press.

McElwain, N. L., & Booth-LaForce, C. (2006). Maternal sensitivity to infant distress and

    nondistress as predictors of infant-mother attachment security. *Journal of Family

    Psychology*, *20*(2), 247.

McMahon, C., Camberis, A. L., Berry, S., & Gibson, F. (2016). Maternal mind-mindedness:

    Relations with maternal–fetal attachment and stability in the first two years of life:

    Findings from an Australian prospective study. *Infant Mental Health Journal*, *37*(1),

    17-28.

McMahon, C. A., & Meins, E. (2012). Mind-mindedness, parenting stress, and emotional availability in mothers of preschoolers. *Early Childhood Research Quarterly, 27*(2), 245-252. doi:10.1016/j.ecresq.2011.08.002

Meins, E. (1997). *Security of attachment and the social development of cognition / Elizabeth Meins*. East Sussex, UK: East Sussex, UK : Psychology Press.

Meins, E. (1999). Sensitivity, security and internal working models: Bridging the transmission gap. *Attachment & Human Development, 1*(3), 325-342. doi:10.1080/14616739900134181

Meins, E. (2013). Sensitive attunement to infants' internal states: Operationalizing the construct of mind-mindedness. *Attachment & Human Development, 15*(5-6), 524-544. doi:10.1080/14616734.2013.830388

Meins, E., Bureau, J.-F., & Fernyhough, C. (In press). Mother-child attachment from infancy to the preschool years: Predicting security and stability. *Child Development*.

Meins, E., & Fernyhough, C. (2010). *Mind-mindedness coding manual, Version 2.0*. Unpublished manuscript. Durham University, Durham, UK.

Meins, E., & Fernyhough, C. (2015). *Mind-mindedness coding manual, Version 2.2*. University of York, York, UK.

Meins, E., Fernyhough, C., Arnott, B., Turner, M., & Leekam, S. R. (2011). Mother-Versus Infant-Centered Correlates of Maternal Mind-Mindedness in the First Year of Life. *Infancy, 16*(2), 137-165.

Meins, E., Fernyhough, C., de Rosnay, M., Arnott, B., Leekam, S. R., & Turner, M. (2012). Mind-mindedness as a multidimensional construct: Appropriate and nonattuned mind-related comments independently predict infant–mother attachment in a socially diverse sample. *Infancy, 17*(4), 393-415.

Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001). Rethinking maternal

sensitivity: Mothers' comments on infants' mental processes predict security of

attachment at 12 months. *Journal of Child Psychology and Psychiatry, 42*(5), 637-

648.

Meins, E., Fernyhough, C., & Harris-Waller, J. (2014). Is mind-mindedness trait-like or a

quality of close relationships? Evidence from descriptions of significant others,

famous people, and works of art. *Cognition, 130*(3), 417-427.

Meins, E., Fernyhough, C., Russell, J., & Clark-Carter, D. (1998). Security of attachment as a

predictor of symbolic and mentalising abilities: A longitudinal study. *Social

Development, 7*(1), 1-24.

Meins, E., Fernyhough, C., Wainwright, R., Clark-Carter, D., Das Gupta, M., Fradley, E., &

Tuckey, M. (2003). Pathways to understanding mind: Construct validity and

predictive validity of maternal mind-mindedness. *Child Development, 74*(4), 1194-

1211.

Meins, E., Fernyhough, C., Wainwright, R., Das Gupta, M., Fradley, E., & Tuckey, M.

(2002). Maternal mind-mindedness and attachment security as predictors of theory of

mind understanding. *Child Development, 73*, 1715-1726. doi:10.1111/1467-

8624.00501

Mesman, J., & Emmen, R. A. (2013). Mary Ainsworth's legacy: A systematic review of

observational instruments measuring parental sensitivity. *Attachment & Human

Development, 15*(5-6), 485-506.

Mikulincer, M., & Shaver, P. R. (2016). *Attachment in adulthood: Structure, dynamics and

change* (2nd ed.). New York, NY: The Guilford Press.

Milligan, K., Khoury, J. E., Benoit, D., & Atkinson, L. (2015). Maternal attachment and

mind-mindedness: the role of emotional specificity. *Attachment & Human

Development, 17*(3), 302-318.

Moss, E., Cyr, C., Bureau, J.-F., Tarabulsy, G. M., & Dubois-Comtois, K. (2005). Stability of

    attachment during the preschool period. *Developmental Psychology, 41*(5), 773.

Moss, E., Dubois-Comtois, K., Cyr, C., Tarabulsy, G. M., St-Laurent, D., & Bernier, A.

    (2011). Efficacy of a home-visiting intervention aimed at improving maternal

    sensitivity, child attachment, and behavioral outcomes for maltreated children: A

    randomized control trial. *Development and psychopathology, 23*(01), 195-210.

Moss, E., Lecompte, V., & Bureau, J. F. (2015). *Preschool and early school-age rating scales*

    (PARS). Unpublished manuscript.

