

**The Longitudinal Influences of Maternal Mind-Mindedness and  
Maternal Sensitivity on Child Emotion Regulation**

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## CONTENTS

Overview	3
Acknowledgement	4
Part 1: Literature Review	5
Abstract	6
Introduction	7
Method	15
Results	20
Discussion	37
References	46
Part 2: Empirical Paper	54
Abstract	55
Introduction	56
Method	64
Results	76
Discussion	83
References	94
Part 3: Critical Appraisal	102
Introduction	103
Developing a Coding System	103
Observational Methods	109
Pre-Existing Data	111
Implications for Research and Practice	112
Conclusions	114
References	116
Appendices	119
Appendix A: Information Sheet	
Appendix B: Consent Form	
Appendix C: Demographics Questionnaire	
Appendix D: Centre for Epidemiologic Studies Depression Scale	
Appendix E: Attractive Toy Task Episodes	
Appendix F: Child's Negative Reactivity Definitions	
Appendix G: Child's Emotion Regulation Definitions	
Appendix H: Maternal Sensitivity Definitions	
Appendix I: Modified Mind-Mindedness Manual	
Appendix J: Ethical Approval Letter	

## **Overview**

This volume consists of three sections

**The Literature Review** examines the role of parental cognitive attributions in physically abusive parenting. 12 studies were reviewed and the majority of the studies revealed overall attributional differences between physically abusive / high risk and non-abusive/ low risk parents in response to their children's behaviour. The type of attributions identified varied; methodological concerns and suggestion for future research are discussed.

**The Empirical Paper** is a longitudinal study investigating the role of maternal mind-mindedness and maternal sensitivity on the child's emotion regulation abilities. There was a relationship between maternal mind-mindedness and maternal sensitivity however this relationship was confounded by maternal verbosity. Mind-mindedness and maternal sensitivity at 15 months did not have an impact on the child's emotion regulation ability at 15 or 24 months. No evidence was found of maternal sensitivity mediating the relationship between mind-mindedness and the child's emotion regulation ability.

**The Critical Appraisal** examines three issues of pertinence to the research. A discussion about selecting an appropriate coding system to measure maternal representations of the child's mental states. The advantages and challenges of using observational methods and pre-existing data. The clinical implications of research in the construct of mind-mindedness and the child's emotion regulation ability.

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## **Part 1: Literature Review**

### **What Are Physically Abusive Parents Thinking?**

## ABSTRACT

**Aims:** Parental maltreatment of young children constitutes a major public health problem, the underlying causes of which are poorly understood. This literature review examined the role of attributions in physically abusive parenting.

**Methods:** 12 studies published between 1980 and 2013 were identified that had investigated parental attributions in relation to abusive parenting or among parents at high-risk for abusive behaviour. No restrictions were placed on the type of research design.

**Results:** The majority of the studies revealed overall attributional differences between physically abusive/high-risk and non-abusive/low risk parents in response to their children's behaviour; however the type of attributions identified in the studies varied. The review identified a number of general limitations of these studies including variations in definitional criteria, methodology and design issues.

**Conclusion:** Parental attributions affect the parent's immediate and behavioural responses, in addition to the long-term quality of the parent-child relationship. Further research would benefit from focusing on well-designed studies with larger sample sizes, valid ways of measuring and assessing attributions and using more stringent criteria to define child abuse study groups. Effective interventions may include directly addressing maladaptive cognitions by including cognitive components in interventions designed for individuals at-risk.

## INTRODUCTION

Child abuse can be divided into physical, sexual, neglect and psychological/emotional abuse (Buchanan, 1996). Researchers who have studied abuse among children and adolescent samples have generally found some evidence of significant negative effects of maltreatment (Prino & Peyrot, 1994; Stith et al., 2009; Cavaiola & Schiff, 1988). Studies with adolescents have demonstrated that more than one type of maltreatment may be more predictive of emotional and behaviour problems, than the effects of any particular type of abuse experienced alone (e.g., Bensley, Van Eenwyk, Spieker & Schoder, 1999; Green, Russo, Navratil & Loeber, 1999). While there is some overlap in factors related to all forms of abuse (e.g., parental drug abuse, poverty and low socioeconomic status), the best prediction of re-abuse is attained when the different types of abuse are analysed separately (McDonald & Marks, 1991). Research also supports the view that compared to each other neglectful, physically abusive and sexually abusive caregivers show quite distinct behavioural (Bousha & Twentyman, 1984; Prino & Peyrot, 1994) and cognitive characteristics (Larrance & Twentyman, 1983; Friedrich, Beilke & Urquiza, 1987).

### *Child Physical Abuse*

The studies mentioned above indicate a strong possibility that the behavioural and cognitive patterns of maltreating parents are distinct. Therefore this review focused on a particular subgroup, namely, physically abusive caregivers. Child physical abuse involves a non-accidental injury to a child, by an adult (Cicchetti & Lynch, 1995; cited in Milner, 2003). Over the past 30 years, child physical abuse has been linked to many negative developmental outcomes such as aggression (Brezina,

1999; MacCabe, Clarke & Barnett, 1999), psychological maladjustment (Eamon, 2000; Turner & Finkelhor, 1996, cited in Milner, 2003) and impaired parent-child relationships (Gershoff, 2002). Adults who have been physically abused as children have shown higher rates of attachment difficulties, cognitive impairment, developmental delays, emotion dysregulation, poor school performance, delinquent behaviour, post-traumatic stress disorder, depression, anxiety, suicidal behaviour, self harm, drug and alcohol abuse (Lowenthal, 1999; Wolfe, 1999; Fromm, 2001, cited in Ateah & Durrant, 2005). A number of studies have attempted to explain why parents may physically abuse their children. Holden and colleagues (1995) noted that determining factors could be distal (pre-existing) or proximal (in the immediate time frame) to the behavioural transgression. Distal factors that have been examined may include, a personal history of receiving physical punishment as a child (Buntain-Ricklefs, Kemper, Bell & Babonis, 1994; Graziano, Hamblen & Plante, 1996; Rodriguez & Sutherland, 1999) approval of its use (Bower-Russa, Knutson & Winebarger, 2001; Holden, Coleman & Schmidt, 1995), lack of knowledge of child development (Durrant, Broberg & Rose-Krasnor, 1999) and lack of knowledge of alternative disciplinary responses (Ateah & Durrant, 2005). Proximal factors may include, parental perception of the seriousness of the child's transgression (Catron & Masters, 1993; Durrant, 1996; Holden, Coleman & Schmidt, 1995), the parent's affective state (Graziano & Namaste, 1990; Holden, Coleman & Schmidt, 1995; Rose-Krasnor, Rubin, Booth & Coplan, 1996) and parental attribution of the child's intent (Rose-Krasnor, Durrant, & Broberg, 1997, cited in Ateah, & Durrant, 2005).

### Attribution Theory

Interest in research of proximal factors (in particular parental attributions) emerged in response to increasing recognition of the role of cognitions within caregiving relationships. With time it became apparent that parental affective and behavioural responses to caregiving events were influenced by variations (across settings and individuals) in the interpretations given to those events (Bugental & Shennum, 1984; Dix & Grusec, 1985; Smith & O’Leary, 1995). Parental attributions came to be seen as ‘interpretative filters’ (Bugental, Johnstone, New & Silvester 1998); this approach differed from previous approaches in that it focused on interpretative questions (e.g. when your child misbehaves, why is it that?) rather than questions of beliefs and advocacy (e.g. Should children be spanked when they disobey?). In this way meaning was assigned to the behaviours and characteristics of children and the nature of the parent – child relationship.

Attribution theory deals with ‘why’ and ‘how’ individuals explain events, or their causal explanations (Hewstone, 1989). It posits that behavioural and emotional responses to external events can be partially predicted from attributions made about the causes and controllability of those events (e.g. Lazarus & Folkman, 1984). The theory was derived from several different theorists for example Weiner’s (1986) achievement motivation theory, which is a self- attribution theory focusing on a person’s explanation of his/ her own failure and success and the consequences of his/her explanations. In contrast Kelley’s (1967) model served to describe the process of how an individual determines if an outcome is due to another person’s personal responsibility or if it is due to situational factors outside the person’s control.

### Types of Attributions

Parents may assign a number of different attributions to their child's behaviour. The most common attributions that have been highlighted in the literature include: internal-external; stable-unstable; global-specific; dispositional- situational.

The internal/ external dimension pertains to the locus of causality. If the causes of the behaviour are perceived to be due to something within the child (such as, a selfish disposition), then an internal locus is present, whereas if the cause of the behaviour is perceived to be due to something outside the child (such as, enticing treats on the shelves), then an external locus of causality is present (Stratton & Swaffer, 1988). The stable/unstable dimension is concerned with the chance of the causal factor occurring. If the cause of the child's behaviour is enduring then it would be considered stable, but if the cause of the behaviour changes frequently, it would be considered unstable (Stratton & Swaffer, 1988). The global/specific dimension refers to the extent to which the cause of behaviour is perceived to affect a few situations/ areas of a child's life or a multitude of situations/areas. If the cause of the behaviour affects only a few areas of a child's life, then it would be classified as specific, whereas if the cause of the behaviour affects a range of areas in the child's life, then it would be classified as global (Stratton & Swaffer, 1988). Dispositional, or trait-like, attributions are classified as internal to the child, stable and global. On the other hand, situational attributions are external to the child, unstable and specific. According to Dix (1993) dispositional attributions reflect an important aspect of the parent-child relationship because these types of attributions not only regulate behaviour, but inferences that surround and motivate these behaviours as well.

While examining attributions within the parent-child context, it is important to make a distinction between child-centred attributions and parent-centred

attributions. Parents can make both types of attributions, but they usually have different implications. In response to any given child, a child-centred attribution is a cause directly concerning the child, such as intent and responsibility; whereas a parent-centred attribution is a cause directly related to the parent, such as parental self-efficacy and self-control (Joiner & Wagner, 1996). For example, if a child displays angry behaviour the parent could make a child-centred attribution such as ‘She is bad’, or parent-centred attributions such as ‘I am such a bad parent’. The type of attributions parents make regarding their children’s behaviour may thus be extremely important in understanding parental care and maltreatment in particular.

#### *Cognitive Models of Child Physical Abuse*

The cognitive behavioural perspective has guided the development of several models designed to explain child physical abuse. For example, Twentyman and colleagues (Larrance & Twentyman, 1983; Twentyman, Rohrbeck, & Amish, 1984) described a cognitive behavioural model which proposed that inappropriate child-related expectations, misattributions of child responsibility and perceptions of negative intent lead to parental ‘overreactions,’ including verbal and physical assault, to children’s behaviour. Expanding on Twentyman’s model, Azar (1986, 1989, 1997) proposed a social cognitive behavioural model. In addition to focusing on parental factors (parent cognitive dysfunction, dysfunctional parent-child interactions and parent problems in impulse control), Azar (1997, cited in Milner, 2003) discussed the putative contributing and buffering roles that social factors (e.g., family stress and social support) play in abusive behaviour.

In an attempt to provide a comprehensive overview of the different parental cognitions believed to contribute to child physical abuse, Milner and colleagues

(1993, 1995, 2000) proposed a social information-processing model that consists of three cognitive stages and a cognitive behavioural stage. The cognitive stages consist of perceptions of social behaviour; interpretations and evaluations that give meaning to social behaviour; information integration and response selection activities. The cognitive behavioural stage involves response implementation and monitoring processes. The model hypothesizes that parents proceed through a series of cognitive stages that may lead them to engage in parent-child aggression.

The model assumes that preexisting cognitive schemata (e.g. beliefs about children and childrearing) influence parental perceptions as well as cognitive activities at other processing stages. The assumption is based on the view that all parents develop and maintain global (related to their children) child-related beliefs that guide their parenting behaviour (Milner, 2000). Thus parenting behaviour is thought to be theory driven (based on preexisting beliefs about children and parenting behaviour) and context driven (impacted by situational factors such as type of child behaviour and level of stress) (Milner, 2003). The assumption that preexisting schemata provide a basis for theory-driven parenting behaviour is similar to the view that parents have “internal working models” (Bowlby, 1982) or “models of relating” that guides their parenting behaviour (Zeanah & Anders, 1987).

The model suggests that high-risk and physically abusive compared to non-abusive and low risk parents have more deficits, distortions, biases and errors in their perception of the children’s behaviour and differ in the interpretation and evaluation of their child’s behaviour. After interpreting the child’s behaviour, parents integrate information about the parent-child situation and choose their response. The final stage of the model focuses on response implementation and parents’ ability to monitor their own behaviour.

According to the model, abusive parents are believed to make quantitatively and at times qualitatively different judgments on various dimensions regarding their child's behaviour. Although attributional differences between abusive / high-risk parents are expected when negative child behaviours are being evaluated, attributional differences are predicted to be greatest in parent-child interactions that involve ambiguous child behaviours, problematic but developmentally appropriate child behaviours and minor child transgressions (Milner, 2003). Abusive parents are also assumed to make different predictions of child compliance following selected transgressions and parental discipline techniques (Milner, 1993, 2000). Further, in each of these situations, it is suggested that interpretations and evaluations are influenced by the parent's preexisting schemata; which in the case of high-risk and abusive parents are more likely to involve biased schemata (Milner, 1993).

### **Previous Studies and Reviews of the Literature**

Studies in the field have looked at the interactions between cognitions and other factors possibly contributing to abusive behaviour. These include high levels of arousal in response to children's behaviour (Frodi & Lamb, 1980; Smith & O'Leary, 1995; Wolfe 1999); deficits in parenting skills such as lower levels of flexibility in disciplinary strategies (Trickett & Kuczynski, 1986); caregivers lack of coping and problem solving skills (Wolfe 1999); negative parent child- interactions (Patterson, 1986); and decreased level of social support (Bethea 1999; Corse, Schmidt, & Trickett, 1990). As such, there is recognition within the literature that parental cognitive processes are one component of the complex interplay between risk factors and parent-child exchanges.

Milner and Chilamkurti (1991) and Milner and Dopke (1997) summarized the literature on parent biological, cognitive, affective and behavioural factors in child physical abuse. These reviews indicated that parental low self-esteem, depression, psychopathology, history of child abuse and social isolation, among other factors, are somewhat consistently positively related to child physical abuse. Some reviews have focused solely on child-related factors (Dubowitz, 1999). Belsky (1993) reviewed the research on risk factors in child physical abuse and neglect examining multiple levels of factors, including those pertaining to individual family members, the family system, interactions with the community and societal factors. His findings supported those of Milner and Chilamkurti (1991), Milner and Dopke (1997) and Dubowitz (1999). A review in the field, by Joiner and Wagner (1996), examined the relation between parental attributional processes and child adjustment. The stable and global dimensions of parental child-centered attributions were well supported as predictors of parental satisfaction / child adjustment.

### **Aim of the Review**

It appears that previous reviews have focused on a number of child-centered and parent-centered factors that may lead to child abuse, or attributions as predictors of parental satisfaction. Although reviews have investigated different risk factors for child physical abuse, no systematic review has focused exclusively on the attributions and interpretations that abusive parents ascribe to their child's behaviour. Thus the aim of this review is to examine whether physically abusive/high-risk parents, relative to non-abusive/low risk parents, show systematic differences in their attributions towards their child's behaviour.

The review will focus on child-centered attributions and consider what the current literature can tell us about physically abusive/ high-risk parents' evaluations, attributions and perceptions in response to everyday child behaviours. It will examine the type of attributions assigned to the child/ children, highlight the quality of the evidence and provide suggestions for future research and clinical practice.

## **METHOD**

### *Inclusion and exclusion criteria*

The review sought to identify studies that examined the cognitive attributions of physically abusive parents towards their children. Studies were included in the review which:

- Included parents/caregivers who were responsible for the care of their child.
- Examined the attributions of physically abusive/ high-risk/ at-risk parents compared to non-abusive/ low-risk parents.
- Empirically examined parental attributions, evaluations and interpretations of their child's social behaviour.
- Examined any or all of the parental cognitive attributions on the dimension of internal / external; intentionality / unintentionally; negative / positive; dispositional/ situational; specific/global and stable/unstable.

Studies were excluded which:

- Focused on other types of abuse such as child sexual abuse, neglect, emotional abuse and Munchausen's syndrome by proxy or infanticide. The reason for this was that the cognitive processes, attributions, profile and

patterns associated with different types of abuse is likely to be different from those associated with physical abuse.

- Recruited parent and child groups composed of individuals with mental health problems or developmental disorders or if the sample had been drawn from a special population (such as parents or child with learning disabilities or physically challenged).
- Focused exclusively on other risk factors of child physical abuse other than parental cognitive attributions.

### Identification of Studies

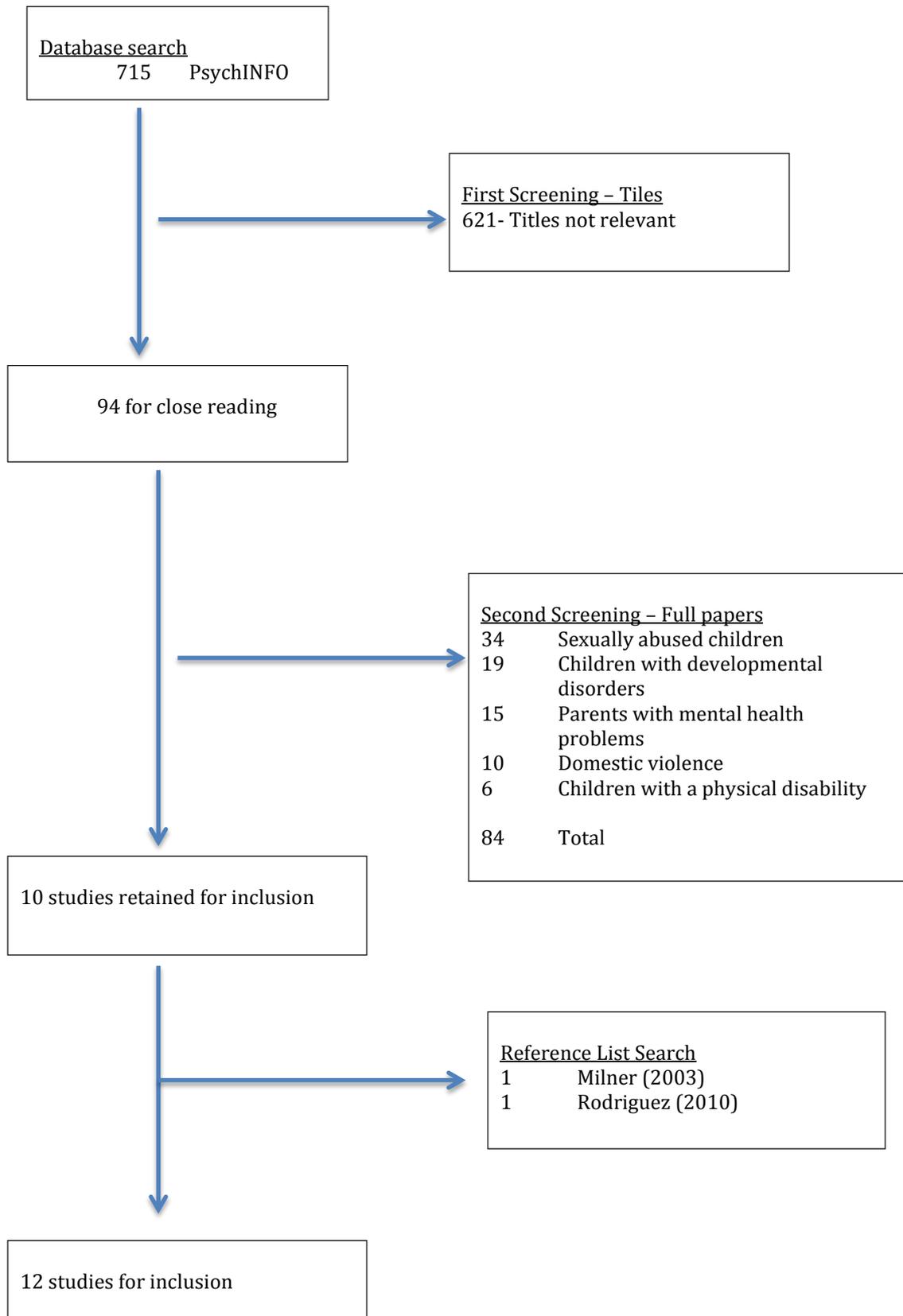
Initially existing reviews in the field were used to identify relevant papers and appropriate search terms. After this, studies were identified through a combination of database searches, reference list of relevant papers, citation searching and searching publication lists of relevant journals (e.g. Child Abuse and Neglect).

