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Bridging the transmission gap in attachment: The role of mind-mindedness in mothers and fathers

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Abstract

Antenatal attachment representations (Adult Attachment Interview classification and reflective function), 'mind-mindedness' (Meins, 1997) in relation to the foetus, and attachment to the unborn child (Condon, 1993) were assessed in 25 couples and 3 solo mothers. Families were followed up at 6 months postpartum, at which time infant-parent interaction was observed separately for mothers (N=21) and fathers (N=17). These free-play interactions were coded for parents' sensitivity (Ainsworth, Bell, & Stayton's, 1974) and mind-mindedness (Meins, Fernyhough, Fradley, & Tuckey, 2001). Infant-parent attachment security was assessed using the Strange Situation in a further follow-up at 12 months for mothers (N=18) and 15 months for fathers (N=15), with parents predicting in advance how their infants would react. Parental mind-mindedness in the Strange Situation was also assessed using Meins et al.'s (2001) scheme.

The results across the four testing ages largely showed that autonomous AAI classification and RF were both positively associated with parental mind-mindedness, although in general, stronger effects were seen (a) for fathers than for mothers, and (b) using RF rather than AAI classification as the index of parental attachment representations. There was evidence for continuity in mind-mindedness from pregnancy to 6 months in mothers and fathers, but there was less continuity in mind-mindedness across different contexts than was observed over time. With respect to accuracy of parental predictions about attachment behaviours, maternal mind-

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mindedness both antenatally and at 6 months was positively related to accuracy. Accuracy in mothers was also related to higher levels of sensitivity and RF.

Potential pathways from antenatal attachment representations to Strange Situation via indices of infant-parent interaction (mind-mindedness or sensitivity) were explored using a descriptive approach. Regardless of whether high sensitivity or high mind-mindedness was used as the intermediary, autonomous AAI classification related to secure Strange Situation classification. Low sensitivity or mind-mindedness appeared to have a negligible impact on the likelihood of a secure attachment being formed if the parent was autonomous. Non-autonomous AAI classification coupled with low sensitivity or mind-mindedness was similarly strongly related to insecure Strange Situation classification. However, unlike for high sensitivity, having a mind-minded parent appeared to ameliorate the effect of non-autonomous AAI classification on infant attachment security, at least for fathers.

Bridging the Transmission Gap in Attachment:

The Role of Mind-mindedness in Mothers and Fathers

I

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PhD Thesis

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Declaration

The material contained in this thesis has not previously been submitted for a degree at this or any other university.

Statement of Copyright

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Chapter 1

Infant Attachment Security and Parental Attachment Representations

1.1: Bowlby and Attachment Theory

John Bowlby, the forefather of attachment theory, merged ideas from ethology,

psychoanalysis and early cognitive psychology to form an eclectic, evolutionary theory

of human development. As a move away from the retrospective, fantasy-focused

conjecture of psychoanalytic theorists of the time, Bowlby sought to create a coherent

explanation for the observations of maladjustment in children who had suffered

maternal deprivation. From his earliest work, Bowlby (1944; 1951) began to postulate

that there was more substance to the mother-child relationship than was credited by

both psychoanalysts and social learning theorists, all of whom emphasised the mother's

role of feeding the child to the near exclusion of other relationship functions. The

opportunity to consider these ideas further came when Bowlby was commissioned by

the World Health Organisation to report on the mental health of homeless children in

the post-war years. His conclusion after reviewing the available evidence was that

infants and children required a continuous, close, warm relationship with a caregiver

for healthy mental development (Bowlby, 1951).

Concurrently, James Robertson, working as a researcher under the supervision

of Bowlby, was filming young children experiencing separation from their caregivers

when being hospitalised or institutionalised. Robertson captured on film what Bowlby

(1980) was later to describe as the stages of protest, despair and detachment. The

revelations from these two unprecedented assignments provided Bowlby with the

impetus to develop a convincing theory to account for the attachment between mothers

and children which he had so clearly observed. Bowlby's initial formulation of

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attachment theory was fully outlined in his trilogy: Attachment and loss: Volume 1. Attachment (1969); Attachment and loss: Volume 2. Separation: Anxiety and anger (1973); and Attachment and loss: Volume 3. Loss: Sadness and depression (1980). Bowlby proposed that infants are innately predisposed to develop a warm relationship and to stay in close proximity to the caregiver, due to the protective advantage that these behaviours afforded in the environment of evolutionary adaptation (EEA).

Bowlby (1969) defined attachment as a behavioural system, which, like all behavioural systems, is characterised by several basic principles. Firstly, they are comprised of behaviours that are co-ordinated to achieve a specific goal and adaptive function. Bowlby proposed that the specific goal of the attachment behavioural system was proximity to the attachment figure, so that when distance increased, attachment behaviours increased. The adaptive function of the attachment system was the protection the relationship offered to the infant against predators in the EEA. The proximity-seeking and contact-maintaining behaviours characteristic of attachment in infancy were proposed to ensure that the infant was close to the attachment figure in times of danger and was therefore afforded protection.

The second basic principle of behavioural systems is that they are activated and terminated by internal and external cues. With respect to the attachment system, Bowlby believed attachment behaviours were activated by an internal (e.g., feeling ill) or external (e.g., the presence of a stranger) threat, and were terminated when proximity to the caregiver was achieved. This relates to the third principle: a behavioural system is guided at a biological level by a feedback system which monitors internal and external cues. Although Bowlby originally proposed that the attachment system could be turned off, he later accepted that it was constantly active but just 'turned down' on some occasions (Bretherton, 1985).

The fourth principle is that behavioural systems are goal corrected; they are regulated by goals and the behaviours required to achieve these goals can be adjusted to suit the environment. Bowlby spoke of active behaviours, such as crying, smiling and following, which had the function of connecting the mother with the infant and thus achieving the goal of proximity.

The fifth principle is that behavioural systems are related to, and interact with, other behavioural systems. Bowlby's theory also gave consideration to other behavioural systems in the infant, such as exploration, that could interact with the attachment behavioural system. He proposed that the systems were in competition with one another, so that when infants were occupied fulfilling their attachment needs they could not simultaneously be engaged in exploration of the environment.

The sixth basic principle is that behavioural systems involve the progressive assimilation of a series of behaviours that help achieve the system's set goal. With respect to attachment, the signalling and locomotive behaviours that the infant uses to stay in proximity to the attachment figure develop over the period of infancy as a result of interactions between the child and the environment. Bowlby predicted that the responsiveness and availability of the caregiver would influence the attachment behavioural system, so that the behaviour of the infant would adapt to that of the attachment figure. That is, if a caregiver is more responsive to one signal than another, the infant will persist with this type of signalling behaviour.

Finally, behavioural systems are believed to be organised by, and integrated with, specific cognitive control systems. In the case of attachment, Bowlby (1969) proposed that Internal Working Models (IWMs) govern individuals' expectations of close relationships. The IWM was a concept taken from the cognitive psychologist Craik (1934), who proposed that individuals have mental models of their environment

and their own actions in it. Bowlby argued that individuals form IWMs of attachment

with respect to both the self and the caregiver which allow them to predict the likely

behaviour of a caregiver in a given situation and their own likely response. These

representations of the self and other were thought to develop as a consequence of the

relationship history (Bowlby, 1973). Since they develop from interactions, the IWMs of

the self and other are complementary (Bowlby, 1973). For example, if an attachment

figure is rejecting, the individual's representation of the self that evolves will be

characterised by a sense of self as unworthy of love. In contrast, if the attachment

figure is available and responsive, the self will be represented as deserving of love. The

more accurate an IWM, the more useful it is in predicting behaviour. However, it is

sometimes the case that the information contained in an IWM of attachment is painful

if accurately represented. Under these circumstances, Bowlby (1980) argued that

defensive exclusion may be employed. According to Bowlby, defensive exclusion is

the process of excluding from awareness any information that may be detrimental to the

psychological well-being of the individual. Although this serves a short-term adaptive

function, it reduces the predictive validity of the IWM and also interferes with the

process of updating the model. Consequently, defensive exclusion can result in

segregated representations of the attachment figure, with conscious access only to the

representation that arose as a consequence of the exclusion – the representation of the

attachment figure in a positive light.

Bowlby (1980) proposed that IWMs were initially quite plastic, adapting in

response to any changes in the pattern of care experienced by the child, but become

more fixed by around age 5. Once established, the IWM ensures a degree of continuity

between formative, current and future attachment-related experiences. In this way,

IWMs are thought to guide the intergenerational transmission of attachment patterns

(Bowlby, 1969). Building on Freud's (1940/1964) assertion that the infant-mother relationship is the prototype of all later relationships, Bowlby (1969) proposed that infants' IWMs of their relationships with primary attachment figures become the template for all future relationships, including those with their own children. It is believed that parents expose their child to their own IWMs of attachment through both verbal (the way in which the parent communicates with the infant) and non-verbal (the way in which the parent responds or fails to respond to the infant) means.

By experiencing a parent's IWM of attachment, the child comes to develop a way of relating to that parent that is complementary to the parent's representations, so that they can still achieve some care. This is likely to be particularly noticeable under conditions of attachment-related stress. A child who experiences a parent who is rejecting of their attachment needs will learn to dampen down their attachment-related stress, after a separation for example, to avoid experiencing further rejection. However, the child still requires some care in attachment-related situations, for example, when frightened. They must therefore develop another strategy to achieve proximity that will not provoke rejection from the parent. In this way the parent induces a pattern of a dismissal of attachment-related feelings. A child who experiences a parent who is inconsistently responsive to attachment needs, for example sometimes responding and sometimes not, or sometimes responding appropriately and sometimes not, will learn to be hypervigilant and overactivate their attachment system. The child may increase the intensity and longevity of their signalling in an attempt to spur the parent into providing the appropriate care. In this case the parent induces a pattern of preoccupation with attachment-related issues due to the need constantly to monitor the attachment figure to ensure adequate care. One should therefore expect systematic relations between parental IWMs and infant-parent attachment, although the process of transmission is

likely to be highly complex.

1.2: Empirical Perspectives on Attachment Theory

Since the publication of Bowlby's ideas on the central importance of the infant-mother relationship, attachment theory has become a widely-used and extremely powerful framework for understanding individual differences in child development. However, it is likely that its influence would have been considerably lessened without the input of two researchers who transformed Bowlby's theoretical ideas into empirical tasks that could be used to assess attachment constructs: Mary Ainsworth and the Strange Situation, and Mary Main and the Adult Attachment Interview (AAI).

1.2.1: Ainsworth and the Strange Situation

Mary Ainsworth can be highly commended for her substantial expansion of the theory at the behavioural level. Ainsworth was influenced by Bowlby's thinking from 1950 onwards when she began working in his research unit. It was here that she became convinced of the need for naturalistic observations of the mother-infant relationship. Ainsworth carried out her first empirical study not in a developed Western-European or American population (which some commentators have criticised subsequent research for focussing too much attention on), but in the East African province of Uganda. She observed 26 families in their homes for a period of 2 hours every 2 weeks for up to 9 months, when the infants were between the ages of 1 and 24 months. The data from these observations allowed her to elaborate an underdeveloped aspect of Bowlby's theory: that of individual differences in the attachments formed. She noted diversity in both the crying and exploratory behaviours of infants and linked this diversity to variations in maternal sensitivity to the infant's cues.

Ainsworth then went on to conduct another ambitious naturalistic observational study, this time in Baltimore, USA. Families participated in 18 home visits starting at the end of the infant's first month of life and continuing throughout the first year. Seventy-two hours of data were available for each mother-infant dyad and it was possible to observe the attachment relationships developing in each case. Again, like in the Ugandan sample, striking individual differences in both mother and infant behaviours emerged. Also the individual differences in both members of the dyad were meaningfully related to one another. For example, when a mother initiated interactions with her infant in a silent manner with an unsmiling facial expression, the responses of the infant were muted and brief. When a mother was smiling and enthusiastic in such face to face interactions, the infant was joyful and vocalised. At the end of this project, Ainsworth and colleagues included a laboratory procedure in which the 1-year-olds participated with their mothers. The aim was to examine the interplay of attachment and exploratory behaviours that Bowlby had argued could not be simultaneously active. What emerged was a procedure that was to become a benchmark for the assessment of attachment at the behavioural level: the Strange Situation.

The Strange Situation (Ainsworth & Wittig, 1969) is the prevalent paradigm for assessing the quality of an infant's attachment to a caregiver. The procedure lasts up to 21 minutes and consists of 3-minute episodes involving increasing degrees of stress for the infant. Firstly the mother[1] and infant are shown into the laboratory playroom, containing two chairs and an array of age-appropriate toys. Mothers are instructed to act as if they were in a waiting room at the doctor's surgery and to interact with the child only if a bid for their attention is made. After 3 minutes, a female stranger enters the room, and increases the amount of interaction with the infant gradually over the

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[1] This procedure can be used with mothers, fathers and professional caregivers but the term mother is used here as the procedure was initially developed for use with mothers and for the purpose of brevity.

course of the following 3 minutes. The mother then receives a signal to leave the room

while the child remains behind with the stranger. The stranger comforts the child if

necessary, or sits quietly if the child is not visibly distressed. This separation lasts up to

3 minutes depending on how upset the child becomes and how effective comfort from

the stranger is. The mother then returns to the room and the stranger leaves

unobtrusively. The mother is instructed that she can greet her child if she wishes and

can comfort if necessary. Once the child is re-engaged in play, the mother should act as

she did in episode one. After another 3 minutes, the mother is instructed to depart

again, this time leaving the infant alone. This episode lasts up to 3 minutes, again

depending on the reaction of the child. The stranger then re-enters the room and acts as

she did in the previous separation, either comforting the child if distressed or sitting

quietly if the child is not openly upset. This episode also lasts up to 3 minutes. Finally

the mother returns again, reacting as before, and the stranger leaves mother and infant

together for a further 3 minutes.

Ainsworth, Blehar, Waters, and Wall (1978) took a unique methodological

approach in analysing the results of the Strange Situation procedure, concentrating on

patterns of behaviour in their context rather than on frequency counts of specific

behaviours; it was quality that was important, not quantity. This borrowed from

Bowlby's (1969) ideas about the organisation of behaviours into a behavioural system;

the same behaviour can serve more than one function and different behaviours can

achieve the same outcome, therefore it is not the behaviours themselves that are

important but rather the way that they are used. Ainsworth et al.'s (1978) main focus

for their classification system was the infants' reunion behaviours. What they found

were three clear patterns of infant behaviour in the Strange Situation, which they

initially labelled A, B and C.

Pattern B was observed in the majority of infants and was characterised by the attachment-exploration behaviour balance, using the mother as a "secure base" from which to explore. However, some infants did not show this pattern. Those who were described as displaying Pattern A showed a lack of secure base behaviour and an apparent focus on exploration at the expense of attachment behaviours. The Pattern C infants, like pattern A infants, were impoverished in their use of the mother as a secure base, however, unlike group A infants, C group infants focused on their attachment behaviours at the expense of exploration. In Ainsworth's sample 56% of children displayed the B pattern of behaviour. A further 26% of infants were described as showing Pattern A behaviour and the remaining 17% showed the type C pattern.

1.2.2: Characteristics of the Infant Attachment Categories

The A, B, C patterns were later re-labelled with the more value-laden terms of insecure-avoidant, secure, and insecure-resistant respectively[2]. The infant with an avoidant attachment shows limited distress, if any, on separation and actively avoids the mother on reunion. They do not seem to show a clear preference for the mother over the stranger. Infants described as securely attached shows clear signs of missing the mother during the separation episodes even if they are not visibly upset. On reunion they make active bids to re-establish contact with the mother, wanting and seeking proximity if distressed, before returning to exploration. Although they are accepting of the stranger, they show a clear preference for the mother. Infants described as resistant are very distressed during separations, and on reunion they are either angry or, less commonly, passive. They seek but fail to achieve comfort from the mother, and do not return to play.

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[2] For brevity infants will from here on in be described as avoidant, secure or resistant, but what we actually mean is they have an avoidant attachment to a specific caregiver, a secure attachment to a specific caregiver or a resistant attachment to a specific caregiver.

The behaviour of infants in the Strange Situation was perceived as their strategy for dealing with stressful situations (Main, 1990). All infants become attached and undertake to use the caregiver as a source of comfort, but the behaviour of the caregiver influences the strategy that they use to maintain proximity to that caregiver in potentially threatening situations. The avoidant behaviour of insecure-avoidant infants was perceived as fulfilling a strategy of minimising attachment needs. This is hypothesised to develop due to the rejecting behaviour of their mothers (Ainsworth, Bell, & Stayton, 1971). If one's attachment needs are rejected by one's caregiver, it is necessary not to show these needs, otherwise one risks being rejected again, and this could be dangerous in evolutionary terms. Therefore, this strategy allows the infant to maintain proximity to the caregiver without being rejected. The resistant behaviour of the insecure-resistant infants was believed to be fulfilling a strategy in which attachment needs were maximised. This is proposed to be a consequence of the inconsistency shown by their mothers towards their attachment needs (Ainsworth et al., 1971; Isabella, 1993). They have learned to maximise their signalling to try to ensure a response, as maternal non-response in evolutionary terms could be dangerous. They can never gain comfort, since they have no confidence in the availability of their caregiver. Securely attached infants have an effective strategy in which they seek proximity when stressed and gain comfort from their caregiver. The behavioural systems of the infants are adapted to the environment as one of the basic behavioural system principles suggested.

It soon became apparent that the three traditional categories could not capture the full range of responses to the Strange Situation procedure. About 15% of infants in normative samples, and much higher percentages in at-risk samples, were reported to be difficult to classify (Main & Solomon, 1990). Main and Solomon (1990) studied

infants in the low-risk Bay Area sample who Main and Weston (1981) had described as exhibiting "conflict" behaviours in a stressful "clown session" at 12 months, in which a stranger dressed as a clown entered the room, stood silently by the door, then removed his mask and attempted to establish a friendly relationship with the infant. The clown would then receive a message that he would have to leave and would turn away from the infant and realistically cry, before recovering and attempting to re-engage the infant in play. Conflict behaviours were those that were odd, purposeless or disordered in appearance. They were hypothesized to reflect simultaneous activation of competing tendencies within the infant. That is, that they were distressed and/or frightened during the procedure but could not turn towards their caregiver, nor towards the environment in order to cope with this. The Strange Situation behaviour of these children was difficult to classify using the traditional 3-category system. These infants displayed an array of odd, disorganised, disoriented, inexplicable behaviours in the presence of the parent in the Strange Situation. These behaviours were often momentary but striking, and usually occurred immediately upon reunion with the parent. They were considered to reflect a disorganising effect of the parent on the child, a breakdown of a strategy. These infants were not organised but *disorganised*. Main and colleagues had identified a fourth category of behaviour in the Strange Situation, a third insecure classification, and the first non-organised strategy: insecure-disorganised/disoriented (from here on in, disorganised or D).

Infants are classified as disorganised in the Strange Situation if their behaviours in the presence of the mother, particularly in the reunion episodes, display: (a) sequential contradictory behaviour patterns (e.g., avoidance immediately followed by a display of resistance); (b) simultaneous contradictory behaviour patterns (e.g., displaying avoidance behaviours while seeking proximity); (c) undirected, misdirected,

incomplete and interrupted movements (e.g., greeting the stranger when the mother

returns); (d) stereotypies, asymmetrical movements, mistimed movements and

anomalous postures (e.g., falling prone when the parent enters the room); (e) freezing,

stilling and slowed movement or expressions (e.g., holding arms out at shoulder height

for 30 seconds); (f) direct indices of apprehension regarding the parent (e.g.,

responding to the mother's return by jerking back with a fearful expression); or (g)

direct indices of disorganisation or disorientation (e.g., raising hands to the face with a

confused or wary expression as a direct response to the return of the parent). The

behaviours must be inexplicable. Each example of a behaviour that fits one of the

above category descriptions is then assessed on a 9-point rating scale to determine

severity. An overall score is then calculated, and if an infant receives a score greater

than 5, they are classified as disorganised. Each D infant also receives a best-fitting A,

B, C secondary classification which describes their general behaviour in the Strange

Situation.

In the meta-analysis by van IJzendoorn (1995) the four way classifications were

available for 548 infants. Avoidant infants accounted for 21% of the sample, secure

infants for 53% of the sample, resistant infants made up 5%, and the remaining 21%

were classified as disorganised. Although the later meta-analysis, van IJzendoorn,

Schuengel, and Bakermans-Kranenburg (1999) concluded that in low risk samples the

typical rate of disorganisation was 15%.

1.2.3: Main and the Adult Attachment Interview

In 1985, only seven years after the Strange Situation procedure became the benchmark

for attachment measures at the behavioural level, Main, Kaplan, and Cassidy published

a paper advocating a move to a new level in attachment research: the level of

representation (Main, Kaplan & Cassidy, 1985). The procedure that they described in this article, the Adult Attachment Interview (AAI), was to become as central to adult attachment research as the Strange Situation had become to infant attachment studies. The narrative produced during the AAI is proposed to give a window on adults' IWMs of their childhood attachment relationships.

Main and colleagues developed the interview protocol (George, Kaplan & Main, 1985) in their Bay Area sample. They were interested in how the parents of infants classified as secure and insecure in the Strange Situation procedure 5 years earlier would talk about their own attachment experiences, building on Bowlby's (1973) idea that IWMs were generated by verbal as well as non-verbal communication patterns. The AAI is a semi-structured protocol taking on average one hour to administer. It consists of 18 questions and is transcribed verbatim for analysis. The interview aims to surprise the unconscious of the participant. The protocol begins with the individual being asked to provide a general description of the family makeup in childhood, followed by a request for 5 adjectives to describe the relationship with each parent. The speaker is then probed to provide memories to support each adjective, first for the mother and then for the father. The interview then goes on to ask what the speaker did when emotionally upset, physically hurt and ill as a child, and how the parents responded. The participant is also queried about salient separations, possible experiences of rejection and/or parental threats, and any experience of abuse. Speakers are also asked about each loss that they have suffered. The interviewer then asks the participant why they think that their parents behaved the way that they did during childhood, what effects their parents have had on their adult personality, and whether there have been any setbacks to their development. Finally, speakers are questioned regarding feelings about a real or imagined child.

Main and Goldwyn in 1984 developed the scoring system for the AAI in the same Bay Area sample, using 44 'development' transcripts. Following verbatim transcription of the narrative, the rater initially tries to assess the likely childhood experience of parental behaviour of the speaker on five experience scales (loving, rejecting, involving-reversing, neglecting, pressure to achieve). The rater then attempts to rate the state of mind of the individual, firstly on three scales for states of mind respecting the parents (idealising, involving anger and derogation) and then on the 5 scales for overall states of mind (overall derogation of attachment, insistence on lack of recall, metacognitive processes, passivity of thought processes, fear of loss). A score for a lack of resolution is given to each individual for loss and experience of trauma on a 9-point scale. Finally, scores for coherence of transcript (based on the maxims of quality, quantity, relevance and manner) and coherence of mind are given, and an overall classification is made.

The aim of the coding scheme is to categorise an adult's state of mind with respect to their attachment experiences. It is not designed to assess an adult's current attachment to their parents or to assess their attachment relationships with their parents in childhood. The current manual (Main & Goldwyn, 1998, version 6.3) proposes that the interview cannot provide information about an individual's state of mind with respect to one particular parent. Hesse (1999) suggests that the central task of the AAI is to provide and reflect upon memories related to attachment, while simultaneously maintaining a coherent discourse with the interviewer.

1.2.4: Characteristics of the Adult Attachment Categories

There are 4 major classifications resulting from the AAI scoring system: dismissing with respect to attachment (Ds); autonomous with respect to attachment (F);

preoccupied with respect to attachment (E); and unresolved with respect to loss or trauma (U)[3]. A fifth category, cannot classify with respect to attachment (CC) is relatively rare in normal populations and will not be considered further here.

Dismissing individuals are characterised by a lack of coherence in the AAI; this is mainly a consequence of repeated violations of the maxims of quality and quantity. They dismiss the importance of attachment relationships by: (a) claiming a lack of memory for childhood, and/or (b) idealising and normalising their childhood without being able to provide support for these generalisations. Their interviews are usually brief. In terms of Hesse's (1999) central task of the AAI, they cannot produce or reflect on memories related to attachment and are unable, therefore, to maintain a collaborative discourse. The IWMs of these individuals are thought to be segregated, so that they only have access to positive generalisations about their attachment figures, but are unable to support them with memories from childhood as these reside in the original representation that was defended against.

Autonomous individuals are characterised by a collaborative, coherent discourse, whether describing a positive or negative childhood. They do not noticeably violate any of the maxims, and provide evidence that they value attachments, while remaining objective about particular relationships. In terms of Hesse's central task, they are able to produce and reflect on memories of attachment-related experiences while maintaining a collaborative discourse. These individuals have IWM models that are accurate and open to change.

Preoccupied narratives are characterised by a lack of coherence, as a consequence of repeated violations of the maxims of quantity, manner and relevance. The speaker seems to be preoccupied by their attachment or traumatic experiences, and

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[3] For brevity from here on in will be referred to as dismissing, autonomous, preoccupied and unresolved.

consequently these interviews are often very long. Preoccupied individuals are angry, passive or fearful. In terms of the central task of the AAI, they are able to produce memories of attachment experiences, but rather than reflecting on them, they become entangled with them, and this prevents them from maintaining a collaborative discourse. The IWMs of these individuals are lacking in accuracy and are less open to change.

Narratives classified as unresolved are characterised by, perhaps, only momentary lapses concerning discussions of loss and/or trauma that reveal a lack of resolution with respect to these experiences. They may show either lapses in reasoning (e.g., that a person can be alive and dead at the same time) or discourse (e.g., prolonged silences which are not acknowledged). These lapses reduce the coherence of the interview. In terms of the central task of the AAI, these individuals may or may not be able to produce and reflect on memories of attachment experiences, but their lapses mean that they are unable to maintain a collaborative discourse at certain points during their narrative. Each individual who receives the unresolved category as their primary classification in the AAI also receives a best-fitting Ds, F or E secondary classification, which reflects their underlying narrative. The unresolved material causing these lapses can be considered as unintegrated into existing IWMs.

In a meta-analysis of non-clinical mothers and fathers, van IJzendoorn and Bakermans-Kranenburg (1996) concluded that the distribution of the 4 major AAI categories was as follows: 16% dismissing, 55% autonomous, 9% preoccupied and 19% unresolved.

1.3: Predicting Infant-parent Attachment Security from Parental Attachment IWMs

The Strange Situation and AAI have enabled researchers to test Bowlby's claims about the intergenerational transfer of attachment patterns. This question was first addressed by Main et al. (1985) who, having developed the AAI protocol and scoring procedure from 44 transcripts from the Bay Area sample, used the AAIs of the remaining 66 participants to investigate concordance between Strange Situation and AAI classifications. What they found was that maternal AAI classifications were related to infant-mother Strange Situation classifications, assessed 5 years previously. Autonomous mothers were more likely to have secure infants (76%) and non-autonomous mothers were more likely to have insecure infants (74%). In particular, dismissing mothers were more likely to have avoidant infants, preoccupied mothers were more likely to have resistant infants, and unresolved mothers were more likely to have disorganised infants (Main et al., 1985). However, because the AAI was developed in this sample, there was a need for this relation to be replicated, and only in samples in which the Strange Situation procedure was administered following the AAI could conclusions about the predictive nature of the AAI be made.

The link between maternal attachment representations and infant-mother attachment security has been successfully replicated in a number of studies. Pederson, Gleason, Moran, and Bento (1998) replicated Main et al.'s (1985) findings in a similar sample of predominantly white, middle-class mothers in the US (80% two-way concordance). The relation between the AAI and Strange Situation classifications has also been found in samples of British mothers (e.g., Fonagy, Steele, & Steele, 1991: 75% two-way concordance), Israeli mothers (e.g., Aviezer, Sagi, Joels, & Ziv, 1999: 76%), teenage mothers (e.g., Ward & Carlson, 1995: 78%), foster mothers (e.g., Dozier, Stovall, Albus, & Bates, 2001: 72%), and fathers (Steele, Steele, & Fonagy,

1996: 71%). Noteably, some of these studies administered the AAI prenatally, and still found the relation to hold true (Fonagy et al., 1991; Steele et al., 1996; Ward & Carlson, 1995) with an effect size equal to retrospective studies (van IJzendoorn, 1995). This suggests that the observed concordance could not be explained simply in terms of experience of having a child impacting on parents' representations of their own childhood attachment relationships.

Despite these positive findings in support of Bowlby's argument for intergenerational transfer of attachment patterns, a number of points of caution need to be voiced. First, although a meta-analysis resulted in parental AAI being identified as a strong predictor of infant attachment security (d=1.06: van IJzendoorn, 1995), some studies have found levels of concordance vary between the specific types of insecure and non-autonomous categories. For example, while the correspondence between parental unresolved status and infant disorganisation can be high (89%: Ainsworth & Eichberg, 1991), quite poor concordance has been found between preoccupied AAI status and resistant attachment. For example, Steele et al. (1996) found no resistant infant-father Strange Situation classifications even although there were 11 preoccupied fathers in their sample. Further, although there were examples of resistant infant-mother classifications none of these were in dyads characterised by maternal preoccupation on the AAI. Slade and Cohen (1996) argued that dichotomous correspondence rates hide non-specific associations between insecure categories; that is, some dismissing adults have resistant infants and some preoccupied adults have avoidant infants. Thus, it may be that it is not the *type* of insecurity that is carried forward (except perhaps in the case of disorganisation), but insecurity per se. This is because avoiding a preoccupied mother may be equally adaptive as showing resistance towards her. Van IJzendoorn's (1995) meta-analysis also found a stronger relation

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between maternal AAIs and infant–mother attachment ($r = .50$) than between paternal

AAIs and infant-father attachment ($r = .37$).

1.4: The Transmission Gap

Van IJzendoorn's (1995) meta-analysis clearly showed the strong link between parents'

attachment representations and the types of attachment relationships formed with their

infants. However, van IJzendoorn's (1995) analysis made perhaps an even more

important contribution to the literature on intergenerational transfer in highlighting the

fact that the mechanisms via which attachment patterns are transmitted from parent to

child are poorly understood. He concluded that the majority of the variance of the

intergenerational transmission of attachment remained unexplained and termed this 'the

transmission gap'. The transmission must be via parental behaviour, as opposed to

directly from parental representations because an infant has no access to the IWMs of a

parent. Instead parents are presumed to reflect their representations with respect to

attachment in their behaviour and it is this that influences the quality of the parent-child

relationship. It was therefore a necessary research aim to attempt to identify which

aspect/s of parental behaviour could be the mechanism for this transmission.

As well as investigating the link between parental AAI and infant-parent

attachment security, van IJzendoorn (1995) addressed how parental sensitivity related

to parent's attachment representations and to infant-parent patterns of attachment.

Maternal sensitivity has long been known to be an important predictor of infant-mother

attachment security. For example, early studies by Ainsworth and colleagues

(Ainsworth, Bell, & Stayton, 1971, 1974) found that maternal sensitivity in the first

year of life strongly predicted the security of the attachment relationship at 12 months,

with higher maternal sensitivity resulting in a secure attachment relationship. Early

maternal rejection was predictive of insecure-avoidant attachment, and insecure-resistant attachment was related to inconsistently sensitive patterns of mothering in the first year. Numerous subsequent studies have attempted to replicate these results. Sensitivity has been shown to be a precursor of security in predominantly White, middle-class, US mothers similar to those participating in Ainsworth et al.'s original study (e.g., Braungart-Rieker, Garwood, Powers, & Wang, 2001), in low SES US mothers (e.g., Frodi, Grolnick, & Bridges, 1985), and in high-risk US mothers (e.g., Egeland & Farber, 1984). The relation has also been shown to be significant in European mothers: in Germany (e.g., Grossmann, Grossmann, Spangler, Suess, & Unzer, 1985), in the Netherlands (e.g., van IJzendoorn, Kranenburg, Zwart-Woudstra, Van Busschbach, & Lambermon, 1991), and in the UK (e.g., Meins, Fernyhough, Fradley, & Tuckey, 2001). Maternal sensitivity has also been shown to be related to attachment security in low birth weight infants (Goldberg, Perotta, Minde, & Corter, 1986) and among infants with irritable temperaments (van den Boom, 1988).

Significant associations have also been found between paternal sensitivity and infant-father attachment in predominantly White, middle-class samples in the US (e.g., Cox, Owen, Henderson, & Margand, 1992) and in non-US samples (e.g., Goosens & van IJzendoorn, 1990). However, despite these successful replications, there have been some non-significant results: van IJzendoorn et al. (1991) found the relation only for mother-daughter dyads and not for mother-son dyads; Goldberg et al. (1986) only found the relation for maternal sensitivity at 6 weeks, and not at 3, 6 or 9 months; and Notaro and Volling (1999) failed to find any relation between maternal sensitivity and security. With respect to fathers, non-significant associations have been found in traditional US samples (e.g., Easterbrooks & Goldberg, 1984) and in non-US samples (Grossmann & Grossmann, 1992). DeWolff and van IJzendoorn's (1997) meta-analysis

highlighted the fact that no replication had achieved an effect size as large as that seen in Ainsworth's original study, and they concluded that the strength of the relation between maternal sensitivity and attachment security was moderate (d=0.24), and that between paternal sensitivity and infant-father attachment was weaker still (d=0.13).

Given this wealth of literature on the importance of parental sensitivity for infant-parent attachment, sensitivity was an obvious candidate for transmitting patterns of attachment from parent to child. According to this model, autonomous parents will be more sensitive caregivers, and will therefore be more likely to have securely attached children. Somewhat surprisingly, very few studies have investigated the relation between AAI classification and the quality of infant-parent interaction. Associations between autonomous status and higher quality infant-parent interaction have been reported in a US sample of mothers (Pederson et al., 1998), a sample of Israeli mothers (Aviezer et al., 1999), a sample of German mothers (Grossmann et al., 1985), and a sample of mothers in The Netherlands (van IJzendoorn et al., 1991). However, the relation was not found in a sample of fathers in the Netherlands (van IJzendoorn et al., 1991) and only received partial support in a US sample of teenage mothers (Ward et al., 1995). In addition, many of the studies which did find a positive association had methodological limitations, which reduced the generalisability or validity of their results. For example, Grossmann et al. (1985) used an early edition of the AAI and reported on only a small sample (n = 20), and Aviezer et al. (1999) used a measure of emotional availability, rather than sensitivity. On the basis of his meta-analysis, van IJzendoorn (1995) concluded that AAI classification accounted for only 12% of the variance in sensitivity, and that sensitivity could only account for 23% of the variance in the relation between maternal AAI classifications and infant attachment security. One particularly interesting result was that, although paternal AAI

classification was less strongly predictive of infant-father attachment security than the corresponding relation for mothers, paternal AAI classification was more strongly related to paternal sensitivity compared with the relation between maternal AAI and sensitivity.

Further evidence for the lack of knowledge about how patterns of attachment are transmitted comes from the finding that disorganisation is not necessarily related to lower parental sensitivity. Although insecure-disorganised attachment is linked to abuse and maltreatment (Carlson, Cicchetti, Barnett, & Braunwald, 1989), around 15% of infants in non-clinical samples are disorganised (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999). For example, research on the determinants of disorganisation suggests that it is the infant's knowledge that the attachment figure cannot be relied upon as a source of comfort and support, rather than the attachment figure's behaviour per se, that predicts insecure-disorganised attachment. If mothers appear frightened, this appears equally disorganising for their infants as mothers engaging in frightening behaviour without actual abuse or maltreatment (Main & Hesse, 1990). It is proposed that, as in the case of the maltreated infants, infants of frightened/frightening parents experience 'fright without solution': the attachment figure, the haven of safety when frightened, becomes the source of the fear, and this has a disorganising effect on the Strange Situation strategy of the infant. Lyons-Ruth, Bronfman, and Parsons (1999) provided evidence to support this hypothesis, linking maternal frightening/frightened behaviour in the home to disorganised/insecure classification in the Strange Situation. Jacobvitz, Hazen, and Riggs (1997) found that mothers classified as unresolved on the AAI engaged in more frightened/frightening behaviours with their infants. When compared to unresolved/non-autonomous mothers, unresolved/-autonomous mothers showed a trend towards engaging in fewer

frightening or frightened behaviours. That is, having a mother with a secondary

autonomous classification may offer some protection for an infant when exposed to

frightened/frightening mothering. It is not clear as yet, whether there is some protection

offered by underlying secure representations and, if so, by what mechanism it operates.

1.5: Trying to Bridge the Transmission Gap

The results of the 2 key meta-analyses on the determinants of infant–parent attachment

security have done much to highlight some pressing issues for attachment researchers.

Van IJzendoorn (1995) proposed that bridging the transmission gap should be a major

research priority, and De Woolff and van IJzendoorn's (1997) conclusion that

"sensitivity cannot be considered to be the exclusive and most important factor in the

development of attachment" (p. 585) was a call to investigate the origins of attachment

security more closely. Research by Fonagy, Target, Steele, and Steele (1998) aimed at

reformulating the way in which adult attachment representations are coded can be seen

as one attempt to explore other potential predictors of attachment security.

1.6: Reflective Functioning

Fonagy et al. (1998) developed an alternative way of rating AAI narratives, focusing on

one aspect of Hesse's central tasks: the ability to *reflect* on memories related to

attachment. The Reflective Function (RF) scale assesses an interviewee's awareness of

the mental processes and functions of the self and others. Fonagy and colleagues

proposed that RF is the mental function that organises behavioural experience in terms

of the mental states of self and others. They argued that: (a) RF develops

interpersonally; (b) RF shows décalage – that is, an individual may show different

levels of reflective functioning in different situations; and (c) the capacity for RF differs among individuals. Specifically, it is individual differences in the ability to be reflective in an attachment narrative, and how this ability relates to interpersonal relationships, which is of interest to attachment researchers investigating the transmission gap.

According to the authors, the capacity for reflection is important as it allows behaviour to become predictable, facilitates the appearance-reality distinction, enhances communication, and encourages meaningful connections between inner and outer reality. Reflecting on mental states is thought to make the behaviour of others more predictable because individuals' behaviour is influenced by their thoughts, beliefs and feelings. Being able to predict the behaviour of others is important as it allows us to make judgements about our own responses to them. In addition, the more predictable others are, the greater physical and mental autonomy we can have from them, as being able to accurately predict their behaviour reduces the need for monitoring. With greater physical and mental autonomy comes the ability to expend one's energy on other matters. The appearance-reality distinction involves understanding that things are not always as they seem, for example, people can hold beliefs that are false. An understanding of this distinction is important in everyday life to avoid misunderstandings in dealings with others. Additionally, it can be important in cases of child abuse, since it enables a child to comprehend that just because their abuser acts as though they are unlovable, it does not mean this is a true representation of their character. Reflection also enhances communication. A key aspect of successful communication is taking into account the mind of the listener, such as checking that they have understood what you have said. Successful communication improves relationships with others and reduces misunderstandings. Finally, reflection is thought

to encourage meaningful connection between the internal and external worlds. By considering the mental states of the self and others in relation to behaviour, an individual can gain insight into the effect of thoughts and feelings on behaviour, which in turn makes life more meaningful.

RF is scored from verbatim transcriptions of the AAI. The RF manual distinguishes between 2 types of questions in the AAI: demand and permit. The demand questions are those that challenge the speaker to be reflective (e.g., "Why do you think your parents behaved as they did in your childhood?"). The permit questions are those that allow the speaker to be reflective if they wish (e.g., "What would happen when you were emotionally upset as a child?"). Raters look for instances of reflective comments in both types of questions. Each reflective comment is given a descriptor, which is a label to give a flavour of the content of the comment (e.g., acknowledging the separateness of minds) and a score. The rater then determines a score for each question and an overall score for the whole transcript, taking into account any passages containing anti-reflective comments (e.g., those that express hostility or an active evasion in response to an opportunity for reflection) and those answers that are lacking in RF or have questionable or low levels of RF. Answers to demand questions are given greater weight in this process.

Interviewees receive an overall rating of RF from -1 to 9, with 6 anchor points. Those receiving a score of -1 are described as having negative RF. They are either rejecting of a reflective stance or their reflections are unintegrated, bizarre and/or inappropriate. An example of a comment receiving this score would be: "You tell me, you are the psychologist" with no further elaboration, in response to the question "Why do you think your parents behaved as they did?" Those receiving a score of 1 are described as Lacking in RF. They either provide accounts that do not acknowledge

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reflection or else their reflections are distorted and/or self-serving. An example of a comment receiving a score of 1 is: "Well one night my parents were supposed to be going away for the night when I was 6 years old, but they never got there as...well they said that the car had broken down, but actually it was obvious that they just couldn't bear to be away from me. They even went through with pretending to get the car fixed just so that I wouldn't see through them" when asked about any separations that occurred during childhood. Those who score 3 are characterised by Questionable or Low RF. Their reflections can be naïve and simplistic or over-analytical and hyperactive. Comments receiving a score of 3 for example are those such as the response: "Well when she left him his ego was probably hurt, wasn't it?" to questioning regarding the parental divorce during childhood. Those who score 5 are described as having Ordinary RF. They show an ordinary understanding or an inconsistent understanding in their reflections. A comment characteristic of this score is: "Well they did used to threaten to send me to the naughty boys' home, but then again they were only joking, at least I thought they were only joking. I knew that they would miss me a lot if they did send me away so I never took them seriously" when questioned regarding threats used by parents during childhood. Those who receive a score of 7 produce transcripts that are characterised by Marked RF. An example of a comment that would receive a score of 7 is: "I knew I should be upset when she died, but I think that sometimes these things don't affect you at first and it is not until later that you realise, you realise how horrible it must have been to lose a child in that way". Finally those who score 9 are described as having Exceptional RF. Comments receiving a 9 are rare and this score tends to be used as a summary score for a whole transcript. It is important to keep in mind that all RF scores are summary scores that characterise the overall transcript and may contain comments receiving a variety of scores.

To reflect on the mental world of the self and others, an individual must perceive the world of intentions, feelings and beliefs to be a safe place to explore. It is proposed that this is not the case for non-autonomous adults. Fonagy, Steele, Steele, Moran, and Higgit (1991) found RF ratings and AAI classifications were related in expected ways; with autonomous parents receiving higher RF ratings. In particular, the coherence of transcript scale on the AAI was highly correlated with RF scores (.73 for mothers, .63 for fathers). The IWMs of individuals may differ in the extent to which they include the mental states of the self and attachment figures. It seems that non-autonomous adults are less inclined to reflect on the mental world, perhaps because they do not perceive it to be a safe place to explore.

A study by Fonagy, Steele, Steele, Moran et al. (1991) found evidence of a significant concordance between parental RF, as scored from prenatal AAI transcripts, and infant Strange Situation classifications with both mother and father. Fifty-two percent of mothers of secure infants received ratings in the two highest RF categories, compared to only 10% of mothers of avoidant infants. However, there was no significant difference between mothers of resistant infants and mothers of secure infants. Further, no disorganised infants were included. The relation between RF and attachment security was weaker for fathers than for mothers, mirroring the pattern of effects for the relation between AAI and Strange Situation classifications (see above). Moreover, this refinement of the AAI scoring procedure predicted infant-parent attachment security independent of parents' overall AAI classification. When RF was controlled for, AAI coherence no longer predicted infant Strange Situation classifications significantly, suggesting that the predictive power of the AAI may lie in its close association with RF. However, Fonagy et al. do not report whether when AAI

coherence was controlled for, RF still predicted infant-parent attachment. Also AAI coherence scores are not equivalent to AAI classifications.