Pawlby, S., Fernyhough, C., Meins, E., Pariante, C., Seneviratne, G., & Bentall, R. (2010).

    Mind-mindedness and maternal responsiveness in infant–mother interactions in

    mothers with severe mental illness. *Psychological Medicine, 40*(11), 1861-1869.

Pederson, D. R., Bailey, H. N., Tarabulsy, G. M., Bento, S., & Moran, G. (2014).

    Understanding sensitivity: lessons learned from the legacy of Mary Ainsworth.

    Attachment & Human Development, 16(3), 261-270.

Pederson, D. R., Moran, G., Sitko, C., Campbell, K., Ghesquire, K., & Acton, H. (1990).

    Maternal sensitivity and the security of infant‐mother attachment: A Q‐sort study. *Child*

    Development, 61(6), 1974-1983.

Powell, B., Cooper, G., Hoffman, K., & Marvin, B. (2014). *The circle of security*

    intervention: Enhancing attachment in early parent-child relationships. New York,

    NY: The Guilford Press.

Rosenblum, K. L., McDonough, S. C., Sameroff, A. J., & Muzik, M. (2008). Reflection in

    thought and action: Maternal parenting reflectivity predicts mind-minded comments

    and interactive behavior. *Infant Mental Health Journal, 29*(4), 362-376.

Rosenblum, K. L., Muzik, M., Marcus, S., Marvin, R., & Whelan, W. (2010). *An attachment-*

    based group intervention for depressed and trauma survivor mothers of preschool-

aged children. Paper presented at the 12th World Congress, World Association for Infant Mental Health, Leipzig, Germany.

Sadler, L. S., Slade, A., Close, N., Webb, D. L., Simpson, T., Fennie, K., & Mayes, L. C. (2013). Minding the baby: Enhancing reflectiveness to improve early health and relationship outcomes in an interdisciplinary home-visiting program. *Infant Mental Health Journal, 34*(5), 391-405.

Sadler, L. S., Slade, A., & Mayes, L. C. (2006). Minding the baby: A mentalization-based parenting program. In J. G. Allen & P. Fonagy (Eds.), *Handbook of mentalization-based treatment* (pp. 271-288). Chichester, England: John Wiley & Sons.

Schacht, R., Hammond, L., Marks, M., Wood, B., & Conroy, S. (2013). The relation between mind-mindedness in mothers with borderline personality disorder and mental state understanding in their children. *Infant and Child Development, 22*(1), 68-84.

Schacht, R., Meins, E., Fernyhough, C., Centifanti, L. C. M., Bureau, J.-F., & Pawlby, S. (In press). Proof of concept of a mind-mindedness intervention for mothers hospitalized for severe mental illness. *Development and psychopathology.*

Shai, D., & Belsky, J. (2011). When words just won't do: Introducing parental embodied mentalizing. *Child Development Perspectives, 5*(3), 173-180.

Sharp, C., & Fonagy, P. (2008). The parent's capacity to treat the child as a psychological agent: Constructs, measures and implications for developmental psychopathology. *Social Development, 17*(3), 737-754.

Slade, A. (2005). Parental reflective functioning: An introduction. *Attachment & Human Development, 7*(3), 269-281.

Slade, A. (2007). Reflective parenting programs: Theory and development. *Psychoanalytic Inquiry, 26*(4), 640-657.

Slade, A., Aber, J., Bresgi, I., Berger, B., & Kaplan, M. (2004). The parent development interview-Revised. *Unpublished protocol. The City University of New York.*

Slade, A., Bernbach, E., Grienenberger, J., Levy, D., & Locker, A. (2004). Addendum to

Fonagy, Target, Steele & Steele reflective functioning scoring manual for use with the

Parent Development Interview. *Unpublished manuscript*.

Solomon, J., & George, C. (2016). The measurement of attachment security and related

constructs in infancy and early childhood. In J. Cassidy & P. R. Shaver (Eds.),

Handbook of attachment: Theory, research and clinical applications (3rd ed.). New

York, NY: The Guilford Press.

Sroufe, L. A. (2005). Attachment and development: A prospective, longitudinal study from

birth to adulthood. *Attachment & Human Development*, *7*(4), 349-367.

doi:10.1080/14616730500365928

Tarabulsy, G. M., Avgoustis, E., Phillips, J., Pederson, D. R., & Moran, G. (1997).

Similarities and differences in mothers' and observers' descriptions of attachment

behaviours. *International Journal of Behavioral Development*, *21*(3), 599-620.

Tharner, A., Altman, F. H., & Væver, M. (2016). Fathers' perceptions of caregiving in

childhood and current mentalizing with their preschool children. *Nordic Psychology*,

1-18.

Thompson, R. A. (1997). Sensitivity and security: New questions to ponder. *Child

Development*, *68*(4), 595-597.