A systematic search of the Psychological Abstracts International (PsychInfo) database was conducted from 1980 to 2013. Initial scoping searches used a wide range of search terms to identify studies that examined the relation between caregivers' cognitive attributions, social information processing and child abuse. The keywords used in the searches were: (*parental, maternal, mother, father or caregiver*) and, (*physical abuse and maltreatment or child abuse*), and (*attitudes, attributions, perceptions, interpretation, evaluation, schemas, expectations*), or (*cognitive style and social information processing*). These were used in a number of different combinations. The search results for certain searches such as, *cogni\* and abuse*, revealed 8858 studies. The final searches run employed the following terms as keywords in all combinations:

*parent\* / maternal/ AND cognitive/ cogni\* / attributions / attrib\* AND child  
physical abuse/ maltreatment.*

Figure 1 provides an illustration of the search and selection of studies. 12 studies were included in the final review.

**Figure1: Flow Diagram of Search and Selection of Studies**



## **Some Definitions**

All studies reviewed only included mothers and their children. The mother's were classified as physically abusive, high-risk/ at-risk of abuse or non-abusive in the studies on the following basis:

### *Physically Abusive Mothers /Mothers With a History of Physically Abusing Their Child*

In the studies mothers classified as physically abusive were those who had been identified as perpetrators of child physical abuse by child welfare agencies.

### *High-Risk/ At-Risk of Physically Abusing Their Child*

In the studies high-risk/ at-risk mothers included those who had not been classified as physically abusive by child welfare agencies however they had attained elevated scores on the CAPI (Milner, 1986). The CAPI is a 160- item, self-administered questionnaire that is answered in a forced-choice, agree-disagree format, which was designed to screen for physical child abuse (Milner, 1986). The questionnaire contains a 77-item physical child abuse scale that can be sub-divided into six factor scales: distress, rigidity, unhappiness, problems with the family, problems with the child and problems with others. The validity scales yield three response distortion indexes (faking-good, faking-bad and random response). Studies have reported that elevated abuse scores on the CAPI (Milner, 1986) are predictive of later reported and confirmed physical abuse and maltreatment (Milner, Gold & Wimberley, 1986; Valle, Chaffin & BigFoot, 2000 cited by Caselles & Milner, 2000).

### *Non-Abusive / Low-Risk of Physically Abusing Their Child*

Non-abusive / low-risk mothers were those who were not known to be physically abusive towards their child and/ or had scored at or below the median norm on the CAPI (Milner, 1986).

## **RESULTS**

The 12 studies varied in the definitional criteria used to classify abusive/ at-risk and non-abusive groups, the range of measures used and the methods of assessing attributions. All studies included only mothers, had a cross sectional design and comparison groups.

The first part of the review focused on studies examining the attributions of mothers who were abusive or had a history of physical abuse towards their children. The second part reviewed studies examining the attributions of mothers who were high risk/ at-risk of child physical abuse. For all the studies, the sample, techniques by which the cognitive attributions were elicited and measured were summarized and the overall findings reported. The key characteristics of the studies were summarized in Table 1.

**Table 1: Study Properties**

Authors	Sample	Location of Study	Selection of Sample	Age of Child (Years)	Measures	Variables
Bauer et al. (1985)	12 mothers history of CPA* 12 mothers history of neglect 12 non-abusing mothers	United States of America	Social Services Day Care Centre	5-6	Shipley Institute of Living Scale. Vividness of Visual Imagery Audio-Tapes of Different scenarios	Attributions Annoyance
Bradley et al. (1991)	8 mothers history of CPA 8 mothers clinical -controls 8 mothers same SES 8 middle class mothers	United States of America	Not Reported	6-11	Eyberg Child Behaviour Inventory Paternal Attribution Test	Attributions Hyper-reactivity
Caselles et al. (2000)	30 CPA mothers 30 matched controls	United States of America	Social Services Schools	6-10	Demographic History Questionnaire Child Abuse Potential Inventory Shipley Institute of Living Scale Vignettes	Attributions Compliance Transgressions
Chilamkurti et al. (1993)	24 high-risk CPA mothers 24 low risk CPA mothers	United States of America	Social Services Schools	6-10	CAPI Vignettes	Attributions Compliance Transgressions
Dadds et al. (2003)	40 high-risk mothers 20 non-clinical mothers	Australia	Social Services Preschool Centre	2-6	Child Behaviour Checklist CAPI Child Behaviour Attribution Test Family Observation Schedule	Attributions Depression Valence Anger
De Paul et al. (2006)	1,316 mothers	Spain	Schools CAPI* Scores	7-12	CAPI* Demographic Questionnaire Vignettes	Attributions Negative Affect Discipline Compliance Transgressions
Dopke et al. (2000)	25 high-risk mothers 25 low-risk mothers	United States of America	Social Services Day Care Centre	Not Reported	CAPI* Stress Appraisal Measure Positive & Negative Affect Schedule Vignettes	Attributions Compliance

Authors	Sample	Location of Study	Selection of Sample	Age of Child (Years)	Measures	Variables
Larrance et al. (1983)	10 CPA mothers 10 neglectful mothers 10 mothers comparison	United States of America	Social Services Day Care Centre	Up to 5	Stimulus Pictures	Attributions Expectations Transgressions
Milner et al (1994)	28 high risk females 28 low risk females	United States of America	Undergraduates	Not Reported	CAPI* Questionnaire of Mental Imagery Childhood History Questionnaire Vignettes	Attributions Mitigating Information Disciplinary Responses
Montes et al (2001)	19 high risk mothers 19 low –risk mothers	Spain	Social Services School	9	CAPI* Vignettes	Attributions Mitigating Information Disciplinary Responses Maternal Affect Transgressions
Rosenberg. et al. (1983)	12 CPA mothers 12 non-CPA mothers	United States of America	Social Services Mothers identified as experiencing problems in parenting	0-5	Vignettes Interviews Shipley Institute of Living Scale Vividness of Visual Imagery Questionnaire Social Readjustment Rating Scale Adjective Checklist	Attributions
Wood-Shuman et al. (1986)	18 at-risk mothers 5 CPA mothers 20 low-risk mothers	United States of America	Participants part of another study and selected on the basis rating scales and questionnaires	Not Reported	Neonatal Perception Inventory Revised Infant Temperament Questionnaire	Attributions Transgressions

CAPI\*= Child Abuse Potential Inventory  
CPA = Child Physical Abuse

*Attributions of Physically Abusive Mothers / Mothers With A History Of Physically Abusing Their Children*

Six studies explored the attributions, perceptions and evaluations of physically abusive mothers. In one of the earliest studies Larrance and Twentyman (1983) examined the difference between three groups. The purpose of the study was to examine the relationship between abusive, neglectful and non-abusive mothers' (a) expectations of their children (b) causal attributions of their children's negative behaviour compared to a similar but unknown child's negative behaviour. Using contrived photographs of their own and other children in common situations, they asked the mothers to make up stories regarding the pictures and to state their attributions and expectations for the occurrence of the child behaviour they described. The attributions and expectations were rated from verbatim dialogues of the structured interviews. Ratings of expectation, internality and stability were made for each set of situations. The authors found that abusive mothers' had the most negative expectations of their child's behaviour and the comparison group had the most positive. Moreover the abusive mothers' attributions about their child's behaviour varied according to situational factors. When their children transgressed, stable and internal attributions were made of their child's behaviour; whereas external and unstable attributions were given in explanation for their own child's successes or the other child's transgressions. The neglectful group displayed a unique pattern of responses. Although like the abusive group they also held negative expectations of their child's behaviour compared to the comparison group, situational factors had little effect on their attributional responses. The data supported the findings that neglectful mothers' are socially unresponsive to their environment (Bousha and Twentyman, 1984)

Bauer and Twentyman (1985) assessed whether mothers with a history of child physical abuse and non-abusing mothers differed with respect to maternal perceptions of their child's behaviour in different situations. Like Larrance and Twentyman's (1983) study, these authors examined three groups (mothers with history of child physical abuse, mothers with a history of neglect and non-abusive mothers). Audiotapes were used to present a description of stressful parent-child interactions. These included situations in which the child was described as 1) simply crying (but no other information was presented) 2) the child was hurt 3) the child engaged in intentional rule breaking 4) the child was hurt and engaged in intentional rule breaking 5) the child misbehaved with others present 6) the child was angry with the parent. During each tape, mothers' were asked to rate their level of annoyance on a Likert scale. Following each tape session the mother's stated whether they agreed or disagreed with the following two statements 'the child did that to annoy me' and 'the child acted that way to communicate his/her feelings'. The authors found that mothers with a history of abuse consistently ascribed more malevolent intentionality and hostile intent to their child than other mothers. Abusing mothers also demonstrated the greatest mean annoyance across all the situations presented. These findings are consistent with other research (Larrance & Twentyman, 1983) suggesting that abusive mothers misattribute negative characteristics to their children even when there is little or no informational basis for their judgment. This study and that by Larrance and Twentyman (1983) provide some evidence for the four-stage cognitive-behavioural model described by Twentyman, Rohrbeck and Amish (1984) according to which misattributions of child responsibility, and perceptions of negative intent lead to parental 'overreactions', to children's behaviour. No differences were reported between the neglectful and comparison group. This may

lend support to the findings that neglectful mothers represent a definite sub-group of maltreating parents who may in many respects have distinct behavioural (Bousha and Twentyman, 1984) and cognitive patterns (Larrance, Amish, Twentyman & Plotkin, 1982).

Wood- Shuman and Cone (1986) examined maternal perceptions of child behaviour in three groups (physically abusive mothers, mothers at-risk of abuse and a comparison group of low-risk / non-abusive mothers). Each mother watched a videotape of positive and negative child behaviour. The videotape was stopped at three designated time points during each scene and the mother was asked the following ‘describe what did you see the child doing’ and ‘what was good/bad about the behaviour?’ The mother’s responses were recorded verbatim. The study demonstrated that at-risk and abusive mothers rated more segments as negative compared to the control group. The at-risk mothers rated the mildly aversive scenes (a child begging for a candy) and child unattended scenes (a child left alone to play with a dog) as more negative compared to controls. While the abusive mothers, evaluated mildly aversive children’s behaviour, child unattended scenes and scenes where children were engaged in normal activities of daily living (e.g. a child being fed) as more negative than at-risk and comparison mothers. This study highlighted that abusive mothers exhibit the greatest number of negatives across behaviour suggesting differences between at-risk and abusive mother.

Bradley and Peters (1991) examined the attributional style of physically abusive mothers. They included four groups (mothers with a history of physical abuse and no history of child neglect; clinical comparison mothers not suspected of physical abuse, but referred for their children’s behavioural problems at home and school; a matched sample of mothers from the community with the same

socioeconomic status; and a sample of middle-class mothers from the community). The Eyberg Child Behaviour Inventory (Eyberg & Pincus, 1999) was administered to assess mothers' report of externalizing behavioural problems in children and the Parent Attributions Test (PAT; Bugental, 2004) was used to examine the extent to which the mother assigned differential importance to aspects of the self, the child or external factors as perceived causes of success and failure in the dyadic relationship. The authors reported that abusive and clinically involved mothers made more dispositional attributions for negative child behaviours and external attributions for positive behaviour than those in the two community groups. It also emerged that the abusive mothers were less likely than the other groups to hold themselves responsible for unsuccessful interactions with their children and abusive mother and the middle-class group gave their children little credit for successful interactions. Interestingly like the abusive mothers the middle class mothers viewed their children's contribution to successful parent-child interaction as minimal. To explain these findings the authors examined the entire pattern of the PAT scores for each of these two groups. On the scores that measured both the parent's and the children's contribution to successful and unsuccessful time spent together, the abusive mothers' attributions were characterized by externalizing perception of control or power. In contrast, the middle-class mothers recorded high scores for self-credit and self-blame, but low for child credit. Therefore it appears that although both groups gave little credit to their children for successful interactions their perceptions of their own role was different. This finding highlights the need to consider individual attributional similarities or differences within the broader context of parenting.

Caselles and Milner (2000) examined abusive and non-abusive mothers' evaluations of child transgressions, choice of disciplinary techniques, expectations

for children's compliance following discipline and appraisals of the appropriateness of disciplinary choice. In addition to recruiting from social services agencies and schools, The Child Abuse Potential Inventory (CAPI, Milner, 1986) was also used to confirm that the abusive groups scores were higher than the non-abusive group. The Shipley Institute of Living Scale (Shipley, 1967), a brief measure of intellectual functioning, was used to detect mild degrees of intellectual impairment. The mothers were asked to respond to questions related to vignettes describing children engaging in moral (e.g. stealing, throwing stones at a dog), personal (e.g. writing on the hand with a pen) and conventional (e.g. watching T.V after bedtime) transgressions. The maternal evaluations were recorded on a Likert scale. Abusive mothers evaluated conventional and personal, but not moral transgressions as more wrong; reported that they would use more physical and verbal force; expected less compliance from their own children and assessed their own disciplinary responses as less appropriate. The finding that abusive mothers had different expectations of children's compliance following discipline provides support for the social information-processing model of child abuse (Milner, 1993; 2000), according to which abusive mothers expect less overall compliance by their own children. In this study the abusive and comparison groups were matched not only on demographic characteristics but also on a measure of intellectual functioning that was designed to assess conceptual abilities. Thus this provided evidence that differences in abusive relative to non-abusive mother's cognitions and disciplinary choices can be found independent of group differences in conceptual abilities.

Rosenberg and Reppucci (1983) examined abusive and non-abusive mothers' perceptions, interpretations and attributions of their own and their child's behaviour. Verbal vignettes in the form of three short stories depicting different child

behaviours were presented to the mothers. The behaviours included breaking an object owned by the parent, disobedience and continual crying. Mothers' perceptions and interpretations of their child's behaviour were measured by a series of forced-choice and open-ended questions. Raters classified the responses according to whether they reflected intentional, dispositional and causal explanations of the child's behaviour. In addition to this, the mothers' were asked to describe a narrative of similar situations happening to them and explain their role in the situation, such as, 'Do you remember what you were feeling at the time?', 'Why do you think the child did that behaviour?' This was done so as to elicit attributions explaining their own behaviour. In contrast to the studies above, no group differences were found in attributions of intent and dispositional characteristics of the child. Abusive mothers reported a wide variety of positive behavioural interpretations than non-abusive mothers in situations where children broke an object and wouldn't stop crying. The abusive mothers were also more critical of their child rearing abilities than non-abusive mothers. The authors raised some methodological issues that may have affected the results, including use of non-validated measures to assess attributions

*Summary:* Five of the six studies revealed a difference between the attributions of abusive and non-abusive parents. According to these studies child transgressions led abusive parents to make dispositional (Bradley & Peters, 1991), stable and internal attributions about the child's behaviour and unstable attributions about their own and other children's transgressions (Larrance & Twentyman, 1983); ascribe hostile intent towards their child's behaviour (Bauer & Twentyman, 1985) and evaluate minor (Wood- Shuman & Cone, 1986) conventional and personal transgression as more severe than moral ones (Caselles & Milner 2000). One study failed to find overall

attributional differences (Rosenberg & Reppucci 1983); however a number of methodological issues were identified by the authors.

#### *Attributions of High-Risk/ At-Risk Parents*

Six studies explored high-risk/at risk mother's attributions, perceptions and evaluations in response to their child's behaviour. In all these studies the CAPI (Milner, 1986) was used to screen for potential child physical abuse. Chilamkurti and Milner (1993) investigated high-risk and low-risk mother's perceptions and evaluations of different kinds of children's transgressions and parental disciplinary action. Vignettes depicting child transgressions (moral, conventional and personal) and disciplinary strategies were presented to the mothers. They were then asked to rate the degree of 'wrongness' of each type of transgression on a Likert scale. Open-ended questions were also asked about the mother's perception of other's (i.e. story characters) transgressions and discipline techniques and their own views and behaviours. These responses were coded into different categories. The authors found that high-risk mothers expected less future compliance following discipline for moral transgression (e.g. stealing) and more future compliance following discipline for personal transgressions (writing on the hand with a pen). That is, high-risk mothers had lower expectations that their child would cease to engage in a more serious behaviour (e.g. stealing) and higher expectation that their child would not engage in less serious, more common child behaviour (e.g. writing on the hand with a pen). Low-risk mothers had the opposite expectations.

Dopke and Milner (2000) examined the impact of repeated child non-compliance on stress appraisals, attributions and disciplinary choices in a high-risk and a low risk sample. Two vignettes, (same as those used by Chimalkurti & Milner,

1993; Caselles & Milner, 2000; Milner & Foody, 1994) describing conventional transgressions were used in this study. The vignettes described a child refusing to set the table for dinner and a child watching television after being told to go to bed. Following each vignette the mothers were asked open-ended questions about what they would do to achieve child compliance. The open-ended questions were coded into several categories, which included, verbal/ physical force, inductive reasoning, combination of techniques or no action. Question on maternal attributions (internal, stable, global and intentional), evaluations of wrongness and seriousness, and expectations of future child compliance were answered on a Likert scale. The study also explored the mother's stress and affect. The authors found that after repeated non-compliance high-risk relative to low-risk mothers made more stable and intentional attributions with a trend towards more internal attributions. High-risk mothers also reported higher levels of overall stress and negative affect. These findings were consistent with the social information processing model (Milner, 1993; 2000) that evaluation of children's behaviour in high-risk and abusive parents may be impacted by stressful situations, which in this case being child non-compliance. However, in contrast to the findings of Chilamkurti and Milner (1993) the study did not find that high-risk mothers assessed child transgressions as more wrong or serious than low-risk mothers after repeated transgressions.