Fonagy and colleagues argued that RF promotes a secure infant-parent attachment relationship because it indexes parents' willingness and ability to reflect on their children's emotions, rather than defend against them. When caregivers are more reflective, children become confident that their mental states will be appropriately reflected on, and therefore responded to accurately. But the IWMs of an individual may differ in the extent to which they include the mental states of the children for whom he or she is an attachment figure. It is therefore important to establish whether individuals who are reflective about their own attachment experiences during the AAI are similarly reflective about the mental and emotional states of their children. Addressing this question requires consideration of a different type of IWM: the parent's IWM of the child.

Chapter 2

Parents' Internal Working Models of the Child

2.1: Bowlby and the Caregiving System

Bowlby (1969) proposed the existence of a biologically based, behavioural system in the attachment figure, reciprocal to that of the attachment behavioural system in the infant. It can, therefore, be assessed in similar terms as the infant system; that is, with respect to the basic principles of behavioural systems (George & Solomon, 1999).

Building on the theoretical contributions of Bowlby, George et al. (1999) argued that the adaptive function that the caregiving system is coordinated to achieve is the same as that of the attachment system: protection. By protecting their infants from harm, parents enhance their own genetic fitness by improving the chances of survival of their genes into the next generation. The specific goal that can achieve this is the same as in the infant: proximity. The adult system is activated by internal and external cues, similar to those that activate the infant system, including separation and cues to danger. Comparable to the infant attachment system, the adult caregiving system is terminated, or 'turned down', by re-establishing contact. Again a feedback system is in operation. The parent system will similarly be goal-corrected, so that the caregiving behaviour exhibited will depend on the context of the situation and the experiences of the parent. The other behavioural systems with which the adult caregiving system competes are the affiliative system, the sexual system, and the exploratory system. The system should assimilate, as the infant system does, a set of behaviours that become increasingly functional with development. That is, parents should develop a caregiving strategy that develops out of the interaction with that child. Finally, the adult system should be organised and integrated by specific cognitive control systems. As in infancy, these are IWMs. In adults they may be of the child and of the self as a caregiver.

Although Bowlby did not develop the idea of caregivers' representations of their

infants, this is being given increasing consideration by other attachment researchers.

2.2: Caregiving Representations

Sroufe and Fleeson (1986) proposed that in infancy we learn about *relationships* and

that as part of our IWMs of attachment we represent both the role of the child and the

role of the caretaker. Therefore, it is feasible that the IWMs of an adult with respect to

the child derive from their own experiences with their attachment figures.

Representations of the child have been investigated using various interviews with

parents.

George and Solomon (1989) developed an hour long, semi-structured

Caregiving Interview (CI) which questions parents about every-day care situations

(e.g., feeding) and situations that are likely to activate both the caregiving and

attachment systems (e.g., separations). Mothers' representations are rated on the basis

of their evaluations of their own feelings, thoughts and behaviours and those of the

child. Interviews are rated on a Secure Base scale. High ratings on this scale reflect

positive and integrated thoughts regarding the self, the child and the relationship. The

narrative is flexible, balanced and undefended. Individuals scoring highly on the scale

are positive and realistic about potential threats to their children's security, and are able

to evaluate caregiving in relation to the personality and development of the child, the

overall context, and their own needs.

Aber, Slade, Berger, Bresgi, and Kaplan (1985) developed The Parent

Development Interview (PDI) and the associated coding scheme was developed by

Slade, Aber, Cohen, Fiorello, Meyer, DeSear, and Waller (1993). The interview

assesses the mother's representation of her relationship with a specific child, focusing

on her capacity to describe her affective experience of the child and the relationship in a flexible and coherent way. It consists of 45 questions and takes between 1 and a half and 2 hours to administer. As in the AAI, the interviewee is initially asked to give a general description of her relationship with her child, and is then asked to provide 5 adjectives to describe the relationship and support each adjective with specific episodic memories. Interviewees are then asked to describe what they like and dislike about the child and how the child is similar to and different from both parents. They are also asked to describe the pleasures and difficulties of the relationship, and to talk about their strengths and weaknesses as a parent. They are further probed as to how their own parenting is similar to and different from the parenting that they received as children, and in any ways they would like their parenting to me more similar to or more different from that which they received. Finally, the interviewee is queried about the child's usual response to separation and routine upsets.

Narratives are transcribed verbatim and scored along three dimensions: parental representations of their own affective experience, parental representations of their child's affective experience, and parental state of mind. Three factors emerge from analyses: (a) joy-pleasure/coherence; (b) anger; and (c) guilt-separation distress. The joy-pleasure/coherence factor consists of scores relating to the joy or pleasure that the parent gets from the interaction with the infant, the coherence of the narrative, and the richness of the parents' perceptions. The anger factor consists of scores relating to the degree of anger in the narrative, the acknowledgement of anger by the parent, and the modulation of this anger. The guilt-separation distress factor consists of scores relating to the acknowledgement by the parent of feelings of distress on separation from the infant, the degree of guilt in response to this separation distress, and the modulation of separation-related guilt.

Zeanah, Benoit, Hirshberg, Barton, and Regan (1994) developed the Working

Model of Child Interview (WMCI). The authors argued that previous measures of

parental IWMs of child focussed on the content of the representations rather than on the

characteristics of the discourse. The WMCI aimed to redress the balance. The interview

is an hour long, structured protocol. Parental narratives are assessed on 15 Likert-type

scales and classified into one of three possible categories: Balanced, Disengaged, or

Distorted.

The balanced perspective is characterised by a consideration of both the positive

and negative aspects of the child and the parent-child relationship. There is a sense of

the caregiver as involved in the relationship and of the infant as an individual. There is

a valuing of the relationship and an empathic appreciation of the infant's experience.

Balanced narratives are open to change and are moderately rich in detail. The

disengaged classification is characterised by a pervasive sense of emotional distance

from and indifference to the infant. Disengaged individuals do not seem to represent

the infant as an individual, and the infant's subjective experience seems foreign to

them. They do not reveal a valuing of the relationship and deny effects of parenting on

children. They approach the interview at a cognitive, rather than an emotional level.

Their discourse is not open to change and their descriptions remain unelaborated. The

distorted narrative is characterised by a preoccupation with other matters beyond the

parent-child relationship, by self-involvement, a perception of being overwhelmed by

the infant, or expectations of excessive infant compliance. Distorted individuals are

insensitive to the infant as an individual and do not recognise the potentially

detrimental impact that parents can have on their children. Their descriptions are

incoherent, and are characterised by a struggle to feel close to the infant and a lack of

emotion regulation in the narrative.

There is evidence for these various assessments of parents' IWMs of their children relating both to AAI classification and to infant-parent attachment. For example, maternal Secure Base ratings on the CI have been found to be positively related to concurrent maternal sensitivity in the home (George et al., 1989) and concurrent infant Strange Situation classifications (George et al., 1996). Mothers who received higher ratings were more sensitive and were more likely to have securely attached infants. Slade, Belsky, Aber, and Phelps (1999) reported that mothers classified as autonomous on the AAI scored highest on the joy-please/coherence dimension on the PDI, and dismissing mothers scored highest on the anger dimension. Benoit, Parker, and Zeanah (1997) report a 74% 3-way concordance between WMCIs administered in pregnancy (for use during pregnancy probes were changed to the future tense to enquire about mothers' expectations) and infant Strange Situation classifications at 12 months. Balanced mothers were more likely to have secure infants and mothers with disengaged or distorted narratives were more likely to have insecure infants. They also found a 73% concordance at a 3-way level between WMCIs conducted 1 month prior to the Strange Situation and infant classifications. WMCI classifications were stable in 80% of cases across the transition to parenthood. Although relations between WMCI and AAI classifications have not yet been investigated empirically, Zeanah et al. (1994) argued that the balanced, disengaged and distorted WMCI categories should respectively map on to the secure/autonomous, dismissing, and preoccupied AAI classifications.

2.3: Shortcomings of the IWM of Child Interview Methods

Although the findings linking these IWM of the child assessments with adult attachment representations and infant attachment security appear impressive, there are

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some shortcomings with the available evidence. First, only work on the CI has addressed potential links with the disorganised infant and unresolved adult categories. George and Solomon (1996) reported that mothers of disorganised infants were characterised by an abdication of caregiving, representing themselves as helpless and their children as out of control. Mothers of disorganised infants also perceived themselves as unable to protect their infant, and often themselves, from danger. In contrast, we do not know how disorganisation in infant attachment and unresolved status on the AAI relates to parents' representations of the child in the PDI or the WMCI because no research has addressed this to date. Second, these interview methods have only been used with mothers, and it is thus not known whether fathers' IWMs of their children are similarly related to paternal AAI classification or infant–father attachment security. Further investigation in this area is required. Third, the existing research tells us little about the mechanisms via which mothers' IWMs of their child impact on infant–mother attachment security, since the methods are narrative accounts of the parent–child relationship, and not assessments of the quality of how parents interact with their child. Although mothers scoring highly on the secure base scale of the CI are more sensitive (George & Solomon, 1989), we do not know whether the more optimal categories on the PDI and WMCI relate to more sensitive patterns of caregiving. Again further research in needed. These assessments therefore do little to help bridge the transmission gap (van IJzendoorn, 1995) because, like the AAI, they are not based on observations of the way in which parents interact with their children. Thus as yet, we do not know whether parents' tendency to reflect on people's mental states during the AAI is related to their willingness or ability to focus on the mental states of their infants during real life interactions. Addressing this question was one of the major aims of the longitudinal study reported here, which used as its starting point a construct

which is at the interface of representation and behaviour: mind-mindedness (Meins, 1997).

2.4: Mind-mindedness

Mind-mindedness (MM) is defined as the proclivity to treat one's infant as an individual with a mind of his/her own, rather than as a being with needs to be met. MM can thus be seen as a form of mentalistic sensitivity; indeed Meins, Fernyhough, Fradley, and Tuckey's (2001) operationalization of MM stemmed from a rethinking of Ainsworth's construct of maternal sensitivity. However, MM should not be seen as a detraction of sensitivity, rather it should be perceived as a construct that can complement the valuable original ideas of Ainsworth. Meins and colleagues (Meins, 1999; Meins et al., 2001) highlighted how, in research following on from that of Ainsworth, maternal sensitivity has become an umbrella concept, including measures of interactional contingency, synchrony and harmony, many of which bear little resemblance to the fundamental quality of sensitive parenting as conceptualised by Ainsworth. Their aim was to go back to the original work of Ainsworth and to elaborate upon it. At the heart of Ainsworth et al.'s (1971, 1974) scheme for assessing maternal sensitivity was the notion that the sensitive mother was able to read the meaning in signals from her young infant, rather than merely responding to such signals. For example, Ainsworth et al. (1974) described the sensitive mother as capable of "perceiving things from [the child's] point of view", and sees her child "as a separate person" (Ainsworth et al., 1971, p.43). Further, Ainsworth et al. (1978) defined the sensitively responsive mother as follows: "alert to her baby's signals, interprets them accurately, and responds appropriately and promptly, unless no response is the more appropriate under the circumstances" (p.124). In contrast, the insensitive mother tries

to "socialize with the baby when he is hungry, play with him when he is tired, and feed him when he is trying to initiate social interaction" (p. 129). Thus, the critical issue is not whether or how quickly the mother responds, but whether the response is appropriate. Unfortunately, while the concept of sensitivity was very clear, the sensitivity scale provided by Ainsworth et al. (1971, 1974) was broad-based, and consequently this specific quality of mother-infant interactions was often overlooked by subsequent researchers.

MM in the first year of life focuses exclusively on mothers' 'mind-reading' abilities. Meins et al. (2001) observed mothers and their 6-month-old infants in free-play interactions and noted whether mothers commented specifically on their infants' putative mental and emotional states. These mind-related comments were then judged according to whether they were an appropriate reading of the child's mind or appeared to misinterpret what the child may have been thinking or feeling. In addition to this language-based assessment of MM, Meins and colleagues included four more direct measures of maternal behaviour that they suggested may be indicative of mothers' proclivity to treat their infants as mental agents: (a) maternal responsiveness to change in infant's direction of gaze; (b) maternal responsiveness to infant's object-directed action; (c) imitation; and (d) encouragement of autonomy. Meins et al. also assessed maternal sensitivity using Ainsworth et al.'s (1971, 1974) scale in order to establish the divergent validity of MM. The mothers and infants were then followed-up at 12 months, when infant-mother attachment security was assessed in the Strange Situation.

Meins et al. (2001) found that mothers' use of appropriate mind-related comments was strongly associated with infant-mother attachment security 6 months later. Mothers who made a greater proportion of appropriate comments about the mental states of their infants were more likely to have infants classified as secure in the

Strange Situation than mothers who made proportionately fewer appropriate comments. In contrast, only one of the behaviour-based indices of MM (maternal responsiveness to infant's object-directed action) was related to subsequent attachment security, with mothers who were more sensitive to their infants' object-directed behaviour being more likely to form secure attachment relationships. However, a regression analysis showed that this index was not an independent predictor of attachment security. Importantly, although maternal sensitivity was positively correlated with appropriate mind-related comments, the 2 constructs were not equivalent. For example, a regression analysis showed that appropriate mind-related comments independently predicted attachment security. Indeed this index of MM was a better predictor of attachment security than Ainsworth et al.'s (1971, 1974) measure of maternal sensitivity. MM accounted for 12.7% of the variance of infant Strange Situation classifications, compared to sensitivity, which predicted 6.5% of the variance. The authors concluded that the ability to comment appropriately on the mental states of one's infant accounts for a greater proportion of the variance because it is more reflective of the underlying IWM compared to the behavioural measure of sensitivity.

The link between maternal MM in the form of appropriate mind-related comments and infant-mother attachment security was recently replicated by Lundy (2003), using the Attachment Q-Sort (Waters, 1995) as the measure of attachment security. This study also assessed paternal MM and its links with subsequent infant-father attachment. Lundy (2003) largely replicated the findings in fathers, although it was not clear that it was fathers' *appropriate* mental state comments, rather than just their mental state comments in general, which related to security.

2.5: Mind-mindedness and the Transmission Gap

MM is a unique concept in that it depends on both representations and behaviour. An appropriate mind-related comment requires the mother accurately to represent and verbally reflect on her infant's likely state of mind, but these comments are made during real life interactions between infants and mothers. As such, MM can be seen as a measure of how a parent's IWM of the child and the parent-child relationship is utilised during on-line interactions. MM allows the parent to consider the mental states of the infant during interaction, which helps parents accurately to perceive the infants' signals, and consequently to respond appropriately. As Fonagy et al. (1991) proposed with respect to RF, this results in children having confidence that their caregivers will accurately interpret their mental states and that the caregiver's subsequent response will be suitable.

The fact that MM reflects how parents use their representations of the child to inform behavioural interactions led Meins (1999) to suggest that MM may be useful in helping to bridge the transmission gap. We know that MM relates both to maternal sensitivity and infant-mother attachment security, and that both MM and sensitivity are important predictors of attachment (Meins et al., 2001). Van IJzendoorn and Bakermans-Kranenburg (2004) stated that the role of maternal sensitivity in the formation of infant-mother attachments was a highly robust finding and that a variety of studies, including: correlational; experimental; and cross-cultural research, had replicated the association. However, the issue that needs attention is whether sensitivity can account for the relation between parental AAI security and infant patterns. In his 1995 paper van IJzendoorn concludes: "The traditional bridge between parents and children – sensitive responsiveness – appears to be *insufficient* to explain the strong association between parents' and children's attachment" (p. 400, emphasis added).

Further, van IJzendoorn (1995) stated that "the largest part of the influence [of parental AAI on infant–parent attachment] would operate through mechanisms other than responsiveness as rated by the Ainsworth scales" (p. 398). Therefore, it seems that sensitive parenting does not appear to be the *main* mechanism via which attachment security is transmitted from parent to child. However, one could predict that MM will be more strongly associated with AAI classification because, unlike sensitivity, MM assesses parents' representations of mental states. Autonomous status and higher reflective function on the AAI should therefore be associated with greater levels of MM.

Until recently, no study had investigated links between MM and AAI classification, but a study by Bernier and Dozier (2003) addressed this question. Bernier and Dozier (2003) found a significant relation between the two concepts in a sample of foster mothers. The results showed that the mothers' proclivity to use mental features to describe the infant was negatively related to maternal and infant security. This finding may at first appear to be counter-intuitive, however, the authors argue that while it is appropriate to describe a 3-year-old child in terms of mental states (Meins, Fernyhough, Russell, & Clark-Carter, 1998) it may not be appropriate to describe an infant in the same way. Since the mental states of young infants are considerably less transparent than those of older children, Bernier and Dozier. (2003) proposed that describing one's infant in mental state terms is inappropriate (and thus an index of *lack of MM*), which explains its observed relation with insecure attachment of both mother and child. The authors concluded that MM was able successfully to bridge the transmission gap, as it accounted for the totality of the predictive power of the AAI on infant attachment measured in the Strange Situation procedure.

However, although these results are promising, a number of caveats need to be mentioned. Firstly, there was large variability in participant characteristics and in the timing of assessments. For example, the participating children ranged in age from 6 to 30 months, foster mothers were between 25 and 78 years of age, and had fostered between one and 100 children. The mean length of the current foster placements was 6.4 months. Secondly, the population was unusual, in that it included only foster mothers, and this finding requires replication in biological families. Thirdly, MM was assessed using Meins et al.'s (1998) 'describe your child' interview, which yields a measure of MM based on the extent to which parents describe their children with reference to their mental (rather than physical or behavioural) characteristics. Consequently, the MM assessment in Bernier et al.'s (2003) study differs from Meins et al.'s (2001) observation-based appropriate mind-related comments scheme. Thus, the benefit of MM as a representational measure obtained from behavioural interaction is lost. As yet, no study has investigated how observationally based MM relates to adults' narrative-based representations of their own childhood experiences, or whether such an index of MM can help to bridge the transmission gap. This was the major aim of the longitudinal study reported here. In addition, this study sought to investigate the timescale during which MM determines attachment security by assessing MM antenatally as well as during the first year of life. Finally, the study included mothers and fathers to investigate concordance between parents, and whether parental gender differentially affects the determinants of children's early social-emotional development.

Chapter 3:

Overview of Methods Used in the Longitudinal Study

3.1: Introduction

The longitudinal study reported here sought to investigate longitudinal relations in MM in the transition to parenthood in both mothers and fathers. Relations between antenatal and postnatal MM and attachment security were also investigated in order to provide data on whether MM might help bridge the 'transmission gap' (van IJzendoorn, 1995) in the intergenerational transfer of attachment. The longitudinal study involved four testing phases: last trimester of pregnancy, and 6, 12, and 15 months postnatal.

3.2: Antenatal Testing Phase

The AAI was administered at the first testing phase and from this state of mind with respect to attachment and Reflective Function were assessed for both parents. Data on antenatal MM and parents' conceptualisations of the unborn child were also collected. Several measures exist to assess the parent's conceptualisations of the foetus. Zeanah et al.'s (1994) WMCI has been used to measure mothers' representations of the unborn child (Huth-Bocks, Levendosky, Bogat, & von Eye, 2004; Benoit, Parker, & Zeanah, 1997), but given that parents were already being given the AAI, a further lengthy interview was deemed inappropriate, and it was decided that this concept should be assessed using a self-report measure. In the available literature, there are a number of measures purporting to assess antenatal attachment of the parent to the unborn child. While this is a methodologically difficult concept, since it is generally agreed in the mainstream attachment literature that a child cannot serve as an attachment figure for a parent, it was felt that such a questionnaire could be employed as a measure of parents' conceptualisations of their child in the antenatal period. Three

such antenatal 'attachment' scales exist: Cranley (1981), Condon (1993), and Muller (1993). The former 2 scales have both been used quite widely, but we favoured Condon's (1993) Antenatal Attachment Scale (AAS) for a number of reasons. First, this assessment has separate scales for maternal and paternal attachment to the foetus. Second, this scale has been used successfully to assess antenatal attachment in several different countries, including Italy (Righetti, Dell'Avanzo, Grigio, & Nicolini, 2005) and Japan (Honjo, Arai, Kaneko, Ujiie, Mirase, Sechiyama, Sasaki, Hatagaki, Inagali, Usui, Miwa, Ishihara, Hashimoto, Nomura, Hakura, & Inoko, 2003), and in diverse populations. For example, this instrument has been used to assess antenatal attachment in women referred for psychological evaluation due to potential foetal abuse (Pollock & Percy, 1999), and in drug-using pregnant women (Shieh & Kravitz, 2002). It therefore appears to be applicable across cultures and populations. Third, responses are meaningfully related to maternal mental health and social support (Condon & Corkindale, 1997) and gestational age (Laxton-Kane & Slade, 2002), while being unrelated to maternal age and SES. This supports the assumption that the scale assesses parents' emotional attachment to the child rather than indexing socially desirable values relating to pregnancy. Finally, Condon's (1993) measure clearly differentiates parents' attitudes to the foetus from their more general opinions on pregnancy or the parenting role. Further, the questionnaire has high internal consistency (Condon, 1993). This self-report questionnaire was included as a measure of parents' representations of the child in the antenatal period.

While it was possible to use existing instruments to assess attachment antenatally, no study has yet attempted to assess MM before birth. However, assessing MM antenatally might provide valuable insight into the origins of this construct. Assessing MM antenatally and comparing it with how parents demonstrate MM

postnatally will speak to the issue of the relative contribution of parent-centred versus child-centred factors to MM. Previous research has not found postnatal MM to be related to children's gender (Meins, 1998), birth status (Meins et al., 2002), mental development (Meins et al., 2001), receptive verbal intelligence (Meins et al., 2002), or temperament (Meins, Fernyhough, Arnott, & Wilson, 2005). However, if strong associations were found between antenatal and postnatal measures of MM, one could be more confident in claiming that MM is independent of child-centred variables, given that individual children's characteristics could not possibly have influenced parents' antenatal MM.

Parents' antenatal MM was assessed from their responses to two questions designed for the study reported here in order to tap into factors that may be indicative of MM before the child is born. First, parents-to-be were asked if they had a pet name for their baby as this was identified as a possible indicator of treating the baby as an individual prior to the birth, and may, therefore, be reflective of antenatal MM. The second question was included as an antenatal equivalent of the open-ended 'Describe Your Child' question that has previously highlighted individual differences in the MM of mothers of preschool age children (Meins et al., 1998). This question focussed on the parent's ability to imagine and conjecture what the unborn child might be like in the future. The question focused on predicting what the infant would be like at 6 months of age because this was the next scheduled visit for families participating in this study. It was hypothesised that parents who were already conceptualising their foetus as a separate individual (thus demonstrating antenatal MM) would be able to provide a fuller description of their future child, focusing more on the child's personality and mental characteristics. For the purposes of this exploratory study, hypotheses were only made with respect to the total number of overall comments and the inclusion of

mentalistic comments. This decision was informed by the previous findings of a study

by Meins et al. (1998) in which only mother's inclusion of mentalistic comments in

response to a 'Describe Your Child' question in the preschool period related to

attachment security assessed in infancy. It will be interesting to determine whether the

same is true in the antenatal period: is it specifically the focus on the putative mental

states of the future child that will be related to attachment in meaningful ways?

Alternatively will parents' ability to generate *any* description of their future children

relate to subsequent attachment? Since these questions were designed for the purpose

of this study, no data on reliability or validity are available. However, previous research

by Meins et al. (2003) showed a significant positive relation between appropriate mind-

related comments in the first year of life and the proportion of mentalistic comments in

response to the 'Describe Your Child' interview in the preschool period.

The first testing phase thus yielded data on 3 major variables: (a) mothers' and

fathers' attachment representations as assessed using the AAI, (b) mothers' and fathers'

conceptualisations of the foetus as assessed using Condon's (1993) AAS, and (c)

mothers' and fathers' antenatal MM, assessed in terms of having a pet name for the

foetus and being able to imagine what the unborn child might be like at age 6 months.

3.3: The 6 Months Postnatal Testing Phase

At this testing phase, data were collected on parental MM and parental

sensitivity. MM and sensitivity were both assessed from 30-minute free play sessions

between parent and child. Mothers and fathers participated in separate play sessions

with the infant, so mother-infant and father-infant MM and sensitivity scores of

partners were independent. Parental MM in the first year of life is operationalised as the

parent's use of internal state language to comment appropriately on the infant's

putative mental or emotional states (Meins et al., 2001). Sensitivity was assessed using Ainsworth et al.'s (1971) scale. The 9-point scale is comprised of 5 "anchor points" with higher scores indicating greater sensitivity. This scale is used to provide a global measure of a parent's sensitivity to an infant's cues. Background information on parental parity status and educational attainment were obtained via a brief questionnaire. Finally, a measure of parental depression was taken. The CES-D self-report scale (Radloff, 1977) was used. This measure was specifically developed for use in studies of depressive symptomatology in the general population. Parental parity, education and depression were included as control variables.

3.4: The 12/15 Months Postnatal Testing Phases

At 12 months postnatal, infants were seen with their mothers in the Strange Situation procedure (Ainsworth & Wittig, 1969) to assess infant attachment security. Infants were seen with their fathers in the same procedure at 15 months. This follows the lead of both Main et al. (1985) and Steele, et al. (1996) in assessing infant-father attachment at a later age than infant-mother attachment. Analyses are presented separately but simultaneously for mothers and fathers, since the procedures are identical, but there is evidence of differences in infant-mother and infant-father relationships. For example, Verschueren and Marcoen (1999) found different correlates of child attachment to mother and attachment to father. Children's positiveness of self was better predicted by child-mother attachment and anxious/withdrawn behavioural problems by child-father attachment.

Parents were also asked to predict how their infants would behave in the Strange Situation by choosing one of 3 paragraphs each of which described behaviours typical of one of the 3 main attachment categories (secure, avoidant, resistant). These

predictions were then compared with children's actual Strange Situation behaviours (via their classifications) to provide a measure of accuracy of parents' predictions. Asking parents to select a profile of behaviour that is reflective of the traditional categories may be an effective window on their internal working models of their child. Previous research has shown that more sensitive mothers' descriptions of their children's attachment behaviour at home were more strongly related to the assessments by trained observers using the Attachment Q Sort (AQS) than descriptions by less sensitive mothers (Tarabulsy, Avgoustis, Phillips, Pederson, & Moran, 1997). This suggested that more sensitive mothers were more able to represent their children's attachment behaviours accurately. It was therefore purported that the ability to correctly predict the behaviour of one's infant in the Strange Situation procedure would relate to parental MM.

Finally, an assessment of parental MM in the Strange Situation procedure was included. Previous research has only used free play observations or interviews to obtain MM measures. Differences between parents' proclivity to treat their infants as individuals with minds of their own may be polarised under stressful circumstances. Just as we expect greater individual differences in the attachment behaviours displayed by infants in the Strange Situation procedure than in the home because it is designed to stress the infant, perhaps there will also be greater variation in parental MM. The Strange Situation may activate parental caregiving systems and therefore be stressful for mothers and fathers as well as infants.

There are therefore 3 major variables for mothers and fathers in these final phases of testing: that of infant-parent attachment security; accuracy and parents' Strange Situation predictions; and parental MM in the Strange Situation procedure.

3.5: Time Series Analysis

The overall aim of this study was to look at longitudinal relations and to attempt to speak to the issue of whether MM can help to bridge the transmission gap. Therefore, analyses across time points were employed. Relations are investigated between the major variables from each phase of testing, namely: (a) parental state of mind with respect to attachment; (b) parental RF; (c) maternal and paternal conceptualisation of the foetus using the AAS; (d) parental antenatal MM; (e) maternal and paternal postnatal MM; and (f) infant-parent attachment security. Table 3.1 shows the data collection points for each of the major variables.

Specifically, the main analyses will be: (a) the relations between parental AAI classifications and postnatal MM, sensitivity, and infant Strange Situation classifications; (b) the relations between parental RF and postnatal MM, sensitivity, and infant-parent attachment security; (c) continuity in MM across the transition to parenthood; and (d) relations between infant-parent attachment security and MM and sensitivity.

With small samples time series analysis can be difficult, particularly when there are issues surrounding attrition. Table 3.2 shows the attrition in this sample across the 4 time points of data collection.

Table 3.1: Variables Collected at Each Phase of the Longitudinal Study

	Mother	Mother-Child	*Father*	*Father-Child*
Prenatal	• AAI • RF • Antenatal MM interview • AAS		• AAI • RF • Antenatal MM interview • AAS	
6 Months	• Parity • Education • Depression	• MM free play assessment • Sensitivity	• Parity • Education • Depression	• MM free play assessment • Sensitivity
12 Months		• Strange Situation • Strange Situation Prediction • MM assessment		
15 Months				• Strange Situation • Strange Situation Prediction • MM assessment

Table 3.2: Sample Attrition Over the Four Data Collection Time Points

	Antenatal	_6 Months_	_12 Months_	_15 Months_
Mothers	28	21	19[4]	N/A
Fathers	25	17	N/A	15

Throughout the time series analyses the problems of sample size and attrition will inform the statistical approaches that are chosen. The small sample size posed particular problems for addressing whether MM can help bridge the transmission gap since regression analyses were not appropriate. Consequently, a descriptive approach was adopted, mapping out longitudinal relations between parental AAI classification, infant-parent interaction at 6 months, and infant-parent attachment security.

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[4] Only 18 valid Strange Situations

Chapter 4
Antenatal Study

Investigating Mind-mindedness and Attachment in the Antenatal Period

4.1 Introduction

In studies investigating the intergenerational transfer of attachment security,

researchers have quite commonly administered the AAI antenatally to assess parents'

childhood attachment representations independently of relationships they form with

their own children. However, these studies have not tended to assess parents' antenatal

representations of the unborn child, despite the fact that such representations would

appear to be similarly important for the type of relationship likely to emerge between

parent and child after birth. Two studies are notable exceptions to the predominant

focus on the AAI during the antenatal period. First, Benoit et al. (1997) assessed

mothers' representations of their unborn children during the last trimester of pregnancy

using the WMCI (Zeanah et al., 1994). Mothers were later followed up when their

infants were 12 months, at which point the WMCI was administered for a second time,

and infant-mother attachment security was assessed using the Strange Situation. Benoit

et al. (1997) reported that WMCI classifications were stable over the transition to

parenthood in 80% of mothers, and antenatal WMCI classification predicted infant-

mother attachment security in 74% of cases.

More recently, Huth-Bocks, Levendosky, Bogat, and von Eye (2004)

investigated links between mothers' antenatal representations of attachment

experiences and the unborn child and infant-mother attachment security at 12 months.

Huth-Bocks et al. (2004) assessed representations of attachment experiences using a

self-report measure (Lichstein & Cassidy, 1991) and the WMCI was used to assess

representations of the unborn child. In contrast to the strong link observed between

antenatal AAI classification and infant-parent attachment (e.g., Fonagy et al., 1991; Steele et al., 1996), Huth-Bocks et al. (2004) found no association between mothers' attachment representations on the self report measure and infant-mother attachment security at 12 months. They did, however, find an association between antenatal WMCI measures and both attachment assessments. Mothers who recalled more negative childhood attachment experiences were more likely to have more negative representations on the WMCI, and more secure WMCI representations were related to a secure infant-mother attachment. On the basis of structural equation models, Huth-Bocks et al. (2004) proposed that mothers' representations of caregiving might be the mechanism via which childhood attachment representations influence infant-mother attachment security, since models involving direct pathways between attachment representations and behavioural attachment security were poorer fits for the data.

But despite these interesting findings, one drawback of these studies using the WMCI is the fact that this interview assesses both the mother's representation of her child and how she represents herself in the caregiving role. The fact that these 2 different representations are highly related (Huth-Bocks et al., 2004) makes it difficult to conclude from the existing data that parents' antenatal representations *of the child* relate to how they represent their own childhood experiences and to the type of attachment relationship they will form with their infants. It is therefore important to establish whether parents' antenatal representations of the unborn child, assessed independently of representations of themselves as caregivers, relate to concurrent childhood attachment representations. Moreover, little is known about how parents' antenatal representations of their own childhood experiences as assessed using the AAI relate to how they represent the unborn child. Addressing these questions was the main aim of the first phase of the longitudinal study reported here.

Parents' antenatal representations of their infants were assessed in 2 main ways. First, antenatal MM was assessed. MM in the first year of life has been found to be an important predictor of infant-parent attachment security (Lundy, 2003; Meins et al., 2001), and 3 aims of the overall longitudinal study undertaken for this thesis were to investigate whether (a) there was continuity in MM across the transition to parenthood, (b) antenatal MM predicted infant-parent attachment security, and (c) whether both antenatal and postnatal MM related to parents' representations of their own attachment experiences as assessed using the AAI. A first step toward achieving these aims was thus to establish a measure of parental MM that could be used before the child was born. The antenatal MM assessment involved an adaptation of Meins et al.'s (1998) 'describe your child' interview that has been used to assess MM in the preschool period. Parents were asked to talk about what the child might be like at 6 months of age. It was reasoned that, if parents were already representing the unborn child as a separate person, they would be better able to provide a more complete prediction about the child, with a greater focus on the child's personality or mental characteristics. Conversely, if parents had not yet begun to contemplate the foetus as an individual entity, they would be less able to conjecture about their future child's characteristics. As a further index of MM, parents were asked whether they had a pet name for the foetus, on the reasoning that parents who were treating the unborn child as an individual entity would be more likely to have a pet name.

The second way in which parents' representations of the unborn child were assessed was via a questionnaire, which aimed to assess parents' attachment to the foetus. As discussed in Chapter 3, this was measured using Condon's (1993) Antenatal Attachment Scale (AAS) which has separate scales to assess both mothers' and fathers' representations of the foetus. The overall scores on the AAS are made up of the sum of

2 sub-scales: (a) quality of attachment, and (b) intensity of preoccupation. The former assesses experiences of closeness and tenderness toward the foetus and the degree to which the unborn child is represented as a "little person". The preoccupation scale was designed to measure the extent to which the foetus occupies a central place in the parent's life. Including a previously used assessment of antenatal attachment was important since it enabled one to address issues of construct validity with respect to the antenatal MM interview. It may be that parents' antenatal conjectures about their future children are positively related to their scores on existing self-report measures of parental representations of the unborn child, or alternatively the 'Describe Your Child' prediction might tap into a capacity to represent the unborn child as a separate individual that is unrelated to the usual behaviour of parents-to-be and the ways in which they commonly think about their unborn child. The AAS has previously been shown to be related to maternal perspective taking on an empathy scale, characterised by items that relate to the mother's ability to imagine, or relate to, what another person is experiencing (Zimmerman, 2003).

The initial aim of the study reported in this chapter was thus to explore relations between antenatal MM and parents' representations both of their unborn child and of their own childhood experiences. The hypotheses were as follows: that

1. Parents who are classified as autonomous on the AAI will score more highly on antenatal measures of MM than their non-autonomous counterparts,

2. Parental RF scores will be positively correlated with antenatal MM scores.

Relations between parents' AAS and (a) MM and (b) attachment representations (AAI classification and RF) were also investigated, but no directional hypotheses were made regarding these relations. Concordance in couples in AAI classification, RF, and MM was also investigated. Finally, it was hypothesised that the finding by Fonagy et al.

(1991), that individuals classified as autonomous on the AAI demonstrate higher levels

of RF than their non-autonomous counterparts, would be replicated.

4.2: Method

4.2.1: Participants

Participants were 28 families recruited from the North East of England, consisting of

25 mother-father-infant triads and three mother-infant dyads. Parents-to-be were

recruited in the third trimester of pregnancy through antenatal parent-craft classes, by a

letter, or by responding to advertisements in the local media. Due to the means by

which participants were recruited, it is not clear what the participation rate was,

although from the number recruited by letter and through parent-craft classes it seemed

low. Some of those who decided not to take part cited the high levels of commitment

required by the study as a reason for non-participation.

In this sample 93% (26) of the mothers and all of the fathers were White, the

remainder were Asian, but fluent in English. All foetuses were healthy singletons.

4.2.2: General Procedure

Parents were sent a letter explaining what they would be required to do at this stage of

the study and they signed a consent form. They were also informed of the nature of 2

planned follow-up phases in which they would be asked to participate. However, they

were not explicitly informed that this study was investigating precursors of attachment.

Each dyad/triad was given £10 per visit to thank them for their participation and to

cover travel expenses.

This testing session during the last trimester of pregnancy (M = 34.5 weeks

gestation, SD = 5.04, range: 22 – 39 weeks) was carried out at the University's

developmental research suite with all parents except for one mother who was seen at home. Couples who attended the session together completed their assessments in adjoining rooms.

Three parents (1 male, 2 female) attended this session after the birth of their child because an appointment could not be arranged sooner. These parents were all seen when their baby was 6 weeks old. These parents' data will be compared to the data for the remainder of the sample on all antenatal variables to identify any confounds that this may have created.

4.2.3: Antenatal Attachment Scale

At the beginning of this testing session, parents were asked to complete the Maternal or Paternal version of Antenatal Attachment Scale (AAS; Condon, 1993). This was included as a measure of parents' representations of their foetus. These questionnaires consist of 19 and 16 items respectively and assess two underlying constructs: (a) quality of attachment, and (b) intensity/strength of preoccupation. Parents answer questions about their emotions, thoughts and behaviour with regard to the unborn baby over the previous 2 weeks. An example question from the Maternal AAS is:

- Over the past two weeks I have been trying to picture in my mind what the developing baby actually looks like in my womb: (choose from one of the following) Almost all of the time; Very Frequently; Frequently; Occasionally; Not at all.

An example question from the Paternal AAS is:

- Over the past two weeks I think of the developing baby mostly as: (choose from one of the following) A real little person with special characteristics; A baby like any other baby; A human being; A living thing; A thing not yet really alive.

Although most of the questions on the Maternal AAS (MAAS) and Paternal AAS (PAAS) are similar, there is a different number of questions in each as some questions are not applicable to fathers, (e.g., questions on the MAAS regarding whether the mother has changed her diet because she feels it will affect the well being of the developing baby). For a full list of MAAS and PAAS questions see Appendices 1 and 2. For the parents who completed the questionnaire after the birth of their baby, they were asked to think back to their feelings during the final 2 weeks of the pregnancy and base their responses on this.

I. Scoring

The first answer to each question on the MAAS and PAAS receives a score of 5, the second a score of 4, decreasing to a score of 1 for the final answer, except for items which are reversed scored (items 2, 4, 8, 11, 13, 14, 17 and 19 on the MAAS; items 2, 4, 9, 10, 11, 14 and 16 on the PAAS). There is a maximum score on the MAAS of 95 and a minimum score of 19. On the PAAS the maximum score is 80 and the minimum 16. This provides an overall attachment score, but it is also possible to calculate a score for quality of attachment and for intensity/strength of preoccupation.

Questions relating to quality of attachment on the MAAS are items 3, 6, 7, 9, 10, 11, 12, 13, 15, 16 and 19. The maximum score on the quality of attachment subscale of the MAAS is 55. On the PAAS questions relating to quality of attachment are items 1, 2, 3, 6, 7, 9, 11, 12, 13 and 16. The maximum score on the quality of attachment subscale of the PAAS is 40.

Questions on the MAAS relating to intensity/strength of preoccupation are items 1, 2, 4, 5, 8, 14, 17 and 18. The maximum score on the intensity/strength of

preoccupation subscale of the MAAS is 40[5]. Questions 4, 5, 8, 10, 14 and 15 on the

PAAS relate to intensity/strength of preoccupation. The maximum score on the

intensity/strength of preoccupation subscale of the PAAS is 30. Only the overall scores

will be included in this study.

4.2.4: MM Assessment

Paternal and maternal antenatal MM were then assessed in a short interview. Couples

were interviewed concurrently in adjoining rooms and were not party to the answer of

their partner. Both mothers- and fathers-to-be were asked the following questions:

1. *Do you call your baby by a pet name?*[6]

2. *What do you think your baby will be like when it is 6-months-old?*

These questions were designed for the purpose of this study. Parents were asked

if they had a pet name for their baby as this was identified as a possible indicator of

treating the baby as an individual prior to the birth, and may, therefore, be reflective of

antenatal MM. The second question was included as an antenatal equivalent of the

open-ended 'Describe Your Child' question that has previously highlighted individual

differences in the proclivity of mothers in the post-natal period to treat their preschool

children as individuals with minds (Meins et al., 1998). This question focussed on the

proclivity to imagine the child as an individual with a mind of his or her own in the

future. The question focused on predicting what the infant would be like at 6 months of

age because this was the next scheduled visit for families participating in this study.

Since these questions were designed for the purpose of this study there are no

validation data available. It is possible that a number of cultural, familial, or other

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[5] Items 6 and 13 do not load highly enough on this factor to be included in the analysis (Condon & Corkindale, 1997).

[6] This question was amended for those parents who did not complete this assessment until after the birth of their baby, that is: *Did you call your baby by a pet name before it was born?*

extraneous variables could confound answers. Although the second question was derived from a previous measure of MM used in the postnatal period the answers provided by parents in the antenatal period may not represent the same concept. The analyses relating to these questions should be considered as exploratory until they can be shown to relate to MM in the postnatal period. The aim is to investigate this in the follow-up studies of this sample reported in later chapters.

I. Scoring

The number and type of comments relating to the mental states of the child in answers to this question were analysed. As well as receiving a score for the total number of descriptions, parents' comments were subdivided into general comments (e.g., "he/she will be at nursery by that age"); physical comments (e.g., "he/she will have blue eyes"); behavioural comments (e.g., "he/she will be sitting up by then"); and mentalistic comments (e.g., "he/she will have his/her own personality by that age"). Parents received two types of score for this assessment. The total number of comments and parents' use of mentalistic comments will be the main focus of the analyses. No specific hypotheses are made with respect to other types of comments. This reduces the chances of making a type I error in the main analyses, since the number of contrasts are kept to a minimum and are hypothesis-driven.

Twenty per cent of the 'describe your child' predictions were also coded by a second trained coder, blind to all other measures, for reliability purposes. The agreement for the level of MM of each comment and the number of comments was assessed using Cohen's kappa. Clark-Carter (2004) suggests the use of kappa rather than percentage agreement of correlation. Percentage agreement fails to take into account the agreement that could have been expected by chance and a large positive

correlation does not necessarily show that two raters are agreeing. A measure that solves both of these problems is Cohen's kappa (κ). Further, Kendall's coefficient of concordance was not considered appropriate, it is advised only when judges are asked to: "put a set of objects in rank order" (Clark-Carter, 2004, p. 312). Inter-rater agreement was good[7] ($\kappa = 0.81$) (see Appendix 3). In the case of disagreements, the two coders came to a consensus after discussion.

4.2.5: Adult Attachment

This first testing session was completed by the administration of the Adult Attachment Interview (AAI; George et al., 1985). The author conducted these interviews with all of the mothers whose partners did not participate in the study and at least one partner of each couple (14 males, 16 females). The author was trained by Dr. Howard Steele in the administration of the AAI. The remaining parents were interviewed either by Dr. Elizabeth Meins, or by one of several female postgraduate and undergraduate Psychology students at the University who were trained to administer the interview by the author. The AAI protocol was described in Chapter 1 and a full list of all of the questions and probes can be found in Appendix 4.

The author then rated the transcripts on the 18 scales described by Main and Goldwyn (1998) and, using their category descriptions, interviews were labelled as autonomous, dismissing, preoccupied, or unresolved. The characteristics of each of the categories are detailed in Chapter 1.