Van Horn, P., & Lieberman, A. F. (2009). Using dyadic therapies to treat traumatized young

children. In D. Brom, R. Pat-Horenczyk, & J. Fornd (Eds.), *Treating traumatized

children: Risk, resilience and recovery* (pp. 210-219). London, England: Routledge.

van IJzendoorn, M. H. (1995). Adult attachment representations, parental responsiveness, and

infant attachment: A meta-analysis on the predictive validity of the Adult Attachment

Interview. *Psychological Bulletin*, *117*(3), 387-403.

van IJzendoorn, M. H., Juffer, F., & Duyvesteyn, M. G. (1995). Breaking the

intergenerational cycle of insecure attachment: a review of the effects of

attachment-based interventions on maternal sensitivity and infant security. *Journal of*

Child Psychology and Psychiatry, 36(2), 225-248.

van IJzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999). Disorganized

attachment in early childhood: Meta-analysis of precursors, concomitants, and

sequelae. *Development and psychopathology, 11*(02), 225-250.

van IJzendoorn, M. H., Vereijken, C. M. J. L., Bakermans-Kranenburg, M. J., &

Riksen-Walraven, J. M. (2004). Assessing attachment security with the attachment Q

sort: Meta-analytic evidence for the validity of the observer AQS. *Child Development,*

75(4), 1188-1213.

Verhage, M. L., Schuengel, C., Madigan, S., Fearon, R., Oosterman, M., Cassibba, R.,

Bakermans-Kranenburg, M., & van IJzendoorn, M. H. (2016). Narrowing the

transmission gap: A synthesis of three decades of research on intergenerational

transmission of attachment. *Psychological Bulletin, 142*(4), 337-366.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*

(M. Cole, V. John-Steiner, S. Scribner, & E. Souberman Eds.). Cambridge, MA:

Harvard University Press.

Walker, T. M., Wheatcroft, R., & Camic, P. M. (2011). Mind-mindedness in parents of pre-

schoolers: A comparison between clinical and community samples. *Clinical child*

psychology and psychiatry, 1-18. doi:10.1177/1359104511409142

Waters, E., & Deane, K. E. (1985). Defining and assessing individual differences in

attachment relationships: Q-methodology and the organization of behavior in infancy

and early childhood. *Monographs of the society for research in child development*, 41-

65.

Yaholkoski, A., Hurl, K., & Theule, J. (2016). Efficacy of the Circle of Security Intervention:

    A Meta-Analysis. *Journal of Infant, Child, and Adolescent Psychotherapy, 15*(2), 95-

    103.

Zeanah, C. H., Benoit, D., & Barton, M. (1995). Working model of the child interview.

    Unpublished manuscript, Brown University, RI.

Appendices

Appendix A Ethics Approval

MACQUARIE UNIVERSITY

Research Office
CSC Research HUB East, Level 3, Room 324
MACQUARIE UNIVERSITY NSW 2109 AUSTRALIA
Phone +61 (0) 2 9850 8612
Fax   +61 (0) 2 9850 4465
Email ro@mq.edu.au

26 February 2013

Ms Anna (Angelika Therese) Huber
35 Scrivener St
O'Connor ACT 2602

Reference: 5201300043

Dear A/Prof McMahon,

FINAL APPROVAL

Title of project: Effectiveness of the circle of Security 20 week psychotherapeutic intervention with an Australian community based clinical population, Study A: A consecutive cohort study or archival data

Thank you for your recent correspondence. Your response has addressed the issues raised by the Faculty of Human Sciences Human Research Ethics Sub-Committee. Approval of the above application is granted, **effective 21st February 2013** and you may now commence your research.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

Chief Investigator: A/Prof Cathy McMahon
Co-Investigator: Dr Naomi Sweller, Ms Angelika Therese Huber

Please note the following standard requirements of approval:

1.   The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).

2.   Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 21st February 2014
Progress Report 2 Due: 21st February 2015
Progress Report 3 Due: 21st February 2016
Progress Report 4 Due: 21st February 2017
Final Report Due: 21st February 2018

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3.   If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

www.mq.edu.au

ABN 90 952 801 237 | CRICOS Provider No 00002J

90

4.   All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5.   Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6.   At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

http://www.mq.edu.au/policy/
http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide Macquarie University's Research Grants Officer with a copy of this letter as soon as possible. The Research Grants Officer will not inform external funding agencies that you have final approval for your project and funds will not be released until the Research Grants Officer has received a copy of this final approval letter.

Yours sincerely,

Dr Peter Roger
Chair
Faculty of Human Sciences Ethics Review Sub-Committee
Human Research Ethics Committee

www.mq.edu.au

Fhs Ethics

Sep 7(4 days ago)

91

Dear A/Prof McMahon,

RE: 'Effectiveness of the circle of Security 20 week psychotherapeutic intervention with an Australian community based clinical population, Study A: A consecutive cohort study or archival data ' (Ref: 5201300043)

Thank you for your recent correspondence regarding the amendment request.

The amendment has been reviewed and we are pleased to advise you that this amendment has been approved.