In a comprehensive study Dadds, Mullins, McAllister and Atkinson (2003) investigated not only differences in cognitive attributions between high-risk and low-risk mothers, but also how attributions predict affective and behavioural reactions to child behaviour. Videotapes depicting eight separate scenarios of an unfamiliar child were shown to the mothers. Four scenarios depicted the child engaging in overtly negative behaviour, two scenarios of positive behaviour and the remaining two

depicted neutral scenarios, neither positive nor negative. In addition to this the behaviour of each child participant was created by video taping a semi-structured mother-child interaction. These included three tasks, free play with child, completion of puzzle and putting away toys. Brief structured interviews were used to obtain mother's rating of valence (child behaviour seen as either positive or negative) and their attributions (external/ internal) of the behaviour for both the unfamiliar child scenarios and their own child interaction. Results indicated that compared to low-risk, high-risk mothers attributed positive child behaviour to external causes (external attributions) and negative child behaviour to internal causes (internal attributions). This is consistent with previous research showing that abusive parents are more likely to make dispositional attributions for negative behaviour than for positive behaviour (Bradley & Peters, 1991; Larrance & Twentyman, 1983). High-risk mothers were also less happy about their children's behaviour and compared to low-risk mothers rated the unfamiliar child's behaviour as more negative across all scenarios. In the high-risk group, positive child behaviour predicted coercive parenting when it elicited angry feelings in the mother, ambiguous and naughty child behaviour led to coercive parenting through attributions of 'internality'. This study was one of the few that assessed attributions and other cognitive variables with the use of videotaped stimuli and did not limit the observations of the parent to their own child's behaviour. Incorporating measures of parents' reactions to positive, as well as negative child behaviour reveal important affective responses that have been largely overlooked in most studies that exclusively focus on problematic child behaviour. Different valences of child behaviour may have the potential to enrich understanding of difficult and healthy parent-child relationships.

Montes, de Paul and Milner (2001) investigated attributions in the presence of mitigating information and child transgression in high-risk and low-risk mothers. Vignettes of six brief stories depicting child transgressions were presented to the mothers; half of the vignettes with mitigating information and the other half without. Mothers indicated the intensity of their attributions on a Likert-type scale. Mother's evaluation of wrongness of the child's transgressions was measured with a question that asked, 'How wrong is (transgression depicted in the story)?' Separate questions were asked about hostile/ non-hostile, stable/unstable, global/specific and internal/external attributions related to their own child's transgressions (as described in each vignette). All responses were recorded on a Likert scale. Maternal disciplinary response selections were measured with an open response question. The authors found that high-risk, compared to low-risk mothers reported higher levels of hostile intent, stable and global attributions, aversiveness, annoyance and the use of power-assertion discipline for child behaviour. No overall differences between groups were found for evaluations of wrongness, internal/external attributions, feelings of indifference and use of inductive discipline when mitigating information was present. The authors attributed the lack of these differences to the manner in which the mitigating information was presented in the study. They concluded that if mitigating information was imbedded in a more extensive story description rather than one sentence added at the end of a story, the high-risk mothers would have had greater difficulty in recognizing the material and the observed difference might have been greater. The results of this study support previous studies that have found attributional differences in abusive mothers (Bauer & Twentyman, 1985; Bradley & Peters, 1991; Dopke & Milner, 2000; Larrance & Twentyman, 1983). The study also

supports the social information-processing model (Milner, 1993, 2000) that suggests high-risk compared to low-risk mothers process child related information differently.

De Paul, Asla, Perez- Albeniz and de Cadiz (2006) examined a number of variables in their study in which they aimed to find out if Spanish high-risk mothers differed in their evaluations, attributions, negative affect, disciplinary choices and expectations of compliance than Spanish low-risk mothers. A convenience sample of 1,319 mothers served as an initial participant pool. Based upon CAPI (Milner, 1986) scores 47 mothers were assigned to the high-risk group and 48 to the low-risk group. Vignettes of child transgression (translated in Spanish) from previous studies were used (Chilamkurti & Milner, 1993). The Spanish version of the vignettes consisted of six brief stories depicting a child engaging in transgressions: one half containing mitigating information and one half without mitigating information. Questions were posed to the mothers to measure appraisals of wrongness of the child's transgressions, cognitive attributions (hostile/non-hostile; stable/unstable; global/specific; internal/external) and expectations of compliance. Their answers were recorded on a Likert scale. An audiotape of a crying infant was used as a situational stressor. The authors reported that high-risk mothers made more attributions of hostile intent, internal and global attributions of child behaviour and reported using more power assertion discipline than low-risk mothers. No overall differences between groups were found for stable/unstable attributions, feelings of aversiveness, annoyance, indifference and expectations of compliance. The lack of group differences in stable/unstable attributions contrasts from previous studies (Larrance & Twentyman; 1983; Dopke & Milner, 2000; Montes, de Paul & Milner, 2001). Contrary to expectations no significant risk effect was found for annoyance even though such effects were found in previous studies (Bauer & Twentyman,

1985; Montes, de Paul & Milner, 2001). Also, contrary to expectations, low-risk mothers evaluated personal transgressions as more wrong than high risk mothers. The groups were similar in their evaluations of moral and conventional transgressions. This data contrasts with the findings of Chilamkurti and Milner (1993) and Caselles and Milner (2000) who found that the abusive and at-risk group viewed personal transgressions as more wrong than low-risk comparison mothers. In the study high-risk mothers, showed similar scores as low-risk mothers on hostile and internal attributions with mitigating information present. The authors highlighted that the mitigating was quite obvious in the vignettes. One speculation was that if mitigating information was imbedded in a more extensive story description in the vignette, the high-risk mothers may have greater difficulty recognizing the material as important, and the observed differences might have been greater (Montes, de Paul & Milner, 2001).

Milner and Foody (1994) investigated the impact of mitigating information on attributions for positive and negative child behaviour made by high-risk and low-risk mothers. Children's behaviour was described in a set of vignettes consisting of positive child behaviour, positive behaviour with mitigating information, negative child behaviour and negative behaviour with mitigating information. Before presenting the vignettes the mother's were asked to imagine their own or someone else's child. Following presentation of each vignette the mothers were asked to respond to an open-ended question about 'what led up to or caused the child's behaviour'? The responses were audiotaped and evaluated by blind raters. Mothers provided responses on a Likert scale to specific attributions questions. Separate questions were asked about internal/external; stable/unstable; global/specific; intentional/unintentional attributions related to the child's behaviour.

Although no overall group differences in attributions were found, the interaction between risk group status and receipt of mitigating information was significant for several attributions. Low-risk participants showed a significant change towards unstable and unintentional attributions following the receipt of mitigating information relating to the child's behaviour, whereas high-risk participants did not change the degree of stable/ unstable or intentional/ unintentional attributions following the receipt of mitigating information. Both low and high-risk participants made more external attributions after receiving the mitigating information. The impact of mitigating information on attributions was independent of whether the child was their own or someone else's child. No specific differences were found for specific /global attributions. As observed in other studies (Montes, de Paul & Milner, 2001; De Paul, Asla, Perez- Albeniz & de Cadiz, 2006) the authors reported that mitigating information was presented in the form of an additional sentence in a brief vignette. It is possible that in situations where the mitigating information was more difficult to observe (e.g. imbedded in a complex social situation) and / or if stress was present, the high-risk compared to the low-risk mothers were possibly less likely to consider the mitigating information. Although this study provides some support for differences in high-risk and low-risk parents the putative reason for the differential impact of mitigating information on high-risk and low risk physically abusive parents judgment needs to be investigated in greater detail.

*Summary:* Five of the six studies comparing high-risk and low risk mothers primarily found overall attributional differences. Dadds, Mullins, McAllister and Atkinson (2003) found that abuse-risk parents made more internal attributions about the causes of their child's negative behaviour and external attributions to positive

behaviour. Dopke and Milner (2000) found that after repeated child non-compliance, high-risk mothers made more intentional and stable attributions about the child's behaviour; while Montes, de Paul and Milner (2001) found they made more global, hostile and stable attributions and displayed higher levels of aversiveness and annoyance to the child's negative behaviour. Dopke and Milner (2000) contradicted previous research findings by Chilamkurti and Milner (1993), who studied abusive mothers, and did not find that high-risk mothers assessed child transgressions as more wrong or serious than low-risk mothers after repeated transgressions. De Paul, Asla, Perez- Albeniz and de Cadiz (2006) found high-risk mothers made more hostile, internal and global attributions; however contrary to other studies (Caselles & Milner, 2000; Chilamkurti & Milner, 2001) low-risk mothers evaluated personal transgressions as more wrong than high-risk mothers. Moreover no differences in groups in hostile and internal/ external attributions were found when mitigating information was present. Milner and Foody (1994) investigated the effects of mitigating information on positive and negative child behaviour. They did not find overall attributional differences between high-risk and low-risk mothers, however the interaction between risk group status and receipt of mitigating information was significant for several attributions. Therefore overall the studies indicate that there are attributional differences between high-risk and low-risk mothers however the type of cognitive attributions vary and this could possibly be due to methodological differences between the studies.

## DISCUSSION

The twelve studies reviewed reported generally supportive results with respect to attributional differences in abusive/ high-risk and non-abusive / low-risk parents. There was support for differences in attributional style on the following dimensions: internal-external (Bradley & Peters, 1991; Larrance & Twentyman, 1983; Dadds, Mullins, McAllister & Atkinson, 2003; De Paul, Asla, Perez- Albeniz & de Cadiz, 2006); stable- unstable (Dopke & Milner, 2000; Larrance & Twentyman, 1983); global-specific (De Paul , Asla, Perez- Albeniz & de Cadiz, 2006; Montes, de Paul & Milner, 2001); hostile intent and responsibility (De Paul, Asla, Perez- Albeniz & de Cadiz, 2006; Dopke & Milner, 2000; Montes de Paul & Milner, 2001; Bauer & Twentyman, 1985). It was also found that abusive/high-risk mothers perceived minor child transgressions as more negative (Caselles & Milner, 2000; Chilamkurti & Milner, 1993; Wood- Shuman & Cone, 1986; De Paul, Asla, Perez- Albeniz & de Cadiz, 2006). However, a few studies (Rosenberg & Reppucci, 1983; Milner & Foody 1994) failed to find overall attributional differences. The studies reviewed also provided some support for the cognitive behavioural model and social information model of child abuse (Larrance & Twentyman, 1983; Twentyman, Rohrbeck, & Amish, 1984; Milner, 2000). It is of note that the studies varied considerably in their definitional criteria, methodology and design. The general limitations of the studies and considerations for future research are discussed in detail.

### Definitional Issues

A main issue with the studies reviewed was that different criteria were used to define child abuse study groups and the comparison groups. Results were based on high-risk/at-risk mothers; physically abusive parents; and mixed groups of physically abusive and neglectful parents. Even when studies used the same broad category of parents (e.g. physically abusive parents), definitions varied. For example, some parents were confirmed physically abusive/ high-risk by social services agencies (e.g. Rosenberg & Reppucci, 1983; Larrance & Twentyman, 1983; Bauer & Twentyman, 1985) some were recruited from social services agencies and the CAPI (Milner, 1986) was administered (Dadds, Mullins, McAllister & Atkinson, 2003; Dopke & Milner, 2000; Montes, de Paul & Milner, 2001; Caselles & Milner, 2000; Chilamkurti & Milner, 1993) others were recruited from schools/colleges on the basis of CAPI score (De Paul, Asla, Perez- Albeniz & de Cadiz , 2006; Milner & Foody, 1994), some were a part of another study (Wood-Shuman & Cone, 1986), while others did not specify where the sample was recruited from (Bradley & Peters, 1991). Although there was awareness that demographic variables need to be controlled some authors failed to use adequately matched abusive and control groups, which may have caused confounding results (Bradley & Peters, 1991). Thus, when demographic differences existed between the study groups it was not known if the observed differences in the dependent variables under investigation were due to abuse/no-abuse group differences and/or due to demographic group differences.

Further, there could be potential confounding effects (of the abuse report, the investigation and the intervention) on the cognitions of physically abusive mothers. It was not clear if the cognitive differences preceded the abusive behaviour or were a consequence of the abuse. In the case of studies that recruited high-risk/ at-

risk parents, other than the study by Wood- Shuman and Cone (1986), who investigated the differences between, abusive and high-risk mothers, none of the studies looked at differences in cognitive attributions between high-risk/at-risk and abusive parents. Critically, high-risk parents studies have thus far not been used to predict later abusive behaviour on the basis of parental attributions. This would be a critical test of the importance of attributions as a causal factor in physical abuse.

### *Gender Bias and General Intellectual Ability*

All studies reviewed revealed a gender bias. Research studies have demonstrated differences between parenting styles and psychosocial factors of mothers and fathers, such as mothers showing a more authoritative style (versus authoritarian style by fathers) and higher levels of parental stress and depression (Aunola, Nurmi, Onatsu-Arviolommi & Pulkkinen, 1999). There is also data to suggest that fathers, relative to mothers, may be more reactive to stressful child stimuli, such as a crying child (Brewster, Nelson, McCanne, Lucas & Milner, 1998). Therefore there is a need to explore the attributions of fathers and investigate whether differences exist between parental attributions on the basis of gender.

Previous studies have demonstrated that there appears to be a relationship between problem-solving skills deficit and child maltreatment (Kelly, 1983). Failure to solve problems related to parenting and other aspects of daily living is hypothesized to result in frustration or inability to cope and lead to deviant behaviour such as aggression or neglect (Wolf, Kaufman, Aragona & Sandler, 1981). In the studies reviewed only three measured the general intellectual ability (Intelligence Quotient, IQ) of the perpetrators of physical abuse. The measure used was the Shipley Institute of Living Scale (Shipley, 1967), a brief measure of intellectual

functioning, designed to detect mild degrees of intellectual impairment. These studies did not reveal a difference in the intellectual functioning of physically abusive and non-abusive mothers. Future studies need to investigate the general intellectual ability and problem solving ability of abusive/ at-risk and non-abusive parents so as to ascertain whether there is a difference in the groups and also to explore whether abusive parents have a generalized problem solving deficit, or whether the deficit is specific to child management difficulties.

#### *Ethnic and Cultural Consideration*

The majority of the studies reviewed were undertaken in the United States of America (Bauer et al. 1985; Bradley et al. 1991; Caselles et al., Chilamkurti et al., De Paul et al., 2006; Dopke et al., 2000; Larrance et al., 1983; Milner et al., 1994; Rosenberg et al., 1983; Wood-Shuman et al., 1986), two were completed in Spain (Montes et al., 2001; De Paul et al., 2006) and one in Australia (Dadds et al., 2003). It is also of note that the ethnicity of most of the participants was Caucasian. Therefore it is not clear the extent to which the findings of these studies reviewed can be generalized to other ethnic groups. It would be useful to investigate and explore the attributions of abusive/ at-risk and non-abusive parents from different ethnic groups so as to ascertain similarities and differences.

#### *Child Age and Gender*

In the studies reviewed the age of the children varied. In some of the studies the children were under six years (Bauer & Twentyman, 1985; Dadds, Mullins, McAllister and Atkinson, 2003; Larrance & Twentyman, 1983) while in others the children were between six and twelve (Bradley & Peters, 1991, Caselles &

Milner, 2000, Chimalkurti & Milner, 1993; De Paul, Asla, Perez- Albeniz & de Cadiz, 2006; Montes, de Paul & Milner, 2001) and some authors did not report the child's age (Dopke & Milner, 2000). Research has yielded mixed findings regarding the association between age and child physical abuse. Some authors have reported that the risk of abuse peaks between the ages of 3 and 12 years, with children outside of that range experiencing relatively less risk (Wolfner & Gelles, 1993; Sedlak & Broadhurst, 1996, cited in Milner 2003). Others have reported little associations between child age and physical abuse (Connelly & Straus, 1992) or negative associations between minor (but not severe) physical abuse and age (Straus, Hamby, Finkelhor, Moore & Runyan, 1998). Studies on child gender and physical abuse are similarly inconsistent, with some reporting no gender differences while others reporting differences in certain circumstances (Wolfner & Gelles, 1993). Longitudinal studies examining the link between gender/ age of the child and parental cognitive attributions and abusive behaviour would be informative in understanding whether child's age/gender are potential risk factors of child physical abuse.

#### *Eliciting and Measuring Attributions*

Across the studies there were different ways of eliciting parental attributions. These included photographs of different scenarios (Larrance & Twentyman, 1983), audiotapes (Bauer & Twentyman, 1985) and videotapes of one's own child and unfamiliar children (Dadds, Mullins, McAllister & Atkinson, 2003). The majority of studies used vignettes that usually required the parent to imagine their own child in a particular situation. Advantages of utilizing vignettes include the controllability of child behaviour stimuli across participants and increased

comparability of child behaviour across participants. However disadvantages may be lack of ‘genuineness’, there is no guarantee that the participant’s child has engaged in the referred-to behaviour before and varying interpretations of the same written scenario may occur across parent participants. The studies were also difficult to evaluate and compare because different methods had been used to measure cognitive factors. Many of the assessments were investigator – or study-specific measures (e.g. specific vignettes and coding systems). There appeared to be a paucity of information on the psychometric characteristics of the cognitive assessments. Multiple–measure, multiple-method approaches to the assessment of cognitive factors were not used, which may limit the reliability of the results.

As aforementioned, in the studies reviewed attributions were elicited from vignettes, video formats audiotapes and picture stimuli and were measured either on Likert scales or through open-ended questions. A study by Johnston Reynolds, Freeman and Geller (1998) compared parental responses with open-ended questions to more traditional Likert-type ratings of causal attributions. They found that although the methods produced reasonable agreement they were far from overlapping and each contributed unique information concerning parental causal reasoning. Likert scales are designed to measure multiple attribution dimensions, with one dimension being assessed on each scale. Thus multiple attribution dimensions can be rated but usually only one ‘cause’ can be assessed. This is a limitation, in that parents are often able to attribute their child’s behaviour to more than one cause, but because of the ways in which researchers usually set up the rating scales, these scales only allow for assessment for one reason. Conversely, open-ended questions about their child’s behaviour allow parents to give as many or as few attributions as they like (Milner & Foody, 1994). Unfortunately some parents

may provide elaborate and multiple reasons, whereas others may provide single causal attributions. This may create problems for the researchers when coding the open-ended response material. A multi-method of assessment of constructs may help to strengthen conclusions.

### *Design Issues*

Research on maladaptive attributions by parents has relied mainly on correlational method, typically measuring parental attribution after an event has taken place or after presenting hypothetical child behaviour scenarios. In all the studies reviewed the design has been cross-sectional. With a cross-sectional design it is not possible to tease out the sequential relationship between variables. It also does not allow for follow-up to determine the degree to which cognitive attributions and coercive parenting are in fact related during real life parenting challenges. Therefore, it is possible that a parent appears high-risk for abuse and demonstrates certain dysfunctional attributions however when presented with real-life parenting situation other factors could compensate for these maladaptive attributions, or conversely increase even further the likelihood of abuse.