The author, who was formally trained in the coding system by Professor Deborah Jacobvitz and Professor Nino Dazzi and is considered to be reliable by Professor Mary Main and Dr. Erik Hesse, coded each AAI. Over 40% (22) of the

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[7] A kappa of 0.70 is considered good (Clark-Carter, 2004).

transcripts were also coded by a second trained rater, blind to all other measures, who has achieved reliability with Main and Hesse. The formal trainers recommend this high percentage of co-coding by a second rater. The coders initially agreed on 82% of the four category classifications ($\kappa = 0.72$), see Appendix 5, and in the case of a disagreement the two coders came to a consensus of opinion after discussion.

4.2.6: Reflective Functioning

Adult Attachment Interview transcripts were also scored using the Reflective Function (RF) scale (Fonagy, Target, Steele & Steele, 1998, version 5) by the author. RF is the ability to think of the self and others in psychological terms and involves a self-reflective and an interpersonal component that optimally provides the individual with an ability to distinguish "inner from outer reality, pretend from 'real' modes of functioning, intra-personal mental and emotional processes from interpersonal communications" (Fonagy et al., 1998, p. 4). When scoring AAI transcripts for RF, the explanations in answers to each question provided by an interviewee are categorised using a series of RF types from the manual and given an appropriate score. The scoring procedures are detailed in Chapter 1. The author was trained by Dr Mary Target and Dr Fulvia Ronchi and has successfully completed the reliability test. Around 20% (9) of transcripts were also coded by a second trained, blind rater. The coders agreed on 89% (8) of the scores. The level of agreement was good ($\kappa = 0.83$)[8], see Appendix 6, and the correlation was significant at the 1% level using Kendall's Tau-b (.91) and Pearson's r (.96).

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[8] The kappa statistic is most often used with nominal data, but Clark-Carter (2004) does provide an example of the use of kappa for ordinal data, therefore it is calculated for this variable. However, since Fonagy et al. (1991) calculate RF inter-rater reliability using a correlation, so Kendall's Tau and Pearson's r statistics are also provided.

4.2.7: Parental Educational Qualifications

Information on parental educational qualifications was collected in a follow-up to this study, but is reported here as a control variable. Due to the attrition rate between the first and second testing phases, this information is not available for 15 of the parents for whom there are antenatal data. Parents completed a background questionnaire that asked them to state their highest educational qualification. They chose from one of the following categories: 0: no examinations, 1: CSEs or GCSEs, 2: O-Levels or A-Levels, 3: further qualification not to degree level (e.g., nursing), 4: undergraduate degree, or 5: postgraduate degree.

The distribution of qualifications for the whole sample and for mothers and fathers separately is shown in Table 4.1.

Table 4.1: Parents' Highest Educational Qualification[9]

	All Parents	Mothers	Fathers
No qualifications	0 (0%)	0 (0%)	0 (%)
CSE / GCSEs	6 (16%)	5 (24%)	1 (6%)
O / A Levels	8 (21%)	5 (24%)	3 (18%)
Further Qualification	8 (21%)	3 (14%)	5 (29%)
Degree	13 (34%)	6 (29%)	7 (41%)
Further Degree	3 (8%)	2 (9%)	1 (6%)

[9] All three parents who were seen postnatally were educated to degree level.

4.2.8: Parity

Parents were also asked to report their parity status during their visit to the laboratory. Table 4.2 shows the status of all parents and for mothers and fathers separately. For the purpose of further analyses, parity status is treated as a dichotomous categorical variable (first time parents and non-first time parents) due to the small sample size.

Table 4.2: Parity Status of Parents for this Pregnancy[10]

	All Parents	Mothers	Fathers
First Child	36 (68%)	19 (68%)	17 (68%)
Second Child	7 (13%)	4 (14%)	3 (12%)
Third Child	8 (15%)	3 (10%)	5 (20%)
Fourth Child	1 (2%)	1 (4%)	0 (0%)
Fifth Child	1 (2%)	1 (4%)	0 (0%)

4.3: Results

4.3.1: Descriptive Statistics and Preliminary Analyses

Due to the small sample, effect sizes are calculated throughout the Results section in order to provide a measure of the strength of the relation between variables independent of sample size. Using Cohen's (1988) conventions for interpretation, the effect size for χ^2 is calculated as w with 0.10, 0.30 and 0.50 respectively denoting small, medium and large effects. Effect sizes for t tests are calculated as d with 0.30, 0.50, and 0.80 respectively denoting small, medium and large effects. Effect sizes for correlations are

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[10] All three parents who were seen postnatally had previous children.

calculated as Pearson's *r* with 0.10, 0.30, and 0.50 denoting small, medium, and large effects respectively.

Tables 4.3 and 4.4 respectively show mothers' and fathers' mean scores for all of the continuous variables. For the 'Describe your child' interview, all mothers and all but 1 of the fathers could provide at least one prediction about what the child would be like. Total scores for the MAAS and PAAS were used rather than those for the individual attachment and preoccupations subscales since the subscales were highly positively correlated and had good internal consistency for both mothers ($r = .59$, p <.001, two-tailed; Cronbach's $\alpha = 0.70$) and fathers ($r = .61$, p <.001, two-tailed; Cronbach's $\alpha = 0.69$). Moreover, no specific hypotheses were made with respect to the subscales of this measure. The AAS data are similar to those reported for mothers and fathers by Condon and Corkindale (1997)[11].

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[11] Mean overall score on MAAS: M = 75.50 (SD = 9.00); Mean overall score on PAAS: M = 57.00 (SD = 8.30).

Table 4.3: Descriptive Statistics for Maternal Variables[12]

	Maternal Overall Comments	Maternal Mentalistic Comments	Maternal RF	Maternal Education	MAAS
N	27[13]	27[14]	28	21	27[15]
Mean	2.80	0.25	3.90	2.76	77.15
SD	1.65	0.36	2.14	1.38	7.42
Range	1 – 6	0 – 1.0	1 – 7	1 – 5	61-92
Skew	0.94	2.87	0.01	1.80	0.62
Kurtosis	-1.27	0.67	-1.30	-0.08	0.10

Table 4.4: Descriptive Statistics for Paternal Variables[16]

	Paternal Overall Comments	Paternal Mentalistic Comments	Paternal RF	Paternal Education	PAAS
N	25	25	25	17	25
Mean	3.20	0.26	3.10	3.24	54.12
SD	1.68	0.35	1.47	1.03	5.43
Range	0 – 7	0 – 1.0	1 – 7	1 – 5	45-67
Skew	0.59	0.94	1.22	0.90	1.06
Kurtosis	-0.10	0.56	1.01	-0.11	-0.34

[12] The means for the mothers seen postnatally were as follows: number of overall comments = 2.00; proportion of mentalistic comments = 0.25; RF = 6.00; AAS = 83.00. The data are similar and were therefore collapsed into the main analyses.

[13] The data for one mother are missing due to technical problems.

[14] The data for one mother are missing due to technical problems.

[15] The data for one mother are missing due to an incomplete questionnaire for one mother who was seen postnatally.

[16] The data for the father seen postnatally were as follows: number of overall comments = 5.00; proportion of mentalistic comments = 0.40; RF = 3.00; AAS = 56.00. The data are similar and were therefore collapsed into the main analyses.

Data for all of the variables shown in Tables 4.3 and 4.4 were tested for normality of distribution. To test for skewness, the index of skew was transformed into a *z* score, as recommended by Clark-Carter (2004) and a *z*-test performed. For samples of 100 or less this is preferable to relying on graphical representations of distribution to establish normality. The level of significance recommended is $p = 0.01$. The z score must therefore have to be at least 2.58 or -2.58 for the distribution to be considered skewed. Kurtosis statistics are also reported, although with caution, since Howell (1997) reports that: "it is important to recognize that relatively large samples of data are needed before we can have a good idea about the shape of a distribution, especially its kurtosis. With sample sizes of around 30, the best we can reasonably expect to see is whether the data tend to pile up" (p. 29). Once again, Clark-Carter recommends transforming the index of kurtosis into a *z* score and comparing this to the values 2.58 and -2.58. As Table 4.3 and Table 4.4 show, the skew and kurtosis scores are within the normal range for all variables except number of mentalistic comments. Pictorial representations of the distributions (histograms of the distributions and boxplots) can be found in appendix 7 *Figures 1* through *22*. These also suggested that the data for all variables except mentalistic comments are normally distributed for mothers and fathers. Further, there are no outliers[17]. Therefore, parametric data analyses will be employed.

With respect to use of mentalistic comments in the antenatal MM interview, 15 mothers and 12 fathers failed to include a mentalistic comment in their predictions. This high number of 0 scores, together with the low means, resulted in the decision to dichotomise this variable (mentalistic comment present vs. mentalistic comment absent).

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[17] The boxplot of paternal mentalistic comments suggests that there are two potential outliers but further investigation using the standardised scores for this variable showed that these data points did not exceed the cut off-points of −3 or 3 (Clark-Carter, 2004) to be considered as outliers.

It was important to establish whether these two groups differed in their overall verbosity on the 'describe your child' interview. Table 4.5 shows that there were no significant differences in the total number of comments used by mothers who did and did not use mentalistic comments in their predictions. The mean difference was 0.25 and the associated standard error was 0.50. Further, the confidence interval included 0 and the effect size was small.

Table 4.5: Comparison of the Number of Overall Comments of Those Mothers Who Included Mentalistic Comments in their Predictions and Those Who Did Not

	No Mentalistic Comments (N=15)		Mentalistic Comments (N=12)		t value[18]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Overall Number of Comments	2.67	1.72	2.92	1.62	0.39	n.s.	-1.09 to 1.59	0.15

Table 4.6 shows the same data for fathers. As Table 4.6 shows, fathers who included at least one mentalistic comment in their prediction produced a greater total number of comments in their predictions than fathers who did not include mentalistic comments. The mean difference was 1.67 and the associated standard error was 0.59. The significant p value is supported by a confidence interval that does not include a 0 value. The effect size for this comparison is large. Using the criteria set down by Coe (2000), this is equivalent to the average number of comments in the mentalistic group exceeding the number of comments of 88% of the non-mentalistic group.

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[18] Independent samples t test.

Table 4.6: Comparison of the Number of Overall Comments of Those Fathers Who Included Mentalistic Comments in their Predictions and Those Who Did Not

	No Mentalistic Comments (N=12)		Mentalistic Comments (N=13)		t value[19]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Overall Number of Comments	2.33	1.16	4.00	1.73	2.81	<0.01	-2.90 to −0.44	1.21

Table 4.7 shows the number of parents who did and did not have a pet name for the foetus.

Table 4.7: Mothers and Fathers Who Did and Did Not Have a Pet Name for the Foetus[20]

	Mothers (N=28)	Fathers (N=25)
Pet Name	10	11
No Pet Name	18	14

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[19] Independent samples t test.
[20] Two of the parents who were seen postnatally (one mother, one father) had a pet name for the foetus.

With respect to participants' attachment representations, Table 4.8 shows the distribution of AAI classifications for mothers and fathers. Of the 3 unresolved mothers, 2 of the secondary classifications were autonomous and 1 was preoccupied. Of the 2 fathers classified as unresolved, 1 secondary classification was autonomous and the other preoccupied[21]. Analyses using the AAI data could be conducted using 4-way, 3-way or 2-way classifications.

A 4-way classification is one in which the major classifications (Ds, F, E and U) are utilised. In a 3-way classification unresolved cases are either forced into their secondary classification placements, so only the Ds, F and E categories are used, or cases with a primary U classification are excluded. Finally, in a 2-way analysis Ds, E and U cases are considered non-autonomous and are compared to the autonomous (F) cases. Due to the small sample size, analyses will focus on autonomous/non-autonomous comparisons, although descriptive statistics on the 4-way classifications are included for information. This will allow the number of contrasts made to be minimised and will reduce the chances of making a type I error.

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[21] Distribution of maternal classifications was similar to that found by other researchers in the UK for mothers (Steele, Steele & Fonagy, 1996) ($\chi^2[1] = 0.01$; n.s.). The distribution of paternal classifications, however, differed from that of previous studies of UK fathers (Steele, Steele & Fonagy, 1996) ($\chi^2 [1] = 5.32$; < 0.05), there seemed to be a greater proportion of insecure classifications in the sample investigated here. However, it was not significantly different from the distribution of the large sample in the van IJzendoorn et al. study (1996) ($\chi^2[1] = 2.23$; n.s.).

Table 4.8: Distribution of Maternal and Paternal AAI Classifications

	Mothers	Fathers
Dismissing	8 (28%)	10 (40%)
Autonomous	16 (57%)	10 (40%)
Preoccupied	1 (4%)	3 (12%)
Unresolved	3 (11%)	2 (8%)

With respect to relations with parental education, there were no significant relations between maternal or paternal educational attainment and any of the antenatal measures[22]. There were also no significant relations between maternal parity and any of the antenatal measures[23]. Paternal parity was unrelated to all variables[24] except total number of comments used in the 'Describe Your Child' prediction and PAAS scores. Table 4.12 shows the mean scores with respect to paternal parity for both of these measures, and scores were compared using independent samples t tests. As Table 4.9 shows, in comparison to first time fathers, those who already had at least 1 child used a greater total number of comments in their predictions. In contrast, first-time fathers had higher PAAS scores than their counterparts who had older children.

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[22] Maternal education and pet name (t[19] = 0.271; n.s.); paternal education and pet name (t[15] = 0.51; n.s.); Maternal education and mothers' overall antenatal comments (r [20] = 0.22; n.s.); Paternal education and fathers' overall antenatal comments (r[17] = -0.10; n.s.); Maternal education and mothers' dichotomous use of mentalistic comments (t[18] = 1.12; n.s.) (while not significant, it is important to note that the raw data indicate that the mean educational score for mothers who did not include mentalistic comments was higher); Paternal education and fathers' dichotomous use of mentalistic comments (t[15] = 0.63; n.s.).

[23] Maternal parity and pet name (modified-χ^2[1] = 0.03; n.s.); Maternal parity and mothers' overall number of comments (t[25] = 0.99; n.s.); Maternal parity and mothers' dichotomous use of mentalistic comments (modified-χ^2[1] = 2.60; n.s.).

[24] Paternal parity and pet name (modified-χ^2[1]=0.20; n.s.); Paternal parity and fathers' dichotomous use of mentalistic comments (modified-χ^2[1] = 0.02; n.s.).

Table 4.9: Comparison of Fathers' Overall Number of Comments and PAAS Scores by Paternal Parity Status

	First Child (N = 17)		Not First Child (N = 8)		t value[25]	p value	95% Confidence Intervals	Effect size
	M	SD	M	SD				
Overall Number Comments	2.71	1.61	4.25	1.39	2.33	< 0.05	-2.92 to −0.17	1.04
Overall PAAS	56.00	5.16	50.13	3.68	2.88	< 0.05	1.65 to 10.10	1.37

4.3.2: The Relation Between Antenatal MM and Adult Attachment Classification

The first hypothesis stated that parents classified as autonomous on the AAI would demonstrate greater MM in the antenatal period. This was investigated in relation to each of the antenatal MM variables.

I. Pet Name

Table 4.10 shows the 4 way AAI classifications of mothers who did and did not have a pet name for the foetus. A 2 x 2 contingency table analysis was employed for the 2 dichotomous nominal variables: AAI (2 way) and use of a pet name. All cells had an expected count of at least 5. Autonomous/non-autonomous classification was unrelated to having a pet name (χ^2[1] =0.31; n.s.)[26]. The effect size for this comparison was small ($w = 0.10$).

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[25] Independent samples t tests.
[26] The continuity correction chi square was non-significant (χ^2[1] = 0.03; n.s.).

Table 4.10: Relations Between Maternal AAI Classifications and Whether Mothers
Had a Pet Name for the Foetus

	Pet Name	No Pet Name
Dismissing	3	5
Autonomous	5	11
Preoccupied	1	0
Unresolved	1	2

Table 4.11 shows the 4 way AAI classifications of fathers who did and did not

have a pet name for the foetus. A 2 x 2 contingency table analysis was performed using

2 way AAI classifications and use of a pet name. Some cells contained an expected

count of less than 5, so a modified chi-square was employed. Autonomous/non-

autonomous classification was not related to having a pet name (modified-χ^2[1] = 1.66;

n.s.)[27]. The effect size for this comparison was small to medium (w = 0.26.).

Table 4.11: Relations Between Paternal AAI Classifications and Whether Fathers Had
a Pet Name for the Foetus

	Pet Name	No Pet Name
Dismissing	3	7
Autonomous	6	4
Preoccupied	0	3
Unresolved	2	0

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[27] The continuity correction chi square was non-significant (χ^2[1] = 0.82; n.s.).

II. 'Describe Your Child' Prediction

Table 4.12 shows the means and standard deviations for the total number of comments made by mothers of different AAI classifications.

Table 4.12: Means and Standard Deviations *(in brackets)* of Overall Number of Comments Used in the Predictions of Mothers of Different AAI Classifications

	Ds (*N* = 8)	F (*N* = 15)	E (*N* = 1)	U (*N* = 3)	Non- Autonomous[28] (*N*=12)
Overall Number Comments	1.50 (0.53)	3.13 (1.73)	2.00 (0.00)	4.67 (0.58)	2.33 (1.50)

As Table 4.13 shows, the independent samples t test was non-significant[29]. The confidence interval contained the value 0. However, the effect size for the comparison of the total number of comments and autonomous/non-autonomous classification was medium. Using the criteria set down by Coe (2000), an effect size of this magnitude would mean that the average autonomous mother would use a greater number of comments in their predictions than 69% mothers in the non-autonomous group.

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[28] Ds+E+U

[29] Mean difference was –0.80 and standard errors of the difference was 0.63.

Table 4.13: Comparison of the Overall Number of Comments on the Antenatal 'Describe Your Child' Measure by Autonomous and Non-autonomous Mothers

	Autonomous (N = 15)		Non-Autonomous (N = 12)		t value[30]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Overall Number Comments	3.13	(1.73)	2.33	(1.50)	1.27	n.s.	-2.10 to 0.50	0.50

Table 4.14 shows the inclusion of mentalistic comments by mothers of different AAI classifications.

Table 4.14: The Inclusion of Mentalistic Comments in the Antenatal 'Describe Your Child Prediction' by Maternal 4 Way AAI

	Ds (N=8)	F (N=15)	E (N=1)	U (N=3)	Non-Autonomous (N=12)
No Mentalistic Comments	6	9	0	0	6
Mentalistic Comments	2	6	1	3	6

The relation between maternal dichotomous AAI classification and the inclusion of mentalistic comments was investigated using a 2x2 contingency table. There were no cells with expected counts of less than 5. There was no relation between the two variables for mothers, $\chi^2[1] = 0.27$, n.s.[31]. This was a small effect ($w = 0.10$).

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[30] Independent samples t test, since samples are unrelated.
[31] The continuity correction chi square was also non-significant ($\chi^2[1] = 0.02$; n.s.).

Table 4.15 shows the means and standard deviations for the total number of comments in the 'Describe your child' predictions produced by fathers of different AAI classifications.

Table 4.15: Means and Standard Deviations *(in brackets)* of the Overall Number of Comments Used in the Predictions of Fathers of Different AAI Classifications

	Ds $(N = 10)$	F $(N = 10)$	E $(N = 3)$	U $(N = 2)$	Non-Autonomous $(N = 15)$
Overall Number Comments	2.50 (1.51)	3.80 (1.93)	3.33 (1.53)	3.50 (0.71)	2.80 (1.42)

As Table 4.16 shows, the difference was non-significant[32]. The 95% confidence interval contained the value of 0. The effect size of the comparison for fathers mirrored those for mothers, with a medium effect size for the relation between autonomous/non-autonomous AAI classification and overall number of comments used in the describe your child prediction. An effect size of this magnitude suggests that the average autonomous fathers would use a greater number of comments in their predictions than 73% of fathers in the non-autonomous group.

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[32] The mean difference was –1.00 and the associated standard error was 0.67.

Table 4.16: Comparison of the Number of Overall Comments on the Antenatal 'Describe Your Child' Measure by Autonomous and Non-autonomous Fathers

	Autonomous ($N = 10$)		Non-Autonomous ($N = 15$)		t value[33]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Overall Number Comments	3.80	(1.93)	2.80	(1.42)	1.49	n.s.	-2.39 to 0.39	0.61

Table 4.17 shows the inclusion of mentalistic comments in the antenatal 'Describe Your Child' prediction by fathers of different AAI classifications.

Table 4.17: The Inclusion of Mentalistic Comments in the Antenatal 'Describe Your Child Prediction' by Paternal 4 Way AAI

	Ds (N=10)	F (N=10)	E (N=3)	U (N=2)	Non-Autonomous (N=15)
No Mentalistic Comments	7	3	1	1	9
Mentalistic Comments	3	7	2	1	6

A 2 x 2 contingency table analysis was employed and showed no relation between the 2 variables ($\chi^2[1] = 2.16$, n.s.)[34]. The associated effect size was medium ($w = 0.29$), suggesting that autonomous fathers may be more likely to include mentalistic comments in their antenatal predictions in comparison with non-autonomous fathers.

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[33] Independent samples t test, since samples are unrelated.
[34] The continuity correction chi square was non-significant ($\chi^2[1] = 1.13$; n.s.)

4.3.3: The Relation Between Antenatal MM and RF

Hypothesis 2 stated that antenatal MM will be positively related to parents' RF scores. This was investigated using parametric analyses.

I. Pet Name

Table 4.18 shows the means and standard deviations of mothers' RF scores with respect to using a pet name. There were no significant differences in RF scores. The mean difference was 1.16 and the associated error was 0.83. As Table 4.18 shows, the 95% confidence interval contained a 0 value. However, there was a medium effect size, suggesting that there is some evidence that mothers who have a pet name for the foetus have higher RF scores. This equates to the average score of mothers with a pet name exceeding the scores of 69% of mothers without a pet name, using the criteria set out by Coe (2000) for the interpretation of effect sizes.

Table 4.18: Means and Standard Deviations of RF Scores of Mothers Based on their Use of a Pet Name for the Foetus

	Yes (N=10) M (SD)	No (N=18) M (SD)	t value[35]	p value	95% Confidence Interval	Effect size
Use of pet name	4.60 (2.07)	3.44 (2.12)	1.39	n.s.	-0.55 to 2.86	0.56

Table 4.19 shows the means and standard deviations of fathers' RF scores with respect to using a pet name. There was a significant difference, with fathers who had a

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[35] Independent samples t tests, since samples are unrelated.

pet name for the foetus showing higher RF scores compared to fathers who did not have a pet name. The mean difference was 1.16 and the associated standard error was 0.56. As Table 4.31 shows, the effect size was medium to large and the confidence interval did not contain a 0 value. Therefore we can have some confidence in this finding. Following the criteria set out by Coe (2000) for the interpretation of effect sizes, an effect size of this magnitude is the equivalent of the average score of fathers with a pet name exceeding the scores of 76% of fathers without a pet name.

Table 4.19: Means and Standard Deviations of RF Scores of Fathers Based on their Use of a Pet Name for the Foetus

	Yes (N=11) M (SD)	No (N=14) M (SD)	t value[36]	p value	95% Confidence Interval	Effect size
Use of pet name	3.73 (1.61)	2.57 (1.52)	2.08	< 0.05	0.01 to 2.30	0.74

II. Describe Your Child Prediction

The correlation for the relation between mothers' overall number of comments in the antenatal predictions and maternal RF was performed. Since RF is an ordinal variable, a Kendall's tau-b correlation was employed. Kendall's tau-b is recommended (Clark-Carter, 2004), as opposed to Spearman's rho, as it provides a better estimate of the value that we would expect to find in the population from which the sample was drawn and is particularly well suited for small samples. There was no significant association between maternal RF and the overall number of comments (τ (27) = -0.19; n.s.). The effect size was small ($r = 0.19$).

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[36] Independent samples t tests, since samples are unrelated.

An independent samples t test was used to investigate the relation between maternal RF and the inclusion of mentalistic comments in the 'Describe Your Child' prediction. Table 4.20 shows the mean RF scores of mothers who did and did not include mentalistic comments in their predictions. As Table 4.20 shows, there was no significant difference in the RF scores of mothers who did and did not include mentalistic comments in their antenatal predictions[37]. The 95% confidence value included a value of 0, supporting the non-significant result. Finally, the effect size for this comparison was small.

Table 4.20: Mean Maternal RF Scores with respect to Inclusion of Mentalistic Comments in Antenatal Predictions

	No Mentalistic Comments (N=15)		Mentalistic Comments (N=12)		t value[38]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
RF Score	3.53	2.07	4.17	2.33	0.75	n.s.	-2.38 to 1.11	0.30

The correlation was also calculated for the relation between fathers' total number of comments in the antenatal 'Describe Your Child' prediction and paternal RF. Once again, a Kendall's tau-b correlation was employed due to the ordinal status of the RF variable. There was a significant relation between the overall number of comments used by fathers and paternal RF ($\tau[25] = 0.33, p < 0.05$). The greater number of overall comments in fathers' antenatal MM predictions, the higher their RF scores were likely to be. This was a medium effect size (Pearson's $r = .36$). We can have some confidence in this finding.

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[37] The mean difference was –0.63 and the associated standard error was 0.85.
[38] Independent samples t test.

The relation between the use of mentalistic comments and paternal RF was investigated using an independent samples t test. Table 4.21 shows the mean RF score of fathers who did and did not include mentalistic comments in their antenatal 'Describe Your Child' predictions. As Table 4.21 shows, the difference in RF scores between the 2 groups was non-significant. The 95% confidence interval does contain a 0 value, however the effect size associated with the comparison is medium. An effect size of this magnitude can be interpreted, using the criteria set down by Coe (2000), as being the equivalent of the average RF score of those fathers who include mentalistic comments exceeding the scores of over 69% of the group of fathers who included no mentalistic comments. There is thus some evidence that fathers who include at least 1 mentalistic comment in their antenatal prediction have higher RF scores than those who include no mentalistic comments.

Table 4.21: Mean Paternal RF Scores with respect to Inclusion of Mentalistic Comments in Antenatal Predictions

	No Mentalistic Comments (N=12)		Mentalistic Comments (N=13)		t value[39]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
RF Score	2.67	1.16	3.46	1.66	1.38	n.s.	-1.99 to 0.40	0.58

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[39] Independent samples t test.

4.3.4: Construct Validity of the Antenatal MM Measures

The construct validity of the antenatal MM measures was first investigated in terms of convergent validity between the pet name and 'describe your child' interview. Table 4.22 shows the mean overall number of comments from the 'describe your child' predictions for mothers who did and who did not have a pet name for the foetus. Independent samples t tests showed that there was no significant difference in the overall number of comments used by mothers with respect to having a pet name[40]. The confidence interval included the value 0 and the comparison showed a small effect size, supporting the non-significant result.

Table 4.22: Means and Standard Deviations of the Overall Number of Comments by Whether Mothers Had a Pet Name for the Unborn Child

	Pet Name (N = 9)		No Pet Name (N = 18)		t value[41]	p value	95% Confidence Interval	Effect size
	M	SD	M	SD				
Overall Number Comments	2.44	1.51	2.94	1.73	0.74	n.s.	-1.90 to 0.90	0.31

Table 4.23 shows the analyses for a comparison of mothers who did and did not call the foetus by a pet name on the inclusion of mentalistic comments in their antenatal 'Describe Your Child' predictions. A 2 x 2 table was employed to assess the relation between these 2 dichotomous variables. Some cells had an expected count of at less than 5, so a modified chi-square was employed. There was no relation between the 2 variables ($\chi^2[1] = 0.00$; n.s.). The effect size was negligible ($w = 0.00$).

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[40] Mean difference was 0.50 and the standard error of the difference was 0.70.
[41] Independent samples t test.

Table 4.23: The Relation Between Maternal Use of a Pet Name for the Foetus and the Inclusion of Mentalistic Comments

	No Mentalistic Comments	Mentalistic Comments
Pet Name	5	4
No Pet Name	10	8

Table 4.24 shows the mean scores from the 'describe your child' predictions for fathers who did and did not have a pet name for the foetus. Independent samples t-tests showed no significant differences in the overall number of comments used by fathers who did and did not have a pet name for their unborn child[42]. The 95% confidence interval included the value 0, supporting the non-significant p value. The effect size for the comparison was small.

Table 4.24: Means and Standard Deviations of the Overall Number of Comments by Whether Fathers Had a Pet Name for the Unborn Child

	Pet Name (N = 11) M SD	No Pet Name (N = 14) M SD	t value[43]	p value	95% Confidence Intervals	Effect size
Overall Number Comments	3.09 1.87	3.29 1.59	0.28	n.s.	-1.63 to 1.24	0.12

Table 4.25 shows the comparison of fathers who did and did not have a pet name with respect to the inclusion of mentalistic comments. A 2 x 2 contingency table analysis was performed on these 2 dichotomous variables. All cells had an expected

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[42] Mean difference was –0.90 and standard errors of the difference was 0.69.
[43] Independent samples t test.

count of at least 5. There was no significant relation ($\chi^2[1] = 0.05$; n.s.)[44]. The effect size was negligible ($w = 0.04$).

Table 4.25: The Relation Between Paternal Use of a Pet Name for the Foetus and the Inclusion of Mentalistic Comments

	No Mentalistic Comments	Mentalistic Comments
Pet Name	5	6
No Pet Name	7	7

The lack of any association between the pet name and 'describe your child' measures for either mothers or fathers suggests that these 2 measures are not tapping into the same construct.

Construct validity was also addressed in terms of discriminant validity by investigating relations between the antenatal MM measures and parental AAS scores.

I. Pet Name

Table 4.26 shows the mean MAAS scores of mothers who did and did not have a pet name for the foetus. As Table 4.26 shows, these 2 groups did not differ in their MAAS scores. The mean difference was 4.69 and the associated standard error was 2.87. The effect size was medium to large but the confidence interval included 0.

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[44] The continuity correction chi square was also non-significant ($\chi^2[1] = 0.00$; n.s.).

Table 4.26: Comparison of MAAS Scores of Mothers Who Did and Did Not Have a Pet Name for their Unborn Child

	Pet Name ($N = 10$) Mean SD	No Pet Name ($N = 17$) Mean SD	t value[45]	p value	95% Confidence Interval	Effect size
Overall MAAS Scores	80.10 7.98	75.41 6.71	1.64	n.s.	-1.22 to 10.59	0.65

Table 4.27 shows the means and standard deviations of the PAAS scores of fathers who had a pet name for the foetus and those who did not. As Table 4.27 shows, fathers who called their foetus by a pet name achieved higher overall scores on the PAAS compared to fathers who did not. The mean difference was 5.47 and the associated standard error was 1.92. The effect size of the comparison was large and the confidence interval did not include 0.

Table 4.27: Comparison of PAAS Scores of Fathers Who Did and Did Not Have a Pet Name for Their Unborn Child

	Pet Name ($N = 11$) Mean SD	No Pet Name ($N = 14$) Mean SD	t value[46]	p value	95% Confidence Interval	Effect size
Overall PAAS Scores	57.18 5.10	51.71 4.51	2.48	< 0.01	1.49 to 9.45	1.14

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[45] Independent samples t test.
[46] Independent samples t test.

II. Describe Your Child Prediction

The relations between maternal and paternal AAS scores and the 'Describe Your Child' variables were also investigated. Relations were explored between AAS scores and (a) total number of comments, and (b) whether mothers and fathers included mentalistic comments.

The relation between maternal AAS scores and the overall number of comments in mothers' predictions was investigated using a Pearson's correlation. The scatterplot can be found in appendix 8 in *Figure 1*. There was no significant association between these 2 variables ($r[26] = -.31$; n.s.). The effect size for this negative correlation was medium. An independent samples t test was employed to determine the relation between maternal AAS scores and mothers' inclusion of mentalistic comments in their predictions. Table 4.28 shows the mean AAS scores for mothers who did and did not include mentalistic comments. As Table 4.28 shows, there was no significant difference between the 2 groups. The mean difference was 3.31 and the associated standard error was 2.96. The confidence interval included the value of 0. The effect size was small to medium. Although these effect were non-significant, it is important to note that higher MAAS scores were related to fewer predictions about the child and a lack of mentalistic comments.

Table 4.28: Comparison of Mean Maternal AAS Scores for Mothers Who Did and Did Not Include Mentalistic Comments in their Predictions

	No Mentalistic Comments (N=14)		Mentalistic Comments (N=12)		t value[47]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
AAS Score	78.64	8.38	75.53	6.37	1.12	n.s.	-2.80 to 9.42	0.46

Paternal AAS scores were also investigated in relation to fathers' responses to the Describe Your Child question. A Pearson's correlation was employed to determine the association between fathers' scores on the PAAS and the overall number of comments. The scatterplot can be found in *Figure 2* in appendix 8. There was no significant relation between these 2 variables (r[25] = -.09; n.s.). The effect size was small. A comparison was made between the AAS scores of fathers who did and did not include mentalistic comments in their predictions. Table 4.29 shows the mean AAS scores for these 2 groups. There was no significant difference between the 2 groups. The mean difference was 2.31 and the standard error of the difference was 2.17. The 95% confidence interval contained the value of 0, supporting the non-significant p value. The effect size was small to medium. Note that, although the relations were non-significant, the data are in the opposite direction for mothers versus fathers.

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[47] Independent samples t test.

Table 4.29: Comparison of Mean Paternal AAS Scores for Fathers Who Did and
Did Not Include Mentalistic Comments in their Predictions

	No Mentalistic Comments (N=)		Mentalistic Comments (N=)		t value[48]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
AAS Score	52.92	4.91	55.23	5.85	1.07	n.s.	-6.80 to 2.17	0.43

4.3.5: Relations Between Maternal and Paternal AAS and Adult Attachment

Relations between AAS scores and AAI classifications were investigated using

parametric analyses. Table 4.30 shows the mean AAS scores for mothers of different

AAI classifications.

Table 4.30: Mean (Standard Deviation in Brackets) AAS Classifications of
Mothers of Different AAI Classifications

	Ds (N=8)	F (N=15)	E (N=1)	U (N=3)	Non-autonomous (N=12)
AAS Scores	80.38 (9.88)	75.60 (6.19)	83.00 (0.00)	74.33 (4.16)	79.08 (8.61)

As Table 4.31 shows, there was no difference in the AAS scores of autonomous

and non-autonomous mothers. The mean difference was 3.48 and the associated

standard error was 2.85. The confidence interval included a value of 0 and the effect

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[48] Independent samples t test.

size was small to medium. It is important to note the direction of the effect for the relation between these variables, with the MAAS scores of the non-autonomous group being higher than the scores of the autonomous mothers.

Table 4.31: Comparison of Mean Maternal AAS Scores of Autonomous and Non-autonomous Mothers

	Autonomous (N=15) M　　SD	Non-autonomous (N=12) M　　SD	t value[49]	p value	95% Confidence Interval	Effect Size
AAS Scores	75.60　　6.19	79.08　　8.61	1.22	n.s.	-2.38 to 9.35	0.47

Table 4.32 shows the mean AAS scores for fathers of different AAI classifications.

Table 4.32: Mean (Standard Deviation in Brackets) AAS Classifications of Fathers of Different AAI Classifications

	Ds (N=10)	F (N=10)	E (N=3)	U (N=2)	Non-autonomous (N=15)
AAS Scores	52.60 (4.65)	56.60 (6.47)	50.33 (0.58)	55.00 (2.83)	52.47 (4.05)

As Table 4.33 shows, the relation between PAAS scores and AAI classification approached significance, with autonomous fathers scoring more highly on the AAS compared to their non-autonomous counterparts. The mean difference between the autonomous and non-autonomous groups was 4.13 and the associated standard error

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[49] Independent samples t test.

was 2.30. The confidence interval only just included a value of 0 and the effect size was large. This is the equivalent of the average score of autonomous fathers exceeding the score of non-autonomous fathers 79% of the time.

Table 4.33: Comparison of Mean Paternal AAS Scores of Autonomous and Non-autonomous Fathers

	Autonomous (N=10)		Non-autonomous (N=15)		t value[50]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
AAS Scores	56.60	6.47	52.47	4.05	1.80	0.06	-9.07 to 0.80	0.83

Note that, as well as the relation between these two variables being stronger for fathers than for mothers, the data are in the opposite direction for mothers versus fathers.

4.3.6: The Relation Between Maternal and Paternal AAS and Reflective Function

The relations between overall AAS scores for mothers and fathers and RF were also explored. Kendall's Tau-b correlations were employed. There was no significant association between maternal AAS and mothers' RF (τ[27] = -.08; n.s.). The effect size for this correlation was small (r = -.12). There was also no significant relation between fathers' AAS scores and paternal RF (τ[25] = .13; n.s.). The effect size for this relation was small to medium (r = .22). Although neither association is significant, it is interesting to note that the correlations are in the opposite direction for mothers and fathers – mirroring the results relating to the AAS and AAI classifications.

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[50] Independent samples t test.

4.3.7: Concordance Between Couples

Analyses were performed to investigate relations between couples' scores on the outcome variables. With respect to the MM assessment, mothers' total number of comments used in their antenatal MM predictions were compared to those of their partners using a Pearson's correlation. The scatterplot can be found in appendix 8 in *Figure 3*. Mothers' total number of predictions did not correlate with those of their partners ($r[24] = 0.34$, n.s.), although the effect size for this relation was medium.

The relation between partners' use of mentalistic comments in the antenatal descriptions was also investigated. A 2 x 2 contingency table analysis showed that there was no relation between partners' dichotomous use of mentalistic comments ($\chi^2[1] = 0.17$; n.s.)[51]. The effect size of this relation was small ($w = 0.08$).

With respect to relations between partners' AAI classifications, 6 of the 13 autonomous women's partners were autonomous, and 8 of the 12 non-autonomous women's partners were non-autonomous. Because 1 of the cells in the 2 x 2 contingency table had an expected count of less than 5, a modified chi-square test was used[52]. Partners' dichotomous AAI classifications were not related (modified-$\chi^2[1] = 0.41$, n.s.). The odds ratio was calculated and was 1.71. The effect size was small ($w = 0.09$).

Concordance between the RF scores of mothers and their partners was calculated using Kendall's tau-b, since the RF scores are on an ordinal scale. Couples' RF scores were not correlated ($\tau[25] = 0.15$, n.s.). The effect size was small ($r = 0.09$).

Finally, concordance in AAS scores was investigated using a Pearson's correlation. Mothers' and fathers' overall scores were divided by the number of items

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[51] The continuity correction chi square was also non-significant ($\chi^2[1] = 0.00$; n.s.);
[52] As recommended by Clark-Carter (2004), as opposed to Fisher's exact which is suggested for use only when the marginal totals are fixed and specified before the study is conducted.

on the MAAS and PAAS respectively, so that a direct comparison of scores could be made. The scatterplot is shown in appendix 8 *Figure 2*. Mothers' AAS scores were not related to those of their partners (r[25] = 0.22, n.s.). The effect size was small to medium.

4.3.8: The Relation Between Adult Attachment Classifications and Reflective Functioning

Previous research by Fonagy et al. (1991) has shown that AAI classifications are related in both mothers and fathers. Table 4.34 shows mean maternal and paternal RF scores by dichotomous AAI classifications. As Table 4.34 shows, autonomous mothers had significantly higher scores on the RF scale, compared to non-autonomous mothers[53]. The significant difference was further supported by the calculated 95% confidence interval which did not include a 0 value. Also, the effect size of the difference was large. According to Coe (2000), an effect size of this magnitude would suggest that the average autonomous mothers to have a higher RF score than 95% non-autonomous group mothers.

Table 4.34: Mean Maternal RF Scores by Dichotomous AAI Classifications

	Autonomous (N=16)	Non-autonomous (N=12)	t-value[54]	p-value	95% confidence interval	Effect Size
RF Score	5.00 (1.79)	2.33 (1.56)	4.12	<0.01	-4.00 to -1.34	1.60

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[53] The mean difference was 2.67 and the associated standard error was 0.56.
[54] Independent samples t test, since samples are unrelated

As Table 4.35 shows, autonomous fathers had higher scores on the RF scale, compared to non-autonomous fathers[55]. The 95% confidence interval did not include 0, and the effect size of this difference was also large. The magnitude of this effect size equates to the average autonomous fathers having a higher RF score than 82% of fathers in the non-autonomous group, according to the interpretation of effect sizes offered by Coe (2000).

Table 4.35: Mean Paternal RF Scores by Dichotomous AAI Classifications

	Autonomous (N=10)	Non-autonomous (N=15)	t-value[56]	p-value	95% confidence interval	Effect Size
RF Score	3.80 (1.03)	2.60 (1.55)	2.15	<0.05	-2.36 to –2.27	0.90

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[55] The mean difference was 1.20 and the associated standard error was 0.56.
[56] Independent samples t test, since samples are unrelated

<u>4.4: Discussion</u>

The initial aim of the study reported in this chapter was to explore relations between antenatal MM and parents' representations both of their unborn child and of their own childhood experiences. The first hypothesis stated that parents with autonomous AAI classifications would score more highly on antenatal MM assessments than their non-autonomous counterparts. No strong support was obtained for this hypothesis, since none of the comparisons yielded significant results, suggesting that autonomous parents were no more likely than those with non-autonomous classifications (a) to have a pet name for the foetus, (b) to be able to predict what the unborn child might be like at age 6 months, or (c) to talk about the future child's potential mentalistic qualities. However, there were medium effects in the predicted direction for relations between dichotomous AAI classification and both of the 'describe your child' indices in fathers, and between AAI classification and total number of comments on the 'describe your child' measure for mothers. There can be more confidence in these results if relations are identified later between these exploratory antenatal MM measures, and existing postnatal measures of MM.

More support was obtained for the second hypothesis, which predicted positive associations between parental RF and antenatal MM, although significant relations between these variables were only seen in fathers. Fathers who had a pet name for the foetus attained significantly higher RF scores than those without a pet name, and fathers' RF scores were significantly positively correlated with their total number of comments on the 'describe your child' prediction. Although non-significant, there was a medium effect for the relation between paternal RF and the presence of mentalistic descriptions. No significant associations were seen between RF and antenatal MM in

mothers. Once again, there can be more confidence in these results if these antenatal MM measures are later shown to be related to existing postnatal MM measures.

Another aim of the study reported above was to explore the construct validity of the antenatal MM measures. This was done by investigating (a) convergent validity between the two MM assessments, and (b) discriminant validity of the MM assessments with respect to an existing measure of attachment to the foetus. No evidence was found for convergent validity, since having a pet name for the foetus was unrelated to responses to the 'describe your child' prediction in both mothers and fathers. This suggests that these 2 measures are not tapping into the same construct. With regard to discriminant validity, having a pet name was significantly related to fathers' AAS scores, with a medium effect size for the non-significant relation between these variables in mothers. This suggests that having a pet name for the foetus may well be a further way in which one can assess parents' more general attachment to and preoccupation with the unborn child, rather than assessing the different construct of antenatal MM. In contrast, there appeared to be good evidence for the discriminant validity of the 2 indices of antenatal MM from the 'describe your child' predictions, since in both mothers and fathers, neither of these measures related to AAS scores.

The relations between parental representations on the AAS and attachment representations were also investigated. There were no significant associations between maternal AAS scores and mothers' AAI dichotomous classification or RF scores. For fathers, there was no relation between AAS and RF scores, but there was a trend towards autonomous fathers having higher overall AAS scores compared to non-autonomous group fathers, with a large effect for this relation. Autonomous fathers thus appear to be more strongly attached to the foetus and show greater preoccupation with the unborn child than their non-autonomous counterparts.