This approval applies to the following amendment:

New personnel - Miss Jessica Gengaroli, Ms Olivia Brown, Ms Emma Smith, Ms Emma Zicat and Ms Katelyn Tasker added to the project, as explained in Section 9.

Please accept this email as formal notification that the amendments have been approved. Please do not hesitate to contact us in case of any further queries.

All the best with your research.

Kind regards,

FHS Ethics
****
Faculty of Human Sciences - Ethics
Research Office
Level 3, Research HUB, Building C5C
Macquarie University
NSW 2109

Ph: +61 2 9850 4197
Fax: +61 2 9850 4465

Email: fhs.ethics@mq.edu.au

http://www.research.mq.edu.au/

RE: HS Ethics Amendment 2 - Approved (Ref No. 5201300043)

Fhs Ethics <fhs.ethics@mq.edu.au>   Mon, Feb 29, 2016 at 11:00 AM
To: Associate Professor Cathy McMahon <cathy.mcmahon@mq.edu.au>
Cc: Dr Naomi Sweller <naomi.sweller@mq.edu.au>, Ms Angelika Therese Huber
<angelika.huber@students.mq.edu.au>, Ms Olivia Brown <olivia.brown1@mq.edu.au>, Ms Emma Smith
<emma.smith2@students.mq.edu.au>, Ms Emma Zicat <emma.zicat@students.mq.edu.au>, Ms Katelyn Tasker
<katelyn.tasker@mq.edu.au>, Ms Anne-Marie Maxwell <anne-marie.maxwell@students.mq.edu.au>

Dear A/Prof McMahon,

RE: 'Effectiveness of the circle of Security 20 week psychotherapeutic
intervention with an Australian community based clinical population, Study
A: A consecutive cohort study or archival data ' (Ref: 5201300043)

Thank you for your recent correspondence regarding the amendment request.
The amendments have been reviewed and we are pleased to advise you that the
amendments have been approved.

This approval applies to the following amendments:

Change in personnel -
1) Ms Jessica Gengaroli - removed from the project team;
2) Ms Anne-Marie Maxwell - added to the project (coding archived data).

Please accept this email as formal notification that the amendments have
been approved. Please do not hesitate to contact us in case of any further
queries.

All the best with your research.

Kind regards,

FHS Ethics
****
Faculty of Human Sciences - Ethics
Research Office
Level 3, Research HUB, Building C5C
Macquarie University
NSW 2109

Ph: +61 2 9850 4197
Fax: +61 2 9850 4465

Email: fhs.ethics@mq.edu.au

http://www.research.mq.edu.au/

Appendix B Variation to Interactional Mind-Mindedness Coding for Older Children

Variations to Initial Mind-Mindedness Coding. Illingworth's extension (Illingworth, 2014; Illingworth et al., 2015) to the mind-mindedness coding system (Meins & Fernyhough, 2010, 2015) includes a number of additions to the original, designed to take account of the expressive and receptive language capacities of older children. Examples of changes from the original are: (a) differential coding of the word "want", depending on whether it is part of an instruction or part of a general phrase (both not mind-related) or whether it refers to wishes and desires or is part of an instruction that offers a genuine choice (both mind-related); (b) exclusion of comments that use "we" to refer to both caregiver and child, even if they contain a mental state term; (c) exclusion of comments that would otherwise be coded as mind-related, but which were spoken by the caregiver during a role play game to a toy the child was playing with or a character the child was pretending to be.

Following further consultation with Meins (personal communication, June 10, 2016), one departure was made from Illingworth's manual. In Illingworth's adaptation, caregivers' repetition of the child's speech containing a mental state term (e.g. Child: "I want to go out." Mother: "You want to go out.") was not coded as mind-minded, as it was not an example of the caregiver spontaneously considering the child's internal state. As these repetitions, while not spontaneous, did seem to represent a caregiver's acknowledgement of the child's emotional state or mental processes, and were likely to be experienced by the child as indications of the caregiver's recognition (and possibly affirmation) of their internal state, they were included as mind-related comments in the current study.

Variations to Dichotomous Appropriate/Non-Attuned Mind-Mindedness Coding.
Illingworth's extension to the original coding system (Illingworth, 2014) was also used for the dichotomous coding. Mind-related comments asking whether the child wanted to become involved in a new activity, when the child was already engaged with something, were coded as non-attuned if the question appeared to come from the caregiver's own agenda for play (as

with the infant coding system). However with older children, if the child's level of involvement with their current activity was low, or if the caregiver seemed to be making the suggestion from prior knowledge of the child, e.g. that the child was likely to be disappointed if he or she missed out on playing with the toy the caregiver was recommending, this was coded as appropriate. In addition mind-related comments were coded as appropriate even if the child responded with "no" to the caregiver's question or suggestion, if the comment appeared appropriate to the observer.