An exception was found in the study by Slep and O'Leary (1998), who experimentally manipulated attributions to better assess a causal relationship between maternal attributions for child misbehaviour and maternal child centered responsibility attributions, of their hard-to-manage toddlers misbehaviour. The authors found that mothers in the 'child-responsible' condition compared to mothers in the 'child-not- responsible' condition attributed negative intent to their child's behaviour and were more over-reactive in their discipline, including a trend towards greater anger. Therefore experimentally induced differences in the nature of mother's

attributions caused differences in mother's discipline style, subjective anger and in the child's negative affect. Studies such as those by Slep and colleagues (1998) could provide further insight into potential causal actors of abuse. Understanding the impact and process of specific mediators and moderators may provide guidance for key points of intervention.

Finally, in the majority of the studies reviewed generalisability was limited due to the small sample size (Rosenberg & Reppucci, 1983; Larrance & Twentyman, 1983; Bauer & Twentyamn, 1985; Wood- Shuman & Cone, 1986; Bradley & Peters, 1991). Due to lack of power such studies may also be prone to Type II error.

### **Conclusions and Further Direction**

The twelve studies outlined here revealed generally supportive results of overall attributional differences between physically abusive/ high-risk and non-abusive/low risk parents. A number of concerns have been highlighted pertaining to definitional, sampling and design issues. Further research would benefit from focusing on well-designed longitudinal studies with larger sample sizes, using multi-method approaches examining the causal relationship between parental attributions and child abuse.

Attribution theory provides a powerful framework for understanding the cognitive, emotional and behavioural processes that may be involved in physical maltreatment. Parental attributions affect the parent's immediate and behavioural responses, in addition to the long-term quality of the parent child relationship (Bugental, Johnstone, New & Silverstone, 1998). Dysfunctional child-centered cognitions are assumed to influence a parent's disciplinary style. These dysfunctional attributional tendencies can in turn increase the anger that a parent might feel in

response to a child's behaviour (Weiner, 1986). At times it may be difficult for parents to recognize patterns of cognitive deficits and distortions. Therefore it is imperative to consider dysfunctional parent cognitions for effective interventions. For example, the use of programs that focus only on the development of parenting skills may be ineffective if problems exist regarding parental dysfunctional attributions, evaluations and interpretations of the child's behaviour. One option is to directly address these maladaptive cognitions by including cognitive components in interventions designed for individuals at risk, such as attributional retraining (Sanders et.al., 2004).

Parental child-centered cognitions are only one aspect of the maladaptive parent-child exchange. Understanding the cognitive attributions of abusive parents is a complex process. Cognitive vulnerabilities alone are unlikely to be sufficient for the occurrence of abuse. Interactions with additional factors such as an ability to inhibit aggression, problem-solving capabilities, parenting skills, social isolation and societal context need also to be considered. In order to effectively address child abuse, it must be acknowledged that multi-level complex interactions between individual characteristics, relationship histories and contextual variables influence these exchanges. Multidimensional approaches that are designed to address individual, family and societal contributions to child abuse risk need to be implemented to effectively tackle this major societal issue.

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**Part 2: Empirical Paper**

**The Longitudinal Influences of Maternal Mind-Mindedness and Maternal Sensitivity on Child Emotion Regulation**

## ABSTRACT

**Aims:** This longitudinal study investigated the role of maternal mind-mindedness and maternal sensitivity on the child's emotion regulation abilities.

**Methods:** 85 mother child-dyads were recruited through the University of Reading's Child Development Group database. Mother-child-interactions, child's reactivity and emotion regulation were videotaped and coded when the child was 15 (Time 1) and 24 (Time 2) months old, in a frustration-eliciting situation, the Attractive Toy Task (Laboratory Temperament Assessment Battery, Goldsmith & Rothbart, 1991). At Time 1, maternal sensitivity was coded using the Global Rating Scale of Mother- Child Interaction (Gunning, Fiori-Cowley & Murray, 1999) and maternal-mindedness was coded using an adaptation of the Mind-Mindedness Coding Manual (Meins & Fernyhough, 2010).

**Results:** As predicted, there was a relationship between maternal sensitivity and maternal mind-mindedness; however the association between maternal mind-mindedness and maternal sensitivity was confounded by maternal verbosity. Mind-mindedness and maternal sensitivity at 15 months did not have an impact on the child's emotion regulation ability at 15 or 24 months. No evidence was found of maternal sensitivity mediating the relationship between mind-mindedness and the child's emotion regulation ability.

**Conclusions:** Overall, the present study found support for the concept that maternal mind-mindedness is linked to maternal sensitivity in emotionally challenging situations. Further research capturing the dynamic nature of emotion regulation by time synchronized and multi-temporal analysis is warranted so as to investigate the contribution of parental sensitivity and mind-mindedness in the child's emotional development.

## INTRODUCTION

### Emotion Regulation

Research on emotion regulation has rapidly increased in the past decade. Emotion regulation is a dialectical construct involving both emotion as a *behaviour regulator* and as a *regulated phenomenon* (Campos, Campos & Barrett, 1989; Cole, Michel & Teti, 1994; Kopp, 1989). It has been defined as the extrinsic and intrinsic process responsible for monitoring, evaluating and modifying emotional reactions, especially their temporal and intensive features, to accomplish certain goals (Thompson, 1994). It has been suggested that there are several ways in which emotions may be regulated, these include, neurophysiological responses, attentional processes, attributions, access to coping resources, exposure to environment and response behaviours (Calkins, 1994; Campos, Campos, & Barrett, 1989; Cole, Michel, & Teti, 1994; Kopp, 1989; Thompson, 1994; Walden & Smith, 1997).

Emotion regulation develops continually over the lifespan, from infancy to senescence, because individuals face new emotional challenges at every stage of development. However, many researchers consider the toddler years to be the most salient period of emotion regulation development (Calkins, Gill & Williford, 1999; Kopp, 1989). Research in children's emotional competence has emphasized the importance of emotion regulation skills to children's socio-emotional functioning (Barrett & Campos, 1987; Parke, Cassidy, Burks, Carson & Boyum, 1992; Saarni, 1999). An early study suggested emotions as begin innate behavioural response patterns in newborns, which become more regulated throughout childhood in response to socialization (Goodenough, 1931, cited in Calkin, 1994). Within this context, emotion regulation has been often defined in relation to the child's ability to monitor, evaluate and modify emotional reactions in order to achieve individual

goals and facilitate adaptation to the social environment (Campos, Mumme, Kermoian & Campos, 1994, cited in Thompson, 1994). This definition suggests that children must learn to manage both their emotional expression and emotional arousal to adapt within a given social context (Saarni, 1999). A number of studies have also investigated the use of certain behaviours hypothesized to be regulatory. For example behaviours such as self-soothing, withdrawal, dealing with the stimulus, gaze aversion, distraction and active stimulation (Grolnick, Bridges, & Connell, 1996, cited in Crockenberg & Leerkes, 2006; Mangelsdorf, Shapiro & Marzolf, 1995; Rothbart, 1986) have been identified as putative regulatory behaviours emerging in early development.

Although temperament has genetically influenced physiological underpinnings and has previously been assumed to be stable across the lifespan, there is ample evidence that environment influences the phenotypical manifestations of temperament, especially early in life (Rothbart & Bates, 2006). Both the reactivity and emotion regulation dimensions appear to change over time. In a cross-sectional study of infant reactions to strangers, Mangelsdorf, Shapiro and Marzolf (1995) noted differences in emotion regulation strategies among 6-month old, 12 month-old and 18-month old infants and attributed change in strategy use to the developing motor, social and attention systems of infants across these ages. Focusing on both aspects of temperament and using a longitudinal design, Braungart-Rieker and Stifter (1996) detected a distinction between reactivity and regulation at both 5 months and 10 months of age, but over time the association between the two constructs changed. Early in life, reactivity was related to regulation, but by 10 months, infants had developed regulatory skills, which were independent of their reactive tendencies. The authors concluded that endogenous factors (e.g., maturation of cognitive and

neurological systems) and/or exogenous factors (e.g., caregiver assistance in regulation) might have contributed to these temperamental changes over time.

A very important aspect of emotion regulation concerns its relations to child and environmental variables (e.g. family and culture). The transaction of the child's temperament and caregiver characteristics and behaviours (e.g. attachment and parenting style) in the development of emotion regulation is considered to be of particular importance (Calkins, 1994). From this perspective emotion regulation develops largely in the context of the relationship between the child and his/her caregivers (Fuchs & Thelen, 1988; Hardy, Power & Jaedicke, 1993, cited in Calkins, 1994; Zeman & Shipman, 1998). Much infant/child research on the development of emotion regulation emphasizes the gradual transition between the infant's initial reliance on the caregiver for direct regulatory assistance (Spangler & Grossman, 1993; Spangler, Schieche, Ilg, Maier, & Ackerman, 1994) and the infant's progressive internalization of emotion regulation (Calkins, Smith, Gill, & Johnson, 1998; Thompson, 1994), bolstered by increasing mastery of self-regulatory strategies such as attention shifting, active coping, or selective approach and avoidance (Kobak, Cole, Ferenz- Gillies, Fleming, & Gamble, 1993; Rothbart, Ahadi & Heshey, 1994). Therefore it appears that the development of self-regulation hinges on both the infant's capacity for utilizing necessary regulatory strategies and the parent's sensitivity in meeting the regulatory needs of the infant.

It is of note that although research has been conducted in the child's emotion-regulation abilities, relatively little is known about the sources of individual differences in the quality and effectiveness of parents' efforts to support children's emotional-regulation efforts. Some studies have found evidence that parents with secure attachment histories provide more effective emotional scaffolding for infants

and children during challenging tasks (Kobak, Everhart, Seabrook & Ferenz-Gillies, 1994; Matas, Arend & Sroufe, 1978, cited in Thompson, 1994; Shipman & Zeman, 2001) but little is known about the mechanisms by which such parental factors influence the quality of parental support for the child's emotion-regulation or their role in supporting the development of child's emotion-regulation skills over time.

### Maternal Sensitivity

Maternal sensitivity refers to the ability to perceive infant signals, to interpret these signals correctly and to respond to these signals promptly and appropriately (Ainsworth, Blehar, Waters & Walls, 1978; Leerkes, Blankson & O'Brien, 2009). There are a number of ways in which maternal sensitivity has been assessed in studies including Ainsworth's Maternal Sensitivity Scale (Ainsworth, Blehar, Waters & Wall, 1978), The Maternal Behaviour Q-sort, (Moran, Pederson, Pettit & Krupka, 1992) and The Global rating Scales of Mother-Child Interaction (Gunning, Fiori-Cowley & Murray, 1999).

Maternal sensitivity/ responsiveness has been shown to modulate infant affect (Haley & Stansbury, 2003), have an effect on attachment security and a number of other social and emotional domains (Ainsworth, Blehar, Waters & Walls, 1978; Shipman & Zeman, 2001; Kochanska, 2002). A few studies have indicated that sensitivity may indeed influence children's emotion regulation skills. Propper and Moore (2006), for example, found evidence that even if infants are highly reactive in early infancy, they may become well adjusted and socially adept if they have sensitive parents. To explore the effects of maternal behaviour on infant emotional development, van den Boom (1994) taught mothers of highly reactive six-month-old infants to respond sensitively to their infants' cues. At nine months, their infants

engaged in more sophisticated exploration of the environment, self-soothed more effectively and were more sociable than irritable infants whose mothers did not receive the intervention. In contrast, insensitive responses from the caregiver, such as, dismissing, or ignoring negative emotions have been demonstrated to teach the child to minimize, mask or over-regulate negative emotions rather than express them or regulate them in an adaptive fashion (Cassidy, 1994). Maternal sensitivity therefore appears to be an important variable in helping the child to regulate their emotion.

### *Rethinking Maternal Sensitivity*

Some researchers have pointed out that Ainsworth's description of sensitive mothers as being capable of seeing things from the child's point of view has been much ignored (Fonagy & Target, 1997; Meins, Fernyhough, Fradley & Tuckey, 2001; Oppenheim & Koren-Karie, 2002) and they have emphasised that it is not merely the mother's prompt but accurate response to the infant's signals that is crucial to sensitivity. Several lines of inquiry suggest that along with maternal sensitivity the mothers capacity to accurately interpret the child's subjective state in terms of mental attitudes such as emotions, thoughts and beliefs is an important intervening variable (Gottman, Katz & Hooven, 1996; Meins, Fernyhough, Fradley & Tuckey, 2001; Fonagy, Gergely, Jurist & Target, 2002). It would seem self-evident that such ability might be particularly important when the parent is attempting to help the child manage his or her emotions.

Fonagy and colleagues' (1991; 1995; 1998) speculated that parents' 'reflective functioning', that is, their ability to use a non-defensive, open thought process regarding their children's mental states, feelings, and the motives underlying

their behaviour, provides the basis for appropriate, emotionally containing (Bion, 1962) responses. This, in turn, enables the child to organize her feelings in a coherent and effective manner—as is typical of the securely attached infant (Fonagy, et.al., 1995; Fonagy, Steele, Moran, Steele, & Higgitt, 1991). In that sense, the parent's reflective functioning allows them to establish a caregiving environment around the child that supports her emotional regulation. The capacity of reflective function has been coded from both parents' adult attachment narratives as well as from interviews designed to assess the parents' representation of the child and has been related to concurrent and subsequent infant attachment security (Fonagy, Steele & Steele, 1991; Schechter et al., 2005; Slade, Grienenberger, Bernbach, Levy & Locker, 2005).

Another construct closely related to reflective functioning is that of maternal insightfulness - the capacity to see things from the child's point of view and the parent's sensitive guidance of dialogues about emotional experiences (Oppenheim & Koren-Karie, 2002). The view that maternal insightfulness into the child's world underlies sensitive caregiving and leads to secure attachment also has deep roots in attachment theory. According to Oppenheim and colleagues (2004) sensitive mothers use their insightfulness and base their interventions on the infant's perspective. In contrast, insensitive mothers draw upon their own states, wishes and general ideas about infants' needs or other determinants unrelated to the infant's specific emotional needs (Koren-Karie, Oppenheim, Dolev, Sher & Etzion-Carasso, 2002). This approach of measuring insightfulness is a very broad and multi-component method, which focuses not only on the here and now mother-child interactions but also on the child's characteristics in different situations, parent's underlying motives and information on the mother's parenting role in general.

*Maternal Mind-Mindedness (Meins, 1997)*

There has been a recent surge of interest in mother's verbal attributions of mental states to their infants, or mind-mindedness (Lundy, 2003; Meins, Fernyhough, Fradley & Tuckey, 2001; Meins, et.al., 2003). Meins and colleagues (2001) coined the term mind-mindedness to refer to the mother's propensity "to treat the infant as an individual with a mind rather than merely a creature with needs that must be satisfied" (Meins, Fernyhough, Fradley, & Tuckey, 2001, p. 638). Maternal mind-mindedness is a construct at the interface between behavioural and representational operationalisations of the caregiver-child relationship. According to Meins and colleagues (2001) in order to be mind-minded caregivers must first form a representation of the infant's internal state and then use the representation to inform their behavioural engagement with the child. Mothers' capacity to consider their infant as an intentional individual governed by mental life allows them to attribute meaning to the infant's behavioural signals (crying, looking away etc.) and thus to respond accurately to the underlying need (Meins & Fernyhough, 1999).

Meins and colleagues (2001) operationalised mind-mindedness as the parents' tendency to spontaneously comment appropriately on the infants' internal states during interactions. Assessing mind-mindedness therefore involves identifying discourse in which the caregiver comments on the infant's putative internal state (Meins, Fernyhough, Fradley, & Tuckey, 2001). The coding of mind-minded comments focuses on the here-and-now interactions between the mother and the child and not on the general characteristics of the child, the attachment history of the parents or the mother's parenting role. In the majority of studies, mind-mindedness has been scored from video-recorded interactions between mothers and babies.

However in a prospective study using an interview measure to assess mind-mindedness, Meins (1998) demonstrated that mothers of infants previously classified as securely attached were more likely than mothers of insecurely attached infants to focus their descriptions around their children's mentalist attributes at age three. In addition to this, Meins, Fernyhough, Fradley, and Tuckey (2001) used both behavioural and linguistic indices of mind-mindedness as manifested during mother-infant interactions and found that they were positively correlated with maternal sensitivity; however only the maternal mind-minded comments were significantly related to security of attachment at 12 months and mind-mindedness was found to be a better predictor of attachment security than observer rating of maternal sensitivity. The concept of mind-mindedness thus shares much in common with the closely related concepts of reflective function and maternal insightfulness, all of which emphasise the central importance of the parent's capacity to think about the child's thoughts and feelings when responding sensitively to their needs. There are however significant differences in the ways and contexts in which these constructs are measured.

Given the importance of maternal mindedness and maternal sensitivity in understanding the child's experiences and emotional needs, it would seem highly plausible that mothers high in mind-mindedness and maternal sensitivity would be able to more effectively support their child's emotional regulation in stress-eliciting contexts. However, to date this hypothesis has not been subjected to empirical scrutiny.

The current longitudinal study thus aimed to assess the relationship between maternal sensitivity, maternal mind-mindedness and the child's emerging capacity of self-regulation in a lab-based challenging task at 15 months. The child's emotion-

regulation ability was again assessed at 24 months of age in order to investigate the role of maternal mind-mindedness and sensitive parenting in the child's capacity to regulate emotions over time. The study has the following aims:

- 1) To investigate the relationship between maternal sensitivity and maternal mind-mindedness.
- 2) To test the hypothesis that children whose mothers demonstrate higher levels of mind-mindedness and maternal sensitivity at 15 months will be more able to regulate their emotions at 15 months.
- 3) To test the longitudinal hypothesis that earlier (15 month) mind-mindedness and maternal sensitivity predict the emergence of better emotion-regulation skills in the child in later development (24 months).
- 4) To investigate, cross-sectionally and longitudinally, whether maternal sensitivity mediates the relationship between mind-mindedness and child emotion regulation.

## **METHOD**

### ***Participants***

85 mother-child dyads participated in the study. Recruitment was through the University of Reading's Child Development Group database. Mothers received a £10 gift-card for their participation in the study. Table 1 provides details of the mother and child characteristics.

**Table 1: Demographic Variables of Mothers and Children**

Variables	Mothers and Child Variables
Child age at 15m assessment	
<i>M, SD</i>	15.13 (.331)
<i>Range</i>	14.11-15.99
Child age at 24m assessment	
<i>M, SD</i>	24.13 (.231)
<i>Range</i>	24.11- 25.99
Child's Gender	
<i>Male (Sum)</i>	46
<i>M, SD</i>	2.82 (1.17)
<i>Female (Sum)</i>	39
<i>M, SD</i>	2.69 (1.13)
Mother's Age	
<i>M, SD</i>	34 (4.68)
<i>Range</i>	23-46
Mother's Ethnicity (%)	
<i>White (Caucasian )</i>	80.1
<i>Asian</i>	14.2
<i>Afro-Caribbean</i>	2.4
<i>Other</i>	3.3
Mother's Education (%)	
<i>Postgraduate Degree</i>	29.4
<i>University Degree</i>	32.9
<i>A-Levels</i>	9.4
<i>GCSE</i>	4.7
<i>NVQ</i>	17.6
Mother's Marital Status (%)	
<i>Married &amp; Cohabiting</i>	70.6
<i>Unmarried &amp; Cohabiting</i>	15.3
<i>Single</i>	8.2
Mother's Occupation (%)	
<i>Employed (Full-Time)</i>	8.2
<i>Employed (Part-Time)</i>	47.5
<i>Self employed</i>	7.1
<i>Unemployed</i>	33
<i>Student</i>	1.2
Family Income per annum (%)	
<i>£70000+</i>	32.9
<i>£50,000-£70,000</i>	18.4
<i>£30,000-£50,000</i>	30.3
<i>£20,000-£30,000</i>	10.5
<i>£10,000-£20,000</i>	2.6
<i>Less than £10,000</i>	5.3

m= months; Sum = Total Number; % = Percentage; M = Mean; SD= Standard Deviation

### Procedure

Once the mothers were contacted and they agreed to participate in the study they were sent an information sheet (Appendix A) consent form (Appendix B), demographics questionnaire (Appendix C) and the Centre for Epidemiologic Studies Depression Scale (Appendix D).