Finally, the study reported above investigated concordance in couples on the main outcome variables. No relations were found between mothers and their partners on any of the measures, suggesting that couples function independently of one another in terms of antenatal MM, AAI classification, RF, and attachment to the foetus. Although the finding that couples are not matched with respect to AAI classification is at odds with the results of van IJzendoorn et al.'s (1996) meta-analysis, the lack of concordance in partners' dichotomous AAI classifications observed in the study reported here replicates the results of Steele et al. (1996) on a separate British sample.

Before discussing these results in greater detail, a number of other findings are worthy of note. First, mothers' educational attainment and previous experience of motherhood were not related to any of the variables taken in the study reported above. These findings thus replicate the lack of association observed between education or parity and postnatal MM (e.g., Meins et al., 2001), and are in line with previous research showing AAI classifications to be unrelated to intelligence (van IJzendoorn, 1995). Similarly, fathers' education did not relate to any of the measures, but fathers' parity related to the total number of comments used in the 'Describe Your Child' prediction and PAAS scores. There were opposite directions of effect of parity on these two variables. With respect to total number of comments, fathers who already had at least one child made more predictions about what their future children would be like than did first time fathers. Conversely, first-time fathers had higher PAAS scores than their counterparts with older children, showing that first-time fathers are more attached to and preoccupied with the unborn child. The data for fathers concur with the findings of Condon et al. (1997) of a negative relation between overall antenatal attachment scores and the number of previous children in a sample of mothers. The study reported

above also replicated the strong link between autonomous AAI classification and higher RF scores reported by Fonagy et al. (1991).

Perhaps the most striking finding of the results reported above is the comparative strength of associations seen for mothers versus fathers. Significant associations were seen for fathers between RF scores and 2 of the 3 antenatal MM indices (pet name and total number of 'describe your child' predictions), with a medium effect size for the relation with the third index (mentalistic predictions). In contrast, no significant associations were seen for mothers on any comparison in the study reported above. Why might relations been stronger for fathers than for mothers? One possibility is that fathers rely more on their own personal experiences of close relationships and their accompanying reflections because of a comparative lack of information and focus on fathers' views about the unborn child and their role during pregnancy. In contrast to the wealth of advice and literature that mothers are typically provided with during pregnancy, few resources are routinely aimed at fathers-to-be, and this may result in them relying more on their approaches to past personal experience when they are asked to think about what their children might be like in the future. This suggestion is supported by the fact that fathers with older children talked more extensively about what their children would be like at 6 months than those with no previous experience of fatherhood, whereas parity was unrelated to mothers' responses to the 'describe your child' interview.

A further point that requires some discussion is the fact that parents' total number of 'describe your child' predictions related more strongly to parental attachment relations than did their use of mentalistic predictions. This finding contrasts with relations observed between postnatal MM and attachment, where the relation is specifically between parents' proportional use of mentalistic descriptions of their

children and attachment security (Meins et al., 1998). However, such a general relation between parents' attachment representations and their predictions about their unborn children is perhaps not surprising, given the comparative difficulty of making a projective description versus describing one's preschool age child. The fundamental marker of antenatal MM may therefore be parents' ability to formulate *any* ideas about what the child will be like in the future, rather than ideas specifically relating to the child's internal states. Alternatively, it may be the projected age that resulted in a lack of association between mentalistic descriptors and the attachment variables. If parents had been asked to predict what their children would be like in the preschool years, perhaps the results would have been more consistent with findings on postnatal MM. In addition, work on postnatal MM during infancy has used an observational measure to assess MM (Lundy, 2003; Meins et al., 2001) rather than the interview method used here and in previous work in the preschool period (e.g., Meins et al., 1998). This difference in the method of assessing MM may thus be a further explanation for the lack of consistency in findings between antenatal and postnatal measures.

Finally, the observed relation between paternal autonomous AAI classification and fathers' attachment to the foetus needs to be placed in the context of critical appraisals of measures of so-called "antenatal attachment". For example, potential relations between antenatal attachment and AAI classification could be regarded unfavourably since the former measures are perceived as flawed in the underlying principles of Bowlby's theory (1969; 1973; 1980). Attachment theory is grounded in the principle that only someone stronger and wiser can act as a secure base and a safe haven for exploration and, therefore, be an attachment figure. By this definition a foetus cannot be an attachment figure and questionnaires attempting to measure "parent–infant attachment" (as opposed to infant–parent attachment) are invalid.

However, if measures such as the AAS are regarded instead as an assessment of parents' antenatal representations of the child and therefore an attempt to index caregiving, they are more compatible with attachment theory. The association observed between AAI classification and antenatal attachment specifically for fathers may be explained in terms of society's expectations of how mothers-to-be ought to feel during pregnancy. Consequently, social desirability may have played a role in the responses of non-autonomous mothers to the AAS, whereas the AAS responses of fathers may have been a more genuine indication of their feelings towards the unborn child.

In summary, antenatal MM (in the form of parents' 'describe your child' predictions and having a pet name for the unborn child) showed meaningful associations with parents' attachment representations, at least for fathers. Given the lack of association between the two antenatal MM measures (pet name and 'describe your child' predictions), no good evidence was obtained for the convergent validity of MM in the antenatal period. Do these findings enable us to claim that parents' predictions about their unborn children or their tendency to have a pet name for the foetus index MM? To be confident in making this claim, one would need to establish that these antenatal measures relate to established MM assessments in the first year of life. Addressing the predictive validity of the antenatal assessments deemed to be indicative of MM was the focus of the first follow-up phase, reported in the next chapter. The next phases also further addressed the possibility that MM can help bridge the transmission gap by investigating the relation between parents' attachment representations and their postnatal MM, and these results are considered in Chapter 7.

Chapter 5

The First Follow-up Study: 6 months postnatal

Investigating Mind-mindedness and Maternal and Paternal Sensitivity

5.1: Introduction

In previous research, the quality of the relationship that an infant has with a parent has been shown to relate to the parent's interactive behaviour with that child, and also to the representations that the parent has with regard to their own childhood attachment figures (Pederson et al., 1998). The quality of relationships with mothers and fathers in infancy has been shown to have a wide range of developmental consequences for the child, including greater autonomy (Sroufe, Fox, & Pancake, 1983) and social competence with peers (Belsky, Garduque, & Hrncir, 1984). Therefore identification of the precursors of quality of attachment is an important research aim.

The security of infant-parent attachment is commonly assessed using the Strange Situation procedure (Ainsworth et al., 1969), which has been shown to have relatively good reliability (Main et al., 1981) and validity (van IJzendoorn & Kroonenberg, 1988). The most important predictor of infant behaviour in the Strange Situation that has been identified is the parent's state of mind with respect to his or her own attachment experiences (van IJzendoorn, 1995), as assessed in the AAI (George et al., 1984). However, it is not clear how parents' own childhood experiences are transmitted to the infant and impact upon the security of the attachment relationship. One mediating variable that was proposed was parental sensitivity. However, as discussed in Chapter 2, although sensitivity has been found to relate to both AAI and Strange Situation classifications, sensitivity could only account for a small proportion

of the variance in the relation between AAI and Strange Situation classifications; hence van IJzendoorn's (1995) argument for the existence of a 'transmission gap'.

One potential means of bridging this gap in the intergenerational transmission of attachment is to consider a redefinition of sensitivity. Such a redefinition was proposed by Meins et al. (2001) in the form of mind-mindedness (MM). MM is defined as the proclivity to treat one's infant as an individual with a mind of his or her own. It is operationalised during infancy as parents' tendency to comment appropriately on their infants' putative mental states. This, argued Meins et al., captures the salient aspect of parental sensitivity that previous measures have neglected, that of *appropriate* responding. They proposed that a parent who comments appropriately on the mental states of the infant is interpreting the infant's signals correctly and is therefore more likely to respond in the most suitable way.

As discussed previously, Meins et al. (2001) showed in a prospective study that maternal MM at infant age 6 months was a significant predictor of subsequent infant-mother attachment security, accounting for over 12 per cent of the variance in Strange Situation classifications. Lundy (2003) replicated this finding in both mothers and fathers using the Attachment Q Set (Waters, 1995). However, neither study looked at concurrent paternal sensitivity. This is an issue that needs to be addressed. In order to establish that any such relations were specific to MM, rather than merely indexing some more general quality of the infant-parent relationship, a measure of parental sensitivity was included in the follow-up study reported in this chapter. A measure of parental depression was also included in the follow-up to control for the potential confounding effect of parental mood on infant-parent interaction.

On the basis of previous research findings, the hypotheses were as follows, that:

1. MM at 6 months would be positively correlated with concurrent sensitivity for both mothers and fathers.

Further, relations between MM and sensitivity were investigated in relation to: (a) parity; (b) education; and (c) depression. Concordance in couples' postnatal MM and sensitivity was investigated.

5.2: Method

5.2.1: Participants

Parents who had participated in the initial study were contacted when their babies were approaching 6 months of age and asked if they would agree to take part in the first follow-up study. Of the 28 families who participated in the first session, 21 returned for a second visit (17 triads and 4 dyads). Mean infant age was $M = 188$ days (6 months and 8 days) and ranged from 150 days to 224 days (5 months and 18 days to 7 months and 14 days). With respect to parity, 9 of the mothers and 7 of the fathers who participated in the follow-up had older children. Of the families who did not attend the second visit, 4 were unable to schedule time to visit the university due to parental work commitments, 2 were unable to be contacted again, and 1 withdrew due to their child's long-term illness.

5.2.2: General Procedure

This session was held in the same university developmental research laboratories as the antenatal visit. Mothers and fathers played with their baby for half an hour each and the order was counterbalanced. While one parent was in the testing room their partner (if they were participating) waited in the adjoining room and completed The Centre for

Epidemiologic Studies-Depression (CES-D; Radloff, 1977) scale, a measure of depression.

5.2.3: Infant-Parent Interaction

I. Assessment of MM

Parents and infants were introduced to the testing room in which there were several easy chairs, some large floor cushions and a range of age-appropriate toys. There were 2 video cameras, mounted on the walls in diagonal corners, which recorded the session. Parents were told they could move around the room as they pleased but should begin by sitting on the play-mat in the middle of the floor. They were asked to play with their baby as they normally would.

These infant-parent interaction videos were transcribed and comments that contained an explicit mental state term pertaining to their infants' minds were identified. All other comments were ignored. These mind-related comments were then scored on an orthogonal dimension: appropriateness. Each comment was coded dichotomously as appropriate or inappropriate. The criteria for a comment being coded as appropriate were as follows: (a) the coder believed that the mother was referring to the likely mental or emotional processes occurring in the infant's mind at that time, for example, if a parent commented that their infant wanted a particular toy and the infant's behaviour seemed to be consistent with this; (b) the comment linked current activity with similar events in the past or future, for example, while playing with a ball with their infant, a parent asked if they remembered playing with a similar ball at the parent and toddler group that they attend; (c) the parent is asked for clarification of how to proceed if there is a lull in the interaction, for example, a parent of an infant who has

been looking around the room for a short time not focussing on anything in particular asks if they would like to play with a teddy. The comments were coded as inappropriate if: (a) the coder believed that the parent was misinterpreting their infant's mental or emotional state, for example a parent stating that a child is bored with a toy when they are still actively engaged in playing with it; (b) the comment referred to a past or future event which has no obvious relation to the current activity, (c) the parent asked the infant for clarification of how to proceed when the infant was already engaged in an activity; (d) the referent of the parents' comment was not clear to the coder, for example a parent commenting "you like that" when it is not clear which object they are referring to. Appropriate and inappropriate mind-related comments were calculated as a proportion of the total number of comments made by the parent in that session, to control for verbosity. Appropriateness was determined with reference to both the transcript and the video. The coding procedures are taken from Meins et al. (2001).

The measures to be used in analyses will be the proportion of appropriate mind-related and the proportion of inappropriate mind-related comments. Mothers and fathers who are more mind-minded will produce proportionately more appropriate mind-related comments and few or no inappropriate mind-related comments.

The author scored each transcription and 20% (8) were also coded by a second trained person for the purpose of reliability. This is shown in Appendix 9. The conventional level of agreement was achieved ($\kappa = 0.73$). In the case of disagreements a consensus was reached following discussion.

II.   Assessment of Sensitivity

The sensitivity of mothers' and fathers' interactions with their infants was coded from the videotapes of the 6-month visit using Ainsworth et al.'s (1971) scale. This 9-point

scale is comprised of 5 "anchor points" (highly sensitive, sensitive, inconsistently sensitive, insensitive, highly insensitive) with higher scores indicating greater sensitivity. This scale is used to provide a global measure of a parent's sensitivity to an infant's cues. The author coded each session and 20% (8) of the tapes were also coded by a second blind person for reliability purposes. Both raters used only the 5 anchor points and the inter-rater agreement was less than acceptable by conventional standards ($\kappa = 0.62$) and so the two raters discussed the disagreements until a consensus was achieved[57]. The reliability calculations for the kappa statistic can be found in Appendix 10. The original correlation between the ratings was significant at the 5% level using Kendall's Tau (.72) and Pearson's r (.80).

5.2.4: Assessment of Depression

A measure of maternal and paternal depression was included as it is possible that depression could impact on a number of other variables. The CES-D self-report scale was used. This measure was specifically developed for use in studies of depressive symptomatology in the general population. The CES-D is comprised of 20 questions about depressive symptoms in the past week, which are rated on a 4-point rating scale: where 0 is "Rarely or none of the time (less than 1 day)"; 1 is "Some or a little of the time (1-2 days)"; 2 is "Occasionally or a moderate amount of time (3-4 days)"; 3 is "Most or all of the time (5-7 days)". An example question from the CES-D is:

- "I felt that I could not shake off the blues even with help from my friends"

The full list of questions can be found in Appendix 11. Possible scores range from 0 to 60. This measure was used as a continuous variable in the analyses.

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[57] Although the kappa statistic is most commonly used with nominal data, Clark-Carter (2004) provides an example of using kappa calculations for ordinal data. However, since correlation is the more traditional method for use with ordinal variables the correlation is also stated.

5.2.5: Parental Educational Qualifications

Parents' level of education was included as an independent variable, since it was

necessary to control for the possibility that some antecedents of infant attachment

security, in particular MM, may be related to parental educational level. Both mothers

and fathers indicated their highest educational qualification at the 6-month visit (see

above). Table 5.1 shows the highest qualifications for mothers and fathers who

participated in the follow-up at 6 months.

Table 5.1: Distribution of Parental Highest Educational Qualifications

	Mothers	Fathers
No Qualifications	0	0
CSE /GCSEs	5	1
O / A Levels	5	3
Further	3	5
Degree	6	7
Higher Degree	2	1

<u>5.3: Results</u>

Due to the small sample, once again effect sizes are calculated throughout the Results

section in order to provide a measure of the strength of the relation between variables

independent of sample size. See Chapter 4 for a more comprehensive explanation.

5.3.1: Descriptive Statistics and Preliminary Analyses

I. Descriptive Statistics

Table 5.2 shows the descriptive statistics for the mothers participating in the first

follow-up study. For each variable the z score for skewness was calculated and all were

found to be less than 2.58, showing that all variables were normally distributed. The

kurtosis z score was also calculated for each variable and all were within the normal

range. Pictorial representations of the distributions can be found in appendix 7. *Figures*

23 and *24* in appendix 7 show the distribution and normal plots of maternal appropriate

comments. *Figure 25* shows the boxplot for this variable. The boxplot showed that

there was 1 potential outlier with respect to maternal appropriate comments. This was

investigated further and the standardised score for this data point did not exceed the

cut-off of 3 (Clark-Carter, 2004). *Figures 29* and *30* in appendix 7 show the

distribution and normal plots for maternal inappropriate comments. The boxplot is

shown in *Figure 31*; there were no outliers. *Figure 35*, in appendix7, shows the

distribution of maternal sensitivity. The distribution for maternal depression is found in

Figures 37. The distribution of maternal education was considered in Chapter 4. All

variables will be investigated using parametric analyses.

Table 5.2: Descriptive Statistics for Mothers

	Range	Mean	Standard Deviation	Skew	Kurtosis
Proportion of Appropriate Comments	0.02 – 0.17	0.08	0.04	1.40	0.09
Proportion of Inappropriate Comments	0.00 – 0.04	0.02	0.01	0.15	-0.94
Sensitivity	1 – 9	4.43	1.91	1.21	0.23
Depression	0 – 22	8.43	5.77	0.68	-0.06
Education	1 – 5	2.76	1.38	0.17	-1.26

Table 5.3 shows the descriptive statistics for the fathers participating in the first follow-up study. For each variable the z statistic was calculated for skewness, and all were less than 2.58. This shows that all of the variables were normally distributed. Kurtosis z scores were also within the normal range. *Figures 26* and *27*, in appendix 7, show the distribution and normal plots for paternal appropriate comments. The boxplot for this variable is shown in *Figure 28;* there are no outliers. The distribution and normal plots for paternal inappropriate comments can be found in *Figures 32* and *33*, in appendix 7. The boxplot can be found in *Figure 24*. There were 4 potential outliers for this variable, however, when these data points were investigated further using standardised values none exceeded the cut-off points. The distribution for paternal sensitivity is shown in appendix 7 in *Figure 36*. The distribution for paternal depression can be found in *Figure 38*. The distribution of paternal education was considered in Chapter 4. All paternal variables will be investigated using parametric analyses.

Table 5.3: Descriptive Statistics for Fathers

	Range	Mean	Standard Deviation	Skew	Kurtosis
Proportion of Appropriate Comments	0.01 – 0.16	0.07	0.04	0.75	-0.61
Proportion of Inappropriate Comments	0.01 – 0.08	0.03	0.02	2.14	1.06
Sensitivity	1 – 7	3.47	1.94	0.68	-0.47
Depression	1 – 26	9.71	7.21	1.39	0.02
Education	1 – 5	3.24	1.03	0.90	-0.11

The descriptive statistics for both mothers and fathers in this sample for the proportion of appropriate and inappropriate comments are similar to those reported by Meins et al. (2001) for mothers of 6-month-old infants[58].

5.3.2: Relation Between Postnatal MM and Concurrent Sensitivity

Sensitivity was investigated in relation to both appropriateness and inappropriateness for mothers and fathers separately. Table 5.4 shows the correlations between the 2 MM indices and concurrent sensitivity for mothers. Kendall's tau-b correlations were employed since some of the variables were ordinal.

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[58] Appropriate: M = 0.10, SD = 0.06; inappropriate: M = 0.02, SD = 0.02.

Table 5.4: Kendall's Tau Correlation Matrix of the Relations Between the Continuous
Variables for Mothers

	1	2	3	4	5
1	1.0				
2	.09	1.0			
3	-.15	.13	1.0		
4	.30†	.20	-.24†	1.0	
5	.31†	-.22	.04	.15	1.0

N = 21
† p < 0.10

1: Proportion of appropriate mind related comments; 2: Proportion of inappropriate mind related
comments; 3: Depression score; 4: Highest educational qualification score, 5. Sensitivity.

As Table 5.4 shows, the positive correlation between maternal sensitivity and

mothers' appropriate mind-related comments scores approached significance (p = .08).

The effect size for this association was medium to large (r = 0.48). Table 5.4 shows that

there was no significant relation between maternal sensitivity and mothers'

proportional scores for inappropriate comments. The effect size for this association was

small to medium (r = .27). As Table 5.4 also shows, mothers' proportional scores for

appropriate mind-related comments were unrelated to proportional scores for

inappropriate mind-related comments.

Table 5.5 shows the relation between fathers' sensitivity scores and those on the

MM indices. Since some variables were ordinal, Kendall's Tau-b was employed since

some variables were ordinal.

Table 5.5: Kendall's Tau's Correlation Matrix of the Relations Between the Continuous Variables for Fathers

	1	2	3	4	5
1	1.0				
2	.51**	1.0			
3	.06	-.07	1.0		
4	.11	.16	.10	1.0	
5	.58**	.22	.02	-.04	1.0

$N = 17$
** significant at 1% level

1: Proportion of appropriate mind related comments; 2: Proportion of inappropriate mind related comments; 3: Depression score; 4: Highest educational qualification score; 5: Sensitivity.

As Table 5.5 shows, there was a significant positive relation between paternal sensitivity and scores for the proportion of appropriate comments ($p = .003$). The effect size for this relation was large ($r = 0.62$). Table 5.5 shows that there was no significant relation between paternal sensitivity and fathers' proportional scores for inappropriate comments. The effect size for this association was small medium ($r = .17$). Table 5.5 also highlights the fact that fathers' proportional scores for appropriate mind-related comments and inappropriate mind-related comments were highly positively correlated ($p = .005$). The effect size for this relation was large ($r = .55$). This relation contrasts with the lack of association seen between the 2 MM indices in mothers. Due to the large number of contrasts, there is a risk of family-wise errors. To guard against this possibility the alpha level was reduced to 0.005[59], and the correlations were still significant at this new level. This relation contrasts with the lack of association seen between the 2 MM indices in mothers.

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[59] This is calculated by dividing the significance level by the number of contrasts.

5.3.3: Relations between Infant-Parent Interaction Variables and Depression

Table 5.4 shows the relations between the 6-month maternal indices of MM and mothers' depression scores. As Table 5.4 shows, the relations between MM and depression were non-significant, although it is interesting to note that depression was negatively correlated with mothers' proportional use of appropriate mind-related comments and positively correlated with their proportional scores for inappropriate mind-related comments. As Table 5.4 shows, mothers' depression scores were unrelated to sensitivity.

Table 5.5 shows the relations between MM and depression for fathers. As was the case for mothers, depression did not relate to either of the MM indices, with both correlation coefficients being close to 0. Table 5.5 also shows that fathers' depression scores did not relate to sensitivity.

5.3.4: Relations between Infant-Parent Interaction Variables and Control Variables

As Table 5.4 shows, there were no significant relations between either of the maternal MM variables and mothers' educational attainment, although there was a non-significant trend for more highly educated mothers to score more highly on appropriate mind-related comments ($p = .09$). The effect size for this relation was small to medium ($r = 0.24$). Due to the number of contrasts, there is a risk of family-wise error and trends must be treated with caution. Table 5.4 also shows that maternal sensitivity was not related to educational attainment. As Table 5.5 shows, neither of the paternal MM variables nor paternal sensitivity related to fathers' educational attainment.

Table 5.6 shows the mean MM scores for first-time mothers and mothers with older children. Mothers' appropriate comments were investigated with respect to maternal parity. There was no significant difference between the 2 groups on this measure[60]. The associated effect size for this comparison was small. There was a non-significant trend in relation to the proportion of inappropriate comments used[61]. The effect size for this comparison was large (d = 1.00). There was some evidence that first-time mothers were using a greater proportion of inappropriate comments compared to non-first-time mothers. This finding requires further replication, since previous research has shown no relation between proportion of inappropriate mind-related comments and family size (Meins et al., 2002). Table 5.6 also shows the sensitivity scores with respect to maternal parity. Sensitivity was unrelated to parity[62]. The effect size associated with this comparison was negligible.

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[60] The mean difference was 0.01 and the associated standard error was 0.02. The 95% confidence interval included the value of 0.

[61] The mean difference was 0.01 and the associated standard error was 0.01. The 95% confidence interval included the value of 0.

[62] The mean difference was 0.22 and the associated standard error was 0.86. The 95% confidence interval included the value of 0.

Table 5.6: Comparison of Mean Scores for MM and Sensitivity by Maternal Parity Status

	First Child (N=12)		Not First Child (N=9)		t value[63]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Appropriate Comments	0.08	0.04	0.07	0.04	0.33	n.s.	-0.03 to 0.04	0.25
Inappropriate Comments	0.03	0.01	0.02	0.01	1.92	= .07	-0.01 to 0.02	1.00
Sensitivity	4.33	1.97	4.56	1.94	0.26	n.s.	-2.03 to 1.59	0.12

Table 5.7 shows the mean MM scores for fathers with respect to paternal parity. A comparison of paternal appropriate and inappropriate comments with respect to parity was made using independent samples t tests. There were no significant differences in either the proportion of appropriate comments[64] or the proportion of inappropriate comments[65] used by first-time fathers in comparison to non-first-time fathers. The associated effect size was negligible with respect to appropriateness and small with respect to inappropriateness. Table 5.7 also shows the sensitivity scores of first-time fathers and those with older children. Paternal sensitivity and parity were unrelated[66]. The effect size was small.

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[63] Independent samples t tests.
[64] The mean difference was 0.00 and the associated standard error was 0.02. The 95% confidence interval included the value of 0.
[65] The mean difference was 0.01 and the associated standard error was 0.01. The 95% confidence interval included the value of 0.
[66] The mean difference was 0.31 and the associated standard error was 0.98. The 95% confidence interval included the value of 0.

Table 5.7: Comparison of Mean Scores for MM and Sensitivity by Paternal Parity Status

	First Child (N=10)		Not First Child (N=7)		t value[67]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Appropriate Comments	0.07	0.05	0.07	0.04	0.12	n.s.	-0.04 to 0.05	0.00
Inappropriate Comments	0.03	0.01	0.04	0.03	0.54	n.s.	-0.03 to 0.02	0.33
Sensitivity	3.60	2.32	3.29	1.38	0.32	n.s.	-1.78 to 2.41	0.183

5.3.5: Concordance in Postnatal MM and Sensitivity

Concordance in partners' postnatal MM was investigated. Mothers' proportional scores for appropriate mind-related comments were positively correlated with those of their partners, and this relation approached significance ($r[17] = .44, p = .08$, two-tailed). This was a medium effect. The scatterplot is shown in *Figure 5* in appendix 8. Partners' proportional scores for inappropriate mind-related comments were not correlated ($r[17] = .06$, n.s.). This was a small effect. The scatterplot is shown in *Figure 6* in appendix 8. These findings suggest that there is some concordance in couples in their proportional use of appropriate mind-related comments, but not in their proportional use of inappropriate mind-related comments.

Concordance in partners' sensitivity was also investigated. Kendall's Tau-b correlations were employed since the variables were ordinal. There was correlation between mothers' and fathers' sensitivity scores ($\tau[17] = .02$, n.s.). The association showed a negligible effect size.

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[67] Independent samples t tests.

5.4: Discussion

The results of the first follow-up phase gave broad support to the main hypothesis: the expected positive relations between concurrent appropriate mind-related comments and sensitivity were observed for both mothers and fathers, replicating and extending previous findings (Meins et al., 2001) since the relation between paternal mind-mindedness and concurrent sensitivity had not previously been investigated. There were no relations between maternal and paternal sensitivity and inappropriateness. This suggests further evidence that the two constructs are assessing similar but not equivalent constructs.

A number of other findings are worthy of comment. First, interesting differences emerged in the relations between the proportions of appropriate and inappropriate comments as a function of parental gender. For fathers there was a significant positive association between the 2 MM indices, but for mothers there was no relation. Previous research on maternal MM has found a similar lack of association between proportional scores for appropriate and inappropriate mind-related comments (Meins et al., 2001). This positive association between the 2 indices of postnatal paternal MM suggests that these indices of MM may have more limited discriminant validity for fathers.

Second, parents' depression was not related to concurrent MM or sensitivity. This finding is in contrast to the results of Lundy (2003) who reported that depression was negatively related to maternal MM (although not to paternal MM). The lack of association in the study reported here may be due to the fact that the levels of depression in the participating parents were relatively low. The highest score in the sample was 26 out of a maximum possible score of 60. Lundy (2003) measured depression using the same scale, but unfortunately did not report the range of CES-D

scores in either fathers or mothers. Although no firm conclusion can be drawn, it is possible that the discrepancy in results arose because of greater variance in depression in Lundy's (2003) study. Future research should study the impact of clinical levels of depression on MM.

There were largely no relations between scores for appropriate or inappropriate comments and either mothers' or fathers' parity, although there was some evidence that first-time mothers may make a greater proportion of inappropriate comments compared to non-first-time mothers. There was also no relation between the proportion of appropriate or inappropriate comments and paternal educational qualifications. However, there was some limited evidence that maternal appropriateness may be related to maternal qualifications. However, these results should be interpreted with caution since Meins et al. (2002) found maternal parity and educational attainment both to be unrelated to MM at 6 months.

Finally, the issue of concordance in partners' postnatal MM and sensitivity was investigated. There were no significant correlations between mothers' and fathers' use of inappropriate comments or sensitivity scores. However, there was a non-significant trend suggesting some evidence of concordance between partners' use of appropriate comments. The lack of significant concordance in MM between partners provides some further support for Meins et al.'s (2005) argument that MM is a relationship-specific construct.

The aim of the second follow-up study is to investigate the potential of developing further measures of MM in the postnatal period. The construct validity of these measures will be investigated by determining relations with concurrent infant-mother and infant-father attachment.

Chapter 6

The Second Follow-up Study: 12 and 15 Months Postnatal

Investigating Other Potential Measures of Postnatal Mind-mindedness and

Relations with Infant Attachment

6.1: Introduction

The study reported in this chapter extended previous research on MM in a number of ways. First, the concept of MM was investigated in a stressful context (the Strange Situation), whereas previous research has only used free play observations or interviews to obtain MM measures. Differences between parents' proclivity to treat their infants as individuals with minds of their own may be polarised under stressful circumstances. Just as we expect greater individual differences in the attachment behaviours displayed by infants in the Strange Situation procedure than in the home because it is designed to stress the infant, perhaps there will also be greater variation in parental MM. The Strange Situation may activate parental caregiving systems and therefore be stressful for mothers and fathers as well as infants. Zelenko, Kraemer, Huffman, Gschwendt, Pageler, and Steiner (2005) showed changes in maternal heart rates during separations and reunions. In addition, using the Strange Situation to obtain MM measures would utilise more of the information that is available from this procedure.

A second attempt to develop a further measure of parents' representations of their infants was to ask parents to predict how their children would react in the Strange Situation procedure. Asking parents to select a profile of behaviour that is reflective of the traditional categories may be an effective window on their internal working models of their child. Previous research has shown that more sensitive mothers' descriptions of

their children's attachment behaviour at home were more strongly related to the assessments by trained observers using the Attachment Q Sort (AQS) than descriptions by less sensitive mothers (Tarabulsy, Avgoustis, Phillips, Pederson, & Moran, 1997). This suggested that more sensitive mothers were more able to represent their children's attachment behaviours accurately. It was therefore purported that the ability to correctly predict the behaviour of one's infant in the Strange Situation procedure would relate to parental MM.

The study reported in this chapter tested the following hypotheses: that (a) parental MM during the Strange Situation procedure will be related to a secure infant-parent attachment relationship, (b) more mind-minded parents will be more accurate in predicting their children's Strange Situation attachment behaviour, and (c) parents with secure attachment relationships with their infants will be more accurate in predicting their Strange Situation behaviour. In addition, concordance between infant-mother and infant-father attachment security was investigated. Relations between infant attachment, MM in the Strange Situation, and parental accuracy with respect to infant attachment behaviours were investigated in relation to depression (measured at 6-months postnatal).

6.2: Method

6.2.1: Participants: Phase 1 Testing (Infant Age 12 months)

Families who had attended the second phase of testing were contacted again when their infants were approaching 12 months of age and asked to come to the University for a third visit. Of the 21 families who attended the 6 months visit, 19 returned to complete this phase of the research (16 triads and 3 mother-infant dyads). The 2 families who withdrew at this stage did so because of parental work commitments. Mean infant age

was 12 months and 11 days with a range of 11 months and 25 days to 13 months and 12 days.

6.2.2: Participants: Phase 2 Testing (Infant Age 15 months)

Families who had attended all previous sessions were contacted for a final time when their infants were approaching 15 months of age and mother, father and infant were asked to attend. Of the 19 families who had participated in the 12-month visits, 16 were eligible to participate in the final phase, as they consisted of mother-father-infant triads, and 15 did so. The 1 family that did not participate in this session was unable to schedule a visit due to the father's work commitments. One infant had to be assessed with his father at 13 months (4 weeks after being seen with mother) due to family plans to relocate abroad. Of the remaining infants, the mean infant age was 15 months and 9 days with a range of 14 months 27 days to 16 months and 4 days.

6.2.3: Infant Attachment

Infants took part in the Strange Situation procedure (Ainsworth & Wittig, 1969) with each parent, with mothers at 12 months and fathers at 15 months (see Chapter One for a full description of this procedure). At each session, parents were briefed on the Strange Situation procedure and were asked to predict how the infant would respond. Parents were given a description of each of the three major categories of infant attachment and asked which one they believed would be most similar to the reaction of their child. The descriptions were as follows:

- A: My baby will explore the room and the toys readily on his/her own and will also play with a friendly stranger. My baby will not be very upset when I leave the room; he/she is quite independent now. When I return to the room, my baby

will continue to play and will not be concerned with being comforted by me, as he/she is quite self-reliant.

- B: My baby will explore the room after a little hesitation and return to me to show me things in between playing with the toys. He/She will play with a friendly stranger after gentle encouragement. When I leave the room my baby might well become upset, and will show signs of wondering where I am, but it's likely that he/she will be able to be distracted by toys or comforted by the stranger. When I return he/she will greet me, and if upset will want to be comforted, but will then explore the room/toys once more.

- C: My baby will be distressed or subdued by this new experience and may be reluctant to play with the toys or with a friendly stranger. He/She will want to stay close to me. When I leave the room, my baby is likely to become pretty upset, and will not easily be comforted by the stranger or distracted by toys. When I return, he/she may be upset with me for leaving, and it will be difficult for me to comfort him/her and re-engage him/her in play.

An example of the response sheet can be seen in Appendix 12.

A description of the D category was not included since all children who are identified as disorganised are given a secondary A, B, C classification so parents would be able to recognise one of these strategies in their child. Also the behaviour that results in a D classification is usually only momentary and bizarre, so it was felt that this could not form the basis of an independent description that parents would endorse. Parents were rated as accurate or inaccurate by comparing actual Strange Situation classifications to predictions. Parents of infants classified as D in the Strange Situation were judged for accuracy based on the secondary A, B, C classification of their child.

A further potential window on parents' representations of their infant investigated in the context of the Strange Situation procedure was the assessment of parental MM. Comments made by parents during the Strange Situation episodes were transcribed verbatim and, as at 6 months, comments referring to infant internal states were highlighted. As in the previous phase of this longitudinal study, each of the mind related comments was assessed as to whether it was appropriate or inappropriate (see Chapter 4 for the coding criteria).

The author, who was formally trained in the Strange Situation coding procedure by L. Alan Sroufe and Elizabeth Carlson, and who is considered reliable, coded the Strange Situation tapes. A randomly selected almost 50% (16) of the tapes were also coded by a second, blind reliable rater. The reliability kappa for Strange Situation coding with both mother and father was 0.90, which is good. The calculations can be found in Appendix 13.

6.3: Results

Due to the small sample, once again effect sizes are calculated throughout the Results section in order to provide a measure of the strength of the relation between variables independent of sample size. See Chapter 4 for a more detailed discussion.

6.3.1: Descriptive Statistics and Preliminary Analyses

The distribution of infant Strange Situation classifications with mother is shown in Table 6.1[68]. The secondary classification of the insecure disorganised child was insecure avoidant.

Table 6.1: Distribution of Strange Situation Classifications with Mother[69]

Avoidant	4
Secure	12
Resistant	1
Disorganised	1

The distribution of infant Strange Situation classifications with father is shown in Table 6.2. The secondary classification of the disorganised infants were insecure: 2 avoidant and 1 resistant.

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[68] Distributions were compared to those of Steele, Steele, and Fonagy (1996) since the sample was also from the UK and data were available for mothers and fathers. The distribution of dichotomous infant-mother attachment in the two samples was not significantly different ($\chi^2 (1) = 0.49$; n.s.). However, the distribution of dichotomous infant-father attachment differed between the two samples ($\chi^2 (1) = 6.53$; p < 0.05). One potential reason for this difference might be the fact that there was a high proportion of secure infant-father classifications in the Steele et al. sample – higher than the proportion for mothers. Infant-father classifications were also compared to those of Frosch, Cox and Davis Goldman (2001), since both involve low-risk middle class samples, and data were collected for both mothers and fathers. Distributions for infant-father attachment between the two samples did not to differ ($\chi^2 (1) = 1.57$; n.s.).

[69] The mother of one infant asked for the Strange Situation to be terminated during the fourth episode (the first separation) and declined to arrange another visit, so the Strange Situation data are missing for this child.

Table 6.2: Distribution of Strange Situation Classifications with Father

Avoidant	4
Secure	5
Resistant	3
Disorganised	3

Descriptive statistics for MM in the Strange Situation are shown in Table 6.3.

Table 6.3: Descriptive Statistics for Maternal and Paternal MM in the Strange Situation

	Maternal Appropriate	Maternal Inappropriate	Paternal Appropriate	Paternal Inappropriate
N	18	18	15	15
Mean	0.07	0.04	0.06	0.03
SD	0.08	0.06	0.06	0.03
Range	0.00 - 0.33	0.00 - 0.20	0.00 – 0.21	0.00 – 0.08
Skew	3.62	2.86	1.57	0.08
Kurtosis	5.09	2.57	1.04	-1.17

The z scores for skewness and kurtosis were calculated for maternal appropriateness in the Strange Situation and were both found to be greater than the cut-off (2.58) suggested by Clark-Carter (2004). The distribution is represented pictorially in appendix 7 in *Figures 39* and *40*. The boxplot is shown in Figure *41*. There is 1 outlier in the data, confirmed by the standardized score passing the recommended cut-off of 3 (Clark-Carter, 2004).

The z scores for skew and kurtosis were also calculated for maternal inappropriateness in the Strange Situation procedure. As Table 6.3 shows, the skew statistic was marginally above the recommended cut-off point and the kurtosis statistic was approaching the cut-off. The distributions are shown in appendix 7 in *Figure 42*

and *Figure 43*. Again the findings suggest that this variable is not normally distributed. The boxplot is shown in *Figure 44*. There is 1 potential outlier, however, further analysis of the standardised scores showed that this did not exceed the cut-off point. However, since the distribution is non-normal future analyses should be non-parametric. These preliminary findings suggest that the MM variables are not normally distributed, and therefore non-parametric analyses were used.

As Table 6.3 shows, the z scores for skew and kurtosis for paternal appropriateness and were within the acceptable range. The distributions are represented pictorially in appendix 7 in *Figures 45 and 46*, and the boxplot for this variable can be found in *Figure 47*. The distribution was normal and there were no outliers.

The *z* scores for paternal inappropriateness were also within the acceptable range for skewness and kurtosis. The pictorial representations of the distribution can be found in appendix 7 *Figures 48* and *49*. The boxplot is shown in *Figure 50*. The distribution is normal and there were no outliers. Although both of the paternal MM variables were within the normal range for skew and kurtosis the graphical representations do suggest a potential problem with the distributions, therefore non-parametric analyses in footnotes will supplement parametric analyses.

The inter-relations between appropriateness and inappropriateness in the Strange Situation were investigated separately for mothers and fathers. Associations were investigated using Kendall's correlation for fathers and for mothers. There was a significant correlation between maternal appropriateness and inappropriateness ($\tau[18]$ = .63, p < 0.01). This is a large effect size (r = .54). There was also a relation between paternal appropriateness and inappropriateness in the Strange Situation ($\tau[15]$ = .39, p = 0.06). This is also a large effect size.

I. Concordance between Infant–mother and Infant–father Attachment

Infant classifications with mothers were compared to classifications with fathers. The results across all 4 categories are shown in Table 6.4. Concordance was investigated using dichotomous secure versus insecure categories and a 2 x 2 contingency table analysis was performed. Due to low cell counts a modified chi square analysis was employed. Results showed no concordance between infant-mother and infant-father attachment (modified-χ^2 [1] = 0.26; n.s.). The effect size was small ($w = 0.14$).

Table 6.4: Relations Between Strange Situation Classifications with Mother and Father

	Avoidant with Mother	Secure with Mother	Resistant with Mother	Disorganised with Mother
Avoidant with Father	0	3	0	1
Secure with Father	1	3	0	0
Resistant with Father	0	2	1	0
Disorganised with Father	2	1	0	0

II. Relations with Control Variables

Infant attachment security was also investigated in relation to parental control variables measures antenatally and at 6 months postpartum: parity, depression and education. For brevity, the results are reported as footnotes. There were no relations between dichotomous infant Strange Situation classifications and any of these control variables

for mothers[70] or fathers[71]. There were no significant relations between MM in the Strange Situation procedure and any of the control variables for mothers[72] or fathers[73]. However, the effect size for the relation between maternal depression and mothers' inappropriate comments in the Strange Situation was large. There is therefore some evidence that mothers who are more depressed at 6 months postnatal may be more likely to comment inappropriately on their infants' internal states in a stressful context at 12 months postnatal. All other effect sizes were small. There were no relations between maternal Strange Situation accuracy and control variables[74]. There were no relations between paternal accuracy and control variables[75], with 1 exception: there was a significant difference in paternal education across the 2 groups ($t[13] = 3.65, p < 0.01$, two tailed). Fathers who were inaccurate in their predictions had higher educational qualifications compared to fathers who were accurate.

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[70] There was no relation between maternal parity status infant classifications (modified-$\chi^2(1) = 0.11$; n.s.). There were no significant differences between infants secure with mother and infants insecure with mother in terms of maternal depression ($t[16] = 0.62$; n.s.) or maternal education ($t[16] = 0.82$; n.s.).

[71] There was no relation between paternal parity status infant classifications (modified-$\chi^2(1) = 1.17$; n.s.). There were no significant differences between infants secure in their relationship with their father and infants insecure in their relationship with their father in terms of paternal depression ($t[13] = 1.38$; n.s.) or paternal education ($t[13] = 1.45$; n.s.).

[72] Relations between Strange Situation MM and parity were investigated using Mann Whitney U analyses. There were no significant differences in maternal appropriateness ($z = .41$, n.s.) or inappropriateness ($z = .65$, n.s.) by parity status. There were no significant association between education and maternal appropriateness ($\tau[18] = .14$, n.s.) or inappropriateness ($\tau[18] = -.06$, n.s.). There were also no significant relations between depression and appropriateness ($\tau[18] = .05$, n.s.) or inappropriateness ($\tau[18] = .20$, n.s.).

[73] Relations between Strange Situation MM and parity were investigated using independent samples t tests. There were no significant differences in paternal appropriateness ($t[13] = 0.31$, n.s.) or inappropriateness ($t[13] = 0.78$, n.s.) by parity status. There were no significant association between education and paternal appropriateness ($\tau[15] = .20$, n.s.) or inappropriateness ($\tau[15] = -.04$, n.s.). There were also no significant relations between depression and appropriateness ($\tau[15] = .12$, n.s.) or inappropriateness ($\tau[18] = .10$, n.s.).

[74] There was no relation between parity status and maternal accuracy (modified-$\chi^2(1) = 0.44$; n.s.). There were no significant differences in education ($t[16] = 1.61$, n.s.) or depression ($t[16] = 1.10$, n.s.) across accurate and inaccurate groups.

[75] There was no relation between paternal accuracy and parity (modified-$\chi^2(1) = 1.44$; n.s.). There was no difference in depression scores across accurate and inaccurate groups ($t[13] = 0.61$, n.s.).

6.3.2: MM in the Strange Situation: Relations With Attachment Security

The first hypothesis stated that higher MM scores will relate to secure infant-parent attachment. Parametric analyses were employed to investigate the relations between infant-father dichotomous classifications and paternal MM in the Strange Situation, although they will be supplemented with non-parametric statistics.