Again, we made a departure from Illingworth's manual for the second stage of mind-mindedness coding. In Illingworth's manual, mind-related comments used to call the child back to a joint activity the child had not completed were coded as appropriate, even when the child was already engaged with another activity. (This contrasts with the infant coding system, in which this would be considered an expression of the caregiver's agenda for play, and therefore non-attuned.) In the current study, such occurrences were coded as non-attuned as per the infant system, since it was not clear how they differed from other comments expressing the caregiver's agenda. Finally, while caregiver-centred redirections of children's play were normally coded as non-attuned, this kind of "would you like" question was coded as appropriate in cases in which the child's behaviour was dysregulated (e.g. running around the room; climbing on the shelving). This was considered akin to the caregiver suggesting how to proceed after a lull in the interaction.

Appendix C Circle of Security Interview: Coding for Parental Representations

Hostility in descriptions of child

Scales 1–5	Presence of words or phrases that indicate hostility / lack of respect / criticism of child	Examples
1 no evidence of construct	**No hostility** **No hostile, critical or deprecating references to child** Talks about child and child behaviour in respectful terms	
2	Assign a 2 if more than a 1 but not quite strong enough for a 3	
3 Moderate level of construct OR some questions about appropriateness of parent statement re this construct	**Moderate/subtle hostility** **a few ridiculing or mildly critical references or disrespectful statements about child—** e.g., Occasionally makes fun of child, one reference to child as silly, naughty (in non-affectionate way), Occasional joking about child, balanced by non-critical references	1. *I said "G, you just sound like a whingeing little brat"* 2. *Yeah that's one of her things, she'll fold her arms and go off and have a "Little Miss" attack and she likes doing that little sort of madam, sort of stuff*
4		
5 High level of construct	**Several hostile, critical or denigrating statements** or descriptors of child e.g., Mocking, demeaning child; describes child with contempt or compares child with despised or hated person	1. *"He really can be quite obnoxious"* 2. *Sometimes I wish I never had this child, she can be such an embarrassment*

Joy/pleasure in descriptions of relationship with child

Scales 1–5	Presence of words/phrases that indicate joy, enthusiasm, interest/curiosity, pride, warmth, love, delight, etc. towards child or about being with the child. To receive a high rating these comments should seem authentic, genuinely warm and balanced (may be accompanied by a believable example)—scripted statements e.g., "he's just gorgeous", "she's fabulous" get a lower rating	Examples
1 No evidence of construct	**No joy/pleasure** **No statements** which show joy or pleasure in the relationship	
2	Assign a 2 if more than a 1 but not quite strong enough for a 3	
3 Moderate level of construct OR some questions about appropriateness of parent statements re this construct	**Moderate joy/pleasure**: **A few statements** which show **some** joy/pleasure in relationship with child **and/or** global positive statements (may feel scripted; e.g., "gorgeous") which are unsupported by believable examples **and/or** statements which show some joy/pleasure but with **some** reservations/conditions **and /or** which show joy but may be not always appropriate	1. **General positive statements e.g.,** *"I love being part of him living his life and living it in a happy way and I'm proud of him that way"* *Or* 2. **Some joy/pleasure with reservations:** 3. *"Um, just being there. You know, **sometimes**, you know, as frustrating as it is, you know, again, you have the moments, you know, the—you know, I'm getting used to, you know, the—the closeness ..... that sort of stuff* 4. *To see him happy, because he's always been a sad child* *Or* 5. Joy but may be not always appropriate (e.g., parent need for closeness): *Um, well, I get to—I get to tuck him in at night. I get to give—you know, I get the first cuddle in the morning*
4		

97

5 High level of construct	**Authentic joy/pleasure in relationship with child** **Several clear believable statements of joy, delight, pride in child and relationship with child**	1. *Watching all the things that he can do, you know, ... I love watching him becoming independent, you know.... I love it when he comes into my bed in the morning. Um, I love sitting with him and reading him a story, um, building Lego with him [happy]. Yeah.* 2. *I suppose she's coming to an age now where she asks fantastic questions and you know, so to be able to answer those and, you know, ... , I am helping her learn and grow.* 3. *I think it's the interactions we have. At—at the moment, she's, um, trying to develop her sense of humour, and telling jokes, and trying to do funny things, so almost every day she says, "I'm doing this to make you laugh," and— and that just, um, makes me feel happy [pleased]. Yeah, I enjoy that.*

Caregiving representations:
Hands: How parent sees themselves in their caregiving role as parent to this child
"Always be bigger, stronger, wiser, and kind; Whenever possible follow the child's needs; Whenever necessary take charge".