### Time 1 Testing (15 months assessment)

The testing session was carried out in the University's Developmental Research Laboratory. Mothers were provided verbal instructions about their role in the Attractive Toy Task. Each mother was introduced to the testing room and the child was first seated in a highchair and presented with a novel, attractive toy and allowed to play with it for 15 seconds. After this period the researcher removed the toy and placed it behind a plexiglass screen. This process was repeated, totaling four separations from the toy, each with 15 seconds of play in between to maintain the child's interest. During the first two retraction episodes the mother was instructed to remain neutral and not interact with the child (referred to as the 'mother-not-involved' episodes). These two episodes allowed for the observation of the child's reactivity and emotion regulation without external support. (Appendix E)

In the third toy retraction episode, the mother was asked to interact with the child verbally without the use of physical contact ('mother-verbally-involved'). This episode led to observations of how the child responds to the frustrating task with the mothers' support.

In the final retraction, the 'mother-freely-involved' episode, the toy was placed on the floor and the mother was asked to remove her child from the highchair but still not allow him/her to play with the toy. She was asked to interact with the

child verbally and physically but keep him/ her from touching the toy. The purpose of this episode was to allow for a more naturalistic observation, enabling mothers to intervene more flexibly. The mother-child interactions were video taped for the duration of the task. Each of the episodes ('mother-not-involved'; 'mother-verbally-involved'; 'mother-freely-involved') were divided into 5 second epochs, with trials being timed from the point that the researcher removed her hand from the toy once it had been placed behind the barrier.

The child's negative reactivity and emotion regulation abilities during the task were coded using The Laboratory Temperament Assessment Battery Operation Manual (Goldsmith & Rothbart, 1991); during the same interactions maternal sensitivity was coded using the Global Rating Scale of Mother- Child Interactions (GRS; Gunning, Fiori-Cowley & Murray, 1999. See Below).

After completion of the task mothers were shown the recording of the task and they were interviewed regarding their understanding of the child's behaviour and emotions. The interview questions included: (1) *How do you think the task went?* (2) *Can you describe to me what happened?* (3) *Did he/ she like the toy?* (4) *How do you think your child responded to this situation? (Prompt for both thoughts and feelings, if they do not emerge spontaneously)* (5) *Why did he/she respond like this?* (6) *When did he/she feel most ...(in relation to question 4).* The questions were asked in relation to several salient moments during the task, such as, when the toy was removed or when the child was playing with the toy. This interview was video recorded and later coded using the Mind-mindedness Coding Manual (Meins & Fernyhough, 2010. See Below).

### Time 2 of Testing (24 month assessment)

Mothers were contacted by mail/email/telephone when their child was nearing 24 months of age and invited to come to the University for the second testing session. Similar to Time 1 the mother –child interaction were videotaped while administering a modified version of the Attractive Toy Task. The child's negative reactivity and emotion regulation abilities were again coded using The Laboratory Temperament Assessment Battery Operation Manual (Goldsmith & Rothbart, 1991).

### Measures

#### Centre for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977)

The CES-D is a short (20-item), self-report scale and one of the most commonly used screening instruments for assessing symptoms of depression in the general population. In the current study, this scale was used to measure maternal depressive symptoms, which have been found to be predictive of children's emotional and behavioural problems in longitudinal studies (Alpern & Lyons- Ruth, 1993). The scale ranges from 0 'Rarely or not at all' to 3 'Most or all of the time'. Reliability and validity have been acceptable across a variety of demographic characteristics including age, education and ethnicity (Radloff, 1977; Radloff & Teri, 1986).

#### The Laboratory Temperament Assessment Battery (Lab-TAB; Goldsmith & Rothbart, 1991)

The Attractive Toy Task, a subtest of the loco-motor version of the Laboratory Temperament Assessment Battery was administered. The task aimed at

eliciting frustration and anger by placing a toy, which the child had been playing with behind a barrier. This action was representative of the type of frustration a child typically encounters when exploration or play is blocked. The purpose was to measure parenting- child interaction and emotional reactivity and regulation in an emotion-eliciting context.

The loco-motor version of Lab-TAB has been developed for 12-month-olds to accommodate children who have learnt to crawl/walk. The older, preschool version (Goldsmith, Reilly, Lemery, Longley & Prescott, 1999) developed for 3-5-year-old children does not include the Attractive Toy Task as an age appropriate test. However, for the present study it was important to continue using the same task across two time points to track changes over time. Therefore at Time 2 (24 months) the task was modified slightly to be age appropriate and pilot testing was conducted to ensure that the task remained a valid measure of negative reactivity and emotion regulation with the older age groups without having to make any major modifications that could potentially mask normative change.

#### *Coding Child's Negative Reactivity (Time 1 and 2)*

Child reactivity was coded independently for Time 1 and Time 2 by video-playback of the Attractive Toy Task. The coding scheme was based on a modification of the coding scheme from the Lab- TAB operational manual (Goldsmith & Rothbart, 1991).

The child's negative emotion reactivity variables included *facial anger scored on 0-3 scale, distress vocalisation scored on a 0-5 scale and struggling scored on a 0-4 scale* (Definitions, Appendix F). In addition to using the original Lab-Tab coding scheme for this task, an overall score of the child's anger was also

calculated for each episode. The overall variable was included to yield a global measure of anger for each child, taking into account bodily anger, gestures and verbalizations that may not have been picked up by the individual variables. Intensity of facial anger was not coded in the final episode of maternal involvement because in this more naturalistic setting the child's face was not always visible.

#### *Coding Emotion Regulation (Time 1 and 2)*

The child's emotion regulation was also coded from video-playback of the Attractive Toy Task, using a modified version of the coding scheme from the Lab-TAB operational manual (Goldsmith & Rothbart, 1991). The regulatory variables included: *gaze aversion, distraction, looks at mother, looks to experimenter, social communication, self-soothing and active stimulation* (Definitions Appendix G). These were coded as either present or absent. A global measure of emotion regulation was also included for each episode, based on the quality and efficiency of the child's emotion regulation in relation to their apparent distress. Gaze aversion was not coded throughout the 'mother-fully-involved episode', again due to the high percentage of epochs in which the child's face not visible.

One trained researcher carried out coding; however reliability and accuracy was monitored in devising the coding scheme and intermittently throughout the coding process by a second researcher. The researchers coded five videotapes of the interactions together, in order to ascertain the requirements for each variable and to discuss the decisions made for each code. Five videotapes were then coded independently before being compared and discussed by the two researchers to finalize the consistency of definitions for each variable. Inter-rater reliability for all

codes was high with correlations for the child's emotion reactivity ranging from .836 to .995 (mean  $r = .947$ ) and regulation data .735 to .98 (mean  $r = .905$ ).

*Global Rating Scale of Mother-Child Interaction (GRS; Gunning, Fiori-Cowley & Murray, 1999)*

Maternal sensitivity within the Attractive Toy Task was coded using a modification of the GRS (Gunning, Fiori-Cowley & Murray, 1999). The original coding scheme was designed to analyze the quality of interactions between mothers and two-to-four month old infants. The modified version allowed assessment of individual differences in parenting styles during the Attractive Toy Task in which the mothers were asked to support their child's efforts to handle the emotionally arousing situation. This scale has shown a predictive validity regarding later performance (Murray, Hipwell, Hooper, Stein & Cooper, 1996) and good discriminant validity for a number of clinical groups such as those with depression, schizophrenia and social adversity (Riordan, Appleby & Faragher, 1999; Murray, Hipwell, Hooper, Stein, & Cooper, 1996).

*Coding Maternal Sensitivity (Time 1)*

The four observed dimensions of parenting behaviour were: *Responsiveness*, *Remoteness*, *Intrusiveness* and *Sensitivity* (Appendix H). The mothers' behaviour was rated during the two episodes in which mothers were able to interact ('verbally-involved' and 'freely-involved').

Two researchers who were not familiar with the infant behaviour-coding scheme coded parenting behaviour. Each of the parenting scales was rated from 1 (lowest quality of observed behaviour) to 5 (highest quality of observed behaviour).

Ten cases were used to assess inter-rater reliability, intra-class correlations between the two coders ranged between .73 and .89 (responsiveness  $r = .73$ , intrusiveness  $r = .85$ ; remoteness  $r = .89$ ; sensitivity  $r = .87$ ). In order to reduce the number of tests that were run, inter-correlations between the four parenting dimensions were examined. Results revealed that Responsiveness, Sensitivity and (Non) Remoteness were significantly correlated (ranging from  $r = .66, p < .001$  to  $r = .84, p < .001$ ). Averaging the scores from the three constructs therefore created a new composite variable, henceforth referred to as 'Maternal Sensitivity', which was analysed in the present study. This composite variable did not correlate significantly with the Intrusiveness variable ( $r = .03, p = .729$ ).

#### *Mind-Mindedness Coding Manual (Meins & Fernyhough, 2010)*

A modification of the Maternal Mind-Mindedness Manual (Meins & Fernyhough, 2010) was used to code the mother's description (derived from the interview described above) of the child's mental states. The scoring of the mind-minded statements were modified for the study and were based on the richness and quality of the mental state terms rather than frequency of mind-minded comments. The mind-mindedness coding scheme has been reported to have good reliability in a number of independent samples (e.g., Laranjo, Bernier & Meins, 2008; Lundy, 2003; Meins, Fernyhough, Fradley & Tuckey, 2001).

#### *Coding of Maternal Mind-Mindedness (Time 1)*

The interviews with the mothers were transcribed verbatim from video playback. They were coded using a modified version of the maternal mindedness-coding manual (Meins & Fernyhough, 2010). Statements were considered to be

mind-minded if they were (i) explicit comments of what the child was feeling, thinking and experiencing (*'He's angry that the toy was taken away from him'*) and (ii) the mother talking on behalf of the child (*'He's thinking, "Why didn't mum help me get the toy?"*). Once all mind-minded statements/ comments had been identified on the verbatim transcript, they were coded as appropriate or non-attuned by viewing child- mother interactions in the Attractive Toy Task. A comment was deemed appropriately mind-minded if the researcher agreed with the mother's reading of the child's current internal state for example, *'She likes it'* (referring to toy that a child is actively playing with). A statement or mental state was coded non- attuned if the researcher disagreed with the mother's reading of the child's current internal state for example, *'She is bored with it'* (referring to a toy that the child was actively playing with). Each mind-related comment was subsequently classified as appropriate and inappropriate (Meins, Fernyhough, Fradley & Tuckey, 2001), and only the former were of interest in the present research.

Statements describing the child's mental state were divided into three categories (Modified Manual Appendix I)

(1) **Basic Mental State Terms**: The statements in category 1 were coded on the basis of simply labeling the child's observable mental states, preferences, intentions, emotions, like and dislikes without any elaboration (*'he's pointing at what he wants'*, *'not completely confident'*, *'he's frustrated with the task'*, *'he's curious'*, *'he's trying to reach for the toy'*).

(2) **Subtle Mental Terms / Linking the Child's Mental State to Behaviour**: Category 2 included statements that linked the mental state with behaviour, suggesting more thoughtfulness (*'He's feeling sorry for himself because the toy has been taken away'*). It included statements stating the thoughts and cognitions of the

child (*'she's concentrating, she's working out what to do'*). This category also included single non-obvious subtle mental state terms, which more strongly suggested a unique description of a mental state (*moody, puzzled, and self-conscious*). The difference between Category 1 and Category 2 statements were, for example, *'she is not comfortable'* (Category 1) vs. *'she is not comfortable because I am not in her immediate vision and she misses me'* (Category 2).

(3) ***Elaboration and Richer Description of Mental States:*** Category 3 included a compelling and insightful elaboration of the child's thoughts and feelings indicative that the mother was profoundly aware of the child's mental state. The length of the comment was not taken into consideration; the focus was on the quality and level of thoughtfulness of the child's mental state (*'He doesn't seem to care much for the toy now, maybe it is not exciting for him, or maybe he thinks that the toy will be taken away from him again'*). This category also included comments in which the mother spoke on the child's behalf and conjecture about what the child might be saying (*She's thinking, "why isn't mummy doing something to stop this"*). Comments made on behalf of the child did not necessarily have to contain an internal mental state term but clearly a dialogue intended to be spoken by the child (*"That toy looks familiar mummy"*). Examples of distinctions between Category 2 and Category 3 comments were *'she's sussing out what to do next'* (Category 2) vs. *'She's trying to make out who is in charge here and therefore is sussing out the relationship between you and me and trying to figure out who will help her get the toy'*.

Any statements, which were not mind-minded according to the description above, were not coded. For each interview, each statement was scored 1 for category 1; 2 for category 2 and 3 for category 3 and these were summed across the interview.

Maternal verbosity (word count of each mother's interview) was calculated and controlled for in the later analysis.

One trained researcher carried out coding; however reliability and accuracy was monitored in devising the coding scheme and then intermittently throughout the coding process by a second researcher. The researchers coded five videotapes of the interactions together, in order to ascertain the requirements for each variable and to discuss the decisions made for each code.

### **Power Analyses**

Rosenblum and colleagues' (2008) study found a correlation of 0.4 between parental non-intrusiveness and mind-minded comments using the Working Model of the Child Interview (Zeanah & Benoit, 1995). In order to have 80% power to detect a correlation of 0.40 at  $\alpha = 0.05$  the required sample size was estimated to be 41. Given the difference in methodology of the present study it was considered that a more conservative effect of 0.3 should be assumed, which would require a sample size of 78 for 80% power at  $\alpha = .05$ .

### **Ethical Approval**

Prior to testing, ethical approval was granted by University of Reading Research Ethics Committee (Appendix J).

## RESULTS

### Plan of Analyses

Prior to testing the hypotheses, demographic differences on mother-child interaction variables (maternal-sensitivity and mind-minded comments), child-emotion variables (emotion regulation and negative reactivity) and maternal verbosity (number of words in the mind-mindedness interview by each mother) were examined using ANOVAs. In order to test the hypotheses, Pearson's  $r$  correlation was conducted to examine the relationship between child-emotion variables, mother-child interaction variables and maternal verbosity. Finally regression analyses were conducted to investigate the cross-sectional and longitudinal relationship between maternal mind-mindedness and maternal sensitivity and the child's emotion regulation skills at 15 and 24 months.

### Demographic Variables

#### Gender

There was a significant gender difference in emotion regulation at 24 months  $F(1,83) = 5.16$ ,  $p = 0.02$  and negative reactivity at 24 months  $F(1,83) = 5.3$ ,  $p = 0.02$ . Girls were lower on negative reactivity and higher on emotional regulation at 24 months. There was no significant difference in the mother's maternal sensitivity; mind-mindedness, maternal verbosity, child's negative reactivity (15 months) and child's emotion regulation (15 months) on the basis of the child's gender. These results are summarized in Table 2.

**Table 2: Gender Differences on Mother-Child Interaction Variables, Child-Emotion Variables and Maternal Verbosity**

Variable	Girls (N=39)		Boys (N=46)		F
	Mean	SD	Mean	SD	
MM	0.08	1.15	-0.07	0.86	0.46
MS	0.09	1.03	-0.07	0.97	0.48
NR (15m)	-0.13	0.85	0.11	0.84	0.04
ER (15m)	0.16	0.75	-0.14	0.89	0.86
NR (24m)	-0.26	0.68	0.22	1.17	5.16*
ER (24m)	0.22	0.62	0.18	0.93	5.30*
MV	410.4	162.9	412.7	167.3	0.41

N= Sum; MM= maternal mind-mindedness; MS=maternal sensitivity; NR= negative reactivity; ER= emotion regulation; MV= maternal verbosity; M= mean; SD=standard deviation; m= months; \*p= < 0.05

### Ethnicity

Except for White (Caucasians), there were a small number of participants for each ethnicity; therefore these ethnicities were combined together and named 'Other'. There were no significant associations between maternal ethnicity and mother-child interaction variables (mind-mindedness and sensitivity), child-emotion variables (negative reactivity and emotion regulation) and maternal verbosity. These results are summarized in Table 3.

**Table 3: Comparison of Maternal Ethnicity, Mother-Child Interaction Variables, Child-Emotion Variables and Maternal Verbosity**

Variable	White Caucasian (N=60)		Other Ethnicities (N=20)		t
	Mean	SD	Mean	SD	
MM	0.07	1.05	-0.16	0.85	0.34
MS	-0.09	1.05	-0.21	0.84	1.22
NR (15m)	-0.03	0.80	0.06	0.96	-0.42
ER (15m)	0.01	0.78	-0.02	0.97	0.89
NR (24m)	-0.06	0.98	0.14	1.06	0.82
ER (24m)	0.04	0.84	-0.09	0.79	-0.66
MV	424.3	176.3	390.3	131.6	-0.8

N= Sum; MM= maternal mind-mindedness; MS=maternal sensitivity; NR= negative reactivity; ER= emotion regulation; MV= maternal verbosity; M= mean; SD=standard deviation; m= months.

#### Maternal Education

There was a significant difference between maternal education and maternal verbosity  $F(4, 75) = 2.75, p = 0.03$ . Mother's with A-levels spoke less than mother's in other categories. There were no significant relationships between maternal education and maternal sensitivity  $F(4,73) = 1.08, p = 0.37$ ; mind-mindedness  $F(4,75) = 1.17, p = 0.33$ ; emotion regulation 15 months and 24 months,  $F(4, 75) = 0.73, p = 0.58$  ;  $F(4, 75) = 0.97, p = 0.43$  respectively and negative reactivity 15 months and 24 months  $F(4, 75) = 0.19, p = 0.95, F(4,75) = 0.56, p = 0.69$  respectively.

#### Marital Status

There was a significant relationship between marital status and mind-mindedness  $F(2, 77) = 3.92, p = 0.02$ . Mother's who were married and cohabiting were more mind-minded than other groups. There was no significant relationship between marital status and sensitivity  $F(2, 75) = 0.35, p = 0.70$ , maternal verbosity  $F(2,77) = 1.58, p = 0.21$  or any of the child-emotion variables (emotion regulation 15

and 24 months,  $F(2,77) = 1.14, p = 0.33$ ;  $F(2,77) = 1.11, p = 0.33$  respectively; negative reactivity 15 and 24 months ,  $F(2,77) = 0.25, p = 0.78, F(2,77) = 0.74, p = 0.48$ , respectively) .