Table 6.5 shows the mean scores for appropriate and inappropriate mind-related comments from the Strange Situation procedure with respect to infant-mother attachment. The difference in the proportion of appropriate comments made by mothers of secure and insecure infants during the Strange Situation procedure was non-significant ($z = 0.71$, n.s.). Dichotomous attachment security was not related to the proportion of inappropriate mind-related comments used by mothers in the Strange Situation ($z = 0.29$, n.s.).

Table 6.5: Mothers' Mean Scores for Appropriate and Inappropriate Mind-related Comments in the Strange Situation with respect to Infant-mother Attachment Security

	Secure ($N = 12$)		Insecure ($N = 6$)	
	M	SD	M	SD
Appropriate Comments	0.08	0.09	0.06	0.07
Inappropriate Comments	0.05	0.06	0.04	0.05

Table 6.6 shows the mean scores for appropriate mind-related comments from the Strange Situation procedure with respect to infant-father attachment. As Table 6.6 shows, the comparison of the proportion of appropriate mind-related comments during the Strange Situation used by fathers of secure and insecure group children was non-

significant[76]. The mean difference was -0.03 and the associated standard error was 0.03. The confidence interval included 0. However, the effect size for this comparison was medium. As Table 6.6 also shows, dichotomous attachment security was not related to the proportion of inappropriate mind-related comments used by fathers in the Strange Situation[77]. The mean difference was 0.00 and the standard error of the difference was 0.02. The confidence interval included a 0 value. The associated effect size was negligible.

Table 6.6: Fathers' Mean Scores for Appropriate and Inappropriate Mind-related Comments in the Strange Situation with respect to Infant-father Attachment Security

	Secure (N = 5)		Insecure (N = 10)		t value[78]	p value	95% Confidence Interval	Effect size
	M	SD	M	SD				
Appropriate Comments	0.08	0.04	0.05	0.07	0.76	n.s.	-0.10 to 0.05	0.59
Inappropriate Comments	0.03	0.04	0.03	0.03	0.12	n.s.	-0.04 to 0.04	0.00

6.3.3: Accuracy in Strange Situation Predictions

I. Relations with Concurrent MM

The second hypothesis stated that more mind-minded parents will be more accurate in predicting their children's Strange Situation attachment behaviour.

Table 6.7 shows the relation between accuracy in predicting child reactions to the Strange Situation and concurrent maternal MM measures. There was no significant

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[76] The non-parametric test (Mann Whitney U for independent samples) was also non-significant (z = 1.50, n.s.).
[77] The non-parametric test (Mann Whitney U) was also non-significant (z = 0.39, n.s.)
[78] Independent samples t tests.

difference in appropriate mind-related comments made during the Strange Situation by accurate and inaccurate mothers ($z = 0.47$, n.s.). There was also no significant difference in the proportion of inappropriate comments in the Strange Situation procedure used by mothers who made accurate or inaccurate predictions ($z = 0.92$; n.s.).

Table 6.7: Comparisons Between Accuracy of Mothers' Strange Situation Prediction and Concurrent Maternal Measures

	Accurate (N=6)		Inaccurate (N=12)	
	M	SD	M	SD
Appropriate Comments	0.10	0.12	0.06	0.06
Inappropriate Comments	0.05	0.03	0.04	0.07

Table 6.8 shows the relation between fathers' accuracy in predicting child reactions to the Strange Situation and concurrent paternal MM measures. Since there were only 2 accurate fathers all analyses are very preliminary and no conclusions should be drawn from the findings. Table 6.8 shows no significant differences in terms of the proportion of appropriate comments used by accurate and inaccurate fathers. The mean difference was 0.06 and the associated standard error was 0.04. However, the effect size was very large and the confidence interval only just included a 0 value[79]. Further replication of this finding is necessary.

As Table 6.8 shows, there were also no significant differences between the 2 groups in terms of the proportion of inappropriate comments in the Strange Situation[80]. The mean difference was 0.01 and the standard error of the difference was 0.03. The

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[79] The non-parametric test (Mann Whitney U for independent samples) was approaching significance ($z = 1.73, p = .08$).
[80] The non-parametric test (Mann Whitney U) was also non-significant ($z = 0.18$, n.s.).

confidence interval confirmed the non-significant p value. The effect size for this

comparison was small.

Table 6.8: Comparisons Between Accuracy of Fathers' Strange Situation Prediction and Concurrent Paternal Measures

	Accurate ($N = 2$)		Inaccurate ($N = 13$)		t value[81]	p value	95% Confidence Interval	Effect Size
	Mean	SD	Mean	SD				
Appropriate Comments	0.11	0.02	0.05	0.06	1.23	n.s.	-0.15 to 0.04	2.00
Inappropriate Comments	0.04	0.05	0.03	0.03	0.28	n.s.	-0.06 to 0.05	0.27

II. Relations with Infant Attachment

The third hypothesis was that parents with secure attachment relationships with their

infants will be more accurate in predicting their infants' Strange Situation behaviour.

Table 6.9 shows the relations between maternal accuracy and infant-mother

classifications. The association was investigated using a 2 x 2 contingency table

analysis with dichotomous infant classifications. Since some cells had expected counts

less than 5, a modified chi square analysis was employed. There was no relation

between accuracy and infant-mother attachment (modified-$\chi^2[1] = 1.06$; n.s.). The

effect size was small to medium ($w = 0.24$).

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[81] Independent samples t tests

Table 6.9: Comparison of Maternal Accuracy of Strange Situation Prediction by Infant-Mother Attachment Classification

	Avoidant	Secure	Resistant	Disorganised
Accurate	1	5	0	0
Inaccurate	3	7	1	1

Table 6.10 shows the relations between paternal accuracy and infant-father classifications. The association was investigated using a 2 x 2 contingency table analysis with dichotomous infant classifications. Once again, a modified chi square analysis was employed. There was a significant relation between accuracy and infant-father attachment (modified-χ^2[1] = 4.31; p < 0.05). The effect size was large (w = 0.54). Fathers of secure infant were more likely accurately to predict the behaviour of their infants in the Strange Situation. Due to the small N with respect to the accurate group these results must be interpreted with caution and regarded as preliminary until replicated.

Table 6.10: Comparison of Paternal Accuracy of Strange Situation Prediction by Infant-Father Attachment Classification

	Avoidant	Secure	Resistant	Disorganised
Accurate	0	2	0	0
Inaccurate	4	3	3	3

<u>6.4: Discussion</u>

The results of the second follow-up phase provided little support for the first

hypothesis, which predicted that parents with secure attachment relationships with

their infants will demonstrate greater MM in the Strange Situation than their

counterparts with insecure infant-parent attachments. In both mothers and fathers,

neither of the MM indices was significantly related to dichotomous Strange Situation

security. That said, there was a medium effect size for the relation between security

and fathers' proportional use of appropriate mind-related comments during the

Strange Situation, suggesting that fathers with secure relationships made

proportionally more appropriate comments than those with insecurely attached

infants. However, non-parametric analyses were also non-significant, therefore further

replication is necessary before there can be confidence in these results.

With respect to the second hypothesis, contrary to expectations, mothers who

were more mind-minded in the Strange Situation were not more accurate in predicting

their child's attachment behaviours. However, some support was found for the

predicted relation between MM and accuracy of prediction in fathers. Fathers who

produced proportionately more appropriate mind-related comments during the Strange

Situation were more accurate in predicting their infants' attachment behaviour,

although there was no relation between accuracy and scores for inappropriate mind-

related comments. These findings did not reach statistical significance using

parametric tests. However, using non-parametric analyses, the difference with respect

to appropriateness was approaching significance. However, due to the small number

of fathers in the accurate group this result must be interpreted with caution until

replication. This finding is, however, in line with Tarabulsy et al.'s (1997) finding that

sensitive parents were more accurate in describing their infants' home-based attachment behaviours than less sensitive parents.

The third hypothesis stated that parents with secure attachment relationships will be more accurate in predicting their infants' attachment behaviour during the Strange Situation. Once again, the hypothesis was supported only for fathers. Dichotomous infant-mother attachment security was unrelated to the accuracy of mothers' predictions, but fathers with secure attachment relationships were more accurate than those with insecure relationships in predicting their infants' attachment behaviours. However, no conclusions should be drawn from this finding due to the very small number of accurate fathers in this study.

With respect to the relation between individual children's attachment relationships with mother and father, there was no concordance in couples with respect to the security of the individual infant-parent attachment relationships. Finally, there were largely no relations between any of the variables obtained at this testing phase and the control variables (depression, educational attainment, or parity). The exceptions were that there was a large effect for the positive association between maternal depression and maternal inappropriateness in the Strange Situation procedure. Greater maternal depression at 6 months postnatal was related to an increase in inappropriate comments about infant internal states in a stressful procedure at 1 year. Paternal depression was unrelated to the use of inappropriate comments. These results mirror those of Lundy (2003) who reported a negative association between concurrent depression and maternal, but not paternal, MM at 6 months. Since Lundy (2003) did not report the levels of depression in the sample, it is possible to propose that it may only be more clinical levels of depression that are related to MM in a relaxed play situation, but that more moderate depression may impact upon MM

in a stressful context such as the Strange Situation procedure. Alternatively, it is possible that it is the duration of depression that is more important.

The lack of association between attachment security and parental MM in the Strange Situation is in stark contrast to previous findings that parental MM in the first year of life is an important independent predictor of subsequent infant-parent attachment security (Lundy, 2003; Meins et al., 2001). It may be that by the end of the first year of life, measuring the proportion of appropriate and inappropriate mind-related comments made by parents about their infants is not as accurate as index of MM since infants' thoughts and feelings will be substantially easier to interpret as infants get older. This may be particularly true for mothers, who are more often the primary caregiver and may therefore have greater insight into their infants' minds by this age. Further, it may be that as the primary caregiver, mothers have experienced more episodes of infant stress/distress and may understand their infants' cues to such feelings more so than fathers at this age. This may help explain why there was some evidence in the study reported above for a link between infant-father attachment security and fathers' concurrent MM. In addition, assessing MM in the context of a stressful situation is likely to mean that infants' internal states will be demonstrated much more obviously than in the context of a low-stress, free-play situation. Future research could attempt to assess MM concurrently with attachment security in the context of free-play as well as in the Strange Situation to establish whether individual differences in MM become less pronounced by age 12 months, and how the nature of the observational context relates to parents' ability to comment appropriately on their infants' internal states.

The positive links between accuracy in predicting infant attachment behaviours and both appropriate mind-related comments and secure infant-parent

attachment in fathers are worthy of further discussion. The fact that more mind-minded fathers are more accurate in predicting their infants' attachment behaviours (be they secure or insecure) suggests a possible link between MM and fathers' ability or willingness to reflect on their infants' responses to separation and reunion, and thus to note how their children typically behave in such situations. The relation between secure attachment relationships and fathers' accuracy suggests that fathers are more willing or able to judge their infant as fitting the optimal, secure pattern of behaviour than the 2 insecure strategies. However, these results must be regarded as very preliminary since the group of accurate fathers was so small.

A number of other findings need to be noted. First, the results from the study reported here show that infant Strange Situation classifications with their mothers were independent of their Strange Situation classifications with their fathers. This supports a key tenet of attachment theory that the quality of the attachment is a consequence of the history of interaction between members of the dyad. Previous evidence with respect to this issue has been mixed. Belsky et al. (1984) and Main et al. (1981) reported independence of infant classifications with mother and father, whereas Fox, Kimmerly, and Schafer (1991) concluded that there was a degree of correspondence. Fonagy et al. (1996) also found infant-mother and infant-father classifications to be related, and concluded that this correspondence was a consequence of the impact of the mother on the infant-father relationship.

Second, the two indices of MM (appropriate mind-related comments and inappropriate mind-related comments) taken from the Strange Situation were positively correlated in both mothers and fathers. The findings on MM in free play reported here and in previous studies (Meins et al., 2001) found no relation between mothers' use of appropriate and inappropriate mind-related comments. Thus, the

greater stress encountered in the Strange Situation may lead to mothers who tend to comment appropriately on their infants' internal states also misreading their infants' minds and emotions to a greater extent. In contrast, the stressful context of the Strange Situation appeared to have no effect on the relation between fathers' use of appropriate and inappropriate mind-related comments. Positive correlations were seen between both of these types of comment during free play at 6 months (see Chapter 5) and in the Strange Situation. This suggests that the different indices of MM assessed in the Strange Situation may have less discriminant validity than MM assessed in a non-stressful situation, at least for mothers. This may explain the lack of associations between this variable and infant attachment and maternal accuracy with respect to mothers.

In summary, this follow-up study extended research on MM to a new situation and investigated relations with attachment security to determine validity of the new measures.

Chapter 7

Time Series Analysis

Can Mind-mindedness Bridge the Transmission Gap?

7.1: Introduction

As discussed in previous chapters, the mechanisms via which attachment security is transmitted from parent to child are poorly understood. Any mechanism that could effectively bridge the transmission gap would have to be shown to relate to infant-parent attachment security as well as to parental attachment representations. This chapter investigates relations between parents' attachment representations, MM, and infant attachment security.

A recent study by Bernier and Dozier (2003) also found a significant relation between MM as assessed in infancy and maternal AAI classifications. However, more research with respect to the AAI and MM is required since this study only investigated the relation in foster mothers. It is necessary to consider the relation in biological mothers and also in fathers. Thus, one of the main aims of this longitudinal study was to investigate the link between mothers' and fathers' attachment representations as assessed by the AAI and their postnatal MM as demonstrated during interactions with their infants.

In previous research, maternal MM has been shown to be a significant predictor of infant-mother Strange Situation classifications (Meins et al., 2001). The evidence to date linking paternal MM to infant-father attachment used a variation of the standard measure of MM and assessed attachment security using the Attachment Q-Set (Lundy, 2003). Thus, research has not addressed links between paternal MM and infant–father Strange Situation classifications.

Parental representations of the unborn child during pregnancy have been shown previously to relate to infant-mother security in the Strange Situation procedure, both concurrently (George et al., 1996) and prospectively (Benoit et al., 1997). However, these relations have not been investigated in relation to the infant-father relationship. Also there is a lack of understanding as to the mechanisms underlying these relations. One of the aims of the study reported here is to investigate the relation between antenatal representations of the infant and the security of the subsequent attachment relationship in both fathers and mothers, and to attempt to investigate potential mechanisms of transmission.

The hypotheses were as follows:

1. Autonomous AAI classification and higher levels of RF will be related to greater postnatal MM.

2. There will be longitudinal continuity in MM.

3. Greater antenatal and postnatal MM will be associated with secure infant–parent attachment.

4. Parents who were more mind-minded during Phase 1 and Phase 2 testing will be more accurate in their predictions of infant Strange Situation behaviour.

5. MM will help bridge the transmission gap.

Replications of previous positive relations among adult attachment, sensitivity, and infant–parent attachment (Pederson et al., 1998) were expected. It was also predicted that there will be relations between RF and (a) parental sensitivity, and (b) infant–parent attachment security (Fonagy, Steele, Steele, Moran, and Higgit, 1991). It was also expected that Tarabulsy et al.'s (1997) finding that more sensitive parents

were more accurate in predicting their infants' attachment behaviours would be replicated.

7.2: Method

Data collected from all phases of the study, described previously, are reconsidered in analyses across time.

7.3: Results

As in previous chapters, due to the small sample, effect sizes are calculated throughout the Results section in order to provide a measure of the strength of the relation between variables independent of sample size. See Chapter 4 for a more detailed discussion.

Descriptive statistics were explored further once attrition rates were taken into account for all variables. There were no changes in the skew, kurtosis, or the existence of outliers.

7.3.1: Relations Between Adult Attachment and Postnatal MM

The first hypothesis stated that parents who were classified as autonomous on the AAI will demonstrate greater MM. Relations between antenatal MM and the AAI were considered in Chapter 4, therefore analyses here will focus on relations with postnatal MM. The descriptive statistics for MM at 6 months can be found in Chapter 5 and for MM in the Strange Situation in Chapter 6. Relations will be considered separately for mothers and fathers.

I. MM at 6 Months Postnatal

Table 7.1 shows the mean and standard deviation scores for all participants with respect to the proportion of appropriate mind-related comments and proportion of inappropriate mind-related comments in relation to maternal AAI classification.

Table 7.1: Means and Standard Deviations for Mind-related Comments By Maternal AAI Classification

	Proportion of Appropriate Comments		Proportion of Inappropriate Comments	
	M	SD	M	SD
Dismissing ($N = 6$)	0.07	0.03	0.03	0.01
Autonomous ($N = 11$)	0.08	0.05	0.02	0.01
Preoccupied ($N = 1$)	0.06	0.00	0.04	0.00
Unresolved ($N = 3$)	0.10	0.05	0.01	0.01
Non-autonomous[82] ($N = 10$)	0.08	0.04	0.03	0.01

Table 7.2 shows the parametric comparison of the proportions of appropriate and inappropriate comments used by autonomous and non-autonomous mothers. Independent samples t tests were employed since the samples were unrelated.

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[82] Dismissing + Preoccupied + Unresolved

Table 7.2: Comparison of Proportion of Appropriate and Inappropriate
Comments Used by Autonomous and Non-autonomous Mothers

	Autonomous (N=11)		Non- autonomous (N=10)		t value[83]	p value	95% Confidence Interval	Effect Size
	Mean	SD	Mean	SD				
Proportion Appropriate Comments	0.08	0.05	0.08	0.04	0.03	n.s.	-0.04 to 0.04	0.00
Proportion Inappropriate Comments	0.02	0.01	0.03	0.01	1.37	n.s.	-0.005 to 0.02	1.00

Autonomous and non-autonomous group mothers did not differ in their

proportional use of appropriate or inappropriate mind-related comments[84]. The

confidence intervals included a 0 value. The effect size for the appropriate comparison

was negligible. Although the difference between the autonomous and non-

autonomous mothers with respect to scores for inappropriate mind-related comments

failed to reach statistical significance, the effect size for this relation was large. Using

the criteria set down by Coe (2000), an effect size of 1.00 equates to the proportion of

inappropriate comments used by the average mother in the non-autonomous group

being greater than the proportion used by 84% mothers in the autonomous group.

There is therefore some evidence to suggest that non-autonomous mothers use

proportionately more inappropriate mind-related comments during interactions with

their 6-month-olds. However, this result should be interpreted with some caution until

replicated.

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[83] Independent samples t tests.
[84] Mean differences (and associated standard errors): appropriate 0.01 (0.02); inappropriate 0.01 (0.01).

Table 7.3 shows the mean and standard deviation scores for proportion of appropriate and inappropriate mind-related comments with respect to paternal AAI classification for all fathers.

Table 7.3: Means and Standard Deviations for Mind-related Comments By Paternal AAI Classification

	Proportion of Appropriate Comments		Proportion of Inappropriate Comments	
	M	SD	M	SD
Dismissing (N = 6)	0.04	0.03	0.03	0.02
Autonomous (N = 6)	0.10	0.04	0.04	0.02
Preoccupied (N = 3)	0.07	0.04	0.04	0.02
Unresolved (N = 2)	0.09	0.05	0.03	0.01
Non-autonomous (N = 11)	0.06	0.04	0.03	0.01

Table 7.4 shows the parametric comparison of the proportions of appropriate and inappropriate comments used by autonomous and non-autonomous fathers. Independent samples t tests were employed since the samples were unrelated. There was a significant difference between autonomous fathers and non-autonomous fathers with respect to appropriate mind-related comments, with autonomous group fathers making a greater proportion of appropriate comments[85]. The confidence interval does not include a value of 0, supporting the significant p value. The effect size for this

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[85] Mean differences (and associated standard errors): appropriate 0.05 (0.02); inappropriate 0.01 (0.01).

difference was large. Again, according to Coe (2000), this equates to the proportion of appropriate comments used by the average father in the autonomous group exceeding the average proportion used by 84% of fathers in the non-autonomous group. We can have confidence in this result.

An independent samples t test comparing the proportion of inappropriate comments of autonomous and non-autonomous fathers was non-significant, although the effect size for this comparison was medium. There is some evidence that autonomous fathers use proportionately more inappropriate mind-related comments, compared to non-autonomous fathers. This equates to autonomous fathers' inappropriate comments being greater than those in the non-autonomous group 69% of the time.

Table 7.4: Comparison of Proportion of Appropriate and Inappropriate Comments Used by Autonomous and Non-autonomous Fathers

	Autonomous (*N*=6) Mean SD	Non-autonomous (*N*=11) Mean SD	*t* value[86]	*p* value	95% Confidence Interval	Effect Size
Proportion Appropriate Comments	0.10 0.04	0.06 0.04	2.35	< 0.05	-0.09 to -0.01	1.00
Proportion Inappropriate Comments	0.04 0.01	0.03 0.01	0.43	n.s.	-0.02 to 0.02	0.50

[86] Independent samples t tests.

II. MM in the Strange Situation

For the maternal comparisons, both maternal appropriateness and inappropriateness data were not normally distributed. Therefore non-parametric tests were employed. Table 7.5 shows the proportion of appropriate and inappropriate mind-related comments in the Strange Situation by mothers of different AAI classifications.

Table 7.5: Means and Standard Deviations for Mind-related Comments in the Strange Situation By Maternal AAI Classification

	Appropriate Comments in Strange Situation		Inappropriate Comments in Strange Situation	
	M	SD	M	SD
Dismissing (N = 4)	0.08	0.08	0.05	0.06
Autonomous (N = 11)	0.08	0.09	0.04	0.06
Preoccupied (N = 1)	0.08	0.00	0.04	0.00
Unresolved (N = 2)	0.02	0.02	0.03	0.04
Non-autonomous (N = 7)	0.06	0.06	0.05	0.05

There is no significant difference in the use of appropriate comments in the Strange Situation procedure by autonomous and non-autonomous mothers ($z = 0.18$, n.s.). There was also no significant difference in the proportion of inappropriate mind-related comments in the Strange Situation by the 2 groups ($z = 0.33$, n.s.).

For the paternal comparisons, the data were normally distributed so parametric data analyses were employed. However, supplementary non-parametric analyses are reported in footnotes. Table 7.6 shows the proportion of appropriate and inappropriate mind-related comments in the Strange Situation by fathers of different AAI classifications.

Table 7.6: Means and Standard Deviations for Mind-related Comments in the Strange Situation By Paternal AAI Classification

	Proportion of Appropriate Comments		Proportion of Inappropriate Comments	
	M	SD	M	SD
Dismissing (*N* = 6)	0.02	0.04	0.02	0.03
Autonomous (*N* = 5)	0.11	0.06	0.03	0.04
Preoccupied (*N* = 3)	0.04	0.04	0.04	0.04
Unresolved (*N* = 1)	0.09	0.00	0.03	0.00
Non-autonomous (*N* = 10)	0.03	0.04	0.03	0.03

Table 7.7 shows the parametric comparison of the proportions of appropriate and inappropriate comments used by autonomous and non-autonomous fathers in the Strange Situation procedure. As Table 7.7 shows, there is a highly significant difference in the proportion of appropriate comments used by the 2 groups[87]. Autonomous fathers use a greater proportion of appropriate mind-related comments in

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[87] Mean difference = 0.08, associated standard error = 0.03.

the Strange Situation procedure, compared to non-autonomous fathers[88]. The significant p value is supported by the 95% confidence interval, which does not include the value of 0. The effect size for this comparison is very large. An effect size of this magnitude is equivalent to the proportions of appropriate comments used by the average autonomous group father being greater than the proportions of 95% of the non-autonomous group fathers.

As Table 7.7 also shows, there is no significant difference in the proportion of inappropriate comments used in the Strange Situation by autonomous and non-autonomous fathers[89]. The confidence interval supports the non-significant p value and the effect size is negligible.

Table 7.7: Comparison of Proportion of Appropriate and Inappropriate Comments in the Strange Situation Used by Autonomous and Non-autonomous Fathers

	Autonomous (N=5)		Non-autonomous (N=10)		t value[90]	p value	95% Confidence Interval	Effect Size
	Mean	SD	Mean	SD				
Proportion Appropriate Comments	0.11	0.06	0.03	0.04	3.02	< 0.01	-0.13 to -0.02	1.67
Proportion Inappropriate Comments	0.03	0.04	0.03	0.03	0.05	n.s.	-0.04 to 0.04	0.00

[88] The non-parametric test (Mann Whitney U for independent samples) was also significant (z = 2.62, p < 0.01).

[89] The mean difference = 0.00, standard error = 0.02. The non-parametric test was also non-significant (z = 0.13, n.s.).

[90] Independent samples t tests.

7.3.2: Relations Between Reflective Function and Postnatal MM

The first hypothesis of this longitudinal time series analysis also stated that parents who score highly on RF will demonstrate greater MM. The relation between antenatal MM and RF was considered in Chapter 4, so only analyses relating to postnatal MM will be performed here. Relations will be investigated separately for mothers and fathers. One should therefore expect RF scores to be positively correlated with the proportion of appropriate mind-related comments and negatively correlated with the proportion of inappropriate mind-related comments.

I. MM at 6 Months Postnatal

Table 7.8 shows the relation between the 6-month MM indices and RF for mothers. Kendall's tau-b relations were employed. As Table 7.8 shows, there was no relation between maternal appropriateness and RF and the associated effect size was small ($r = .05$). There was however, a negative relation between RF and maternal inappropriateness, which was approaching significance. The trend indicated that higher the RF score the fewer inappropriate comments made by mothers. The effect size for this relation was medium to large ($r = .41$). Although this relation was hypothesised, is in the expected direction, and shows a medium to large effect size, it must be treated with some caution until replicated.

Table 7.8: Kendall's Tau Correlation Matrix to Show Inter-Relations Between

Maternal RF and Mothers' 6 Month MM

	RF	6 Month Appropriateness	6 Months Inappropriateness
RF	1.0		
6 Month Appropriateness	.05	1.0	
6 Months Inappropriateness	-.32†	.09	1.0

$N = 21$
$† = p = .06$

Table 7.9 shows the relations between 6 month MM and RF for fathers. As

Table 7.9 shows, there was a significant positive relation between paternal

appropriateness and RF. The higher the RF score the greater proportion of appropriate

comments used. This association showed a large effect size ($r = .50$). Since this result

was hypothesized and is in the expected direction and also shows a large effect size

we can have some confidence in it. There was no significant relation between paternal

RF and inappropriateness, and the associated effect size was small ($r = .17$).

Table 7.9: Kendall's Tau Correlation Matrix to Show Inter-Relations Between
Paternal RF and Fathers' 6 Month MM

	RF	6 Month Appropriateness	6 Months Inappropriateness
RF	1.0		
6 Month Appropriateness	.42*	1.0	
6 Months Inappropriateness	-.03	.51**	1.0

$N = 17$
** = significant at the 1% level
* = significant at the 5% level

II.   MM in the Strange Situation

Table 7.10 shows the relation between the Strange Situation MM indices and RF for

mothers. Kendall's tau-b relations were employed. As Table 7.10 shows, there were

no significant relations between maternal RF and mothers' appropriate or

inappropriate comments in the Strange Situation procedure. The effect sizes of these

correlations were medium with respect to appropriateness ($r = .31$) and small with

respect to inappropriateness ($r = .12$).

Table 7.10: Kendall's Tau Correlation Matrix to Show Inter-Relations
Between Maternal RF and Mothers' Strange Situation MM

	RF	Strange Situation Appropriateness	Strange Situation Inappropriateness
RF	1.0		
Strange Situation Appropriateness	.21	1.0	
Strange Situation Inappropriateness	.11	.63**	1.0

N = 18
** = significant at the 1% level

Table 7.11 shows the relation between the Strange Situation MM indices and

RF for mothers. Kendall's tau-b relations were employed. As Table 7.11 shows, there

were no significant relations between paternal RF and fathers' appropriate or

inappropriate comments in the Strange Situation procedure. The effect sizes of these

correlations were small with respect to appropriateness (r = .18) and inappropriateness

(r =.05).

Table 7.11: Kendall's Tau Correlation Matrix to Show Inter-Relations
Between Paternal RF and Fathers' Strange Situation MM

	RF	Strange Situation Appropriateness	Strange Situation Inappropriateness
RF	1.0		
Strange Situation Appropriateness	.22	1.0	
Strange Situation Inappropriateness	-.09	.39†	1.0

N = 18
† p = 0.06

7.3.3: Continuity in MM

The second hypothesis stated that there would be continuity between the ante- and post-natal measures of MM. Associations were investigated separately for mothers and fathers.

Table 7.12 shows the relations among the overall number of antenatal comments, appropriateness and inappropriateness at 6 months, and appropriateness and inappropriateness in the Strange Situation for mothers. Kendall's tau analyses are employed, since they are more robust than parametric analyses.

Table 7.12: Kendall's Tau Correlation Matrix of Continuous Maternal MM Variables

	1	2	3	4	5
1	1.0				
2	.37*	1.0			
3	-.05	.09	1.0		
4	-.03	.33†	.01	1.0	
5	.19	.47*	.06	.63**	1.0

Ns 17 to 21
** significant at the 1% level
* significant at the 5% level
† *p* = .07

1. Overall number of antenatal comments, 2. Appropriateness at 6 months, 3. Inappropriateness at 6 months, 4. Strange Situation Appropriateness, 5. Strange Situation inappropriateness.

As Table 7.12 shows, the overall number of comments in the antenatal 'Describe Your Child' interview was positively correlated with mothers' proportional scores for appropriate mind-related comments at 6 months. This showed a large effect size (*r* = .50). There was also a positive correlation between mothers' appropriate mind-related comments scores at 6 months and their inappropriate mind-related comments scores in the Strange Situation. This was a medium to large effect size (*r* =

168

.41). Finally, the positive correlation between mothers' scores for appropriate mind-related comments at 6 months and in the Strange Situation, and the associated effect size was large (r = .54). The increased risk of family-wise errors with multiple contrasts should be precluded by the use of non-parametric analyses.

Table 7.13 shows the relations between paternal MM measured in the prenatal period, at 6 months, and in the Strange Situation procedure. Kendall's Tau correlations were employed.

Table 7.13: Kendall's Tau Correlation Matrix of Continuous Paternal MM Variables

	1	2	3	4	5
1	1.0				
2	.33†	1.0			
3	.23	.51**	1.0		
4	.25	.41*	.33†	1.0	
5	.54*	.20	.32	.39†	1.0

Ns = 15 to 17
** significant at the 1% level
* Significant at the 5% level
† p < 0.10

1. Overall number of antenatal comments, 2. Appropriateness at 6 months, 3. Inappropriateness at 6 months, 4. Strange Situation Appropriateness, 5. Strange Situation inappropriateness.

As Table 7.13 shows, fathers' total number of comments in the antenatal 'Describe Your Child' interview were positively correlated with their scores for inappropriate mind-related comments in the Strange Situation (p = .01). This association showed a large effect size (r = .66). There was a non-significant relation between the total number of comments and appropriateness at 6 months. This association also showed a medium effect size (r = .44). There was also a significant relation between appropriateness at 6 months and in the Strange Situation and this

showed a medium effect size (r = .47). Finally the relation between inappropriateness

at 6 months and appropriateness in the Strange Situation was approaching significance

(p = .06). The effect size for this relation was large (r = .52). As noted in Chapter 5,

there is a significant positive correlation between 6-month appropriateness and

inappropriateness. Also, as noted in Chapter 6, there is a significant positive

correlation between appropriateness and inappropriateness in the Strange Situation.

Finally, there is a significant relation between inappropriateness at 6 months and

appropriateness in the Strange Situation, and also an association between

inappropriateness at 6 months and in the Strange Situation procedure that is

approaching significance (p = .09). These correlations show large and medium effects

respectively. Since non-parametric correlations were employed the risk of family-wise

errors is reduced. Also the medium and large effect sizes allow some confidence in

the findings. However, further replication is necessary.

Relations between the inclusion of mentalistic comments in the antenatal

predictions were investigated in relation to the four postnatal MM measures for

mothers and fathers separately. Parametric tests were employed for all paternal

analyses and for maternal 6-months data. Non-parametric analyses were employed for

maternal Strange Situation MM.

Table 7.14 shows the mean postnatal MM scores for mothers who did and did

not include mentalistic comments in their antenatal 'Describe Your Child' predictions.

Independent samples t tests were employed for 6-month MM analyses. There were no

significant differences in the proportion of appropriate comments at 6 months by

mothers who included mentalistic comments in their antenatal predictions compared

to mothers who did not (t[18] = 0.03, n.s.)[91]. The effect size for this contrast was

negligible (d = 0.00). There was a non-significant trend in the proportion of

inappropriate comments at 6 months used by the 2 groups of mothers (t[18] = 1.84, p

= .08)[92]. Mothers who included at least one mentalistic comment in their predictions

used fewer inappropriate comments at 6 months compared to mothers who included

no mentalistic comments. The effect size for this comparison was large (d = 0.75).

This equates to the average proportion of inappropriate comments of mothers who

include at least one mentalistic comment in their predictions being less than 76% of

the proportion of inappropriate comments of mothers who included no mentalistic

comments. Mann Whitney U tests were employed for Strange Situation MM analyses.

There were no significant differences in the proportion of appropriate comments (z =

0.34, n.s.) or inappropriate comments (z = 0.00, n.s.) used in the Strange Situation by

the two groups of mothers

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[91] The mean difference was 0.00, the standard error was 0.02, and the 95% confidence interval included a 0 value (-0.04 to 0.04).
[92] The mean difference was 0.01, the standard error was 0.01. The 95% confidence interval included a 0 value (-0.001 to 0.02).

Table 7.14: Comparison of Mean Postnatal MM Scores for Mothers who Did and Did

Not Include Mentalistic Comments

	No Mentalistic Comments[93]		Mentalistic Comments[94]	
	M	SD	M	SD
Appropriate 6 month	0.08	0.03	0.08	0.05
Inappropriate 6 month	0.03	0.01	0.02	0.01
Strange Situation Appropriate	0.07	0.06	0.08	0.11
Strange Situation Inappropriate	0.06	0.07	0.04	0.03

Table 7.15 shows the mean postnatal MM scores for fathers who did and did

not include mentalistic comments in their antenatal 'Describe Your Child' predictions.

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[93] N for 6 month MM variables was 10, N for Strange Situation MM variables was 9.
[94] N for 6 month MM variables was 10, N for Strange Situation MM variables was 8.

Table 7.15: Comparison of Mean Postnatal MM Scores for Fathers who Did and Did Not Include Mentalistic Comments

	No Mentalistic Comments[95]		Mentalistic Comments[96]		t value[97]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Appropriate 6 month	0.05	0.03	0.09	0.04	2.53	< 0.05	-0.09 to -0.01	1.17
Inappropriate 6 month	0.03	0.01	0.04	0.02	1.94	= .07	-0.03 to 0.001	0.75
Strange Situation Appropriate	0.04	0.05	0.08	0.07	1.42	n.s.	-0.10 to 0.02	0.69
Strange Situation Inappropriate	0.02	0.02	0.04	0.04	1.57	n.s.	-0.06 to 0.01	0.75

As Table 7.15 shows, there was a significant difference in the proportion of appropriate comments used at 6 months by fathers who did and did not include mentalistic comments in their antenatal 'Describe Your Child' predictions[98]. The significant p value was supported by a confidence interval that did not include a 0 value. The effect size for this comparison was large. This equates to the proportion of appropriate comments used by the average father who included at least one mentalistic comment in their antenatal predictions exceeding 84% of the proportion of

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[95] N for 6 month MM variables was 7, and the N for Strange Situation MM variables was 7.
[96] N for 6 month MM variables was 10, and the N for Strange Situation MM variables was 8.
[97] Independent samples t tests.
[98] Mean difference = 0.05, standard error = 0.02.

appropriate comments used by fathers who included no mentalistic comments. There was non-significant difference in the proportion of inappropriate comments made by fathers at 6 months between the 2 groups[99]. The confidence interval included a value of 0. The associated effect size was large. This equates to the proportion of inappropriate comments used by the average father who included at least one mentalistic comments in their antenatal predictions exceeding 76% of the proportion of inappropriate comments used by fathers who included no mentalistic comments. This was in the opposite direction to that expected.

There was no significant difference in either the proportion of appropriate or inappropriate mind-related comments used in the Strange Situation by fathers who did and did not include mentalistic comments in their antenatal predictions[100]. The confidence intervals supported the non-significant p values[101]. However, the associated effect sizes for these comparisons were both large. The effect size with respect to Strange Situation appropriateness is the equivalent of the proportion of appropriate comments used by the average father who included at least one mentalistic comment in their antenatal predictions exceeding 76% of the proportion of appropriate comments used by fathers who included no mentalistic comments. The effect size with respect to Strange Situation appropriateness is the equivalent of the proportion of inappropriate comments used by the average fathers who included at least one mentalistic comment in their antenatal predictions exceeding 76% of the proportion of inappropriate comments used by fathers who included no mentalistic comments. The results relating to Strange Situation appropriateness were in the expected direction. However, the results relating to Strange Situation

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[99] Mean difference = 0.01, standard error = 0.01.

[100] Strange Situation Appropriate: Mean difference = 0.04, standard error = 0.03; Strange Situation Inappropriate: Mean difference = 0.02, standard error = 0.02.

[101] The non-parametric tests (Mann Whitney U for independent samples) was also non-significant: appropriate ($z = 1.18$, n.s.) and inappropriate ($z = 1.40$, n.s.).

inappropriateness were in the opposite direction to that which was expected. Further replications are required.

7.3.4: *Relations Between Infant Attachment Security and MM*

The third hypothesis stated that infant security would be related to greater parental MM. The relations between infant attachment and MM in both the antenatal and postnatal periods are considered. Analyses are performed separately for mothers and fathers.

I. Antenatal MM

The mean scores for secure and insecure group mothers with respect to the total number of comments produced in their antenatal predictions are shown in Table 7.16. As Table 7.16 shows, mothers' antenatal predictions were not significantly different across the secure and insecure infant-mother attachment security groups. The mean difference was 0.35 and the associated standard error was 0.93. The 95% confidence interval included the value 0 and the effect size of the comparison was small.

7.16: Mothers' Mean Scores for Antenatal MM, Appropriate and Inappropriate Comments at 6 months with respect to Infant-mother Attachment Security

	Secure (N = 12)		Insecure (N = 6)		t value[102]	p value	95% Confidence Interval	Effect size
	M	SD	M	SD				
Antenatal MM	3.18	1.66	2.83	2.14	0.37	n.s.	-2.33 to 1.64	0.19
Appropriate 6 Months	0.09	0.05	0.07	0.03	0.95	n.s.	-0.07 to 0.03	0.54
Inappropriate 6 Months	0.02	0.01	0.03	0.01	1.84	= 0.09	-0.00 to 0.02	1.00

Table 7.17 shows the mean antenatal prediction scores for the secure and insecure group fathers. As Table 7.17 shows, infant-father attachment was not related to fathers' antenatal predictions. The mean difference was 0.30 and the associated standard error was 0.89. The confidence interval included the value of 0 and the effect size was small for this comparison.

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[102] Independent samples t tests.

Table 7.17: Fathers' Mean Scores for Antenatal MM, Appropriate and Inappropriate

Comments at 6 months with respect to Infant-father Attachment Security

	Secure (N = 5)		Insecure (N = 10)		t value[103]	p value	95% Confidence Interval	Effect size
	M	SD	M	SD				
Antenatal MM	3.40	1.67	3.10	1.60	0.34	n.s.	-2.22 to 1.62	0.19
Appropriate 6 Months	0.10	0.04	0.05	0.04	2.14	< 0.05	-0.09 to -0.05	1.16
Inappropriate 6 Months	0.03	0.02	0.03	0.02	0.01	n.s.	-0.02 to 0.02	0.00

Analyses were also performed with respect to the relation between infant-mother attachment and mothers' use of mentalistic comments in the antenatal predictions. This potential relation was investigated using a 2 x 2 contingency table analysis. Table 7.18 shows the two dichotomous variables. Since some expected cells had counts of less than 5 a modified chi-square was employed. There was no relation between these two variables (modified-χ^2[1] = 0.03, n.s). The effect size for this association was negligible ($w = 0.04$).

Table 7.18: Crosstabulation of Infant-mother Attachment and Maternal

Inclusion of Mentalistic Comments in Antenatal Predictions

	No Mentalistic Comments	Mentalistic Comments
Secure	6	5
Insecure	3	3

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[103] Independent samples t tests.

The relation between infant-father attachment and paternal inclusion of mentalistic comments in the antenatal 'Describe Your Child' prediction was also investigated using a contingency table analysis. The relation between these 2 dichotomous variables is shown in Table 7.19. Since some expected cell counts were low a modified chi-square was employed. Although the relation was non-significant (modified-χ^2[1] = 2.00, n.s) there was a medium to large associated effect size (w = 0.37). There is therefore some suggestion that fathers of insecure infants are more likely to include no mentalistic comments in their antenatal responses to a 'Describe Your Child' question, compared to fathers of secure infants.

Table 7.19: Crosstabulation of Infant-father Attachment and Paternal Inclusion of Mentalistic Comments in Antenatal Predictions

	No Mentalistic Comments	Mentalistic Comments
Secure	1	4
Insecure	6	4

II. MM at 6 Months

Table 7.16 (p.178) also shows the mean scores for the 2 MM indices from the 6-month free play session with respect to the security of the infant–mother attachment relationship. As Table 7.16 shows, the difference between the secure and insecure groups with respect to the proportion of appropriate comments was non-significant. The mean difference was 0.02 and the associated standard error was 0.02. The confidence interval included the value of 0. However, there was a medium effect size for the comparison. This equates to the proportion of appropriate comments made by the average mother in the secure group exceeding the proportion of appropriate comments of 69% of the mothers in the insecure group, according to the criteria set

down by Coe (2000). There is therefore some evidence that mothers of securely attached infants produce proportionately more appropriate mind-related comments than those of insecurely attached infants.

As Table 7.16 shows, the comparison with respect to inappropriate comments approached significance[104] and showed a large effect size. An effect size of this magnitude is equal to the proportion of inappropriate comments of the average mothers of insecure group infants being greater than the proportion of inappropriate comments of 84% of mothers of secure group infants[105].

Table 7.17 (p. 179) shows the mean scores for appropriate mind-related comments and inappropriate mind-related comments from the 6-month free play session with respect to infant-father attachment security. As Table 7.17 shows, there was a significant difference with respect to the proportion of appropriate comments. The mean difference was 0.05 and the associated standard error was 0.02. Fathers of securely attached children produced proportionately more appropriate mind-related comments than fathers of insecurely attached children. There was a large effect size for this comparison. This equates to the proportion of appropriate comments made by the average father in the secure group exceeding the proportion of appropriate comments of 84% of the fathers in the insecure group, according to the criteria set down by Coe (2000). As Table 7.17 shows, there was no significant security-related difference in fathers' use of inappropriate mind-related comments. The mean difference was 0.00 and the standard error of the difference was 0.01. The confidence interval included 0 and the effect size for the comparison was negligible.

Relations between MM in the Strange Situation and infant-mother and infant-father attachment were considered in Chapter 6.

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[104] The mean difference was 0.01 and the associated standard error was 0.01. The confidence interval included the value of 0.
[105] Coe (2004) criteria.

7.3.5: Accuracy of Parental Predictions and MM

Hypothesis 4 stated that more mind-minded parents would be more accurate in their predictions of infant Strange Situation behaviour. This proposal is investigated separately for mothers and fathers. No conclusions should be drawn from the results with respect to paternal accuracy, due to the very small N of the accurate group.

    I. Antenatal MM

Table 7.20 shows the relation between accuracy in predicting child reactions to the Strange Situation and maternal MM measures from the antenatal and 6 month assessments. The relation with measurements of MM from the Strange Situation was considered in Chapter 6.