"Bigger, stronger" in description of self in relationship with the child

Scales 1–5	**Statements that clearly suggest parent feels in charge, able to take control and manage the child** This includes statements about having more control than the child in the relationship, taking charge when necessary and being able to manage the child's behaviour, having more capacity than the child, clearly taking the adult role	**Examples**
1 No evidence of construct	**No statements** which show parent sees self as bigger and stronger than child	
2	Assign a 2 if more than a 1 but not quite strong enough for a 3	
3 Moderate level of evidence of construct OR some questions about appropriateness of parent statement re this construct	**A few statements** which **suggest parent feels in charge, able to take control and manage the child** **and/or** with **some** reservations/conditions **and/or** in charge but may be not always appropriate, e.g., may be authoritarian "in charge" rather than "authoritative"	1. *I, sort of, think, you know, I'm the adult [laugh]. I should have that in control-ness. Um, and sometimes I—actually it feels good to be angry, it's like my way of venting about the situation, you know.* 2. *Mo. of 3-yr-old: Well, in the end she just—she came good, like I just kept repeating over and over, "I understand that you're cranky, but it's not okay to do this ... So I don't know exactly what happened, but I just kept repeating the things I'd learnt and, um, [pause] and it was also my way of not losing control.* 3. *I'm the parent and this is what's happening today so too bad (laugh).*
4	Assign a 4 if more than a 3 but not quite strong enough for a 5	

5 High level of evidence of construct	**Several statements** that clearly suggest parent feels in charge, able to take control and manage the child whenever needed	1. *Fa. of 3-yr-old: Um, so even when he's frightened, he'll be reassured, like calmed—in the pool, he hates swimming on his back—floating on his back, um, and I just said to him once that, um—I said, "I'm your dad. I'm not going to let you sink."* 2. *It takes a lot of effort to deal with that, but I still feel in control and that I'm her mother and I can help her through it.* 3. *I ended up just biting the bullet and taking charge and, um, I was quite firm with her that she wasn't getting out of the trolley.*

"Kind" in descriptions of self in relationship with the child

Scales 1–5	Parent reports behaving in a kind way towards child or showing concern for the child Parent reports offering help, support, comfort, assistance, time, understanding in pleasant way	Examples
1 No evidence of construct	**No statements** which show kindness or concern for child	
2	Assign a 2 if more than a 1 but not quite strong enough for a 3	
3 Moderate level of construct OR some questions about appropriateness of parent statement re this construct	**A few statements** which show **some kindness or concern for child and/or** with **some** reservations/conditions **and/or** which show kindness/concern but may be not always appropriate	1. *I've found a hug, just getting him in for a hug and some close contact brings him down a lot faster, to be able to reason with him* 2. *L approached us in a quiet voice asking for some help to get dressed, so then I went into her room and helped her getting dressed.* (Mo. acts kindly after being punitive) 3. *I can't meet her needs because I've got to go to work, so—so it's a matter of trying to give her a bit of the time and attention but then set a boundary*
4	Assign a 4 if more than a 3 but not quite strong enough for a 5	
5 High level of construct	**A number of statements showing unconditional kindness/concern towards child**	1. *I could see that it was really causing such a lot of grief and I wanted to be there to comfort and soothe her* 2. *Last night he had a nightmare and he come out to the lounge room, and I just cuddled him, and reassured him, and he fell straight back asleep on me*

"Mean" in descriptions of self in relationship with the child:
parent describes relating to the child using power over the child in a punitive, cruel, harsh or intimidating way
(Mean = bigger and stronger without kind)

Scales 1–5	**Parent reports behaving in ways which hurt, threaten, or intimidate child** **Parent reports disciplining child using harsh or punitive methods** (e.g., ignoring, smacking, yelling, threatening punishments, removing child's possessions as punishment (as opposed to for safety or caring purpose), depriving of food, comfort, human contact, clean clothes/nappies, activities child enjoys (which are appropriate for child to engage in), isolating or denigrating child) **Parent reports setting limits for child which are not reasonable and appropriate to developmental stage of child** e.g., makes child wait for periods of time which are developmentally inappropriate to enforce parent's power (e.g., he has to stay on the naughty chair until I am ready) **Parent reports harsh behaviour management approaches are delivered with anger**	Examples
1 No evidence of construct	**Not mean** **No statements** which show meanness **and/or several statements which show parent relates to child without being mean:** e.g., not punitive towards child; does not use power over child in negative way; does not physically, verbally or psychologically abuse child	
2	Assign a 2 if more than a 1 but not quite strong enough for a 3	
3 Moderate level of construct OR some questions about appropriateness of parent statement re this construct	**Sometimes mean** **A few statements** which show **some instances of relating to child with meanness** **and/or** parent reports not being mean when describing an action which is mean (see above). These mid-range score statements may be qualified by the parent indicating they tried not to lose control.	1. *Um, but yeah, I—I still get angry, and I still yell at her and smack her <u>occasionally</u>, and sort of when she's defying and refusing to do the things I ask her to do.* 2. *Mo. of 4-yr-old: <u>sometimes</u> I just lose it [laugh] and which—I just—you know, I know it doesn't achieve anything and all she does is model her behaviour on mine, so, you know, but in the moment you're just so angry, but, yeah.*