Family Household Income

There was no significant relationship between household income and mind-mindedness  $F(5, 70) = .765, p .578$ ; sensitivity  $F(5,68)= .893, p= .491$ ; maternal verbosity  $F(5,70)= .967, p= .444$  or any of the child-emotion variables (emotion regulation 15 months and 24 months,  $F(5, 70) = .994, p = .181 , F(5, 70) = 2.18, p = .066$  respectively ; negative reactivity 15 months and 24 months  $F(5, 70) = .1.07, p = .379, F(5,70) = 1.94, p = 0.66$  respectively).

Depression

Table 4 shows that there was no significant relationship between maternal depression as assessed by the Centre for Epidemiologic Studies Depression Scale (CES-D), mother-child interaction and child-emotion variables.

**Table 4: Correlation between Maternal Depression, Mother-Child Interaction Variables, Child-Emotion Variables and Maternal Verbosity**

Variable	MS	MM	NR		ER		MV
			15m	24m	15m	24m	
Maternal Depression	-.029	-.019	.095	-.020	.052	-.036	.011

MS=maternal sensitivity; MM= maternal mind-minded comments; NR= negative reactivity; ER= emotion regulation; MV= maternal verbosity; m=months.

**Relationship between Mother-Child Interaction Variables, Child-Emotion Variables and Maternal Verbosity**

As demonstrated in Table 5 and as predicted, there was a positive statistically significant relationship between maternal sensitivity and mind-mindedness ( $r = .230$ ,  $N=85$ ,  $p= .036$ ). Notably, there were also significant associations between maternal verbosity and maternal sensitivity ( $r=.266$ ,  $N= 83$ ,  $p= 0.01$ ); maternal verbosity and mind-mindedness ( $r= .763$ ,  $N= 85$ ,  $p=< 0.001$ ); and negative reactivity 15 months and negative reactivity 24mths ( $r=.285$ ,  $N= 85$ ,  $p=<0.001$ ). There was also a negative relationship between emotion regulation 15mths and child’s negative reactivity 15mths ( $r= -.841$ ,  $N=85$ ,  $p= <0.001$ ); and between emotion regulation 24mths and negative reactivity 24 months ( $r= -.857$ ,  $N=85$ ,  $p=< 0.001$ ).

**Table 5: Correlation, Means and Standard Deviation of the Infant Emotion Variables, Mother-Child Interaction Variables and Maternal Verbosity**

Variable	MS	MM	NR		ER		MV	M	SD
			15m	24m	15m	24m			
MS	1.00							3.33	.87
MM	.230*	1.00						27.58	13.05
NR (15mths)	-.019	.119	1.00					.01	.95
NR (24 mths)	-.141	-.011	.285**	1.00				.25	1.21
ER (15 mths)	.690	-.186	-.841**	-.203	1.00			3.03	1.20
ER (24mths)	.066	-.040	-.205	-.857**	.208	1.00		3.51	1.34
MV	.266*	.763**	.004	-.054	-.092	-.029	1.00	414.35	164.35

MS=maternal sensitivity; MM= maternal mind-mindedness ; NR= negative reactivity; ER= emotion regulation; MV= maternal verbosity; M= mean; SD=standard deviation; m= months; \*P < 0.05, \*\*P < 0.01

**Relationship between Maternal Mind-Mindedness and Maternal Sensitivity**

A regression analysis was run to test whether maternal mind-mindedness predicted maternal sensitivity after controlling for maternal verbosity. The model as a whole was statistically significant  $F(2, 80) = 3.12$ ,  $p = 0.049$  accounting for 7% of

the variance ( $R^2 = 0.07$ ). However, as demonstrated in Table 6 neither independent variable was significantly related to sensitivity (maternal mind-mindedness,  $\beta = 0.07$ ;  $p=0.08$ ; maternal verbosity,  $\beta= 0.21$ ;  $p= 0.20$ ). Thus, the associations between maternal mind-mindedness and verbosity in relation to sensitivity were mutually confounded.

**Table 6: Regression of Maternal Sensitivity on Mind-Mindedness and Maternal Verbosity**

Variable	B	SE B	B
MM	0.07	0.17	0.07
MV	0.001	0.001	0.21

MM= maternal mind-mindedness; MV= maternal verbosity

**Cross Sectional and Longitudinal Analysis of Maternal Mind—Mindedness and Maternal Sensitivity in Relation to Child-Emotion Regulation at 15 and 24 months**

A regression analysis was run to test whether maternal sensitivity and mind mindedness at 15 months was related to the child’s emotion regulation at 15 months after controlling for demographic variables. It appeared that high levels of maternal sensitivity and mind-mindedness were not associated with the child’s emotion regulation ability at 15 months,  $F(21,52)= 1.06$ ,  $p= 0.45$ . However, this model was somewhat over-fit, so a regression was also run without controlling for demographic variables. This model also did not reveal any significant relationships  $F(3,79 = 1.40$ ,  $p = 0.25$ . The regression coefficients for proposed variables were statistically non-significant (maternal-mindedness,  $\beta= 0.28$ ,  $p = 0.10$ ; maternal sensitivity,  $\beta = 0.11$ ,  $p = 0.35$  and maternal verbosity,  $\beta = 0.10$ ,  $p=0.55$ ). These results are summarized in Table 7.

**Table 7: Regression of Emotion Regulation at 15 months on Maternal Sensitivity, Mind-Mindedness and Maternal Verbosity**

Variable	B	SE B	$\beta$
MM	-0.24	0.14	0.28
MS	0.09	0.09	0.11
MV	0.0005	0.0009	0.10
ER (15m)	0.19	0.11	0.20

MM= maternal mind-mindedness; MS= maternal sensitivity; MV= maternal verbosity; ER (15m) = emotion regulation at 15 months.

A regression analysis was also run to test whether maternal sensitivity and mind mindedness was related to the child's emotion regulation at 24 months after controlling for demographic variables and emotion regulation at 15 months. It appeared that high levels of maternal sensitivity and mind-mindedness were not associated with the child's emotion regulation ability at 24 months,  $F(22,51)= 1.40$ ,  $p= .16$ . Running the model again without demographic covariates also did not reveal any significant relationships ( $F(4,78) = 0.91$ ,  $p = 0.46$ ). In addition, none of the regression coefficients were large or close to significance (maternal mind-mindedness,  $\beta=0.02$ ,  $p= 0.92$ ; maternal sensitivity,  $\beta=0.06$ ,  $p= 0.61$ ; maternal verbosity,  $\beta=-0.04$ ,  $p= 0.80$ ; emotion regulation at 15 months,  $\beta=0.20$ ,  $p= 0.09$ ). These results are summarized in Table 8.

**Table 8: Regression of Emotion Regulation at 24 months on Maternal Sensitivity, Mind-Mindedness and Maternal Verbosity**

Variable	B	SE B	$\beta$
MM	0.002	0.14	0.02
MS	0.05	0.09	0.06
MV	0.001	0.0008	-0.04
ER (15m)	0.19	0.11	0.20

MM= maternal mind-mindedness; MS= maternal sensitivity; MV= maternal verbosity; ER (15m) = emotion regulation at 15 months.

As there was no statistical relationship between maternal mind mindedness and child-emotion regulation there was no need to test the mediating role of parental sensitivity. This analysis was therefore not conducted.

## DISCUSSION

The results of the study revealed that mind-mindedness and maternal sensitivity were positively related. Further analysis of the relationship revealed that maternal mind-mindedness predicted 7% of the variance in maternal sensitivity. It is of note that there was a strong association between maternal verbosity and mind-mindedness ( $r = .76$ ). Therefore due to the strong relationship between maternal mind-mindedness and maternal verbosity it was not possible to distinguish between the effects of maternal mind-mindedness and maternal verbosity in relation to maternal sensitivity. The study did not find that high levels of maternal mind-mindedness or maternal sensitivity at 15 months were related to the child's emotion regulation ability at 15 and 24 months. Subsequently, maternal sensitivity did not

mediate the relationship between mind-mindedness and emotion-regulation at 15 or 24 months.

In previous studies parental mind-minded comments during interaction with 6-month-old infants have been significantly correlated with behavioural sensitivity and interactive synchrony (mother-child interactions in which the mother constantly adjusts her behaviour to that of her baby), (Lundy, 2003; Meins, Fernyhough, Fradley & Tuckey, 2001; Laranjo, Bernier & Meins, 2008; Demers, Bernie, Tarabulsy & Provost, 2010). In the present study, maternal-mindedness was related to maternal sensitivity but not independently because of the strong correlation between the maternal-mindedness and maternal verbosity. In past research using the mind-mindedness approach verbosity has been statistically controlled for, and significant predictive associations have been found (Meins Fernyhough, Fradley & Tuckey, 2001; Laranjo, Bernier, & Meins, (2008). However, the current study is distinctly different to most past research on mind-mindedness in that the interview questions specifically asked parents to reflect on their child's thoughts and feelings and encouraged them to think about why their child behaved in the way that they did (as opposed to observing spontaneous comments made to the child by the parent during free play interactions). As such, longer answers tended to reflect deeper, more elaborated and more psychologically rich answers. In that sense, the close connection between the psychological richness of the response and the length of the response may have been an inevitable consequence of measuring mind-mindedness in this way.

The reason for adapting the interview and scoring system in this way was that mind-minded comments were not elicited through free play mother-child interactions as in previous studies (Lundy, 2003; Meins, Fernyhough, Fradley & Tuckey, 2001;

Meins, Fernyhough, Arnott, Turner, & Leekam, 2011; Meins, Fernyhough, de Rosnay, Leekam, & Turner, 2012; Laranjo, Bernier, Meins & Carlson, 2010). In free play situations very spontaneous responses are elicited which creates two limitations: first this context may suffer from floor effects, particularly during short observational periods, and second this way of assessing mind-mindedness may not allow the parent to demonstrate the full extent of their ability to think and reflect on the child's thoughts and feelings, as all that is observed is what they chose to verbalize spontaneously during the interaction. In the present study through video-play back of the task and interviews the mother's were able to reflect and produce richer and more elaborate responses therefore the quality of the mind-minded statements were taken into consideration rather than the number of mind-minded comments. This also helped to differentiate between mothers who gave basic responses to the questions versus those that gave more convincing answers that gave strong evidence of their ability to mentalize about their child. Overall, the present study found support for the notion that maternal mind-mindedness is linked to maternal sensitivity in emotionally challenging situations. Mothers who were able to think in more elaborated ways about the child's thoughts and feelings supported the child's efforts to regulate their emotions more sensitively than those that scored less highly for mind-mindedness.

Despite the positive finding regarding mind-mindedness and the mothers' sensitivity during the emotion-regulation task, the present study failed to find that higher levels of mind-mindedness or maternal sensitivity at 15 months predicted the child's emotion regulation at 15 or 24 months. A few studies have examined the effects of maternal sensitivity and emotion regulation. Using a global coding system, Gable and Isabella (1992) found that positive maternal state (mood/affect) and higher

maternal physical activity (providing an appropriate level of stimulation) with their 1-month-old infant was associated with better regulation (affect and gaze) at 4 months of age. Studying older children, National Institute of Child Health and Human Development Early Child Care Research Network (2004) found that children who were dysregulated (i.e., displayed high negative affect, especially with mother, and/or defiance) received less sensitive and less stimulating caregiving at both 24 and 36 months of age. Prior research has also demonstrated that sensitive maternal behaviours observed during emotionally arousing tasks in infancy (e.g., reengagement following the still-face situation, receiving immunizations, goal blocking and novelty tasks) were related to the child's adaptive emotion regulation and the absence of behavioural problems (Crockenberg & Leerkes, 2006; Crockenberg, Leerkes, & Barrig Jo, 2008; Jahromi & Stifter, 2007; Moore & Calkins, 2004). With regard to mind-mindedness, previous studies have not explored the role of maternal-mindedness and the development of the child's emotion regulation abilities. However, mind-mindedness has been associated with a range of positive child outcomes. Higher levels of caregiver mind-mindedness in the first year of life are known to predict secure caregiver-child attachment (Lundy 2003; Meins et al. 2001, 2012) and superior performance on theory of mind tasks at ages 2 (Laranjo, Bernier, Meins & Carlson, 2010) and 4 (Meins et al. 2002; 2003). A recent study found that mind-mindedness was negatively related to the children's externalizing and internalizing behaviours specifically in low socioeconomic status families (Meins, Centifanti, Fernyhough & Fishburn, 2013). In other studies mind-mindedness was found to be unrelated to children's temperament (Meins, Fernyhough, Fradley & Tuckey, 2001) and general cognitive ability (e.g., Meins et al., 2003), suggesting that individual child characteristics do not determine

caregivers' mind-mindedness. The lack of significant findings in the present study that high levels of maternal mind-mindedness or maternal sensitivity predicts better child emotion regulation ability could possibly be due to the frequency of assessment and period of development that was observed (15 – 24 months). Maternal sensitivity is associated with a degree of temporal variability (Anisworth Blehar, Waters & Wall, 1978), and research has demonstrated that multiple observations of maternal sensitivity are a better predictor of child attachment behaviours than individual observations (Isabella, 1998). In addition to this, multiple time-synchronized assessment and temporal analyses of emotion regulation at different time points may provide useful information regarding the role of maternal sensitivity and maternal mindedness in the child's emotion regulation ability.

Due to the lack of significant association between maternal mind-mindedness and the child's emotion regulation ability there did not seem a need to test the mediating role of maternal sensitivity. In studies that have found a significant association between maternal mind-mindedness, maternal sensitivity and the child's attachment security, the authors found that sensitivity and mind-related comments made independent contributions to attachment security (Meins, Fernyhough, Fradley & Tuckey, 2001), thus suggesting that mind-mindedness and sensitivity were capturing related but distinct aspects of maternal behaviour. Other studies confirmed that maternal sensitivity mediated the relation between mind-mindedness and child attachment security (Laranjo, Bernier and Meins, 2008; Meins & Fernyhough, 1999). One suggestion for the differences in the findings was that the outcome variable of the present study was emotion regulation. At present research on emotion regulation faces technical limits in distinguishing emotion regulation from emotion itself and at times it is difficult to distinguish the initial intensity of an emotional reaction from

emotion regulation (Kagan, 1994, cited in Thompson, 1994). At the physical level, emotional reactions emerge from neural activity that occurs in milliseconds (Davidson, Jackson, & Kalin, 2000); traditional emotion measures (e.g., facial expression, subjective report, physiological markers) are as likely to reflect regulatory influences, as they are emotional reactions per se. Although technical advances may eventually permit the capturing of an emotion in progress, at present consensus is needed on how best to use existing methods to provide the strongest inference that emotion regulation is being studied (Fox, 1994).

In the present study gender differences were found in the negative reactivity and emotion regulation of children at 24 months of age. Girls compared to boys had lower levels of negative reactivity and higher level of emotions regulation at 24 months. Research on sex differences in behavioural indices of child emotion regulation has revealed mixed results. In a sample of 100 healthy infants, no sex differences were observed in level of distress or the strategies used to regulate distress during frustration tasks at 5, 10 and 18 months (Stifter & Jain, 1996). Nor were there sex differences in the effectiveness of different strategies on reduction of negative emotions (Stifter & Braungart, 1995). In a sample of neonates from low-income environments, no sex differences were found with regard to irritability assessed at 10 days after birth (van den Boom, 1994). However there have been studies that have found gender to influence reactivity and regulation of emotion in childhood, with boys tending to react with more anger, whereas girls with more fear and sadness (Buss, Brooker & Leuty, 2008). Gunnar, Porter, Wolf, Rigatuso, and Larson (1995) reported that from an early age, girls were found to engage in more socially mediated regulation (seeking contact and proximity to caregiver) than boys. It has been suggested that this may be partly a result of the influence of the parents,

promoting more anger reactions in boys and encouraging more dependency in girls. In the present study maternal sensitivity and mind-mindedness did not differ on the basis of gender.

### **Limitations**

Certain limitations in the study need to be acknowledged. In previous studies mind-mindedness had been elicited and coded from mother-child interactions in free play situation (Meins & Fernyhough, 1999; Meins, Fernyhough, Fradley & Tuckey, 2001). The approach of measuring maternal mind-mindedness in the present study involved interviewing the mothers and encouraging them to describe the child's feelings and thoughts. This may have limited the naturalness and spontaneity of mental state descriptions that may be elicited in more naturalistic free play situations.

Despite the evidence for the predictive validity of observational methods (Patterson & Forgatch, 1995), it is important to take into consideration the extent to which the mothers/ child's behaviour might have been affected by the presence of the observer (social desirability), imposition of tasks (such as asking the mother when to and not to interact with the child) and the location of the observation which in this case was the laboratory rather than the home. In the present study mothers commented on parts of the task being 'an unfamiliar situation for the child' and their interaction with the child being 'unusual' as normally they would pick up the child or give her the toy. However it is important to note that the main purpose for introducing a task was to elicit the behaviours of interest rather than observe 'natural' interaction. Finally in addition to using observational methods, a more comprehensive view of the child's reactivity and emotion regulation ability may

have been obtained by mother reported data, observing the child in different setting and over times.

### **Further Research**

Further studies need to focus on comparison of emotions and regulatory phenomena in contrasting conditions, temporal relations between emotions and regulatory phenomena, and using multiple, converging measures (Cole, Martin & Dennis, 2004). This may include observations of different types of emotions such as anger, sadness; reporting of maternal observation, observations of emotions under different social or situational contexts, using sophisticated temporal strategies such as time-series analysis, sequential analysis and controlling for autocorrelations within individuals to demonstrate co-regulatory processes; and measuring physiological indexes associated with regulation (e.g. vagal tone, frontal asymmetry). This will help to provide convergent evidence regarding the child's emotion regulatory abilities, which will not be solely based on laboratory experiments and observational data.

Previous research has demonstrated that the quality of maternal mind-mindedness and maternal sensitivity has an impact on future child cognitive and affective development (Meins & Fernyhough, 1999; Meins, Fernyhough, Fradley & Tuckey, 2001; Meins et al., 2003; Meins et al., 2002; Ainsworth, Bell & Stayton, 1971). In this context it is important for further research to take into account the parents' views and feelings about their child's emotional behaviour, which incorporates parental attributions and the impact these attributions may have on the child's affective and cognitive development. The focus of mothers' goals may influence children's emotional development in important ways (Dix 2000; Leerkes,

Crokenberg & Burrous, 2004). For example sensitive mothers may hold the child for child-centered reasons (e.g. to provide physical comfort or provide emotional support) while less sensitive mothers may hold the child for parent-centered reasons (e.g. to make them stop crying because the mothers are embarrassed or irritated). Through mere observation, maternal behaviour in the immediate context of the emotionally challenging situation is indistinguishable. Therefore it would be informative to gain information on the underlying motives and thought processes behind the parent's behaviour.

In addition to this there is also a pressing need to explore the potential child contributions to maternal-mindedness. At 24 months of age, multiple, aspects of the parent-child relationship and many child characteristics are well established, and dynamic bi-directional effects appear more than simple linear relations. Longitudinal designs involving repeated assessments of child characteristics and maternal behaviour at later stages are also needed to sort out the underlying developmental sequence.

Finally, future studies should aim to investigate the antecedents of mind-mindedness among groups of parents differing in age, gender, culture, socioeconomic status, and other potential indicators of psychosocial risk.