As Table 7.20 shows, there was no significant difference in the total number of comments produced in the antenatal 'Describe Your Child' measure between mothers who made accurate and inaccurate predictions. The mean difference was 0.61 and the associated standard error was 0.92. The effect size for this comparison was small.

Table 7.20: Comparisons Between Accuracy of Mothers' Strange Situation Prediction
and Maternal MM Measures

	Accurate (N = 6)		Inaccurate (N = 11)		t value[106]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Antenatal Total Comments	2.67	1.79	3.27	1.86	0.66	n.s.	-1.36 to 2.57	0.33
Proportion Appropriate 6 months	0.10	0.06	0.07	0.02	1.35	n.s.	-0.10 to 0.03	1.00
Proportion Inappropriate 6 months	0.01	0.01	0.03	0.01	3.55	< 0.01	0.01 to 0.03	2.00

Table 7.21 shows the relation between fathers' accuracy in predicting child reactions to the Strange Situation and paternal MM measures from the antenatal and 6 months assessments. As Table 7.21 shows, there was no significant difference in the total number of comments used in the antenatal predictions between fathers who made accurate or inaccurate predictions about their infants' Strange Situation behaviour[107]. The mean difference was 0.23 and the associated standard error was 1.23. The confidence interval included 0. The effect size for the comparison was small.

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[106] Independent samples t tests.
[107] The non-parametric test (Mann Whitney U) was also non-significant ($z = 0.18$, n.s.).

Table 7.21: Comparisons Between Accuracy of Fathers' Strange Situation Prediction and Paternal MM Measures

	Accurate (N = 2)		Inaccurate (N = 13)		t value[108]	p value	95% Confidence Interval	Effect Size
	Mean	SD	Mean	SD				
Antenatal Total Comments	3.00	2.83	3.23	1.48	0.19	n.s.	-2.43 to 2.90	0.12
Proportion Appropriate 6 months	0.06	0.01	0.07	0.05	0.37	n.s.	-0.07 to 0.08	0.60
Proportion Inappropriate 6 months	0.02	0.01	0.03	0.02	0.85	n.s.	-0.02 to 0.04	0.75

Analyses were performed with respect to the relation between maternal accuracy and mothers' use of comments in the antenatal predictions. This potential relation was investigated using a 2 x 2 contingency table analysis. Table 7.22 shows the relations between these 2 dichotomous variables. Since some of the expected cell counts were less than 5, a modified chi-square analysis was performed. There was a significant relation between the variables (modified-χ^2[1] = 4.61, p < 0.05). The associated effect size was large (w = 0.54). Of the 6 mothers who made accurate predictions, 5 used mentalistic comments in their antenatal predictions. Of the 11 mothers who made inaccurate predictions, 8 included no mentalistic comments.

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[108] Independent samples t tests

Table 7.22: Crosstabulation of Maternal Accuracy and Mothers' Inclusion of Mentalistic Comments

	No Mentalistic Comments	Mentalistic Comments
Accurate	1	5
Inaccurate	8	3

Analyses were also performed with respect to the relation between paternal accuracy and fathers' use of comments in the antenatal predictions. This potential relation was investigated using a 2 x 2 contingency table analysis. Table 7.23 shows the relations between these 2 dichotomous variables. Since some of the expected cell counts were less than 5, a modified chi-square analysis was performed. There was no significant relation between the variables (modified-χ^2[1] = 1.89, n.s). However, the associated effect size was medium ($w = 0.35$). Of the 2 fathers who made accurate predictions, both included mentalistic comments in their antenatal predictions. Of the 13 fathers who made inaccurate predictions, 7 included no mentalistic comments and 6 included at least one. Further replication is required.

Table 7.23: Crosstabulation of Paternal Accuracy and Fathers' Inclusion of Mentalistic Comments

	No Mentalistic Comments	Mentalistic Comments
Accurate	0	2
Inaccurate	7	6

II. 6 Month MM

As Table 7.20 shows, there was no significant difference between mothers who made accurate predictions about their children's behaviour in the Strange Situation and those who did not with respect to the proportion of appropriate mind-related comments at 6 months. The mean difference was 0.02 and the standard error of the difference was 0.03. However, although this difference was non-significant, the effect size for this comparison was large. An effect size of this magnitude is the equivalent of the proportion of appropriate comments of the average mother in the accurate group exceeding 84% of the proportion of appropriate comments used by mothers in the inaccurate group, according to Coe (2000). There was some evidence that mothers who made inaccurate predictions were using a smaller proportion of appropriate comments at 6 months. There was a significant difference in the proportion of inappropriate comments used by accurate and inaccurate mothers at 6 months. Mothers who made inaccurate predictions were more likely to use a greater proportion of inappropriate mind-related comments at 6 months, compared to mothers who made accurate predictions. The mean difference was 0.02 and the standard error of the difference was 0.01. The significant p value was supported by a confidence interval that did not include a value of 0. This comparison showed a very large effect size. This is the equivalent of the proportion of inappropriate comments by the average mother in the inaccurate group exceeding 98% of the proportion of inappropriate comments used by mothers in the accurate group, according to Coe (2000). Therefore we can have some confidence in this finding.

As Table 7.21 shows, there was no significant difference in the proportion of appropriate mind-related comments at 6 months used by accurate and inaccurate

fathers[109]. The mean difference was 0.01 and the standard error of the difference was 0.03. The confidence interval supported the non-significant *p* value. However, the effect size for the comparison was medium to large. This is the equivalent of the proportion of appropriate comments by the average father in the inaccurate group exceeding 73% of the proportion of appropriate comments used by fathers in the accurate group, according to the criteria set down by Coe (2000). This result was in the opposite direction to that expected. As Table 7.21 also shows, there was no significant difference in the proportion of inappropriate comments at 6 months by accurate and inaccurate fathers[110]. The mean difference was 0.01 and the standard error of the difference was 0.02, and the confidence interval included a 0 value. However, there was a large effect size for this comparison. According to Coe (2000), this is the equivalent of the proportion of inappropriate comments used by the average father in the inaccurate group exceeding 76% of the proportion of inappropriate comments used by fathers in the accurate group. However, these results should be regarded as very preliminary and require replication before we can have confidence in them.

7.3.6: Bridging the Transmission Gap

The final hypothesis stated that parental MM will help bridge the transmission gap. Ideally, path analyses and regression analyses would be used to explore the developmental pathways between the antenatal and postnatal variables, including control variables. However, given the very small sample size, such analyses would not be valid. The possibility that MM might bridge the transmission gap was therefore

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[109] The non-parametric test (Mann Whitney U) was also non-significant ($z = 0.34$, n.s.).
[110] The non- parametric test (Mann Whitney U) was also non-significant ($z = 0.77$, n.s.).
[111] Independent samples t tests

explored using a descriptive approach, mapping out longitudinal relations between parental AAI classification, infant-parent interaction at 6 months, and infant-parent attachment security following the procedure adopted by Gloger-Tippelt, Gomille, Koenig, and Vetter (2002). While this approach cannot compare the relative strength of MM versus sensitivity in mediating the relation between parental attachment representations and infant-parent attachment security, individual pathways from AAI classification to attachment security via each of the 6-month variables can be compared.

The first step in this process was to convert parents' MM and sensitivity scores into dichotomous categories using a median-split. The index of MM used in these analyses for mothers versus fathers depended on which type of comment related to parental and infant attachment: appropriate mind-related comments for fathers; inappropriate mind-related comments for mothers. Parents were designated as 'high' or 'low' in MM or sensitivity.

Figure 1 shows the pathways from AAI classification to attachment security for mother-infant relationships. As *Figure 1* shows, there are 2 main pathways. One pathway linked autonomous maternal AAI classification to secure infant-mother attachment via high maternal MM. All infants whose mothers were autonomous and high in MM were securely attached. The second pathway linked non-autonomous maternal AAI classification to insecure infant-mother attachment via low MM. Four out of 5 infants whose mothers were non-autonomous and low in MM were insecurely attached. The distribution of secure versus insecure infants from the other pathways suggests that maternal MM may ameliorate the effects of non-autonomous AAI classification, whereas a lack of MM appears to have less effect on attachment security when the mother is autonomous. However, a goodness-of fit analysis showed

that the distribution of Strange Situation classifications did not differ from the

expected outcome ($\chi^2[7] = 13.56$, n.s.), although this was very close to the critical

value required for significance at the .05 level ($\chi^2 = 14.07$).

Figure 1: Pathways from antenatal maternal attachment representations to infant-mother attachment security at 12 months via MM at 6 months
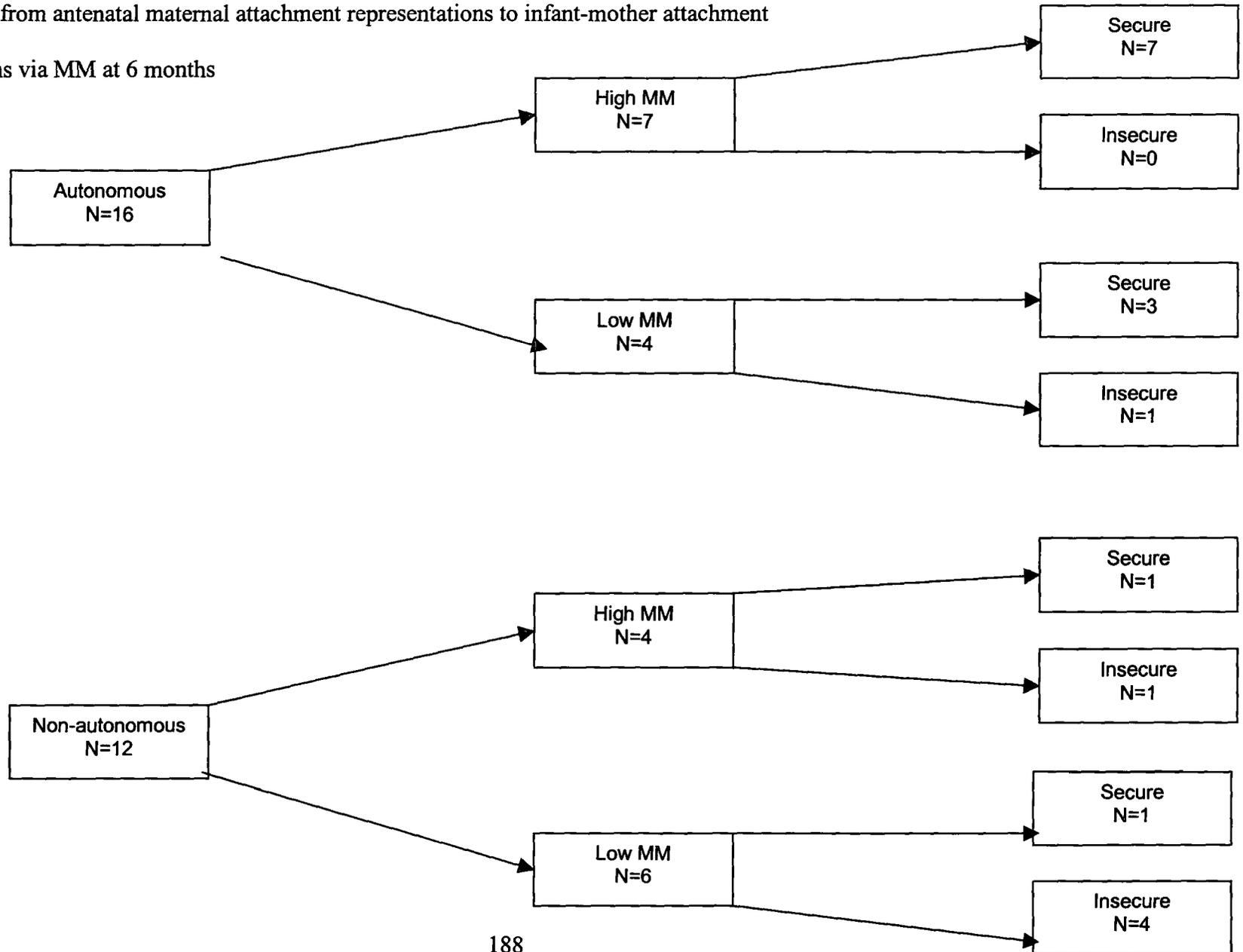
Figure 2 shows the same longitudinal relations for fathers. The same two main pathways emerged for infant-father attachment security as for infant-mother security, although the relations were stronger for fathers. All infants whose fathers were autonomous and high in MM were securely attached, and all infants whose fathers were non-autonomous and low in MM were insecurely attached. As was the case for mothers, high MM appeared somewhat able to compensate for non-autonomous paternal classification and result in a secure attachment relationship, whereas having a father lacking in MM did not affect the likelihood of becoming securely attached if the father was autonomous. A goodness-of-fit analysis showed that the observed pattern of Strange Situation classifications for fathers differed from that expected, $\chi^2(7) = 22.00$, $p < .01$, two-tailed.

Figure 2: Pathways from antenatal paternal attachment representations to infant-father attachment security at 15 months via MM at 6 months
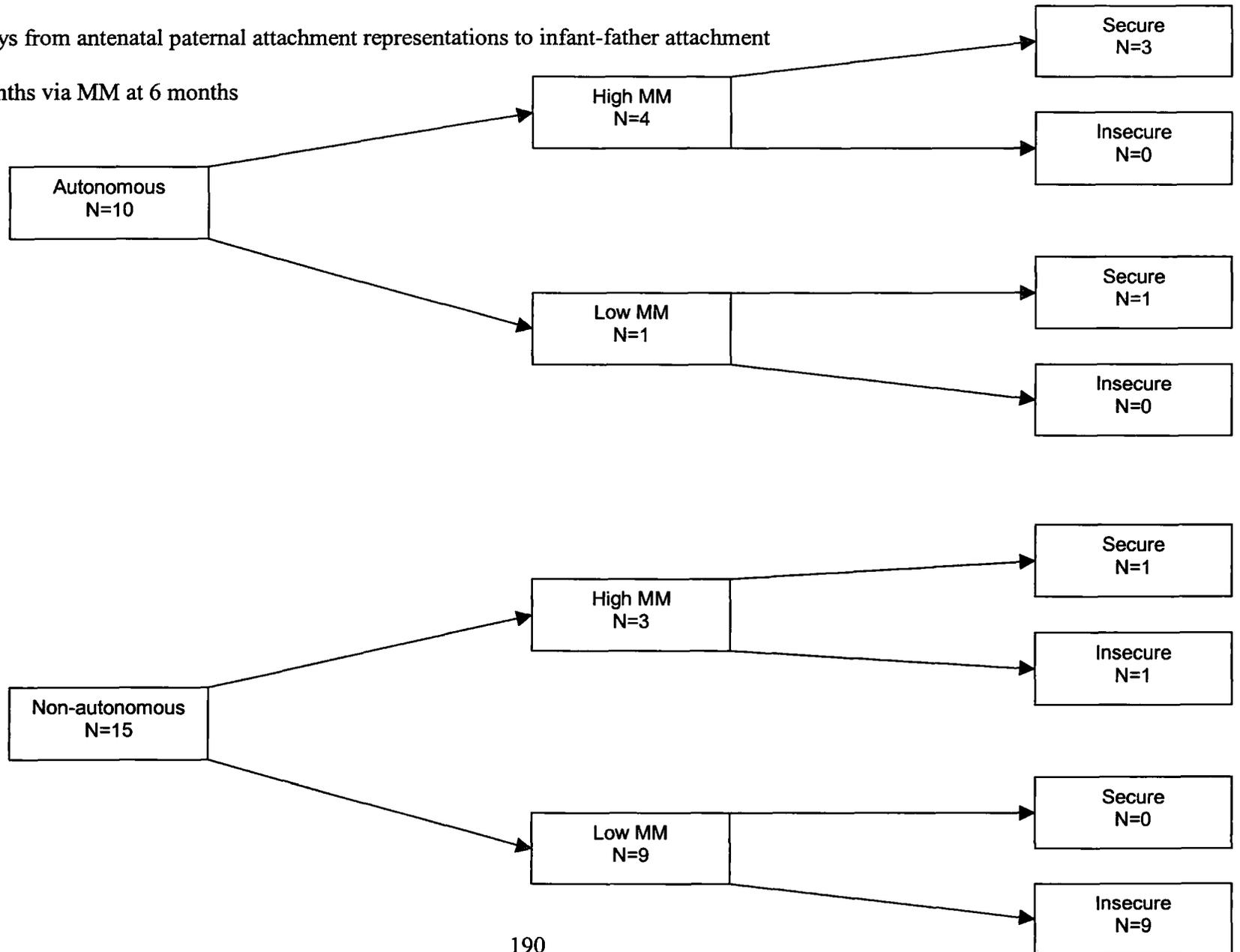
190

Figure 3: Pathways from antenatal maternal attachment representations to infant-mother attachment
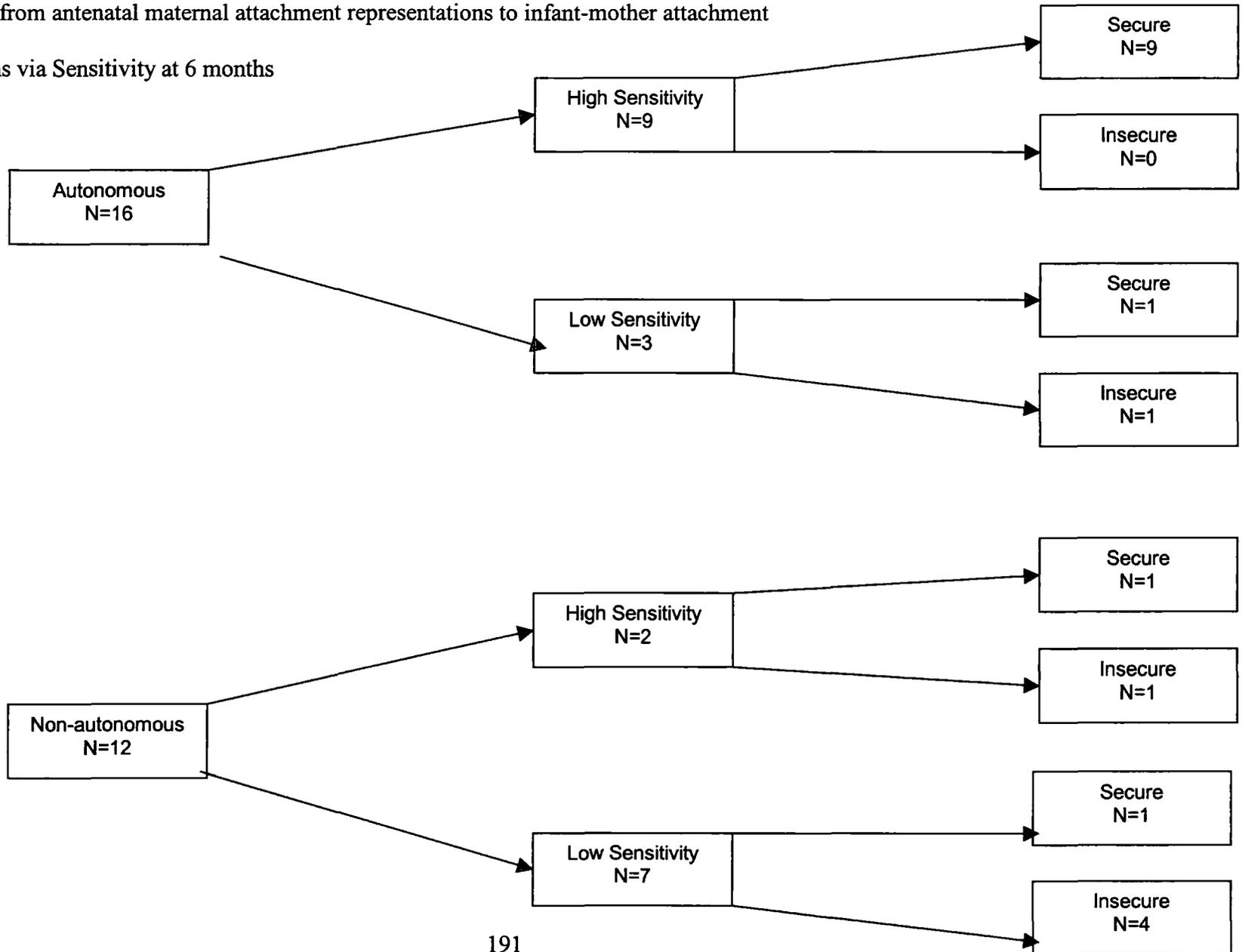
security at 12 months via Sensitivity at 6 months

Figure 4: Pathways from antenatal paternal attachment representations to infant-father attachment security at 15 months via Sensitivity at 6 months
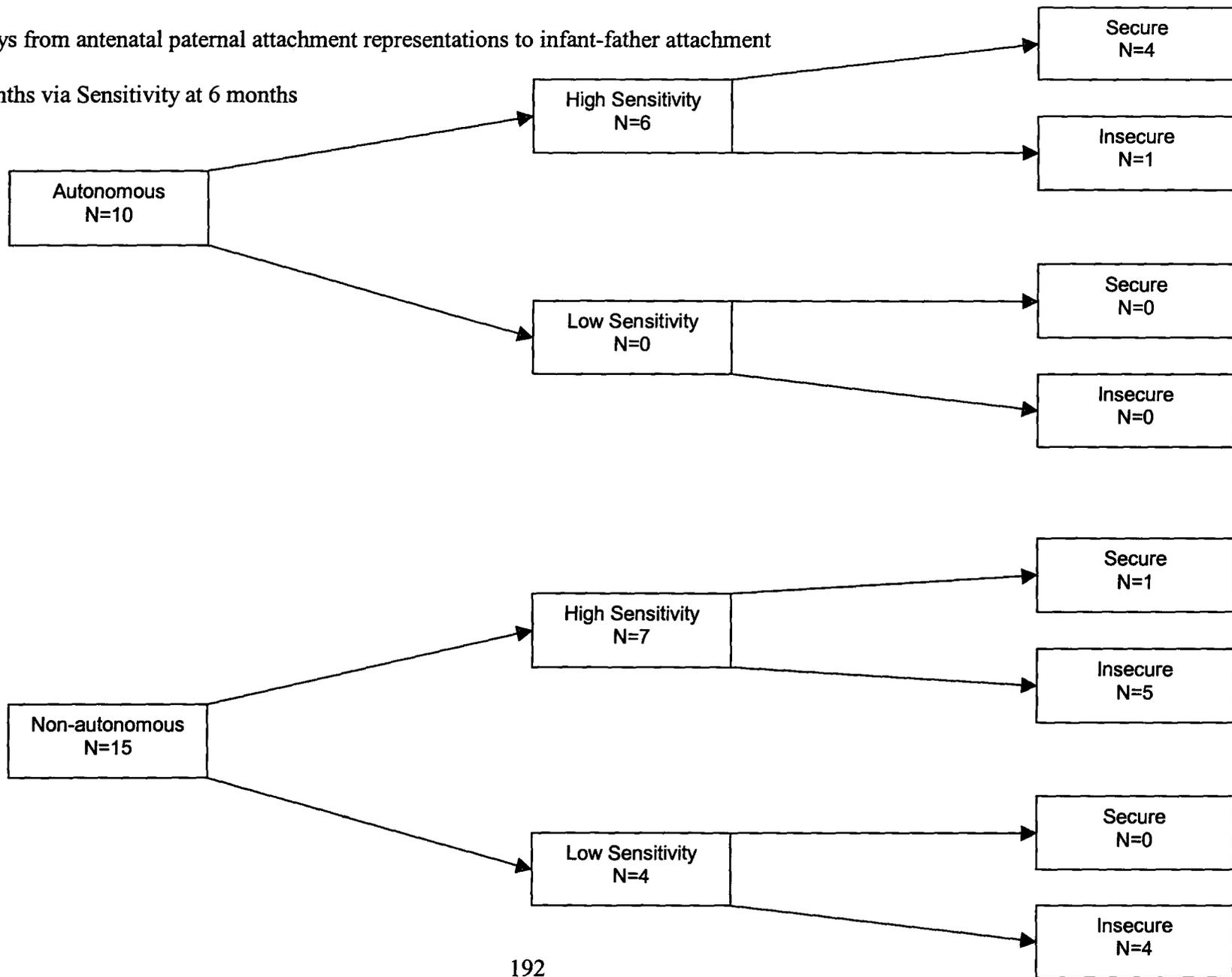
192

Figure 3 (p. 193) shows the pathways from AAI classification to attachment security for mother-infant relationships via sensitivity. As *Figure 3* shows, there are 2 main pathways. One pathway linked autonomous maternal AAI classification to secure infant-mother attachment via high maternal sensitivity. All infants whose mothers were autonomous and high in sensitivity were securely attached. The second pathway linked non-autonomous maternal AAI classification to insecure infant-mother attachment via low sensitivity. Four out of 5 infants whose mothers were non-autonomous and low in sensitivity were insecurely attached. A goodness-of-fit analysis showed that the observed pattern of Strange Situation classifications for mothers differed from that expected, ($\chi^2[7] = 20.14$, $p < .01$, two-tailed).

Figure 4 (p. 194) shows the same pathways from for father-infant relationships via sensitivity. As *Figure 4* shows, there is a main pathway from autonomous AAI classification to secure infant-father attachment via high sensitivity. Four of the 5 infants whose fathers were autonomous and high in sensitivity were securely attached. There were also pathways from non-autonomous AAI to insecure infant-father attachment via both low and high sensitivity. This suggests that a fathers' level of sensitivity has little impact on the security of the attachment relationship that his infant will form with him if he has a non-autonomous AAI classification. A goodness-of-fit analysis showed that the observed pattern of Strange Situation classifications for fathers did not differ from that expected, ($\chi^2[7] = 12.88$, n.s.), not reaching the critical value for 5% significance of $\chi^2 = 14.07$, but just passing the 10% significance level of $\chi^2 = 12.02$.

7.3.7: Analyses Relating to Replications of Previous Findings

I. Relations Between Adult Attachment Representations and Parental Sensitivity

Parents' attachment representations were expected to be positively related to parental

sensitivity as in previous research. Table 7.24 shows the sensitivity scores by AAI

classification for mothers and fathers.

Table 7.24: Sensitivity Scores of Parents by AAI Classification

	Mothers ($N = 21$)		Fathers ($N = 17$)	
	Mean	SD	Mean	SD
Dismissing	3.00	1.41	2.00	1.10
Autonomous	5.33	1.87	4.67	1.51
Preoccupied	3.00	0.00	3.00	2.00
Unresolved	3.67	1.15	5.00	2.83
Non-autonomous	3.22	1.20	2.82	1.89

Table 7.25 shows the comparison of the sensitivity scores for autonomous and

non-autonomous mothers. Independent samples t tests were performed since the

samples were unrelated. Autonomous mothers were significantly more sensitive in

comparison with non-autonomous mothers. The mean difference was 2.11 and the

associated standard error was 0.72. The 95% confidence interval did not include the

value of 0. This comparison showed a very large effect size. According to the criteria

set down by Coe (2000), this would mean that the sensitivity score of an average

autonomous group mother would exceed the sensitivity score of 92% of non-autonomous mothers.

Table 7.25: Comparison of the Sensitivity Scores of Autonomous and Non-autonomous Mothers

	Autonomous (N=12)		Non-autonomous (N=9)		t value[112]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Sensitivity Score	5.33	1.87	3.22	1.20	2.95	< 0.01	-3.61 to -0.61	1.45

Table 7.26 shows the comparison of sensitivity scores for autonomous and non-autonomous fathers. The difference between the sensitivity scores of autonomous and non-autonomous fathers was approaching significance. As Table 7.26 shows, there was a trend towards autonomous fathers being more sensitive. The mean difference was 1.85 and the associated standard error was 0.90. This comparison showed a very large effect size. This equates to the sensitivity score of the average autonomous father exceeding the sensitivity score of 98% of non-autonomous fathers, according to the Coe (2000) criteria.

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[112] Independent samples t test.

Table 7.26: Comparison of the Sensitivity Scores of Autonomous and Non-autonomous Fathers

	Autonomous (N=6)		Non-autonomous (N=11)		t value[113]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Sensitivity Score	4.67	1.51	2.82	1.89	2.06	= 0.06	-3.76 to 0.62	2.10

It was also hypothesised that there would be a significant positive association between RF and sensitivity. Relations were investigated separately for mothers and fathers. Kendall's tau correlations were employed due to the ordinal nature of the variables. There was a significant positive relation between mothers' RF and maternal sensitivity ($\tau[21] = .58; p < 0.01$, two-tailed). The effect size for this association was large ($r = .67$). The higher the RF score the greater the sensitivity score. There was also a significant relation between paternal RF and fathers' sensitivity scores; higher RF was related to greater sensitivity ($\tau[17] = .50; p < 0.05$, two-tailed). This effect size for this relation was also large ($r = .58$). We can have some confidence in these associations due to the large effect sizes. Also these relations were hypothesised and are in the expected direction.

II. Relations Between Adult Attachment Representations and Infant Attachment Security

It was expected that infant-parent attachment security would be related to autonomous AAI classification, as previous research has shown. Table 7.27 shows the relation between 4 way maternal attachment classifications and 4 way infant-mother attachment

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[113] Independent samples t test.

classifications. Using dichotomous categories (secure/insecure against autonomous/non-autonomous), a 2 x 2 contingency table analysis was performed. Since some expected cell counts were less than 5, a modified chi square analysis was employed. The results showed that autonomous mothers were more likely to have securely attached infants (modified-χ^2[1] = 7.06; p <0.01, two-tailed). The associated odds ratio was 25.00. The effect size was large ($w = 0.63$). The correspondence between AAI classification and attachment security was 94%.

Table 7.27: Relations Between Maternal AAI Classifications and Infant-mother Strange Situation Classifications

	Dismissing	Autonomous	Preoccupied	Unresolved
Avoidant	3	0	0	1
Secure	0	10	1	1
Resistant	0	1	0	0
Disorganised	1	0	0	0

Table 7.28 shows the relation between 4 way paternal attachment classifications and 4 way infant-father attachment classifications. Using dichotomous categories (secure/insecure against autonomous/non-autonomous), a 2 x 2 contingency table was employed. Since some cells contained a count of less than 5, a modified chi-square was employed. The results showed that autonomous fathers were more likely to have securely attached infants modified-χ^2[1] = 6.86; p <0.01, two-tailed). This was a large effect size ($w = 0.68$). The associated odds ratio was 36.40. The correspondence between AAI classification and attachment security was 87%.

Table 7.28: Relations Between Paternal AAI Classifications and Infant-father Strange Situation Classifications

	Dismissing	Autonomous	Preoccupied	Unresolved
Avoidant	3	1	0	0
Secure	0	4	1	0
Resistant	2	0	1	0
Disorganised	1	0	1	1

Previous research has shown an association between infant-mother and infant-father attachment security and RF scores. It was expected that this longitudinal study would provide a replication of these findings.

Table 7.29 shows the mean reflective function scores for secure and insecure group mothers. As Table 7.29 shows, secure group mothers scored significantly more highly on RF than insecure group mothers. The mean difference was 3.33 and the associated standard error was 0.84. The finding that the confidence interval did not include the value of 0, supported this conclusion. The effect size for this comparison was very large. This is the equivalent of the RF score of the average mother of secure group infants exceeding the score of 98% of mothers of insecure group infants, according to the criteria set down by Coe (2000).

7.29: Mothers' Mean Scores for Reflective Function and Sensitivity with respect to Infant-mother Attachment Security

	Secure (N = 12)		Insecure (N = 6)		t value[114]	p value	95% Confidence Interval	Effect size
	M	SD	M	SD				
RF	5.33	1.88	2.00	1.10	3.99	< 0.01	-5.10 to -1.56	2.40
Sensitivity	5.50	1.73	3.00	1.27	3.12	< 0.01	-4.20 to -0.80	1.71

Table 7.30 shows the mean reflective function scores for secure and insecure group fathers. As Table 7.30 shows, secure group fathers scored more highly on RF than insecure group fathers. The mean difference was 1.40 and the associated standard error was 0.55. The confidence interval did not include 0 and the effect size for this comparison was large. This is the equivalent of the RF score of the average father of secure group infants exceeding the score of 88% of fathers of insecure group infants, according to the criteria set down by Coe (2000).

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[114] Independent samples t tests.

Table 7.30: Fathers' Mean Scores for Reflective Function and Sensitivity with respect to Infant-father Attachment Security

	Secure (N = 5)		Insecure (N = 10)		t value [115]	p value	95% Confidence Interval	Effect size
	M	SD	M	SD				
RF	3.80	1.10	2.40	0.97	2.54	< 0.05	-2.59 to -0.21	1.36
Sensitivity	4.60	1.67	2.60	1.58	2.27	< 0.05	-3.90 to −1.00	1.23

III. Relations Between Parental Sensitivity and Infant-Parent Attachment Security

Previous research has shown that secure infant attachment is related to higher levels of parental sensitivity.

Table 7.29 (p. 201) shows the mean sensitivity scores for secure and insecure group mothers. As Table 7.29 shows, secure group mothers were more sensitive than insecure group mothers when interacting with their infants at 6 months. The mean difference was 2.50 and the standard error of the difference was 0.80. The effect size was very large for this comparison. According to the Coe (2000) interpretation of effect sizes, this equates to the sensitivity score of an average mother of secure group infants exceeding the scores of 95% of mothers of insecure group infants. We can have confidence in this result since it replicates previous findings.

Table 7.30 shows mean sensitivity scores for fathers with respect to the security of the infant-father attachment relationship. As Table 7.30 shows, secure group fathers were more sensitive during the 6-month interaction session than insecure group fathers. The mean difference was 2.00 and the associated standard error was 0.88. The comparison also showed a large effect size. According to the Coe (2000) interpretation

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[115] Independent samples t tests.

of effect sizes, this equates to the sensitivity score of an average father of secure group infants exceeding the scores of 88% of fathers of insecure group infants.

7.3.8: Relations between Parental Sensitivity and Accuracy of Attachment Behaviour Predictions

Table 7.31 shows that mothers who were accurate in their Strange Situation predictions had significantly higher sensitivity scores. The mean difference was 2.00 and the associated standard error was 0.88. The confidence interval did not include a 0 value. The effect size for this comparison was large. This is the equivalent of the sensitivity score of an average mother from the accurate group exceeding the score of 84% of mothers in the inaccurate group (Coe, 2000).

Table 7.31: Comparisons Between Accuracy of Mothers' Strange Situation Prediction and Maternal RF and Sensitivity

	Accurate (N = 6)		Inaccurate (N = 12)		t value[116]	p value	95% Confidence Interval	Effect Size
	M	SD	M	SD				
Reflective Function	5.00	3.10	3.83	1.80	0.85	n.s.	-4.43 to 2.09	0.52
Sensitivity	6.00	2.10	4.00	1.60	2.26	< 0.05	-3.87 to –0.13	1.10

Table 7.32 shows the comparison between accurate and inaccurate fathers in terms of their sensitivity scores. As Table 7.32 shows, there were no significant

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[116] Independent samples t tests.

differences between the 2 groups of fathers with respect to sensitivity. The mean difference was 2.00 and the associated standard error was 1.33, and the confidence interval included a value of 0. However, the effect size for this comparison was large. An effect size of this size is the equivalent of the sensitivity score of an average father from the accurate group exceeding the score of 82% of fathers in the inaccurate group (Coe, 2000). However, these results must be regarded as very preliminary and require further replication in a larger sample.

Table 7.32: Comparisons Between Accuracy of Fathers' Strange Situation Prediction and Paternal RF and Sensitivity

	Accurate ($N = 2$)		Inaccurate ($N = 13$)		t value[117]	p value	95% Confidence Interval	Effect Size
	Mean	SD	Mean	SD				
Reflective Function	4.00	1.41	2.69	1.11	1.52	n.s.	-3.17 to 0.56	1.06
Sensitivity	5.00	2.83	3.00	1.63	1.50	n.s.	-4.88 to 0.88	0.97

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[117] Independent samples t tests.

7.3.9: Relations between RF and Accuracy of Attachment Behaviour Predictions

Table 7.31 (p. 203) also shows the comparison between accurate and inaccurate mothers in terms of their RF. As Table 7.31 shows, there is no significant difference in the mean RF scores of the 2 groups[118]. The non-significant p value was supported by the confidence interval, which included a 0 value. However, there was a medium effect size associated with this comparison. This is the equivalent, according to Coe (2000), of the RF scores of the average mother in the accurate group exceeding the scores of 69% of those mothers in the inaccurate group.

Table 7.32 also shows the comparison between accurate and inaccurate fathers in terms of their RF. As Table 7.32 shows, there is no significant difference in the mean RF scores of the 2 groups[119]. The 95% confidence interval includes a 0 value. However, there is a large effect size associated with this comparison. This equates to the RF score of an average father in the accurate group exceeding the score of 84% of the group of inaccurate fathers. Once again, no conclusions can be drawn from these findings. Further replication is necessary.

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[118] Mean difference = 1.17, standard error = 1.14.
[119] Mean difference = 1.31, standard error = 0.86.

<u>7.4: Discussion</u>

The first hypothesis was that parents classified as autonomous on the AAI would demonstrate greater MM at 6 months postpartum; that is, they would make a greater proportion of appropriate mind related comments and fewer inappropriate comments. There was some evidence that autonomous mothers made a smaller proportion of inappropriate comments, compared to non-autonomous group mothers. However, caution should be applied until this result is replicated. There were no differences between the 2 groups in terms of the proportions of appropriate comments made. In contrast, autonomous fathers differed from their non-autonomous counterparts on both indices of MM. Autonomous fathers used proportionately more appropriate mind-related comments, but also made proportionately more inappropriate mind-related comments. The latter result, not statistically significant, was somewhat unexpected and requires replication, but did show a medium effect size. Thus overall, the relation between antenatal AAI classification and MM in infant-parent interactions at 6 months appears to be stronger for fathers than for mothers. This mirrors the pattern of results seen for the relation between AAI and parental sensitivity, where the link between autonomous classification and greater sensitivity is stronger for fathers compared with mothers (van IJzendoorn, 1995).

At first these results may appear to be in contrast to those of Bernier et al. (2003), who found that maternal attributions of mental states in an open-ended description of their 6- to 30 month-old children was negatively related to maternal AAI classification. Aside from the fact that the sample studied in the study reported here differed in many ways from that studied by Bernier et al., there are other potential reasons for the apparent discrepancy in these studies' findings. For example, since Bernier et al. used an interview to assess MM, it was not possible for them to

distinguish between appropriate and inappropriate mind-related comments. The results reported here show that mothers' AAI classification was only related to their proportionate use of inappropriate comments, and not appropriate comments. The finding that autonomous fathers made a greater proportion of inappropriate comments is, however, consistent with the Bernier et al. results.

With respect to MM in the Strange Situation procedure, there was no difference in the proportion of appropriate or inappropriate comments used by autonomous and non-autonomous mothers. In contrast, autonomous fathers used a greater proportion of appropriate comments during the Strange Situation procedure compared to their non-autonomous counterparts. There was no difference between these two groups of fathers in terms of the proportion of inappropriate comments made. These results reflect some of the findings with respect to MM at 6 months; the relation with the AAI appears to be stronger for fathers than for mothers, and for fathers it is the proportion of appropriate comments that is most important.

The first hypothesis also stated that parents who scored highly on the RF scale would demonstrate greater MM at 6 months. As with relations between MM and overall AAI classification, there were interesting gender differences. There was no relation between maternal RF and the proportion of appropriate comments used by mothers, but maternal RF was negatively related to the proportion of inappropriate mind-related comments ($p = .06$, two-tailed). For fathers, RF was positively related to the proportion of appropriate mind-related comments, but unrelated to the proportion of inappropriate mind-related comments. Thus, parental RF was related to specific types of MM depending on parental gender. Fathers' tendency to be reflective during the AAI related to them producing proportionately more comments that were appropriate reflections of their infants' likely internal states, whereas mothers' RF was associated

with them producing proportionately fewer comments indicating that they were misreading their infants' mental and emotional states. However, these results should be interpreted with caution until replicated.

In contrast to the significant relations with 6 month MM, there were no associations between maternal or paternal MM in the Strange Situation procedure and parental RF. It is possible that the lack of significant results with respect to Strange Situation MM may be reflective of lower validity of this measure of MM in this context; this issue was considered further in Chapter 6.

In summary, this study has found evidence that MM meets the first requirement of any concept being proposed to help bridge the transmission gap: showing meaningful relations with parental attachment representations. Although parental gender sometimes differentially affected the pattern of findings, broadly speaking, parents' with autonomous internal working models of attachment were shown to be more mind-minded than parents with non-autonomous representations. This is the first time that a link between AAI classification and MM has been reported in parents and their biological children.

The second hypothesis proposed that there would be longitudinal continuity in MM. As predicted, there was evidence of continuity. Continuity was seen for both the total number of comments produced in the antenatal 'describe your child' predictions and the inclusion of mentalistic comments. Mothers' total number of comments in the antenatal predictions was positively related to their proportional scores for appropriate mind-related comments at 6 months, but unrelated to scores for inappropriate mind-related comments. For fathers, total number of comments in the antenatal predictions was also positively associated with the proportion of appropriate comments ($p = .08$, two-tailed). There was also a positive association between the total number of

comments in the antenatal predictions and inappropriate mind-related comments at 6 months. This result was in the unexpected direction, but did show a medium to large effect size. These results require further replication to increase confidence in them.

Parents' antenatal tendency to predict their infants' mental characteristics in the antenatal period showed relations to MM at 6 months postnatal. For mothers, there was a difference with respect to inappropriateness, although not appropriateness, at 6 months. Mothers who included at least 1 mentalistic comment in their antenatal predictions used a smaller proportion of inappropriate mind-related comments at 6 months compared to those who included no mentalistic comments ($p = .08$, two-tailed). For fathers, there was a difference with respect to both appropriateness and inappropriateness at 6 months postnatal. Fathers who included at least 1 mentalistic comment in their antenatal predictions used a greater proportion of appropriate comments, but also a greater proportion of inappropriate comments, compared to those who included in mentalistic comments. The latter result was in the unexpected direction and approaching significance, but showed a large effect size. Again, these results should be interpreted with caution until replicated.

Mothers' total number of comments in the antenatal predictions were unrelated to either index of MM in the Strange Situation procedure. In contrast, both paternal appropriateness and inappropriateness were positively related to the total number of overall antenatal comments. Both of these relations showed large effect sizes, although in the case of the latter, the finding was in the opposite direction to that expected. Again this may be a consequence of the significant correlation between paternal appropriateness and inappropriateness in the Strange Situation, as discussed in Chapter 6. Once again, these results should be interpreted with caution until replicated.

Parents' antenatal tendency to predict their infants' mental characteristics in the antenatal period showed relations to MM in the Strange Situation procedure, only for fathers. There was a significant difference in the appropriateness and inappropriateness of the 2 groups. The latter result was in the opposite direction to that expected. Fathers who included at least 1 mentalistic comment in their antenatal predictions used a greater proportion of appropriate mind-related comments, but also a greater proportion of inappropriate comments compared to those who included no mentalistic comments. Neither result reached statistical significance but both showed large effect sizes. Caution should be applied when interpreting these findings until they are replicated.

Support for continuity in MM over the transition to parenthood was obtained for relations between postnatal MM and parents' total number of comments in their antenatal 'Describe Your Child' predictions and the tendency to consider mental characteristics. These findings add support to the conclusion suggested in Chapter 4 that parents' willingness or ability to predict *any* characteristics of their future children, is a suitable index of antenatal MM. However, the tendency to include mentalistic attributes also seems to be important, at least in relation to continuity in MM.