4	Assign a 4 if more than a 3 but not quite strong enough for a 5	
5 High level of construct	**Mostly mean** **Several statements** reporting mean behaviour towards child, especially when disciplining, managing behaviour	1. *Mo. of 4-yr-old "she wet her pants twice in the morning and then on the third occasion she came out and said, "Well, I've wet my pants," and was, kind of, almost bragging about it and so I made her take them off and hang them out. I didn't wash them, I made her hang them out over the railing outside in the sun to dry [laugh] and didn't let her have another pair, so."* 2. *Mo. of 3-yr-old: she just started up again, screaming and being ridiculous. Um, [pause] so I think yesterday I ended up smacking her across her leg because I was just so frustrated.*

Weak: Parent describes self as incapable, powerless, helpless and lacking in confidence in her/his ability to parent this child, especially when parent needs to take charge)

(Weak = kind without bigger and stronger)

	Statements which clearly suggest parent feels unable to take charge when needed, incapable and lacking the confidence to manage this child; reporting helplessness as caregiver	**Examples**
Scales 1–5	**Parent reports low self-efficacy or capability as parent,** no/low authority or no/low confidence in parenting this child; reports being powerless with child **Reports collapsing, caving in when child needs parent to be firm, persistent and to take charge** Reports giving up or giving in when going gets tough **States: I can't, I don't know how to manage him/her** **Describes child as more powerful, capable, strong, clever than her/him**	
1 No evidence of construct	**Never weak** **No statements of weakness**, helplessness, lack of authority and powerlessness as parent to this child **and no statements of fear of the child**	
2	Assign a 2 if more than a 1 but not quite strong enough for a 3	
3 Moderate level of construct OR some questions about appropriateness of parent statement re this construct	**Sometimes weak:** **A few statements** which show **weakness**, helplessness, lack of authority and powerlessness as parent to this child **and/or** with **some** reservations/conditions **and/or** statements about taking charge may be not always appropriate e.g., I get him into the bath by bribing him with lollies—indicating parental control predicated by "caving in" to child desires	1. *I was a bit nervous. Um, I did manage to push that down, though, and find my leadership again with her … Um, then I think I—I stepped up again and we finally got the job done.*
4	Assign a 4 if more than a 3 but not quite strong enough for a 5	

5 High level of construct	**Mostly weak** **Several statements of weakness**, helplessness, lack of authority and powerlessness as parent to this child **No statements** which show sense of authority, confidence, efficacy, capability as parent to this child	1. "*She just—just seems to get irrationally angry and uncooperative and it's not something that I feel like I have any control over …—I don't know how to stop it* 2. *Mo. of 5-yr-old: Like I want to help him, but I know I can't because he won't let me in there, so I just sit with him and back off. Um, I can't think of the word, it's on the tip of my tongue. [Pause] I can't get it out. Um, powerless, is that the word?* 3. *Mo. of 4-yr-old: Cause I should be able—how can a 3-year-old wind me up so easily. It's like, to me that's [pause] me being weak.*

Gone: Parent reports being physically and psychologically unavailable and/or unresponsive when needed by this child

	Statements which clearly suggest parent abdicates, abandons, is unavailable/absent, preoccupied, uninterested or indisposed and therefore physically and psychologically unavailable to parent the child.	Examples
Scales 1–5	**Parent reports rejecting or avoiding parental role,** being unresponsive to child needs or opting out of parenting role when child needs support; (e.g., I can't, won't,) **Parent reports she/he does not keep child in mind**, either by being indisposed e.g., mentally ill, worried for own safety or focused on engaging in own pursuits e.g. substance abuse, too busy working, other priorities	
1 No evidence of construct	**No statements** which show parent is gone	
2	Assign a 2 if more than a 1 but not quite strong enough for a 3	
3 Moderate level of construct OR some questions about appropriateness of parent statement re this construct	**A few statements** which show **some instances of being gone and/or** statements that show parent is available and responsive, but inconsistently, and/or with **some** reservations/conditions; parent makes statement about wanting to be "out of there" even if they don't enact it **and/or** which show parental availability/responsiveness but may be not always appropriate e.g., only when it suits parent	1. *Yeah, Sunday, like I said, I would have rather just do what I would have normally done, and just walked away with the hope that she'd see me and go "Ooh, mum's leaving, I'll stop it". Um, just to avoid those feelings and whatever else. But instead I stayed, but there was a battle, thinking "If this doesn't work, then I'm high tailing it out of here because she's embarrassing me" [laughs].* 2. *Um, <u>sometimes</u> I cry, sometimes I withdraw, sometimes I just sit on the floor and look blankly [laugh] out into space.*
4	Assign a 4 if more than a 3 but not quite strong enough for a 5	

5 High level of construct	**A number of statements showing parent abdicates, abandons child, or is often unavailable and/or unresponsive to the child when needed**	1. *Mo. of 4-yr-old: I probably for possibly even as long as 18 months was fairly unresponsive to both my kids because I just [pause]—I just wasn't available. I—[pause] I was unwell, um, [pause] and also the medication has this awful effect of detaching you from your world and I was—I was in a shell.* 2. *I do emotionally shutdown, um, I detach and I guess it's a self defence thing or a, um, [pause] don't know what to do so let's shut it down.*