### **Clinical Implications**

The nature of early interactions with caregivers can act to shape both the child's cognitive interpretations of given affect-eliciting events and the emotions displayed in response to those events (Calkins, 1994). For example, a child's capacity to manage distress coupled with support provided by the mother, can facilitate the development of an ability to self-comfort and rely less on parents as

well as a growing sense of security (Field & Fogel, 1982; cited in Calkins, 1994), whereas an inability to develop this sort of tolerance may lead to both withdrawn behaviour and feeling of insecurity on the part of the child. Such interventions directed towards the capacity of the caregiver, to read the child's self-directed behaviours might help to aid the child's regulatory behaviour in the future. Many intervention programs intend at modifying maternal representations and hence improving maternal sensitivity (e.g., Madigan, Hawkins, Benoit & Goldberg, 2006; Oppenheim, Goldsmith, & Koren-Karie, 2004; Slade, 2006). A noteworthy intervention program is the Video-Feedback Intervention to promote Positive Parenting (VIPP). VIPP aims at breaking the potential intergenerational cycle of insecure attachment by giving feedback to parents on their behaviours toward their child and to help them connect their past attachment experiences to their current caregiving behaviours (Klein Velderman, Bakermans-Kranenburg, Juffer, & van IJzendoorn, 2006). In this way mind-mindedness can be included in intervention programs. Techniques such as video feedback could be integrated to accompany parents while they work on paying greater attention to their child's mental life by, for instance, reflecting on the child's intentions, desires, and needs that are revealed in her behaviour.

### **Conclusions**

The longitudinal study examined the role of maternal mind-mindedness and maternal sensitivity at 15 months on the child's emotion regulation ability at 15 and 24 months. There was a significant relationship between mind-mindedness and maternal sensitivity; mother's who were able to think in more elaborate and detailed ways about the child's thoughts and feelings supported the child's efforts to regulate

their emotions more sensitively than those that scored less highly for mind-mindedness. However the associations between maternal mind-mindedness and maternal verbosity in relation to sensitivity were mutually confounded. The study failed to find that high levels of maternal mind-mindedness or maternal sensitivity at 15 months were related to the child's emotion regulation ability at 15 and 24 months. Maternal sensitivity did not mediate the relationship between mind-mindedness and the child's emotion regulation ability. Further research capturing the dynamic nature of emotion regulation is warranted so as to investigate the effect of parent-child interactions on the child's emotional development.

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**PART 3**  
**Critical Appraisal**

## **Introduction**

This critical appraisal provides a reflection on the process of examining the role of mother child-interactions in the development of the child's emotion regulation ability. The review will discuss three issues pertinent to the research.

1. A discussion about selecting an appropriate coding system to measure maternal representations of the child's mental states.
2. The advantages and challenges of using observational methods and pre-existing data.
3. The clinical implications of research in the construct of mind-mindedness and the child's emotion regulation ability.

## **Developing a Coding System**

One of the main tasks in this study was devising a coding system to evaluate the comments the mothers made about their child's thoughts, feelings and emotions. I personally, was not involved in the data collection process for the study, which was conducted in the University of Reading. Upon receiving the data my primary task was to transcribe 85 interviews that were conducted after the administration of the Attractive Toy Task (Goldsmith & Rothbart, 1991). The mother's were shown video-playback of their interaction with the child and they were interviewed so as to elicit comments on how they understood the child's mental states. After discussion with my supervisor, Prof. Pasco Fearon my initial thoughts were to examine the cognitive attributions of the mothers towards their child. After transcribing the interviews and trying to code a few using the Leeds Attributional Coding System (Stratton, et al., 1988), it became clear that it was not possible to code the interviews on the basis of negative-positive, internal-external, stable-unstable and global-specific dimensions.

The reason being that they focussed on the mothers understanding of the infant's current thoughts, feelings and emotions rather than maternal attribution or 'reasons why' the infant was acting in a particular manner. The statements produced by the mothers seemed to be similar regarding the content, i.e. describing the child's mental states, but there seemed to be a quite a lot of variability in the detail of their description. I therefore turned my attention to examining the constructs of reflective functioning (RF), maternal insightfulness (MI) and maternal mind-mindedness (MMM), which focus on mental representations, especially those pertaining to the infant's emotions and thoughts.

The constructs of MMM, RF and MI have received substantial attention over the years with publications examining links between their characteristics and later child outcomes (e.g. Fonagy, Steele & Steele, 1991; Meins, Fernyhough, Fradley & Tuckey, 2001; Meins et al., 2003; Schechter et al., 2005; Slade, Grienenberger, Bernbach, Levy & Locker, 2005). Initially I found it difficult to distinguish between the different constructs. A common feature between them was that they were influenced by Bowlby's attachment theory (1982), which was empirically validated by Ainsworth and colleagues (1978). In general all these constructs were based on the view that a mother with a secure attachment representation will treat her baby as a mental agent who has thoughts and feelings that can be reflected back to the infant. In doing so, the infant develops representations of being understood and cared for emotionally. The development of these constructs were in part also prompted by the recognition of the 'transmission-gap' that existed in the documented relationship between a mother's own representation of her attachment security and the subsequent attachment security displayed by her child (Benoit & Parker, 1994; Fonagy, Steele, & Steele, 1991; Van IJzendoorn, 1995). Van IJzendoorn (1995)

proposed a number of suggestions to account for the transmission gap, one of which was that the existing measures for sensitive responsiveness did not capture all relevant aspects of openness of communication, and other interactive mechanisms that might be responsible for transmitting the parental state of mind to the child. Although the bases of all three constructs were quite similar they exhibited subtle but distinct differences in the way that they had been operationalized.

The term RF itself can be somewhat confusing, as it has been used and understood in the past as reflective self-functioning and is often used interchangeably with mentalization. Essentially reflective functioning refers to (a) the ability to understand one's own and other's behaviours in terms of mental states (thoughts, feelings, motivations) in addition to (b) an appreciation and recognition that such perceived states are subjective, fallible, malleable and based on a wide range of possible perspectives (Fonagy & Target, 1996). RF refers to the operationalization of the mentalizing capacity as measured in speech during an interview. The processes captured by reflective functioning appear to be focused on an 'introspective' and 'contemplative' way of thinking, that is, the mother's tendency to stop and think after an event has occurred about the child's and her own mental states. The original RF scale was designed to score reflective functioning on the basis of the Adult Attachment Interview (AAI; George, Kaplan & Main, 1985) narratives. It was later adapted to use with the Parent Development Interview (PDI; Slade, Aber, Berger, Bresgi & Kaplan, 2003), in which the parent was asked to describe her child, himself or herself as a parent and discuss emotions stimulated by the experience of parenting.

Another concept similar to reflective functioning is that of Maternal Insightfulness (MI; Oppenheim, Koren-Karie & Sagi, 2001). MI refers to the parent's capacity to think about motives that underlie the child's behaviour,

acceptance of the child's challenging behaviour and openness to new information about the child (Oppenheim, Koren-Karie & Sagi, 2001). This concept has been operationalized through the development of the Insightfulness Assessment (Oppenheim & Koren-Karie, 2009), in which parents are shown several video segments of their child interacting with the parent and are asked about the child's thoughts and feeling during the segments. It appears that insightfulness is focused on the immediate mother-child interaction but also on how the parent is able to reflect on the child's behaviour. The mother and child interactions are videotaped into different interactional contexts. The IA consists of classification of transcripts into insightful and three non-insightful categories (one-sided, disengaged, mixed). As a part of gathering richer information, the mother's are also asked about the child's general characteristics in other situations and their parenting role.

MMM has been described as the mother's proclivity to treat the infant as an individual with a mind, rather than a creature with needs that need to be satisfied (Meins, 1997). MMM has been operationalized through recording the mother's use of mental state language to reflect the child's psychological states. Conceptually, mind-minded comments may be considered as a type of RF 'in action'; that is, mothers' understanding of the mental states of their infant during interactions may depend on their capacity to mentalize more generally. MMM focuses on the caregiver's willingness or ability to read the child's behaviour with reference to the likely internal states that might be governing it. It is measured using the Mind-Mindedness Coding Manual (Meins & Fernyhough, 2010) and is coded from free play sessions between the mother and child.

After examining the different coding systems and guidance from Prof. Fearon it appeared that the MMM coding manual was the most appropriate to use with the

data. The reason for this was that the maternal interview that was conducted after the mother-child interaction primarily focused on eliciting maternal comments about the child's mental states during the task and not about the general characteristics of the child (relevant to coding insightfulness), the attachment history of the parents or the mothers parenting role (both relevant to coding RF). In the maternal interview there appeared to be variability in the quality of the parents' responses in that certain participants merely labeled the emotions and thoughts of the child, for example *'He seems to like the toy'* while others' provided an in-depth and thoughtful description of the child's mental states and why he/she may be reacting in a particular way for example, *'That is very subdued and quite chilled out if she really wanted it she would get very upset, kick off and not be held she would fling herself about doing anything she could to get it'*. Therefore we decided to modify the MMM scoring system for use in this context.

In the original coding system (Meins & Fernyhough, 2010) the frequency measures of the appropriate mind-related comments and non-attuned comments were collated. In the present study a comment was deemed appropriately mind-minded if I agreed with the mother's reading of the infant's current internal state for example, *'She likes it'* (referring to toy that a child is actively playing with). A statement or mental state was coded non-attuned if I disagreed with the mother's reading of the infant's current internal state for example, *'She is bored with it'* (referring to a toy that the child was actively playing with). For the purpose of the study appropriately mind-minded comments were analyzed. One main reason for this was that there did not seem to be any non-attuned comments. In the current coding system appropriately mind-minded statements were collated and put in one of the three categories 1) Basic mental state terms, for example, *'He looks sad'*. 2) Subtle terms/

linking the infant's mental state to behaviour, for example, *'She's seems indifferent to the fact that she can't get the toy'*. 3) Elaborate mental state terms depending upon the quality and richness of the comment, for example, *She wanted me to step in and say 'give my toy back to my little girl', I probably do that at home, 'give it to her because she's too young to understand about waiting'*. Each statement was scored 1 for category 1; 2 for category 2 and 3 for category 3 and these were summed across the interview to get a global mind-mindedness score for each participant. Therefore a mother who provided a more thoughtful and rich description of her child's mental states got a higher score. The rationale behind this was that since the task was not a free play situation and the mother's responses were not entirely spontaneous, a frequency measure of mind-minded comments may not be an accurate representation of their mind-mindedness or would not differentiate well between those mothers who gave basic responses to the questions versus those that gave more convincing answers that showed strong evidence of being able to mentalize about their child.

When the results of the interview were analyzed there was a strong association between MMM and maternal verbosity. It appeared that mothers who produced more words during the interview provided more detailed in-depth descriptions of their child's mental states. However due to the strong relationship between MMM and maternal verbosity it was not possible to distinguish between the effects of MMM and maternal verbosity in relation to sensitivity. The study did provide evidence that MMM is linked to maternal sensitivity in emotionally challenging situations.

Overall adapting the MMM coding system appeared quite suitable for the study as it appropriately measured the information that had been gathered in the

interview. However one main limitation was that the validity and reliability of the system had not been established.

### **Observational Methods**

The study primarily relied on observational techniques, which involved observing mother-child interactions and conducting maternal interviews. Observational techniques provide a window on real behaviours of interest, e.g. child's emotion reactivity. These can be defined consistently and reliably by the researcher, rather than by the parent. In contrast, participant reports are based on definitions that are likely to be specific to that individual. They are also more likely to be affected by systematic personal biases related to factors such as the participant's expectations, their negative attributions about the child, or their low mood (Eddy, Dishion, & Stoolmiller, 1998; Fergusson, Lynskey, & Horwood, 1993). In a study they allow the researcher to view directly the overt processes within the mother-child interaction. These fine details would be very hard for the mother to access through self-report, as much of the mother-child interactions and the child's reactivity are automatic and fast moving. As well as providing a microscopic view of how the behaviours unfold in time, observational data is useful in providing data based on rates and proportions, e.g. using Likert scales and frequency measures to measure the child's emotional regulation (gaze aversion, distraction, self-soothing) and maternal sensitivity (responsiveness, remoteness, intrusiveness). Behaviours indexed by a combination of measures and rated by trained observers help to avoid the problem of systematic bias that may occur if the measures are based purely on self-report.

There are however challenges with employing observational techniques. Many studies have investigated observer effects on the behaviour of mothers and their young children. Factors such as the child's gender or age, the familiarity of the participants with the observer and the observation setting could all potentially influence reactivity (Gardner, 2000). The mothers in the present study did comment on the 'unusual setting' and their response to the child being affected by some of the constraints of the task. The purpose of introducing the task rather than watching 'natural' interactions was to elicit efficiently the behaviours of interest i.e. the child's negative reactivity, emotion regulation ability and maternal sensitivity. Introducing the constrained task also helped to increase the reliability of findings, by decreasing the range of possible situational influences on the behaviour. It seems reasonable that the mothers felt the situation was unnatural. Alternatively if the mothers were asked to engage in free play or in a less clearly defined task it is possible that they might have felt even more unnatural and would be more conscious of the observer and video recording.

One major drawback of observational techniques is that they are very time-consuming in terms of training observers, carrying out observations, coding interaction and carrying out inter-observer reliability checks. In the original study that was conducted at the University of Reading, in addition to the Attractive Toy Task (which elicited frustration in the child), the Stranger Approach Task (Lab-Tab) was also administered and the purpose of the task was to observe the infant's emotion regulation abilities in a fearful situation. With the help of research students I transcribed all the interviews for both these tasks and it would have been quite informative to be able to examine the infant's reactivity, emotional regulation ability, maternal sensitivity and MMM in tasks eliciting different emotions. Unfortunately, I

was unable to include the task in my study due to the lack of availability of trained coders to code the mother–child interactions in the Stranger Approach task.

There were also some technical issues when conducting the interviews with the mothers. In the original study 144 mother-child dyads were observed and interviewed. However, in the present study data of only 85 participants was examined, this was due to faulty sound quality.

### **Pre-Existing Data**

It was helpful to have pre-existing data as I did not have to get ethical approval and recruit participants. However there were some drawbacks to this too. The original study not only aimed at exploring the links between the quality of mother- child’s interactions on the emerging capacity of self regulation but also the child’s attachment history and the parent’s reflective functioning ability. This involved a number of variables and I had to be mindful to refine the hypotheses and choose the variables that were most relevant to my study. It also took me a while to understand the procedures of the study and how the tasks were conducted. I directly got in touch with the researchers in University of Reading who were very helpful in providing that information. As mentioned previously, choosing a coding system and modifying it accordingly so as to be able to code the interviews appropriately was one of the main challenges.

Another concern that was noted while transcribing the interviews was the variability in the way the interviews were conducted. In most of the interviews, the interviewers followed the script however occasionally the interviewers deviated from the prescribed script and would prompt the mothers for a response more than usual or at times even label an emotion. While coding the data I was mindful of such

comments and they were removed from the analysis. In addition to this, transcribing the interviews was extremely time-consuming due to the poor sound quality and variability in maternal verbosity.

### **Implications for Research and Practice**

The construct of mind-mindedness is now well supported by research evidence. Mind-mindedness has been found to relate to maternal sensitivity (Meins, Fernyhough, Fradley & Tuckey, 2001), maternal state of mind with regard to past attachment experiences (Arnott & Meins, 2007; Bernier & Dozier, 2003), child attachment security (Laranjo, Bernier & Meins, 2008), child theory of mind understanding (Meins et al., 2002), and maternal depression (Lundy, 2003). Mind-mindedness thus appears to be a relevant concept to help us understand the contributions of maternal representations to the child's socio-emotional development. Given the growing empirical evidence that maternal representations are related to mother-child interactions (Grienenberger, Kelly & Slade, 2005; Steinberg & Pianta, 2006), it will be useful for future studies to investigate the antecedents of mind-mindedness among groups of parents differing in age, culture, socioeconomic status, and other potential indicators of psychosocial risk. More longitudinal studies would be of great relevance to capture factors that influence the trajectory of parental mind-mindedness and its impact on the child's own representations of self and others.

Although the study did not find a significant relationship between MMM at 15 months and the child's emotion regulation ability at 24 months, further research is warranted in this area. This may include tasks that measure different emotion (such as fear, sadness, frustration) and the child's regulatory abilities at different time

points. Studies observing emotions have mostly used expressive behavioural procedures (facial, vocal) to assess the child's emotional state. Evidence of child's emotion regulation ability may be more compelling when additional measures such as physiological assessments (e.g. heart rate, vagal tone) may be available to offer convergent evidence.

While working on modifying maternal representations of the child or behaviours toward the child, intervention programs should systematically take account of maternal mental health problems, major life events, and child characteristics that could have an impact on the quality of mother-child interactions. Infant mental health interventions may be directed at the representational levels of the parent-infant relationship and/ or the interactive behaviour of the dyad (Sameroff, McDonough & Rosenblum, 2004). Directing attention towards supporting the mothers' capacity to effectively mentalize and understand the child's mental states overtime is likely to hold positive consequences for both her mental experience of the child and the relationship as well as her behaviour during interactions. Certain programs such as the "Circle of Security" intervention aims at shifting patterns of attachment in high- risk samples based on three major goals: (a) to increase parents' sensitivity and appropriate responses to the child; (b) to increase parental ability to reflect on their own or on the child's behaviour, thoughts, or feelings; and (c) to reflect on past experiences that may affect current caregiving patterns (Hoffman, Marvin, Cooper, & Powell, 2006).

Another effective mentalization-based intervention is "Minding the Baby Program" (Slade et al., 2005). This is an interdisciplinary, relationship based home visiting program that was initiated to help young at-risk mothers. This approach appears particularly well suited to highly traumatized mothers and their families, as

it is aims at addressing the particular relationship disruptions that stem from mothers' early trauma and poor attachment history. Based on the work of Fonagy and colleagues (Fonagy, Steele, Steele, Moran & Higgit, 1991) the reflective capacities of at-risk mothers are assumed to be comprised because of attachment disruption and trauma. Therefore this intervention aims at enhancing parental reflective functioning, which would help mothers facilitate their child development in crucial ways.

Finally, in terms of clinical intervention, Sable (2007) highlighted the critical function of positive affects such as joy, comfort, and contentment in human attachment experiences. Sable proposed that the role of the therapist is to help adults interpret their histories in new perspectives and find a positive outlook on these experiences. Such work should be done with mothers as well, especially those who have a more difficult attachment history, to help them reframe their past experiences with attachment figures and develop the capacity to see and appropriately comment on the positive elements emerging from their infant's personality.

## **Conclusions**

In conclusion, this review has examined the decision- making process in selecting an appropriate coding system for the study, the advantages and challenges of using observational methods and pre-existing data and the clinical implications and the possibility of further research in the areas of mind-mindedness and emotion regulation.

As Slade (2006) noted, parental representations play a fundamental role in the development of an array of healthy adaptations in both parents and children. The essential task for human beings, to be in relationships, is to capture and to understand

other's minds. Hence, the capacity for a mother to recognize that her child has a distinct and vivid mental life appears as a crucial element in the child's development.

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## **APPENDICES**

**Appendix A**

**Participant Information Sheet**

Dear «Full\_Name»,

Thank you for agreeing to participate in the Emotion Regulation study with the Child Development.