These results appear to be in contrast to those of Bernier et al. (2003), which suggested that the use of mentalistic comments in postnatal 'Describe Your Child' interviews in early infancy was an index of a *lack* of MM. However, the results can be reconciled to an extent: the unexpected findings that fathers who included at least 1 mentalistic comment in their antenatal predictions used greater proportions of inappropriate comments at 6 months and in the Strange Situation procedure concur with the findings of Bernier et al. One reason for the potential differences between the 2 studies is that in there were differences in the samples, as discussed previously, and also differences in the way that mentalistic comments were measured: Bernier et al.

used a continuous measure of mentalistic comments as a proportion of the total number of comments; in the study reported here, a dichotomous distinction was made between the inclusion of 1 or more mentalistic comments compared to no mentalistic comments. Further investigation of the willingness of parents to attribute mental characteristics to their infants is required.

With respect to continuity in the postnatal period, there were relations between maternal MM at 6 months in a free-play session and at 12 months in the Strange Situation procedure. Maternal appropriateness was positively associated in both assessments. This relation was approaching significance ($p = .07$, two-tailed) and showed a large effect size. There was also a significant positive association between maternal appropriateness at 6 months and inappropriateness in the Strange Situation. This was in the opposite direction to that expected. For fathers, there were similar patterns. There was a significant positive relation between appropriateness at 6 months in a free play session and at 15 months in the Strange Situation procedure. This showed a large effect size. Finally, there was an unexpected significant positive relation between 6-month inappropriateness and Strange Situation appropriateness, which also showed a large effect. There was therefore some evidence of continuity across the postnatal period for mothers and fathers.

In summary there was evidence of continuity in MM across the transition to parenthood and across the first year of life. This is the first time that MM has been assessed in the antenatal period, and also the first time that it has been assessed at 2 time points in infancy using the same measure. However, the results are comparable with the previous research by Meins et al. (2003), which found significant continuity from appropriateness and inappropriateness at 6 months through to the use of mentalistic comments in a 'describe your child' interview in the preschool years.

Hypothesis 3 stated that parents of secure infants would be more mind-minded: using a greater proportion of appropriate comments and a smaller proportion of inappropriate comments. Secure group mothers used proportionately more appropriate mind-related comments during their interactions with their infants at 6 months. Although this difference was not statistically significant it did show a medium effect size. Secure infant-mother attachment was also related to mothers using proportionately fewer inappropriate mind-related comments during the infant-mother interaction session at 6 months. This was approaching significance ($p = .09$, two-tailed) and showed a large effect size. Attachment security was not, however, related to antenatal MM. This was true whether the overall number of comments or the inclusion of mentalistic comments was assessed. The relation between paternal postnatal MM and attachment security was specific to fathers' use of appropriate mind-related language. Secure infant-father attachment was related to fathers using proportionately more appropriate mind-related comments during the free play interaction at 6 months. Fathers' use of inappropriate mind-related comments was not related to attachment security. There was a link between security and antenatal MM, but only with respect to the inclusion of mentalistic comments. Fathers of insecure infants were more likely to include no mentalistic comments in their antenatal predictions, compared to fathers of secure infants. There was no link between infant-father attachment and the overall number of antenatal comments. Thus, support was obtained for hypothesis 2, but mainly with respect to the postnatal indices of MM. The results reported here are therefore in line with those of previous studies showing a link between parental MM in the first year of life and infant-parent attachment security (Lundy, 2003; Meins et al., 2001).

The fourth hypothesis stated that more mind-minded parents would be more accurate in their predictions of their infants' Strange Situation behaviour. For mothers, very strong relations were found between both indices of MM at 6 months and the accuracy of prediction. Mothers, who had used proportionately more appropriate mind-related comments at 6 months, and those who had used proportionately fewer inappropriate mind-related comments at 6 months, were more accurate in predicting their infants' Strange Situation behaviour. The association between appropriateness at 6 months was not statistically significant but showed a large effect size. Accuracy was related to maternal antenatal MM in terms of the inclusion of mentalistic comments. Mothers who accurately predicted their infants' attachment behaviours in the Strange Situation were more likely to have used at least 1 mentalistic comment in their antenatal predictions, compared to inaccurate mothers. Accuracy was not, however, related to antenatal MM when the index was the total number of comments used.

For fathers, similar patterns of relations between MM indices and accuracy of prediction were seen. Fathers who were accurate in predicting their infants' attachment behaviours used a smaller proportion of inappropriate comments at 6 months postnatal. Although this difference was not statistically significant there was a large effect size. Accurate fathers also made a smaller proportion of appropriate comments at 6 months, although this was not a statistically significant finding, and was in the opposite direction to that hypothesized, it showed a medium effect size. There was also a medium effect size for the relation between paternal accuracy and fathers' tendency to comment on their infants' future mental characteristics in the antenatal period. Accurate fathers were more likely to include at least 1 mentalistic comment in their antenatal predictions, compared to inaccurate fathers. There was no link between accuracy and the total number of comments in the antenatal predictions for fathers.

Thus, there was support for the hypothesis that more mind-minded parents will be more accurate in predicting their infants' Strange Situation behaviour. Although once again, the findings should be interpreted with caution until replicated.

While this link has not previously been considered, the research of Tarabulsy et al. (1997) is relevant. Tarabulsy and colleagues found that more sensitive mothers' descriptions of their children's attachment behaviour at home were more strongly related to the assessments by trained observers using the AQS, compared to descriptions by less sensitive mothers. The findings from this current study suggest that more mind-minded mothers and fathers are similarly more able to accurately represent their children's attachment behaviours.

Finally, it was predicted that MM would help bridge the transmission gap. Following the findings of Huth-Bocks, et al. (2004), an attempt to determine whether it was specifically parental representations of the *child* that were important to the process of transmission of attachment. Due to the small sample size, this hypothesis was tested using a series of exploratory descriptive pathway analyses. Although the results could not address the full mediational hypothesis directly using regression analyses, the descriptive pathway analyses strongly suggest that certain combinations of parental state of mind with respect to attachment and levels of either MM or sensitivity are powerful predictors of infant attachment classifications. This was the case for both mothers and fathers. However, the evidence with respect to MM is stronger for fathers and for sensitivity is stronger for mothers. With respect to MM, there is evidence that high MM may ameliorate the effects of non-autonomous classifications, but MM seems to have less effect when the parent is autonomous. It seems that it may be parental representations of the child that are important for the transmission process. Although

these findings must be treated with caution, they suggest tentative support for the hypothesis that MM can help to bridge the transmission gap, particularly for fathers.

The finding that sensitivity can help explain the extent of the transmission of attachment from mothers to infants shown here must be interpreted with caution, since previous research has not found this strength of relation. Although many studies have found relations between adult autonomous state of mind with respect to attachment and sensitivity (Pederson et al., 1998; van IJzendoorn et al., 1991) and between sensitivity and infant security (Braungart-Rieker et al., 2001; Cox et al., 1992), the van IJzendoorn (1995) meta analysis made clear that AAI classification could only account for 12% of the variance in sensitivity and sensitivity could only account for 23% of the variance in infant attachment. Van IJzendoorn concluded that: "sensitivity cannot be considered to be the exclusive and most important factor in the development of attachment" (p.585) and therefore a transmission gap existed in the literature. The results from this current study have shown larger effect sizes between sensitivity and those traditionally associated with infant attachment (De Wolff and van IJzendoorn (1997), with the exception of the original studies by Ainsworth and colleagues (Ainsworth et al., 1971, 1974). This may explain why the transmission from AAI to the Strange Situation via sensitivity is stronger than in many previous studies.

This current study also replicated a number of previous results. The expected positive relation between: antenatal AAI classification and postnatal sensitivity was seen for both mothers and fathers, replicating previous findings (van IJzendoorn, 1995). The study reported here also found a positive relation between RF and sensitivity for mothers and fathers. The link between RF and sensitivity has not been investigated in previous research. These should be interpreted with caution until replicated in another sample.

Parental autonomous AAI classifications were found to be strongly related to a secure infant-parent attachment relationship. Concordance between dichotomous AAI classification and dichotomous infant attachment security was 94% for mothers and 87% for fathers. These findings are in line with those of previous studies of white middle class samples, which found similarly high levels of concordance (e.g., Pederson et al., 1998) and lower rates of intergenerational transfer of attachment patterns in fathers compared with mothers (Steele et al., 1996). The particularly high rate of concordance seen in the mothers in the study reported in this chapter may be due to the fact that there was only 1 preoccupied mother, and this classification is known to show less concordance with infant attachment (Steele et al., 1996). Despite high rates of concordance, there was some evidence of divergence from expected 4-way mapping of classifications (i.e., dismissing-avoidant, autonomous-secure, preoccupied-resistant, unresolved-disorganised) for both mothers and fathers. However, Slade and Cohen (1996) argued that dichotomous correspondence rates hide non-specific associations between insecure categories; that is, some dismissing adults have resistant infants and some preoccupied adults have avoidant infants. Thus, it may be that it is not the *type* of insecurity that is carried forward (except perhaps in the case of disorganisation), but insecurity per se. This is, for example, because avoiding a preoccupied mother may be equally adaptive as showing resistance towards her.

Support for the link between parental attachment representations and infant-parent attachment security also extended to parental RF during the AAI. Results showed that parents of infants with secure classifications were more likely to have higher RF scores, with large effect sizes for this relation in both mothers and fathers (although the relation was stronger for mothers than for fathers). Once again, these results concur with those of previous research that found a strong link between RF and

infant-parent attachment security, with a greater effect for mothers compared with fathers (Fonagy et al., 1991).

The study reported here also replicated the link between sensitivity and subsequent attachment security in both mothers and fathers, with greater sensitivity at 6 months relating to a secure attachment relationship. The present finding that this link is stronger for mothers than for fathers also concurs with previous research (DeWolff & van IJzendoorn, 1997).

This study also raised other issues worthy of comment. Firstly, relations between accuracy and parental RF were considered. Results showed that there was a difference in RF scores of accurate and inaccurate groups. For both mothers and fathers, accurate parents showed higher RF scores compared to inaccurate parents. Although neither result was statistically significant there was a medium effect size for mothers and a large effect size for fathers. These results suggest that parents who are more reflective are better able to predict how their children will behave, even though they may not have observed their children's reactions to such a situation. Thus, these parental predictions may be an effective window onto their ability to evaluate how their children's characteristics will enable them to cope in a new situation. These results should be interpreted with caution until replicated.

Secondly, relations between accuracy and sensitivity were investigated. Results showed that there was a significant difference in the sensitivity scores of accurate and inaccurate parents. For both mothers and fathers, accurate parents had higher sensitivity scores compared to inaccurate parents. These findings suggest that some parents may be better able to predict the attachment behaviours of their infants and may therefore be able to respond more sensitively to them. Caution should be applied when interpreting

these results until replicated, particularly for fathers. However, the results do concur with the findings of Tarabulsy et al. in relation to the AQS.

In summary, this time series analysis investigated the 2 main requirements of the potential of MM to help bridge the transmission gap: (a) the relation between parental AAI and maternal and paternal MM and (b) the relation between maternal and paternal MM and infant-mother and infant-father attachment security as assessed in the Strange Situation procedure. This is the first time that these specific relations have been investigated in the same study in biological mothers and fathers. The results broadly supported the hypotheses. Further exploratory analyses suggested that MM may be important in helping to explain the relation between parental representations of attachment and infant-parent attachment, particularly in fathers.

Chapter 8
General Discussion

8.1: Summary of Main Findings

The primary aim of the longitudinal study reported here was to explore the relations

between parents' antenatal attachment representations and how mind-minded they were

when thinking about or interacting with their infants. These relations were explored

using two indices of parental attachment representations (AAI classification and RF),

with various assessments of MM being taken antenatally and postpartum. Autonomous

AAI classification and RF were both hypothesised to be positively associated with

parental MM. The results across the 4 testing ages largely supported this hypothesis,

although in general, stronger effects were seen (a) for fathers than for mothers, and (b)

using RF rather than AAI classification as the index of parental attachment

representations. In summary, in the antenatal period, (a) neither maternal nor paternal

AAI classification related to MM, (b) maternal RF was not related to MM, and (c)

fathers' RF was positively associated with 2 of the 3 antenatal MM measures (pet name

and total number of predictions), with a medium effect for the relation with the third

(mentalistic descriptions). For MM in infant-parent interaction at 6 months, in

comparison with non-autonomous parents, (a) autonomous fathers produced

proportionately more appropriate mind-related comments, and (b) autonomous mothers

produced proportionately fewer inappropriate mind-related comments. Paternal RF was

significantly positively correlated with scores for appropriate mind-related comments at

6 months, and maternal RF was negatively correlated with inappropriate mind-related

comments. For MM in the Strange Situation, there were no links with maternal AAI

classification, but autonomous fathers used proportionately more appropriate mind-

related comments than their non-autonomous counterparts. RF was not related to MM in the Strange Situation in either mothers or fathers.

The second major aim was to investigate continuity in MM both across the transition to parenthood and in stressful and non-stressful contexts. There was evidence for continuity in MM from pregnancy to 6 months in mothers and fathers, although antenatal MM in fathers related to use of appropriate mind-related comments and inappropriate mind-related comments at 6 months. These findings, taken with the fact that there was a positive correlation between the 2 indices of MM at 6 months for fathers, suggests that distinguishing between mind-related comments on the basis of their appropriateness may have less discriminant validity for fathers than for mothers. There appeared to be less continuity in MM across different contexts than was observed over time. Parental MM at 6 months and in the Strange Situation showed some lawfully meaningful associations in both mothers and fathers.

The final main aim was to explore whether parental MM might help bridge the transmission gap in understanding how parental attachment representations predict infant–parent attachment security. Unfortunately, a full test of the mediational model could not be performed due to the small sample size coupled with the attrition in numbers over time. Instead, potential pathways from antenatal attachment representations to Strange Situation via indices of infant–parent interaction (MM or sensitivity) were explored using a descriptive approach. Regardless of whether high sensitivity or high MM was used as the intermediary, autonomous AAI classification related to secure Strange Situation classification. Moreover, low sensitivity or MM appeared to have a negligible impact on the likelihood of a secure attachment being formed if the parent was autonomous. Non-autonomous AAI classification coupled with low sensitivity or MM was similarly strongly related to an insecure Strange

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Situation classification. However, unlike for high sensitivity, having parent who was high in MM appeared to ameliorate the effect of non-autonomous AAI classification on infant attachment security, at least for fathers. Of course, given the exploratory nature of these analyses and the small sample size, no firm conclusions can be drawn, but these findings are intriguing and worthy of being followed up in a larger sample of mothers and fathers.

The longitudinal study reported here also addressed a number of subsidiary aims. First, in addition to investigating the predictive validity of the new antenatal MM interview with respect to relations with existing postnatal MM measures (as discussed above), its discriminant validity was assessed against a measure of antenatal attachment (AAS: Condon, 1993). The antenatal MM interview was found to have good discriminant validity, with no associations seen between parents' predictions about their future infants and their strength of attachment to or preoccupation with the foetus as assessed on the AAS.

Second, this study investigated whether MM was related to parents' accuracy in predicting their infants' attachment behaviour in the Strange Situation. Relations between accuracy and (a) attachment security, (b) parental sensitivity, and (c) parental attachment representations were also explored. Unfortunately, only 2 fathers accurately predicted their infants' attachment behaviour, so it is not possible to draw any conclusions from the paternal data. However, maternal MM at 6 months was strongly related to accuracy; specifically, mothers who made accurate predictions had used proportionately fewer inappropriate mind-related comments at 6 months than this inaccurate counterparts. In addition, mothers' use of mentalistic descriptions in the antenatal MM interview related to accuracy, with accurate mothers being more likely than those who were inaccurate to include at least one mentalistic description of their

future child. Accuracy in mothers was also related to higher levels of sensitivity and RF. The former replicates Tarabulsy et al.'s (1997) finding that more sensitive mothers were better at predicting their children's home-based attachment behaviours, but previous research has not investigated links between RF and accuracy.

As detailed in the discussion sections of the preceding chapters, the study reported here also replicated a number of other findings, giving us some confidence in the validity and reliability of the measures obtained. In addition, no strong evidence was found for any of the attachment, MM, or infant-parent interaction variables being determined by background factors such as parity or educational attainment. Moreover, parental depression appeared to have surprisingly little effect on any of the outcome variables. It is therefore highly unlikely that any of the observed relations can be explained in terms of these extraneous factors.

8.2: The Concept of Mind-mindedness

There are 2 issues that will be discussed: advances in the study of MM and the validity of MM as a construct.

8.2.1: Advances in the Study of Mind-mindedness

This longitudinal study has made a number of advances in the study of the concept of mind-mindedness. Firstly, previously there had been very little research considering MM in fathers. Although Lundy (2003) attempted to redress the balance to an extent, results from that study were not directly comparable with previous studies by Meins and colleagues on maternal MM, as the criteria used to assess MM were not identical. Since the current study has illustrated a number of differences in maternal and paternal

MM it seems that considering the concept in both parents may be a fruitful direction for future research.

Secondly, MM had not previously been investigated in the antenatal period. A major aim of this study was therefore to determine whether it was possible to assess this concept prior to the birth of the child. If MM could be assessed antenatally it could be possible to determine whether the child had any impact on parental MM. Since there were relations between antenatal and postnatal measures of MM, it is possible to suggest that parental MM is independent of child effects. The findings reported here are therefore consistent with a failure to find relations between maternal MM and a host of infant-centred variables (e.g., Meins et al., 2001, 2002, 2005).

Finally, MM had previously been investigated exclusively in low-stress situations. Following the ideas of George et al. (1999) that the caregiving system is activated by similar cues to those that activate the infant system, the study reported here investigated how observing parents in a stressful context (the Strange Situation) impacted on their MM. This is consistent with the emphasis of Posada, Jacobs, Carbonell, Alzate, Bustamante, and Arenas (1999) on the importance of studying maternal sensitivity in emergency as well as ordinary contexts. Differences in the proclivity of parents to comment appropriately on their infants' internal states may be more apparent when the infant is experiencing their own attachment-related stress. Such appropriate comments in a stressful situation are likely to vary as a function of parents' own attachment status, given that non-autonomous parents are likely to defend against their infants' distress which presumably will make them less likely to comment on it appropriately. Alternatively, the parents' own heightened stress reactions (Zelenko et al., 2005) might make parents who are normally mind-minded less able accurately to comment on their infants' internal states. Given the complex and mixed pattern of findings for the

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relations between MM in a non-stressful observational context and in the Strange Situation, the latter alternative may be more accurate.

8.2.2: Construct Validity

Evidence for the construct validity of the MM measures was presented above, but a number the relation between RF and MM should also be discussed in relation to this issue. At first glance, MM and RF may appear to be functionally equivalent. The operationalisation of MM as the proclivity to comment appropriately on the mental states of the infant while in interaction with them is conceptually similar to the operationalisation of RF as the proclivity to consider the mental states of the self and others in an attachment narrative. Both have been previously related to infant and adult attachment security (Bernier & Dozier, 2003; Fonagy, Steele, Steele, Moran, & Higgit, 1991; Meins et al., 2001). Fonagy and colleagues theorised that RF promotes a secure infant–parent attachment relationship because it indexes parents' tendency to reflect on their children's emotions and mental states. When caregivers are more reflective, children become confident that their internal states will be appropriately processed, thus laying the foundations of a secure attachment relationship. Two recent studies have further investigated RF. In a study of 40 mothers and infants, Slade, Grienenberger, Bernbach, Levy, and Locker (2005) suggested that maternal RF played a crucial role in the intergenerational transmission of attachment. However, since Slade et al.'s (2005) measure of RF was obtained from a interview which assessed the mother's representations of her child and herself as a parent (the Parent Development Interview: Aber, Slade, Berger, Bresgi, & Kaplan, 1985), it is not possible to establish from this study whether a mother who scores highly for RF when talking about her relationship with her child is similarly skilled in processing and responding to her

child's internal states during real life interactions. In a study on the same sample of mothers and infants, Grienenberger, Kelly, and Slade (2005) reported that the quality of infant–mother affective communication mediated the relation between maternal RF (assessed from the Parent Development Interview) and infant-mother attachment security. However, this study did not include AAI classification, and the measure of affective communication was obtained from the strange situation. The fact that the maternal behaviour and attachment security measures were obtained concurrently from the same observation, together with the lack of AAI data, means that these results cannot fully address a mediational hypothesis with respect to bridging the transmission gap. Thus, no empirical data yet exist to verify that parents who score highly on RF during the AAI are similarly skilled in accurately reflecting on their infants' internal states during on-line interactions with them.

The study reported here provided the first evidence that RF and MM in infant-parent interactions are indeed related, but the findings suggests that, while there are significant associations between MM and RF, they are not equivalent constructs. Moreover, the way in which RF and MM are related may differ as a function of parental gender. Recall that RF was positively correlated with scored for appropriate mind-related comments at 6 months for fathers, but negatively correlated with inappropriate mind-related comments for mothers.

It is interesting to consider why RF was related to different indices of MM depending on parental gender. Although the observed gender specificity of these relations may be simply a result of our small sample size, it may be that there are genuine differences between mothers and fathers with respect to how they engage in mind-minded interaction with their infants. The fact that fathers were more likely than mothers to produce inappropriate comments, coupled with the positive correlation

between appropriate and inappropriate mind-related comments seen only for fathers, highlights differences between parents. These findings suggest that fathers may be less skilled than mothers in accurately reading their infants' internal states. Future research should attempt to verify whether such differences between mothers and fathers are found in a larger sample of families more representative of the population as a whole.

8.3: Differences Between Mothers and Fathers

There were noteable differences in the results on MM reported here depending on whether relations were for fathers or mothers. First, there was a stronger relation between adult attachment and mind-mindedness at 6 months for fathers, and a stronger relation between 6 month MM and infant security for mothers. Second, paternal scores for appropriate mind-related comments at 6 months were highly positively correlated with concurrent scores for inappropriate mind-related comments in fathers, but there was no relation between the two MM indices for mothers, replicating previous null findings (Meins et al., 2001). Why might fathers who tend to comment appropriately on their infants' internal states also be more likely to misinterpret what their infants are thinking or feeling? A meta-analysis by Leaper, Anderson and Sanders (1998) found that mothers talked more to their children than fathers, using more supportive speech but also more negative comments. Mothers' speech was less directive than that of fathers but also less informative. In addition, fathers engage in fewer care-related activities (Bretherton, 1985) but more play (Lamb, 1977), particularly physical and emotionally arousing play (Clarke-Stewart, 1978), than do mothers. These differences between how mothers and fathers interact with their children might help explain the differences in MM observed in the study reported here. If fathers are typically engaging in more play activities where positive emotions tend to be involved, then the

consequences of using inappropriate mind-related comments may be less crucial in terms of predicting later development. In contrast, mothers will need to be more attuned to the negative emotions that will signal the infant's needs in caregiving situations, and their ability appropriately to read these signals will therefore be important.

It is feasible that the observed differences in MM and the comparative strength with which MM related to adult attachment representations and the security of the infant-parent attachment relationship may arise because there actually are differences in the transmission processes depending upon the parent's gender. This could explain the findings of different outcomes of infant-father, compared to infant-mother, attachment (Verschueren & Marcoen, 1999). Evidence relating to this proposition comes from the finding in the study reported here that the relation between adult attachment and 6 month MM was stronger for fathers than for mothers. This finding intriguingly parallels the pattern of findings seen in relations between AAI and parental sensitivity. Van IJzendoorn's (1995) meta-analysis showed that paternal AAI classification was more strongly related to fathers' sensitivity compared with the relation between maternal AAI and sensitivity, and this effect was also seen in the study reported here. Thus, both in terms of responding sensitively and commenting appropriately on internal states, fathers' interactions with their infants are more strongly governed by representations of their own attachment experiences than are infant-mother interactions. Why might mothers be less influenced by their representations of childhood attachment than fathers? One possibility is that mothers are likely to be exposed to considerably more advice and information on how to be an effective and responsive parent, and will therefore have a greater wealth of material on which to draw. Alternatively, mothers tend to spend more time with their infants in the early postpartum months, resulting in more opportunities to learn about their infants' likes, dislikes, interests, and moods. The

latter alternative is thus consistent with the argument, mentioned previously, that MM is a relationship-specific quality and requires extensive previous knowledge of the infant (Meins et al., 2005).

Further, it is possible that fathers are less used to being fathers in the public eye, and therefore, under the watchful eye of the camera in developmental research laboratories, they put on more of a performance than mothers. Consequently, their results may be less ecologically valid. Evidence that fathers may find any observation of them in interaction with their child as stressful comes from the relations between their proportion of appropriate and inappropriate mind-related comments in both the free-play situation and the Strange Situation procedure; this relation for mothers is only seen in the Strange Situation. Increasing parental stress may foster the tendency to comment inappropriately on the mental states of the infant.

8.4: Bridging the Transmission Gap

To bridge the transmission gap MM would have to be shown to be successfully related to both adult and infant attachment. Although a previous study by Bernier and Dozier (2003) showed that this was the case, there were a number of problems remaining. Firstly, Bernier and Dozier (2003) only considered the relation in mothers, more specifically in foster mothers. The study reported here investigated whether MM could bridge the transmission gap in biological mothers and fathers. Secondly, Bernier and Dozier used a 'describe your child' question to assess MM in the first or second year of life and found negative associations with adult and infant attachment. Their findings seemed counter-intuitive but they argued that mentalistic comments in mothers' descriptions were mind-minded when used at 3 years and related to infant attachment (Meins et al., 1998), but that the use of mentalistic comments in descriptions before the

onset of representational capacities showed a lack of mind-mindedness and was, therefore negatively related to infant, and adult, attachment. The study reported here used the better-established measure of MM in infancy: the proportions of appropriate and inappropriate mind-related comments. As discussed above, this measure was found to be positively related to both infant and adult security, and there was some suggestion from the descriptive pathways analyses that high MM might ameliorate the effects of non-autonomous parental AAI classification on the security of the infant–parent attachment relationship. Although the findings reported here must be regarded as preliminary until they are replicated on a larger sample, it is still meaningful to map out a theoretical account of how MM might help to bridge the transmission gap.

It seems that it may be parental representations of *the child* that are specifically important for the process of transmission of attachment from one generation to the next. Previous work by Benoit et al. (1997) and Huth-Bocks et al. (2004) has shown that WMCI classifications were related to both adult and infant attachment. However, the WMCI assesses both parental representations of the child and the self as a caregiver. In the WMCI these constructs are highly related. One aim of this longitudinal study was to investigate whether a construct assessing purely the representations of *the child* would relate to both adult and infant attachment, and further address the issue that it was child-specific representations that were important for transmission. The findings from this study go some way towards this. Further investigation of the ability of child-specific representations to explain the process of transmission is required. Also, although beyond the scope of this study, it would be interesting to determine whether MM would relate more strongly to representations of the child on the WMCI, compared to representations of the self as a caregiver.

How does MM operate, as a representation of the child, in its role in the transmission of attachment from one generation to the next? It may be useful to consider the proposal by Main (2000) that the three organised attachment strategies, both in infancy and adulthood, can be considered in terms of their flexibility under attachment-related stress. She argues that security is a reflection of flexibility of behavioural and/or attentional strategies in the Strange Situation and AAI, which are both sources of stress to the attachment system. Insecurity is a reflection of inflexibility of strategy in these measures. The disorganised infant and unresolved adult classifications are thought to indicate a collapse of behavioural and/or attentional strategy. It is possible to hypothesize more specifically, that it is attention and behavioural reactions to infant *mental states*, that is, mind-mindedness, which is characteristic of the differences. There are individual differences in parents' willingness or ability to imagine their infants' putative mental states. These differences may be particularly pronounced under stress, but are also apparent in relatively stress-free situations.

According to Main (2000), autonomous AAI narratives are characterised by flexibility. Autonomous adults are able to successfully manage both central tasks of the interview: they are able to provide and reflect upon memories related to attachment, while simultaneously maintaining a coherent discourse with the interviewer. Non-autonomous adults fail to manage both tasks together due to their attentional limitations. Dismissing adults are unable to accomplish either task as they have turned their attention away from attachment-related memories and during the interview also turn their attention away from the attachment-related discussion. Preoccupied adults are able to provide and reflect upon memories, but are unable to maintain a coherent discourse. This is a consequence of their focus on attachment, at the expense of

exploration; they become caught up in their attachment-related memories and fail to monitor how the interviewer is receiving their narrative. There is evidence of an attachment-exploration balance, or imbalance, but it is reflected in discourse, rather than in behaviour as it is in the Strange Situation. The unresolved adult category is characterised by lapses in behavioural or attentional strategy under attachment related stress. In the interview as a whole, the individual may be flexible or inflexible in their discourse, but around some topics (i.e., loss, abuse) they become overwhelmed and are unable to maintain their strategy. The indicators of unresolved status reflect either a reported collapse in behavioural strategy, or a collapse in attention while narrating.

The redefinition of the AAI in terms of RF allows us to characterise responses in terms of dialogue about the mental states of the self and others under attachment-related stress. Autonomous narratives are reflected by an appropriate consideration of mental states. Non-autonomous narratives are typified by either a lack of consideration of mental states (usually dismissing individuals), or by an inappropriate consideration of mental states (usually preoccupied individuals). With respect to the unresolved category, some individuals may have a breakdown in their strategy regarding mental states when talking about certain topics, such as loss or trauma. It is also possible to consider the reaction of the different categories to the mental states of the interviewer during the AAI. Autonomous individuals take the mental states of the interviewer into account in their narrative, for example, they will offer explanations and not assume that the interviewer has certain knowledge. However, non-autonomous individuals seem to have difficulty doing this. Dismissing individuals not only fail to consider their own mental states and those of their caregivers, but they also fail to take into account the mental states of the interviewer. They may provide a narrative that is sometimes inconsistent and yet not consider that the interviewer may find this confusing.

Preoccupied individuals neglect the mental states of the interviewer as they are so focussed on their own and those of their attachment figures. Unlike autonomous narratives, those of preoccupied individuals may assume that the interviewer has knowledge of certain subjects. Finally, unresolved individuals may have lapses in their consideration of the mental states of the interviewer, for example they may pause for a long period of time while discussing a loss or trauma and yet not comment on this. Perhaps these variations in the ability to consider mental states are present not only under conditions of attachment stress, but also in relatively stress-free situations. Clearly, these differences in engagement with and consideration of other people's mental states that are the markers of the different AAI categories could be framed in terms of differences in MM.

In the Strange Situation procedure, it is proposed (Main, 2000) that secure infants show flexibility in their behavioural and attentional strategies upon reunion. They are able to attend to their distress at the separation, to focus their behaviour on seeking proximity, and to turn towards the comforting offered by their caregiver. They are then able to turn their attention towards the environment once again and resume exploration. Both insecure-avoidant and insecure-resistant infants show inflexibility in their behaviour and attention in the Strange Situation reunions. The avoidant infants turn their attention, and therefore their behaviour, away from their caregiver and their distress, and instead focus on the environment and exploration. In contrast, the resistant infant focuses their attention on their distress and the caregiver, and turns away from the environment. The degree of flexibility of the strategies of attention and behaviour are reminiscent of the individual differences in the attachment-exploration balance that Ainsworth was originally interested in investigating when she devised the Strange Situation procedure. Disorganised infants show either a flexible or inflexible strategy,

depending on their underlying security or insecurity, but are characterised by the momentary collapse of the strategy. The behaviours that are used to classify disorganisation can be viewed as behavioural or attentional lapses; when the stress is so overwhelming that the strategy can no longer be employed successfully.

One could propose that infants are showing individual differences in their ability to attend to and respond to their own mental states. Secure infants are able to attend to their mental states and communicate them. Avoidant children, it seems, may have learned to limit access to, and communication about, their mental states. Resistant infants may have access to their internal mental states, but they may have learned to distort their communication of them. The disorganised infant has an underlying strategy relating to mental states that is either secure, avoidant or resistant, but breaks down under attachment-related stress. In more severe circumstances, the disorganised infant has no strategy and no consistent way of relating to their own mental states. It may be that there are also individual differences in infants relating to their access to their mental states in non-stressful situations, although this would require investigation.

It is necessary to consider how these individual differences in the capacity to consider the mental states of the self and others come to be. It is possible to propose that the degree of flexibility of attention and behaviour under attachment-related stress might be a reflection of a degree of flexibility of underlying IWMs of attachment. Bowlby (1969) argued that IWMs of attachment were models of the relationship with the attachment figure that stored information. It was possible that expectations about the behaviour of the self and the other in certain situations would derive from such stored information. Further, Bowlby argued that such expectations were higher order control systems, which could bias perception and evaluation. Main (2000) extended this

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by proposing that IWMs might be processes, rather than structures. That is they may allow, or limit, access to certain attachment-related information.

It is possible to hypothesise in relation to MM, that individuals can allow or limit access not only to attachment-related information, but also to the consideration of the mental states of the self and others in non-stressful situations. Although Bowlby (1969) focussed on IWMs in relation to attachment, he did apply his theory to other representations, and this has been generally neglected by other researchers. How would individuals come to differ in terms of their ability to access their own mental states and the putative emotional and cognitive states of others?

Siegel (1999) proposed that the mind could be understood simply as the patterns of the flow of energy and information. That is, minds can be understood in terms of processing and acting on information. More specifically, Siegel argued that this applied to the flow of information both within one brain and between 2 or more brains. Further, he went on to hypothesise that the mind develops at the interface of human relationships and the unfolding structure and function of the brain. This makes his ideas very relevant to attachment theory. It is possible to conceive of the different attachment strategies of infants and adults as reflecting minds in, and between, which the flow of information is flexible or inflexible in terms of whether it considers mental states. More specifically, it would be the relationships with others during the periods of brain development that influenced whether the flow of information regarding the mental states of the self and others was flexible or not. Finally, it would be expected that since early experiences were shaping the mind that the flow of information might be flexible or inflexible whatever the situation. Differences may be apparent in stress-free situations, as well as under conditions of attachment-related stress; although they may be more apparent in the context of stress.

Those who during infancy experience an attachment figure, whose flow of information within their own mind regarding the mental states of the self and others is inflexible, will develop a mind inflexible in structure and function. That is, they will develop a mind in which access to mental states is limited; reflecting the mind of their caregiver. This is because they will only have experience of a restricted flow of information between the 2 minds during interactions. They will not have experienced being treated as if they were a mental agent, therefore there will be impairments in their understanding of the self and others as mental agents. These differences between individuals can be considered to be variations in their IWMs. Bowlby (1969) proposed that the more accurate an IWM, that is, the less information it restricts access to, the more predictable the individual will find behaviour. It is possible to suggest that an individual who has experienced the free flow of information relating to mental states between themselves and their caregiver would find behaviour more predictable. They would understand that mental states were the precursors of behaviour.

How does information flow between 2 minds? Bowlby (1969) argued that IWMs could be communicated both verbally and non-verbally. With respect to non-verbal communication, those who understand that mental states are the precursors of behaviour would appear more sensitive. With respect to verbal communication, those who did not restrict access to mental states would be more likely to comment on them and would therefore appear more mind-minded. Since Bowlby (1969) proposes that behaviour is more predictable to those with flexible IWMs, it is possible that individuals with flexible IWMs (autonomous individuals) would find it easier to understand the behaviour of others. This may mean that they are more likely to comment appropriately on the underlying causes of behaviour: mental states.

Therefore, they will be more mind-minded. This is in keeping with the findings from this study.

It is possible to propose that MM may help to bridge the transmission gap because the representations that it informs are verbal, whereas the representations that arise from sensitive caregiving are non-verbal. Internal working models that have verbal components are more accessible compared to those that do not (Bowlby, 1969). Even for relatively pre-verbal infants this may be important. Exposure to verbal indicators of the self as a mental agent may be crucial from the very beginnings of language development. An idea that Ainsworth proposed in 1967 is useful in understanding this process. She argued that at each phase of development, the attachment figure is required to compensate for and complement the skills that the child is lacking *while affording them the independence to learn these skills*. It is proposed that this is what more mind-minded parents are able to do; they perceive their infant as a mental agent before the infant has the capability to represent the self or others as having mental states. More mind-minded parents may expose their child to more appropriate mental state talk from early infancy, and therefore foster the proclivity in the child to treat the self and others as individuals with mental states. This may help explain why high MM, but not high sensitivity, appeared to have some impact on the security of the attachment relationship even in cases where the parent was non-autonomous.

What distinguishes a child's representations from those of adults is the complexity of attribution and meaning making (George et al., 1999). An important developmental achievement is for children to become more complex in their attributions. It is necessary to consider whether children's exposure to complex

attributions, that is mental states, not only fosters security but also fosters complexity of their meaning making.

Thompson (1999) states that a young child's earliest representations are shaped by shared discourse. Their attachment figure's interpretations of significant events influence how the child constructs these representations, and later the child assumes the same interpretations to develop representations of their own. A caregiver who does not refer to mental states in conversation with their child will foster a proclivity in the child not to talk about mental states. This will result in the child restricting access to their own and others' mental states. There is evidence from Cicchetti and Beeghly (1987) that insecure, maltreated children show impairments in their proclivity to talk about the mental states of the self and others. Alternatively, a child whose caregiver does engage in talk about mental states but does not do so appropriately, will also learn to mistrust mental states. Rather than restricting their talk about mental states altogether, they will limit it to certain topics and will distort communication of them. It seems that children who are exposed to more complex, appropriate, attribution making by virtue of their parents being more mind-minded might develop more complex meaning making mechanisms of their own. It may be that children of less mind-minded parents may need to restrict their conversations about mental states in order to make them acceptable to caregivers. Thus, because they never experience open, flexible communication about mental states children of less mind-minded parents learn to mistrust internal states as governors of behaviour.

A child's ongoing relationship with their parents may also be related to parental MM. In terms of attachment, Bowlby (1969) argued that around age 5 a 'goal-corrected partnership' is established. This relies on an understanding on the part of the child that the attachment figure's goals and motives can differ from those of their own. Children

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of less mind-minded parents, we would expect, would have difficulty considering the mental states of their parents, and this would hinder the development of a goal-corrected relationship in these dyads.

It is possible to hypothesise that MM might be applicable throughout the development of the child. Although, Meins et al. (2003) found that early MM was more important than concurrent MM with respect to children's mentalising abilities, other developmental capacities may be related to parents' MM at later ages. Allen and Land (1999) argue that the central task of sensitive parenting of a teenager is to provide an emotional secure base from which the individual can explore a wide range of emotional states when he or she is learning to live independently. This is comparable with the idea of Grossmann, Grossmann, and Zimmerman (1999) that the adult equivalent of 'freedom to explore' is 'freedom to evaluate experiences'. It seems that the ability to serve as a secure base for *mental exploration* would be more likely among parents with a proclivity to treat their offspring as individuals with minds of their own. This could be related to the ability to produce a coherent narrative in the AAI. Future research could investigate this proposal by assessing parents and their children in the AAI procedure, evaluating parental MM, and determining the ability of the parent to act as a secure base from which the adolescent can explore his or her mental states.

8.5: Future Directions for Research

If parental MM promotes mental state understanding in children, one direction for future research is to consider whether children of more mind-minded parents are more mind-minded themselves. Studies may investigate whether children of parents who were more mind-minded towards them in infancy later describe their friends in more mentalistic terms, or perhaps comment appropriately on the putative mental states of their younger siblings in interaction with them.

It would also be interesting to consider MM in parents of older children. To date MM has only been considered in children of up to 48 months of age (Meins, Fernyhough, Wainwright, Clark-Carter et al., 2003). It is possible that the concept is also applicable with older children and teenagers. Different methods of assessment would need to be developed since mental states are more transparent beyond infancy. The outcomes with which parental MM may be associated at later ages include the capacity of the child themselves to be mind-minded, as discussed above.

It is also interesting to ask whether, as well as the differences between secure and insecure groups, we should expect to see differences between the insecure groups themselves. Specifically, it has been proposed (Meins, 1999) that what we should expect to find is that parents of avoidant infants, and presumably dismissing parents too, make a smaller proportion of comments with respect to the mental states of their infant. Parents of resistant infants, it is argued, and presumably preoccupied parents also, make a greater proportion of inappropriate comments. The present sample was too small to investigate these differences. Research on a larger sample is required to investigate these differences further.

Meins (1999) made no predictions with respect to disorganised infants and in this current study the sample was too small to determine whether any consistent pattern of results emerged with respect to them, or unresolved parents. It may be that, as with sensitivity, MM predicts security (vs. insecurity) rather than organisation (vs. disorganisation). Frightened/frightening behaviour seems to be the most important precursor of disorganisation at present (Hesse and Main, 1999). Hesse and Main have proposed that parents exhibit frightened or frightening behaviours when they are in an altered state, brought about by unintegrated memories of a loss or trauma. It is possible that parents may show impairments in MM when they are in such states, i.e.,

dissociating. Future research with a large sample is needed to investigate this possibility.

One further issue considered in this study was the re-definition of the AAI in terms of reflective functioning. The evidence from this study adds to the existing research that suggesting that they are separate but highly related constructs (Fonagy et al., 1991). One problem that persists is that the studies linking the RF to the Strange Situation, or the AAI, to date have not been blind (Hesse, 1999). It is difficult to score RF blind from AAI transcripts when to be trained in RF requires training with the AAI. It also remains to be seen whether the AAI is the best context in which to assess RF. It is possible that RF is a more useful concept than the AAI, however, further research is necessary.

Future research could also give greater consideration to the relevant information from the Adult Attachment Interview with respect to parental representations of the child. In the protocol there are a number of questions pertaining to a real or imagined child. At present this information is used only to classify those who express a 'fear of loss' of the child, which is a subtype of the dismissing classification. However, parental responses to these questions may reveal much more about their representations of their infant, particularly prior to the birth. Since there was a lack of relations between some of the antenatal attachment measures used in this study and other variables, and concerns about the convergent validity of the antenatal MM measures, this may be a useful task for future research.