Role reversal: Statements which show lack of appropriate hierarchy in the caregiving relationship

Scales 1–5	**Statements which clearly suggest parent sees self and child as little together, as friends, or child as looking after parent, providing pleasure for the parent, making the parent's life better; managing or controlling parent** Parent statements indicate he/she sees child as partner, lover, may include sexualised references Parent statements indicate he/she sees child as caregiver for parent Parent describes child in adult terms—e.g. he's the man of the house Parent statements show he/she seeks child's approval, acceptance, love of him/her as a person	**Examples** **Note: this is similar to weak, gone, but more explicit statements about child being responsible / in charge would go here**
1 No evidence of construct	**No statements** which show role reversal	
2	Assign a 2 if more than a 1 but not quite strong enough for a 3	
3 Moderate level of construct OR some questions about appropriateness of parent statement re this construct	**A few statements** which show **role reversal / inappropriate reciprocity and/or** role reversal with **some** awareness that it is undesirable	1. **Lack of hierarchy** *It can go from, you know, being perfectly calm to fighting about whatever it is very, very quickly .... she comes across as fearless, um, because [pause] she just gives as good as she gets, which I find an absolute shock in a 4-year-old. So, it's like arguing with an adult sometimes.* 2. **Let's be friends** *Mo. of 5-yr-old: we can still be really good, like, helping each other. She asks me for help and I go and she'll—she asks me if she can help me and, so, yeah.*
4	Assign a 4 if more than a 3 but not quite strong enough for a 5	

5 High level of construct	**Several statements showing role reversal and no statements which show awareness that this is undesirable**	1. *Mo. of 3-yr-old: Does he ever try to soothe you when you are upset or distressed? Yeah it's beautiful. It's beautiful. He comes and gives me a kiss and yeah he's absolutely beautiful at doing that. Oh, I love it. I just lap it up. Yeah, it's wonderful. ... He's helping mum and he's important, you know, he's significant.* 2. *Mo. of 5-yr-old: He came into my room and woke me up, because my alarm had been going off every nine minutes and I kept snoozing. Um, and he just came in and gave me a beautiful cuddle and a beautiful kiss and he said, "It's okay, mummy. You can have some more sleep and I'll get up" [laugh].* 3. *Mo. of 4-yr-old: He says "it's okay mummy, it'll be alright." He, sort of, I guess steps up and be...s the man.*

Concerning statements about caregiving or about the child (weighted indicators of concern)

Frightened/frightening:

Assign a yes (Score 1) or no (Score 0) code regarding the presence of statements on each of the following indicators:	Examples
Statements in which the parent **acknowledges and shows he/she is aware of** being frightening to, or frightened of, the child **Frightened:** Parent may state she/he is frightened of child because child is seen as able to harm, control, punish, reject or disapprove of parent **Frightening:** Parent reports behaving in ways which she/he knows frighten the child	**A: Frightened:** 1. *Mo. of 3-yr-old: I'm frightened of him, of his anger, you know, frightened of his…* 2. *Mo. of 4-yr-old* **Are there ever times when she's irritated or angry with you that it's frightening for you?** *Yes.* **Can you tell me something about that?** *Um, well it's just the length some of them can go for. Um, yeah that's pretty scary … cause she's clearly in the fight and flight mode and will do anything and is capable of anything, she has great strength when she is in that.* 3. *Mo. of 5-yr-old:* **Are there ever times when he is irritated or angry with you that it's frightening for you?** *[Pause] Um, in the past like he went through this stage where when he'd get cranky it would be just because I'd said no to something and he'd get so angry that I'd see him, he'd lock his bottom jaw, the talons would come out and he would just go for me.* **B: Frightening:** 1. **Mo. of 4-yr-old: I think sometimes she is afraid when I get angry, um, she doesn't like me yelling. Does L ever get scared of you?** *Mm [pause], I would say rarely, as in a couple of times a year where I—I can see that she's scared because I feel angry.* 2. And so how can you tell that she is scared of you? **Um, she backs away, she's sobbing uncontrollably** 3. *Mo. of 5-yr-old: oh definitely gets scared I would say … How can you tell that he might be scared of you?* 4. *Well he might like have a little cry or he'll tell me, he'll go "Mummy you scared me".* **What does he do at those times that**

	he might be scared of you? [Pause] He'll just cry.
	1. *Mo. of 4-yr-old:* **Does A ever get scared of you?** *Mm (nods).* **How can you tell?** *Um, she'll cower away. She's—yeah, or run away.*
	2. *Fa. of 3-yr-old: "I think sometimes I can be, ah, alarming when I do lose my temper" ... I react very strongly ... Um, I don't hit him, or shake him or anything like that, but I grab him and tell him very forcefully, and I can see the fear in his eyes. So how can you tell that he is scared? Um [pause], by his reaction. Um, his response is a—he has a—he has a freeze response to that. And then what does he do at those times? Um [pause], then he cries and wants comfort.*