### Study Background

We are a team of researchers working in the School of Psychology and Clinical Language Sciences at the University of Reading. We are launching a new study that aims to further our understanding of the ways in which babies and young children gradually learn to control their own behaviour and their emotions. We think this is a very important skill that children acquire over the first three years of life. We are particularly interested in how these skills grow and develop from 15 months through to age 3, and we are also interested in the role that parents play in helping children manage their behaviour and emotions in a range of situations. Furthermore, we are keen to find out more about what strategies parents think help children manage their behaviour and feelings.

If you get involved in this study, you will be asked to come to the University of Reading on two occasions, when your child is 15 months and 2 years. On each occasion we will give you a number of questionnaires to fill out and we will introduce your child (with you present) to a number of situations and videotape, and afterwards we will ask you about what you thought about your child's response and how you approach supporting him/her in these situations and situations like them. Some tasks will involve your child meeting a new person, being briefly separated from you, or seeing an exciting toy that they can't reach. During the brief separation, you will always be able to see your child and if he/she is at all upset you would be free to return immediately. We always finish these situations with some fun playing with interesting toys so that the overall experience is a good one.

The first time you visit us, you will be with us for approximately 90 minutes. The later visits will be shorter than this. In order to show our appreciation of your help with the study, we will give you a small gratuity of a £10 Mothercare Voucher. We will also cover any travel expenses you incur for your visit to the unit, or arrange transport for you if needed. We will also be happy to send you a copy of the video if you would like it. You are also entitled to access the results of your assessments as well as those of your child should you so wish.



All of the researchers in this study have undergone checks with the Criminal Records Bureau to be able to work with children. With this approval, the study has been reviewed by the University of Reading Research Ethics Committee, who raised no objections on ethical grounds and have permitted the study to proceed.

All information collected will remain fully confidential. All the information you provide us with will be assigned an anonymous number, and no name will appear on any

of the documents. All data will be kept safely locked at the University of Reading, where only the specified trained researchers have access. The data will be used only for research purposes, and in accordance with the Data Protection Act of 1998, they will be destroyed 5 years after the completion of the study. Data will remain confidential unless information emerges that may impact on the safety of others. Participation in this study is entirely voluntary, so you are under no obligation to agree to participate. Also, you may withdraw at any point during the study without giving any reason. However, your help will offer us invaluable knowledge about how children develop self control skills in the early years.

Obviously you know your child better than anyone; therefore, we would also like you to complete an interview for us about your child's development and personality after the tasks.



**Appendix B**  
**Consent Form**

**Emotion Regulation Study- Consent Form**

This is the standard consent form that the University Ethics Committee asks people to sign when they take part in a research project.

Please sign both copies and keep one for your own records. One of our researchers will collect the other sheet for our records.

Have you read the Invitation letter/Information sheet?	Yes / No
Were you given an opportunity to ask questions and discuss the study?	Yes / No
Have you received satisfactory answers to your questions?	Yes / No
Have you received enough information about the study?	Yes / No
Who have you spoken to? Dr/Mr/Ms _____	

Do you understand that you are free to leave the study:

- at any time
  - without having to give a reason for leaving
  - and without affecting your medical care
- Yes / No

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Name (in block letters):

\_\_\_\_\_

**Appendix C**  
**Demographics Questionnaire**

## Family Composition

### Child

Date of Birth:

D	D	M	M	Y	Y	Y	Y
---	---	---	---	---	---	---	---

Prematurity (in days or weeks): \_\_\_\_\_

Birthweight: \_\_\_\_\_

Does the child have any special needs? (please give details): \_\_\_\_\_

Gender:

Male	<input type="checkbox"/>
Female	<input type="checkbox"/>

Ethnic Origin:

* I would describe child's ethnic origin as:		
Asian or Asian British <input type="checkbox"/> Bangladeshi <input type="checkbox"/> Indian <input type="checkbox"/> Pakistani <input type="checkbox"/> Any other Asian background  Black or Black British <input type="checkbox"/> African <input type="checkbox"/> Caribbean <input type="checkbox"/> Any other Black background	Mixed <input type="checkbox"/> White & Asian <input type="checkbox"/> White & Black African <input type="checkbox"/> White & Black Caribbean <input type="checkbox"/> Any other mixed background  White <input type="checkbox"/> British <input type="checkbox"/> Irish <input type="checkbox"/> Any other White background	Other Ethnic Group <input type="checkbox"/> Chinese <input type="checkbox"/> Any other ethnic group  <input type="checkbox"/> I do not wish to disclose this

Was this person born in the United Kingdom?  Yes  No

If not, how long have they been living in the United Kingdom? \_\_\_\_\_

First language spoken \_\_\_\_\_

Time spent in childcare (i.e. non-parent caring for child) per week \_\_\_\_\_ hours/days

Type of childcare:

- Grandparent or other family member
- Childminder
- Nursery
- Nanny/Au pair
- Other: \_\_\_\_\_

### Other Children

Please fill out the table below for each of your children.

Date of Birth	Relation to caregiver (e.g. birth child, foster or adopted child)	Gender (M/F)	Lives with you? (Yes/No)

**Household Income:**

Less than £10,000 pa	
£10,000- £20,000 pa	
£20,000 - £30,000 pa	
£30,000- £50,000 pa	
£50,000 - £70,000 pa	
£70,000 + pa	

**Mother**

Date of 

D	D	M	M	Y	Y	Y	Y
---	---	---	---	---	---	---	---

 Birth

**Occupational status:** (please tick)

Employed (Full time)	
Employed (Part time)	
Self-employed	

Unemployed	
Employed, on maternity leave	

If employed: What is your job title? \_\_\_\_\_

**Highest Level of Education:**

None	
GCSEs/ O-levels or equivalent	
A-level or equivalent	
NVQ, HND or equivalent	
Degree	
Postgraduate Degree	
Other (please give details)	

**Marital Status:**

Married & Living apart	
Separated	

Single	
Unmarried & Co-habiting	
Married & Co-habiting	

Widowed	
Divorced	

Ethnic Origin:

* I would describe my ethnic origin as:		
<p>Asian or Asian British</p> <input type="checkbox"/> Bangladeshi <input type="checkbox"/> Indian <input type="checkbox"/> Pakistani <input type="checkbox"/> Any other Asian background	<p>Mixed</p> <input type="checkbox"/> White & Asian <input type="checkbox"/> White & Black African <input type="checkbox"/> White & Black Caribbean <input type="checkbox"/> Any other mixed background	<p>Other Ethnic Group</p> <input type="checkbox"/> Chinese <input type="checkbox"/> Any other ethnic group
<p>Black or Black British</p> <input type="checkbox"/> African <input type="checkbox"/> Caribbean <input type="checkbox"/> Any other Black background	<p>White</p> <input type="checkbox"/> British <input type="checkbox"/> Irish <input type="checkbox"/> Any other White background	<input type="checkbox"/> I do not wish to disclose this

Was this person born in the United Kingdom?  Yes  No

If not, how long have they been living in the United Kingdom? \_\_\_\_\_

First language spoken \_\_\_\_\_

Spouse or partner (if living with family):

Date of Birth 

D	D	M	M	Y	Y	Y	Y
---	---	---	---	---	---	---	---

Occupational status: (please tick)

Employed (Full time)	
Employed (Part time)	
Self-employed	

Unemployed	
Maternity leave	

If employed: What is this person's job title? \_\_\_\_\_

Highest Level of Education:

None	
GCSE's/ O-levels or equivalent	
A-level or equivalent	
NVQ, HND or equivalent	
Degree	
Postgraduate Degree	

Other (please give details)	
-----------------------------	--

Marital Status:

Single	
Unmarried & Co-habiting	
Married & Co-habiting	

Married & Living apart	
Separated	
Widowed	
Divorced	

Ethnic Origin:

* I would describe my spouse/ partner's ethnic origin as:
---

<p>Asian or Asian British</p> <p><input type="checkbox"/> Bangladeshi</p> <p><input type="checkbox"/> Indian</p> <p><input type="checkbox"/> Pakistani</p> <p><input type="checkbox"/> Any other Asian background</p> <p>Black or Black British</p> <p><input type="checkbox"/> African</p> <p><input type="checkbox"/> Caribbean</p> <p><input type="checkbox"/> Any other Black background</p>	<p>Mixed</p> <p><input type="checkbox"/> White &amp; Asian</p> <p><input type="checkbox"/> White &amp; Black African</p> <p><input type="checkbox"/> White &amp; Black Caribbean</p> <p><input type="checkbox"/> Any other mixed background</p> <p>White</p> <p><input type="checkbox"/> British</p> <p><input type="checkbox"/> Irish</p> <p><input type="checkbox"/> Any other White background</p>	<p>Other Ethnic Group</p> <p><input type="checkbox"/> Chinese</p> <p><input type="checkbox"/> Any other ethnic group</p> <p><input type="checkbox"/> I do not wish to disclose this</p>
--	---	---

Was this person born in the United Kingdom?  Yes  No

If not, how long have they been living in the United Kingdom? \_\_\_\_\_

## **Appendix D**

### **Centre for Epidemiologic Studies Depression Scale**

**Feelings questionnaire**

Below is a list of the ways you might have felt or behaved. Please tell us how often you have felt this way during the past week.

- Rarely or none of the time = less than 1 day
- Some or a little = 1-2 days
- Occasionally = 3-4 days
- Most or all of the time

		Rarely or not at all	Some or a little	Occasion-ally	Most or all the time
1	I was bothered by things that usually don't bother me.				
2	I did not feel like eating; my appetite was poor.				
3	I felt that I could not shake off the blues even with help from my friends and family.				
4	I felt that I was just as good as other people.				
5	I had trouble keeping my mind on what I was doing.				
6	I felt depressed.				
7	I felt that everything I did was an effort				
8	I felt hopeful about the future				
9	I thought my life had been a failure				
10	I felt fearful				
11	My sleep was restless.				
12	I was happy.				
13	I talked less than usual.				
14	I felt lonely.				
15	People were unfriendly.				
16	I enjoyed life.				
17	I had crying spells.				
18	I felt sad.				
19	I felt that people disliked me.				
20	I could not get "going."				

**Appendix E**  
**Attractive Toy Task Episodes**

Episode	Condition	Length (seconds)	Description
1	Mother-not-involved	30	Mother was instructed not to interact, providing infant with no external support
2	Mother-not-involved	30	Mother was instructed not to interact, providing infant with no external support
3	Mother-verbally-involved	60	Mother was instructed that she could interact with her infant verbally but not to use any physical contact
4	Mother-freely-involved	60	<b>Took place on the floor.</b> Mother was instructed that she could interact freely, but to not allow infant to play with toy

## **Appendix F**

### **Child's Negative Reactivity Definitions**

<b>Infant Expressions and Behaviours</b>	<b>Definition</b>
<b>Emotion Reactivity Codes:</b>  Intensity of Facial Anger  Intensity of Distress Vocalisations  Intensity of Struggling	Peak intensity of facial anger in each epoch (scored on 0-3 scale)  Peak intensity of distress vocalisations in each epoch (scored 0-5)  Peak intensity of behaviours attempting to reach the toy in each epoch, such as pulling/pushing against the barrier and attempts to get out of highchair/get away from Mother (scored 0-4)
Overall Anger Score	A global score of child's anger; takes account of bodily gestures, facial expressions and vocalisations (scored 0-5)

## **Appendix G**

### **Child's Emotion Regulation Definitions**

<b>Infant Emotion Regulation Codes</b>	<b>Definition</b>
Gaze Aversion	Child briefly shifts gaze away from toy without focusing on any particular object (present or absent)
Distraction	Child moves attention to an object that is unrelated to the task (present or absent)
Looks to Mother	Child looks to mother (present or absent)
Looks to Experimenter	Child looks to experimenter (present or absent)
Social Communication	Child attempts to engage and interact with parent or experimenter (present or absent)
Self-soothing	Child uses a body part to engage in repetitive manipulation (e.g., thumb sucking, hair stroking; present or absent)
Active Stimulation	Child engages in high energy behaviour with no apparent instrumental focus (e.g., leg swinging; present or absent)
Global Emotion Regulation Score	Child's capacity to regulate their emotions; intended to capture an overall view of the effectiveness of child's behaviours for coping during the task

**Appendix H**  
**Maternal Sensitivity Definitions**

<b>Parenting Dimension</b>	<b>Definition</b>	<b>Scale</b>
Responsiveness	Captures the contingency with which the mother responds to her child's behaviours. The scale focuses purely on whether she notices and responds to cues but does not take into account the appropriateness of these responses.	1 – 5 1 = unresponsive 5 = responsive
Remoteness	Reflects the degree of mother's physical and psychological withdrawal from her child during the task. The scale assesses the mother's distance from the child, as indicated by helplessness in the interaction and a lack of interest, engagement and acknowledgement of her child's signals, as well as the physical space she puts between them.	1 – 5 1 = remote 5 = non-remote
Intrusiveness	Refers to maternal behaviours that disrupt or cut across the child's actions or communication. Intrusive behaviours may involve interrupting or overriding the child's signals in order to push her own agenda causing distress or increased avoidance in the child.	1 – 5 1 = intrusive 5 = non-intrusive
Sensitivity	Assesses the mother's awareness of her child's signals and her ability to respond and appropriately. The scale indicates the mother's warmth towards her child and how able she is to empathise and correctly interpret his/her cues.	1 – 5 1 = insensitive 5 = sensitive
Overall Sensitivity Responding	This reflects the average score of three variables which are highly correlated :Sensitivity, Non-remoteness and Responsiveness	

## **Appendix I**

### **Modified Maternal Mindedness Manual**

## **Modified Mind-Mindedness Manual**

Adapted from Meins and Fennyhough (2010) 'Mind-Mindedness Manual'

### **Mental State Terms**

These are comments and terms that focus on the child's internal states which are (a) an explicit comment on what the child is feeling, thinking and experiencing (b) the mother talking on the infant's behalf.

The coding is divided into 'basic mental state terms' (Category 1); 'Subtle mental state terms/ linking the child's mental state to behaviour' (Category 2) and 'Rich elaboration of the child's mental state' (Category 3). These are described in detail below.

### **Basic Mental State Statements**

#### *Emotions*

These are basic words / statements commonly used to describe the child's emotion and are obvious from the child's behaviour. These include labeling an emotion for example *sad, happy, cross, angry, frustrated*, 'Now he is happy you can see his smile', 'He's getting annoyed now'.

#### *Likes/ Dislikes*

These are statements about the likes, dislikes and preferences, which are obvious and observable from the child's behaviour. For example: 'He likes the toy', 'He doesn't like strangers', 'he wants to get the toy back'.

#### *Intentions*

*Trying to* is classified as mind related as the mother is specifying the precise goal the child is trying to achieve. For example. 'She is trying to get out of the chair'. But general uses of trying to, for example, 'what are you trying to do?' is not coded mind-related.

The statements in this category are coded on the basis of simply labelling the child's observable mental states, preferences, intentions, emotions, like and dislikes without any elaboration for example; 'he's pointing at what he wants', 'not completely confident', 'he's frustrated with the task', 'he's curious', 'he's trying to reach for the toy'.

### **Subtle Mental State Terms / Linking the Child's Mental State to Behaviour**

#### *Subtle Mental State Terms*

This category includes single non-obvious subtle mental state terms, which may suggest a unique description of a mental state. For example: *stressed, moody, puzzled, and self-conscious*.

#### *Cognitions*

This includes stating a cognition of the child such as deciding, making a decision, recognizing, working out. For example 'she's concentrating, she's working out what to do'.

#### *Linking Mental State to Behaviour*

This category also includes statements that link the mental state with behaviour and suggests more thoughtfulness. For example 'she's stressed that I'm not doing anything to help her', 'He's feeling sorry for himself because the toy has been taken away'.

The difference between MS1 and MS2 statements is between, for example 'she is not comfortable' (Category 1) vs. 'she is not comfortable because I am not in her immediate vision and she misses me' (Category 2).

### **Elaboration and Rich Description of Mental States**

#### *Rich Elaboration of the Child's Mental State*

In this category the parent describes, elaborates and provides an in depth explanation of the child's mental state. A compelling elaboration of the child's thoughts and feeling which indicates that the parent is thinking profoundly about the child's mental state. This is not about the length of the comment but more about the profound and thoughtful insightfulness of the parent of the child's mental state. For example 'Frustrated really, because she wanted

*it and I wasn't letting her have it, because it's obviously a toy I'd let her play with before, and she doesn't get why she's not allowed to play with it now'.*

#### *Talking on the Child's Behalf*

This category also includes any utterance that is obviously meant to be dialogue said/thought by the infant. When the mother goes on to talk on the infant's behalf and conjecture what the child might be saying. for example *She's thinking, "why isn't mummy doing something to stop this"*, *She's trying to get a reaction I think and pointing, moving, sort of gestures to say, "I want it"*. Comments do not necessarily have to contain an internal mental state term but are clearly a dialogue intended to be spoken by the infant for example *"that toy looks familiar mummy"*.

The difference between Category 2 and Category 3 is between, for example *'she's sussing out what to do next'* (Category 2) vs. *'She's trying to make out who is in charge here and therefore is sussing out the relationship between you and me and trying to figure out who will help her get the toy'* (Category 3)

### **Comments That are not Mental State Terms**

#### *Perception*

Comments about seeing, watching, looking, listening, touching, tasting are not classified as mind-related.

#### *Saying/talking*

Comments about the infant saying something or talking (made in response to vocalisations from the infant) are not classified as mind-related for example, *'Are you talking to me?'*, *'What are you saying?'*

#### *Physical States*

Comments on the infant's physical state for example *tired, hungry, thirsty, hot, cold* are not coded as mind-related.

#### *Non-Specific References to Infant's Internal States*

Comments which indicate that the mother has noted a change in the infant's internal state, but does not reflect the specific state being experienced, for example *'What's the matter/wrong/up?'* *'Are you all right/OK?'*, *'Is that better?'*, are not classified as mind-related. Comments such as *'Is that nice/good?'* or *'That's nice/good'* are not classified as mind-related.

### **Classifying Mind-Related Comments as Appropriate/Non-Attuned**

While identifying all mind-related statements and comments video sessions between the mother and child are examined to aid in appropriateness of the mind-related comments. A comment is deemed appropriately mind-minded if the researcher agrees with the mother's reading of the infant's current internal state. For example *'She likes it'* (*referring to toy that a child is actively playing with*). A mind-related comment is not coded if the researcher disagrees with the mothers reading of the infant's current internal state, for example. *'She is bored with it'* (*referring to a toy that the child is actively playing with*).

**Appendix J**  
**Ethical Approval**

**Research Ethics Committee**

Dr Pasco Fearon School of Psychology and Clinical Language Sciences

01 February 2011

**Research Ethics Committee Project No. 08/65 Amendment: The development of children's emotion- regulation skills**

Dear Dr Fearon

Thank you for your email providing amended documents in relation to the above project. I can confirm that the Chair has reviewed the changes and is happy for the project to proceed.

Yours sincerely,

Nathan Helsby

Planning Support Officer (n.e.helsby@reading.ac.uk, x6972)

cc: Professor M A Gosney (Chair) Professor Judi Ellis, Head of the School of Psychology and Clinical Language Sciences