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Maternal Antenatal Attachment Scale

1. Over the past two weeks I have thought about, or been preoccupied with the baby inside me:
   - ❑ Almost all of the time
   - ❑ Very frequently
   - ❑ Frequently
   - ❑ Occasionally
   - ❑ Not at all

2. Over the past two weeks when I have spoken about, or thought about the baby inside me I got emotional feelings which were:
   - ❑ Very weak or non-existent
   - ❑ Fairly weak
   - ❑ In between strong and week
   - ❑ Fairly strong
   - ❑ Very strong

3. Over the past two weeks my feelings about the baby inside me have been:
   - ❑ Very positive
   - ❑ Mainly positive
   - ❑ Mixed positive and negative
   - ❑ Mainly negative
   - ❑ Very negative

4. Over the past two weeks I have had the desire to read about or get information about the developing baby. This desire is:
   - ❑ Very weak or non-existent
   - ❑ Fairly weak
   - ❑ Neither strong nor weak
   - ❑ Moderately strong
   - ❑ Very strong

5. Over the past two weeks I have been trying to picture in my mind what the developing baby actually looks like in my womb:
   - ❑ Almost all the time
   - ❑ Very frequently
   - ❑ Frequently
   - ❑ Occasionally
   - ❑ Not at all

6. Over the past two weeks I think of the developing baby mostly as:
   - ❑ A real little person inside me with special characteristics
   - ❑ A baby like any other baby
   - ❑ A human being
   - ❑ A living thing
   - ❑ A thing not yet really alive

7. Over the past two weeks I have felt the baby inside me is dependent on me for its well-being:
   - ❑ Totally
   - ❑ A great deal
   - ❑ Moderately
   - ❑ Slightly
   - ❑ Not at all

8. Over the past two weeks I have found myself talking to my baby when I am alone:
   - ❑ Not at all
   - ❑ Occasionally
   - ❑ Frequently
   - ❑ Very frequently
   - ❑ Almost all the time I am alone

9. Over the past two weeks I think about (or talk to) my baby inside me, my thoughts:
   - ❑ Are always tender and loving
   - ❑ Are mostly tender and loving
   - ❑ Are a mixture of both tenderness and irritation
   - ❑ Contain a fair bit of irritation
   - ❑ Contain a lot of irritation

10. The picture in my mind of what the baby at this stage looks like inside the womb is:
   - ❑ Very clear
   - ❑ Fairly clear
   - ❑ Fairly vague
   - ❑ Very vague
   - ❑ I have no idea at all

11. Over the past two weeks when I think about the baby inside me, I get feelings which are:
   - ❑ Very sad
   - ❑ Moderately sad
   - ❑ A mixture of happiness and sadness
   - ❑ Moderately happy
   - ❑ Very happy

12. Some pregnant women sometimes get so irritated by the baby inside them that they feel like they want to hurt it or punish it.
- ❑ I couldn't imagine I would ever feel like this
- ❑ I could imagine I might sometimes feel like this, but I never actually have
- ❑ I have felt like this once or twice myself
- ❑ I have occasionally felt like this myself
- ❑ I have often felt like this myself

13. Over the past two weeks I have felt:
- ❑ Very emotionally distant from my baby
- ❑ Moderately emotionally distant from my baby
- ❑ Not particularly emotionally close to my baby
- ❑ Moderately close emotionally to my baby
- ❑ Very close emotionally to my baby

14. Over the past two weeks I have taken care with what I eat to make sure the baby gets a good diet:
- ❑ Not at all
- ❑ Once or twice when I ate
- ❑ Occasionally when I ate
- ❑ Quite often when I ate
- ❑ Every time I ate anything

15. When I first see my baby after the birth I expect I will feel:
- ❑ Intense affection
- ❑ Mostly affection
- ❑ Dislike about one or two aspects of the baby
- ❑ Dislike about quite a few aspects of the baby
- ❑ Mostly dislike

16. When my baby is born I would like to hold the baby:

- ❑ Immediately
- ❑ After it has been wrapped in a blanket
- ❑ After it has been washed
- ❑ After I have had a rest for an hour or so
- ❑ The next day

17. Over the past two weeks I have had dreams about the pregnancy or baby:

- ❑ Not at all
- ❑ Occasionally
- ❑ Frequently
- ❑ Very frequently
- ❑ Almost every night

18. Over the past two weeks I have found myself feeling, or rubbing with my hand, the outside of my stomach where the baby is:

- ❑ A lot of times each day
- ❑ At least once per day
- ❑ Occasionally
- ❑ Once only
- ❑ Not at all

19. If the pregnancy was lost at this time (due to miscarriage or other accidental event) without any pain or injury to myself. I expect I would feel:

- ❑ Very pleased
- ❑ Moderately pleased
- ❑ Neutral (i.e. neither sad nor pleased; or mixed feelings)
- ❑ Moderately sad
- ❑ Very sad

Paternal Antenatal Attachment Scale

1. Over the past two weeks I have thought about, or been preoccupied with the developing baby:
   - ❏ Almost all of the time
   - ❏ Very frequently
   - ❏ Frequently
   - ❏ Occasionally
   - ❏ Not at all

2. Over the past two weeks when I have spoken about, or thought about the developing baby I got emotional feelings which were:
   - ❏ Very weak or non-existent
   - ❏ Fairly weak
   - ❏ In between strong and weak
   - ❏ Fairly strong
   - ❏ Very strong

3. Over the past two weeks my feelings about the developing baby have been:
   - ❏ Very positive
   - ❏ Mainly positive
   - ❏ Mixed positive and negative
   - ❏ Mainly negative
   - ❏ Very negative

4. Over the past two weeks I have had the desire to read about or get information about the developing baby. This desire is:

- ❑ Very weak or non-existent
- ❑ Fairly weak
- ❑ Neither strong nor weak
- ❑ Moderately strong
- ❑ Very strong

5. Over the past two weeks I have been trying to picture in my mind what the developing baby actually looks like in my wife's womb:

- ❑ Almost all the time
- ❑ Very frequently
- ❑ Frequently
- ❑ Occasionally
- ❑ Not at all

6. Over the past two weeks I think of the developing baby mostly as:

- ❑ A real little person with special characteristics
- ❑ A baby like any other baby
- ❑ A human being
- ❑ A living thing
- ❑ A thing not yet really alive

7. Over the past two weeks when I think about the developing baby my thoughts:

- ❑ Are always tender and loving
- ❑ Are mostly tender and loving
- ❑ Are a mixture of both tenderness and irritation
- ❑ Contain a fair bit of irritation
- ❑ Contain a lot of irritation

8. Over the past two weeks my ideas about possible names for the baby have been:
   - ❑ Very clear
   - ❑ Fairly clear
   - ❑ Fairly vague
   - ❑ Very vague
   - ❑ I have no idea at all

9. Over the past two weeks when I think about the developing baby I get feelings which are:
   - ❑ Very sad
   - ❑ Moderately sad
   - ❑ A mixture of happiness and sadness
   - ❑ Moderately happy
   - ❑ Very happy

10. Over the past two weeks I have been thinking about what kind of child the baby will grow into:
   - ❑ Not at all
   - ❑ Occasionally
   - ❑ Frequently
   - ❑ Very frequently
   - ❑ Almost all the time

11. Over the past two weeks I have felt:
   - ❑ Very emotionally distant from the baby
   - ❑ Moderately emotionally distant from the baby
   - ❑ Not particularly emotionally close to the baby
   - ❑ Moderately close emotionally to the baby
   - ❑ Very close emotionally to the baby

12. When I first see the baby after the birth I expect I will feel:
    - ❑ Intense affection
    - ❑ Mostly affection
    - ❑ Affection, but I expect there may be a few aspects of the baby I will dislike
    - ❑ I expect there may be quite a few aspects of the baby I will dislike
    - ❑ I expect I might feel mostly dislike

13. When the baby is born I would like to hold the baby:
    - ❑ Immediately
    - ❑ After it had been wrapped in a blanket
    - ❑ After it has been washed
    - ❑ After a few hours for things to settle down
    - ❑ The next day

14. Over the past two weeks I have had dreams about the pregnancy or baby:
    - ❑ Not at all
    - ❑ Occasionally
    - ❑ Frequently
    - ❑ Very frequently
    - ❑ Almost every night

15. Over the past two weeks I have found myself feeling, or rubbing with my hand, the outside of my wife's stomach where the baby is:
    - ❑ A lot of times each day
    - ❑ At least once per day
    - ❑ Occasionally
    - ❑ Once only
    - ❑ Not at all

16. If the pregnancy was lost at this time (due to miscarriage or other accidental event) without any pain or injury to my wife, I would expect to feel:
    - ❑ Very pleased
    - ❑ Moderately pleased
    - ❑ Neutral (i.e. neither sad nor pleased; or mixed feelings)
    - ❑ Moderately sad
    - ❑ Very sad

Appendix 3

Antenatal MM Reliability

	General	Physical	Behavioural	Mentalistic	Total
General	2	0	4	0	6
Physical	0	1	0	0	1
Behavioural	0	0	15	1	16
Mentalistic	0	0	1	10	11
Total	2	1	20	11	34

Kappa =   total agreements – total expected

           Number of observations – total expected

Total expected:

General = (2 x 6) / 34 = 12/34 = 0.35

Physical = (1 x 1) / 34 = 1/34 = 0.03

Behavioural = (20 x 16) / 34 = 320/34 = 9.41

Mentalistic = (11 x 11) / 34 = 121/34 = 3.56

= 13.35

Kappa = 30 – 13.35

           34 – 13.35

Kappa = 0.81

AAI

We are asking parents-to-be about the way that they feel the kind of parenting they had in childhood has had an effect on them as potential parents. I would like to ask you about your early relationships with your family but also a bit about your later years.

1. Could you start by helping me get oriented to your early family situation, and where you lived and so on? If you could start out with where you were born, whether you moved around much, what your family did at various times for a living?

   (*Only use the following probe if you feel they have not given enough information*)
   Did you see much of your grandparents when you were little?

   (*Only use the following probes if you feel they have not given enough information*)
   Were there brothers and sisters living in the house, or anyone besides your parents? Are they living nearby now? Or is your family pretty scattered?

2. I'd like you to try to describe your relationship with your parents as a young child...if you could start from as far back as you can remember?
   (*from age 5, if possible, up to age 12, indicate that difficulty in remembering at first is natural*)

3. Now I'd like you to choose 5 adjectives that reflect your childhood relationship with your mother. I know this may take a bit of time, so go ahead and think for a minute.
   (*write adjectives down*)

Okay, now let me go through some more of my questions about your description.

(For each adjective in turn use the following probe)

You say she was….are there any memories or incidents that come to mind with respect to her being…?

4. <u>Now I'd like you to choose 5 adjectives that reflect your childhood relationship with your father.</u>

    (For each adjective in turn use the following probe)

    You say he was….are there any memories or incidents that come to mind with respect to him being…?

    (If you feel they have already answered the next question say "I think I know the answer to the next question, but I'd like to ask it briefly anyway")

5. <u>To which parent did you feel the closest when you were a child, and why?</u>
    (Let them answer this part of the question before moving on to the next part)
    Why wasn't there this feeling with the other parent?

6. <u>When you were emotionally upset as a child, what would you do?</u>
    (Let them answer before moving on)
    Are there any memories or incidents that come to mind?

    <u>When you were hurt physically as a child, what would you do?</u>
    (Let them answer before moving on)
    Are there any memories or incidents that come to mind?

    <u>When you were ill as a child, what would happen?</u>
    (Let them answer before moving on)
    Are there any memories or incidents that come to mind?

7. <u>What is the first time you remember being separated from your parents?</u>

(Allow them to answer this part before moving on)

How did you respond? How did they respond?

(Allow them to answer this part before moving on)

Are there any other separations that stand out in your mind?

8. <u>Did you ever feel rejected as a young child? Of course, looking back on it now, you may realize it was not really rejection, but what I am trying to ask here is whether you remember ever having felt rejected in childhood.</u>

(Let them answer this part before moving on)

How old were you when you first felt this way? What did you do?

(Let them answer this part before moving on)

Why do you think your parent/s did those things – do you think they were really rejecting you?

9. <u>Were your parents ever threatening with you in any way, maybe for discipline, or maybe just jokingly?</u>

Some parents have told us, for example, that there parents would threaten to leave them or send them away from home. Did anything like this ever happen to you?

(Let them answer this before moving on to probes)

(If they answer yes, ask each probe separately and allow time for an answer before moving on)

How old were you at the time?

Did it happen frequently?

Do you feel this experience affects you now as an adult?

Do you think it will influence your approach to your own child?

Some people have memories of some kind of behaviour that was abusive.
Did anything like that ever happen to you or in your family?
(If they answer yes, ask each probe separately and allow time to answer before moving on)
How old were you at the time?
Did it happen frequently?
Do you feel this experience affects you now as an adult?
Do you think it will influence your approach to your own child?

Are there any other experiences that you feel were traumatic and that you wish to mention?
(If they answer yes, ask each probe separately and allow time to answer before moving on)
How old were you at the time?
Did it happen frequently?
Do you feel this experience affects you now as an adult?
Do you think it will influence your approach to your own child?

10. <u>How do you think all of the experiences with your parents that you have talked about have affected your adult personality?</u>
(Let them answer this before moving on)
Are there any aspects to your early experiences that you feel were a set-back in your development?

11. <u>Why do you think your parents behaved as they did during your childhood?</u>

12. <u>Were there any other adults with whom you were close as a child?</u>

13. <u>Did you experience the loss of a parent or other close loved one (sibling, etc) while you were a young child?</u>

(Allow them to answer this before moving on to probes)

(Ask each probe separately allowing time for an answer before moving on)

(Only ask probes if the information is not volunteered)

Could you tell me about the circumstances?

Was the death sudden or expected?

How old were you at the time?

How did you respond at the time? Can you recall your feelings at the time?

Were you allowed to attend the funeral? What was this like for you?

Have your feelings regarding this death changed much over time?

(If it was a parent or sibling ask the following probes)

What would you say was the effect on the other people in the house? How did this change over the years?

Would you say this loss has had an effect on your adult personality?

How do you think it might affect your approach to your own child?

13a. <u>Did you lose any other important persons during your childhood?</u>

Could you tell me about the circumstances?

Was sudden or expected?

How old were you at the time ?

How did you respond? Can you recall your feelings at the time?

Were you allowed to attend the funeral? What was that like for you?

Have your feelings regarding this death changed much over time?

(if parent or sibling)

What would you say was the effect on the others in the house?

How did this change over the years?

Would you say this loss has had an effect on your adult personality?

How do you think it may affect your approach to your own child?

13b. Have you lost other close persons, in adult years?

(let them answer before moving on to the probes)

Could you tell me about the circumstances?

Was it sudden or expected?

How old were you at the time?

How did you respond? Can you recall your feelings at the time?

Did you attend the funeral? What was that like for you?

Have your feelings regarding this death changed much over time?

14. Have there been many changes in your relationship with your parents *(or remaining parent)* since childhood? I mean from childhood through until the present.

15. What is your relationship with your parents like for you now as an adult?

16. This is a different type of question, not about your parents but about your child (or an imagined child) How do you feel (how do you think you would feel) when separated from your child?

(If no worries about child are mentioned ask)
Do you ever feel worried about your child?

17. <u>If you had 3 wishes for your child 20 years from now, what would they be?</u>
    <u>I'm thinking partly of the future you would like to see for your child. I'll</u>
    <u>give you a minute to think about this one.</u>

18. <u>Is there any particular thing that you feel you learned above all from your</u>
    <u>own childhood experiences?</u>
    (*Let them answer this part of the question before moving on to the next part*)

    <u>What would you hope your child might learn from their experiences of being</u>
    <u>parented by you?</u>

AAI Reliability

	Dismissing	Secure	Preoccupied	Unresolved	Total
Dismissing	4	0	0	0	4
Secure	2	11	1	0	14
Preoccupied	0	1	2	0	3
Unresolved	0	0	0	2	2
Total	6	12	3	2	23

Kappa =   total agreements – total expected

number of observations – total expected

Total expected:

Ds = (6 x 4) / 23 = 24/23 = 1.04

F = (12 x 14) / 23 = 168/23 = 7.30

E = (3 x 3) / 23 = 9/23 = 0.39

U = (2 x 2) /23 = 4/23 = 0.17

= 8.90

Kappa = 19 – 8.90

23 – 8.90

Kappa = 0.72

Reflective Function Reliability

	One	Three	Five	Seven	Nine	Total
One	1	0	0	0	0	1
Three	0	2	0	0	0	2
Five	0	0	1	1	0	2
Seven	0	0	0	4	0	4
Nine	0	0	0	0	0	0
Total	1	2	1	5	0	9

Kappa = $\dfrac{\text{total agreements} - \text{total expected}}{\text{number of observations} - \text{number expected}}$

Total expected:

One = (1 x 1) / 9 = 1/9 = 0.11

Three = (2 x 2) / 9 = 4/9 = 0.44

Five (1 x 2) / 9 = 2/9 = 0.22

Seven = (5 x 4) / 9 = 20/9 = 2.22

Nine = (0 x 0) / 9 = 0/9 = 0.00

= 2.99

Kappa = $\dfrac{8 - 2.99}{9 - 2.99}$

Kappa = 0.83

Appendix 7

Variable Distributions

Prenatal Variables

Figure 1:

Mothers' Overall Antenatal Comments

Figure 2:

Normal Plot of Maternal Overall Antenatal Comments

Mothers' Overall Antenatal Comments

Number of Comments

Figure 4:

Fathers' Antenatal Comments

Figure 5:

Normal Plot of Fathers Overall Antenatal Comments

Figure 6:

Fathers' Overall Antenatal Comments

Figure 7:

Maternal Mentalistic Comments

Percentage of Mentalistic Comments in Predictions

Figure 8:

Normal Plot of Percentage of Mentalistic Comments Predictions

Boxplot of Maternal Mentalistic Comments

Percentage of Mentalistic Comments Predictions

Paternal Mentalistic Comments

Percentage of Mentalistic Comments
Predictions

Figure 11:

Normal Plot of Percentage of Mentalistic Comments Predictions

Figure 12:

Boxplot of Paternal Mentalistic Comments

Percentage of Mentalistic Comments in Predictions

Figure 13:

Maternal RF

Figure 14:

Paternal RF

Figure 15:

Maternal Education

Figure 16:

Paternal Education

Figure 17:

Maternal AAS Score

Maternal Antenatal Attachment Scale score

Figure 18:

Normal Plot of Maternal Antenatal Attachment Scale score

Figure 19:   *Boxplot of Maternal AAS Scores*

Maternal Antenatal Attachment Scale score
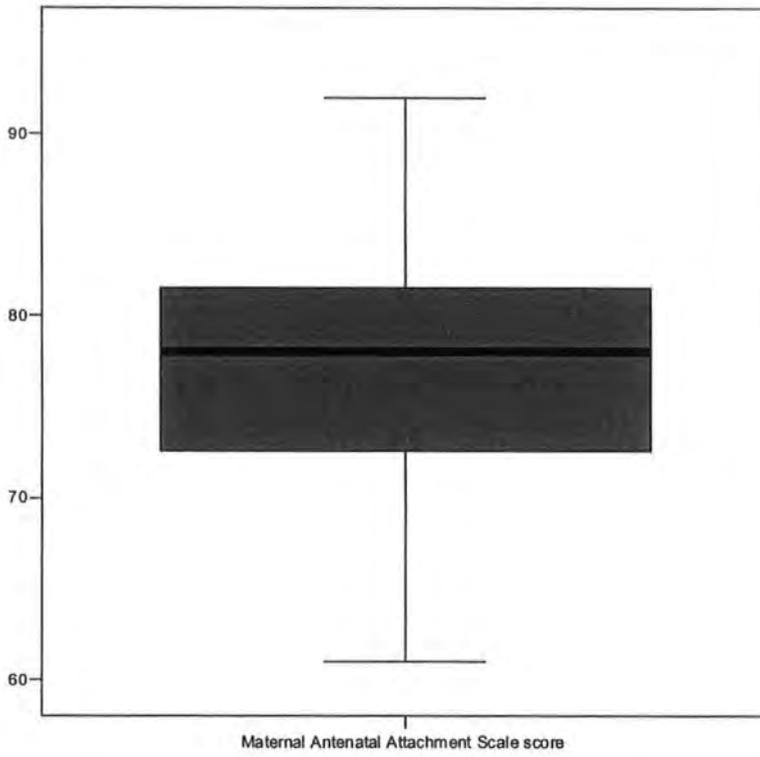
Figure 20:

Paternal PAAS Score

Paternal Antenatal Attachment Scale score

Figure 21:

Normal Plot of Paternal Antenatal Attachment Scale score
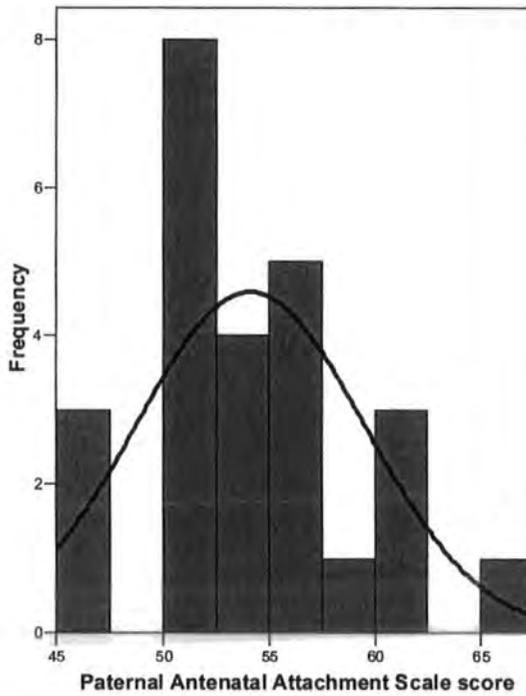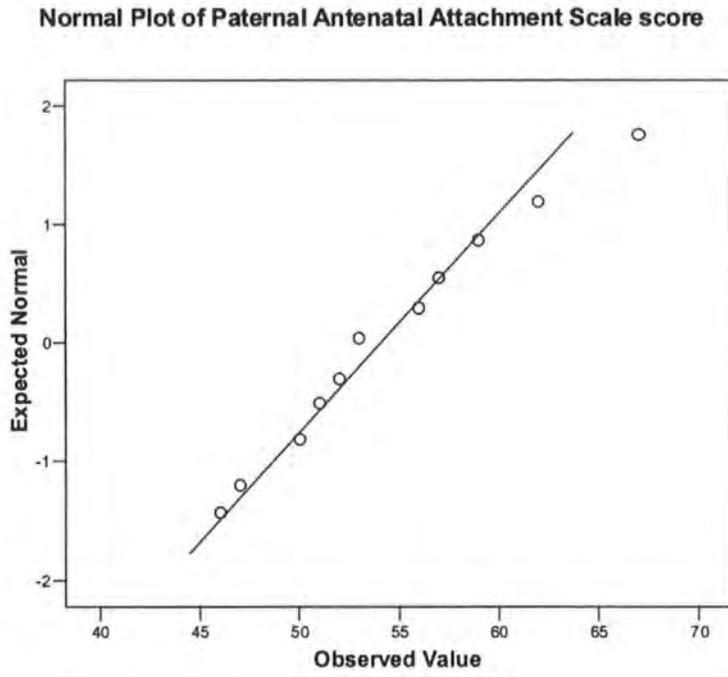
Figure 22:

Boxplot of Paternal AAS Scores

Paternal Antenatal Attachment Scale score

287

Figure 23:

Maternal Appropriate Comments at 6 months
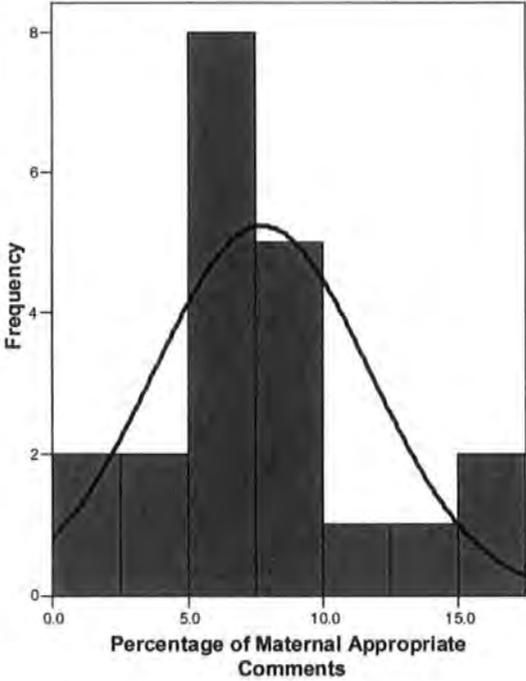
Figure 24:

Normal Plot of Maternal Appropriate Comments
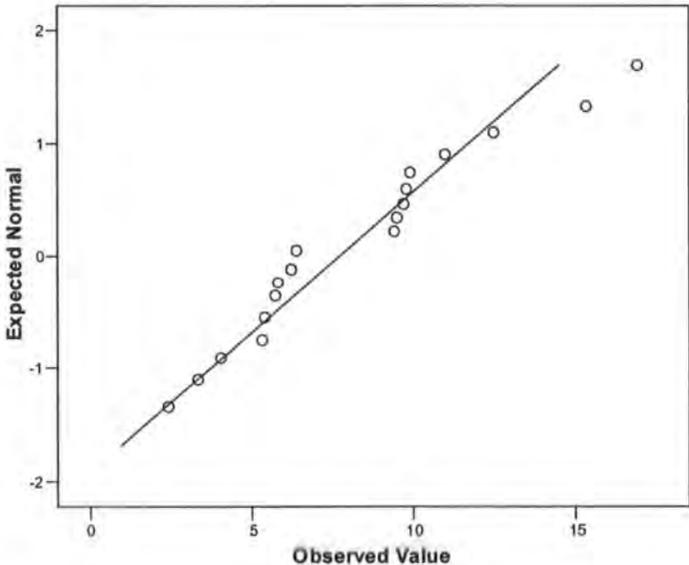
Figure 25:

Percentage of Maternal Appropriate Comments at 6 Months

Percentage of Maternal Appropriate Comments
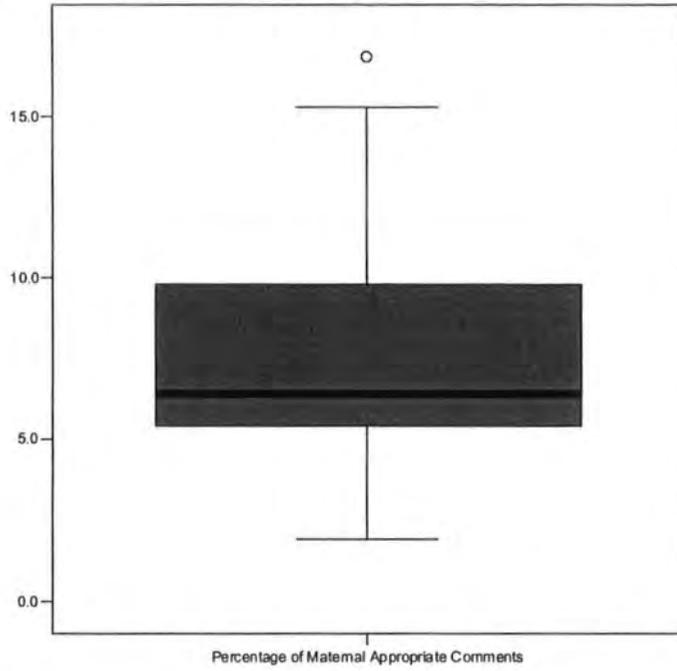
Figure 26:

Paternal Appropriate Comments at 6 months

Percentage of Paternal Appropriate Comments

289

Figure 27:

Normal Plot of Paternal Appropriate Comments
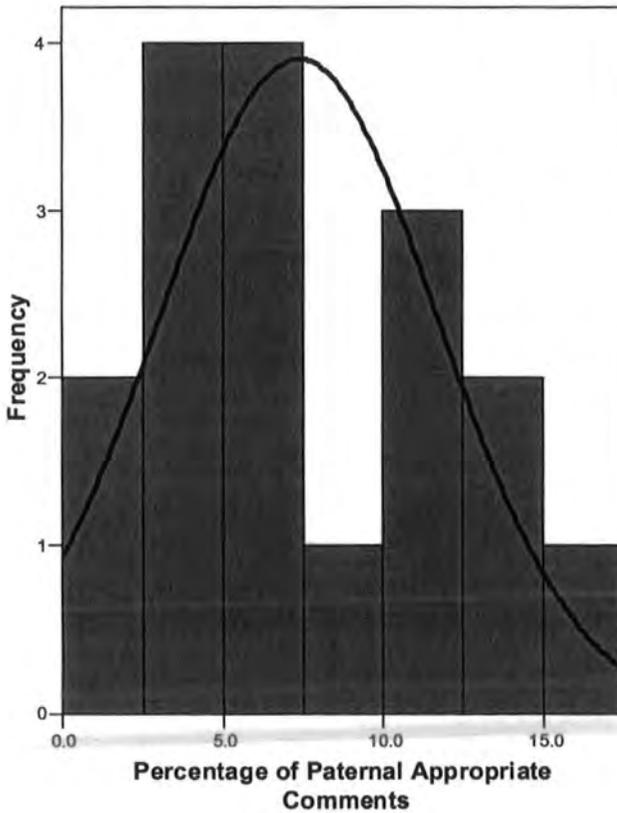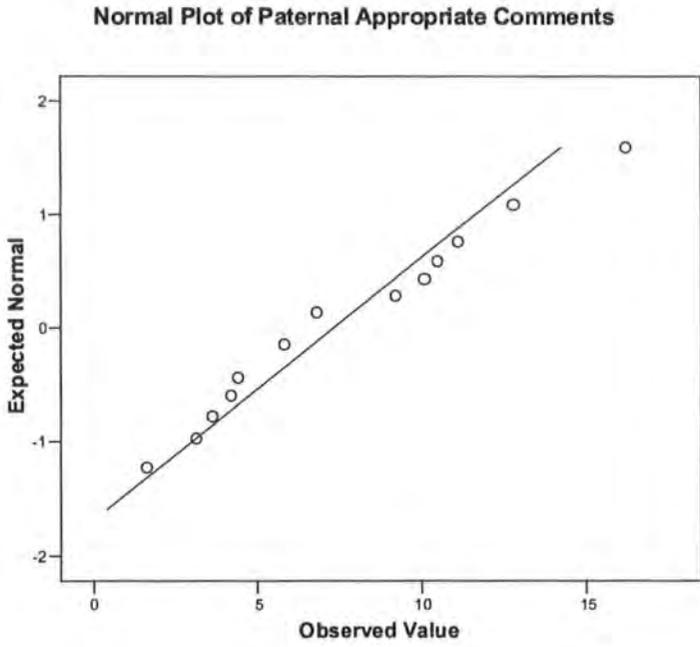
Figure 28:

Percentage of Paternal Appropriate Comments at 6 Months
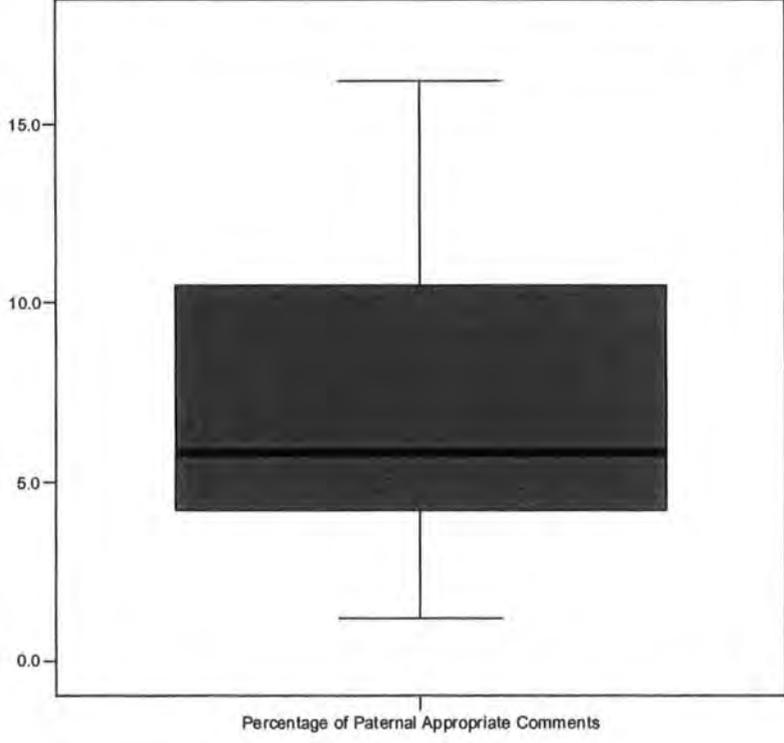
Maternal Inappropriate Comments at 6 months
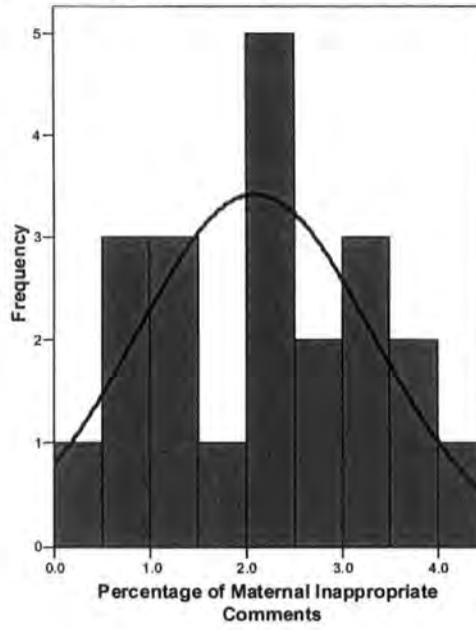
Figure 30:

Normal Plot of Maternal Inappropriate Comments
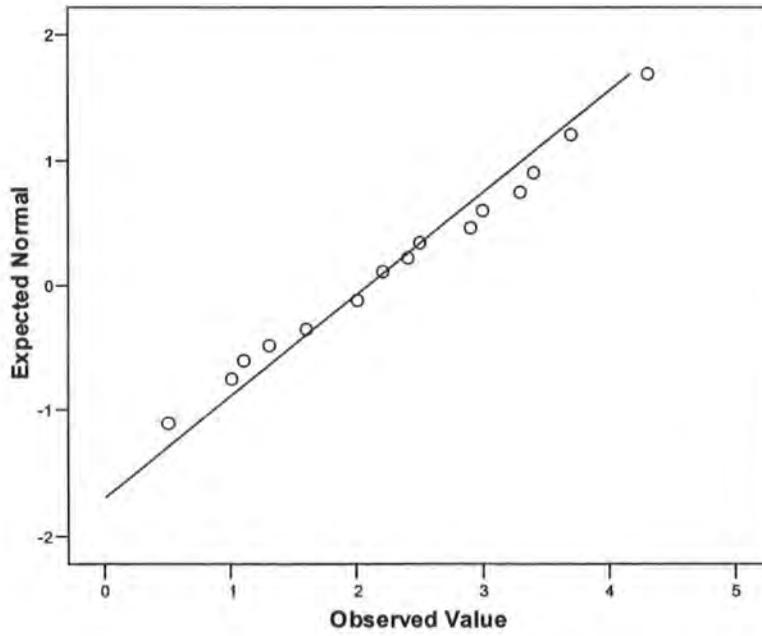
Percentage of Maternal Inappropriate Comments at 6 Months

Percentage of Maternal Inappropriate Comments

Paternal Inappropriate Comments at 6 Months
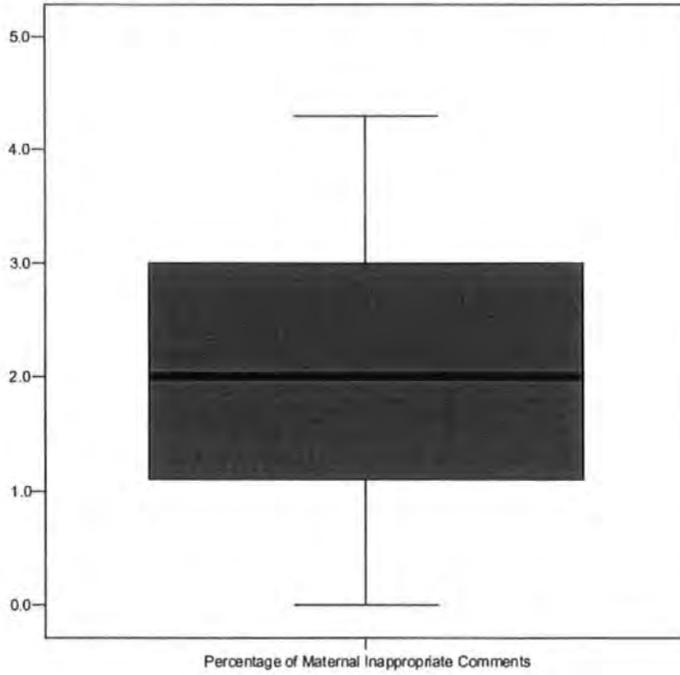
Figure 33:

Normal Plot of Paternal Inappropriate Comments
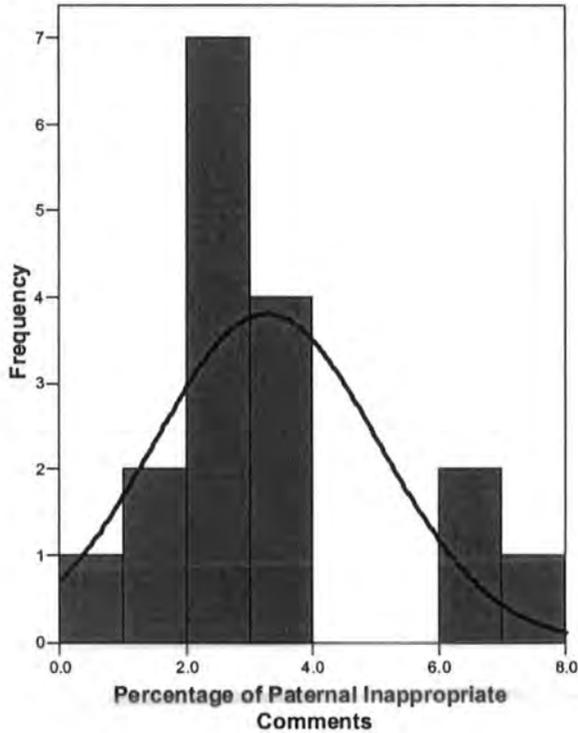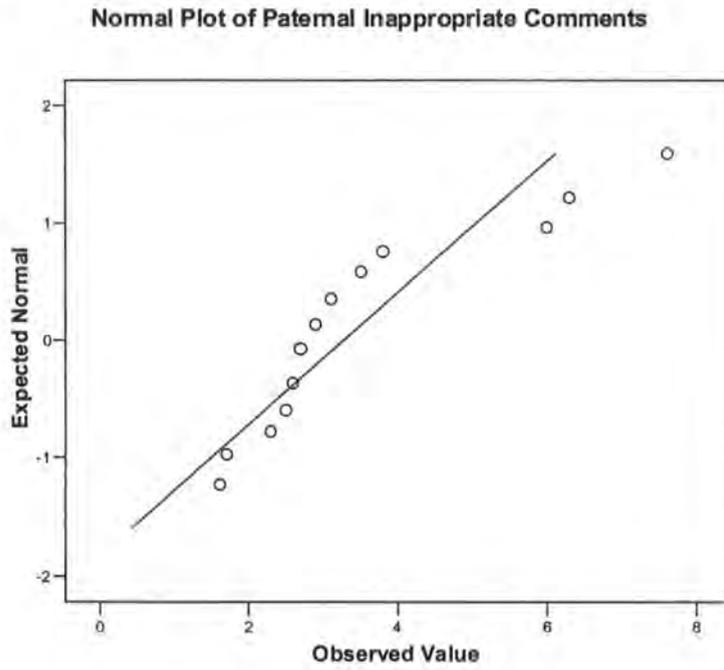
Figure 34:

Percentage of Paternal Inappropriate Comments at 6 Months

Percentage of Paternal Inappropriate Comments

Figure 35:

Maternal Sensitivity Score

Figure 36:

Paternal Sensitivity Scores

Figure 37:

Maternal Depression Score

Figure 38:

Paternal Depression Score
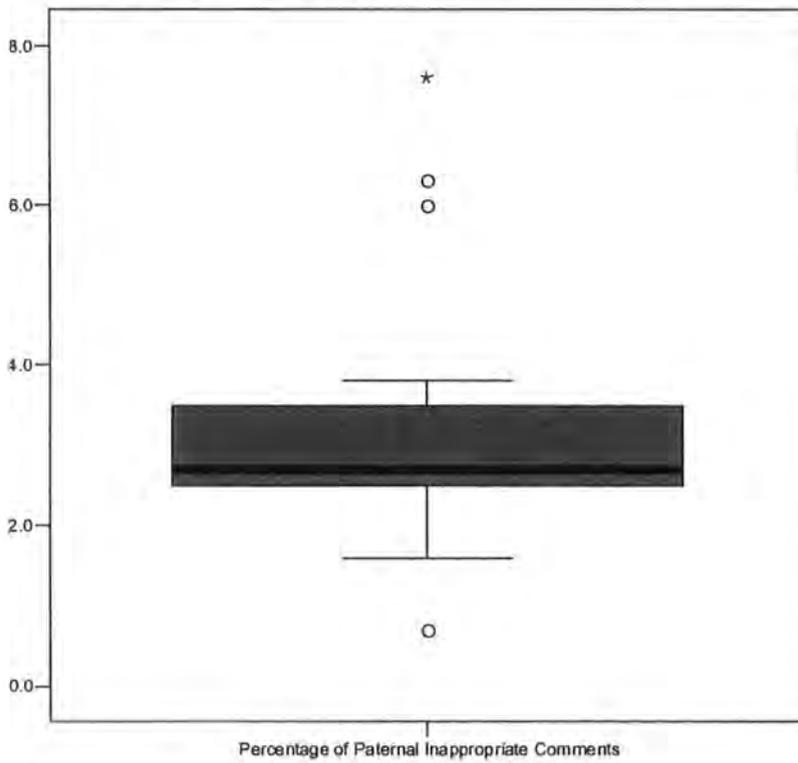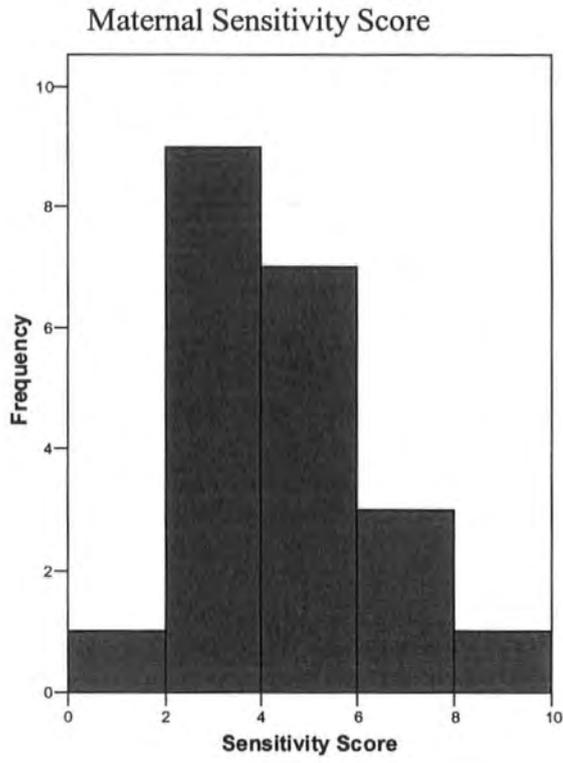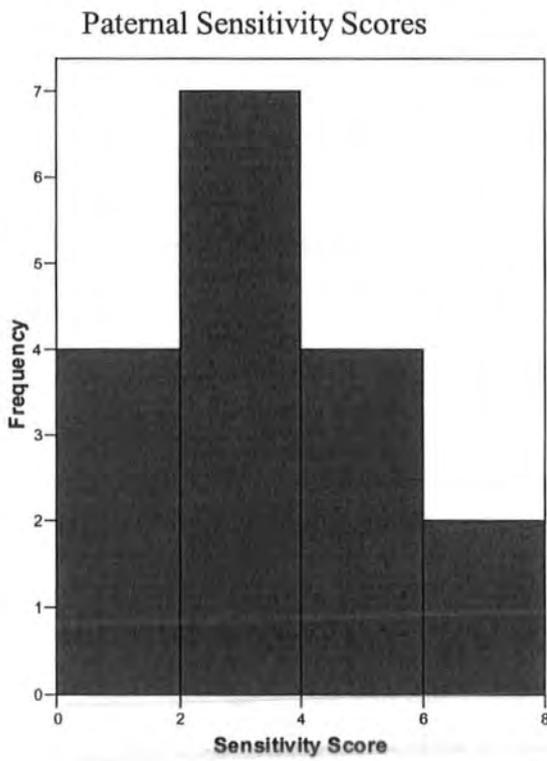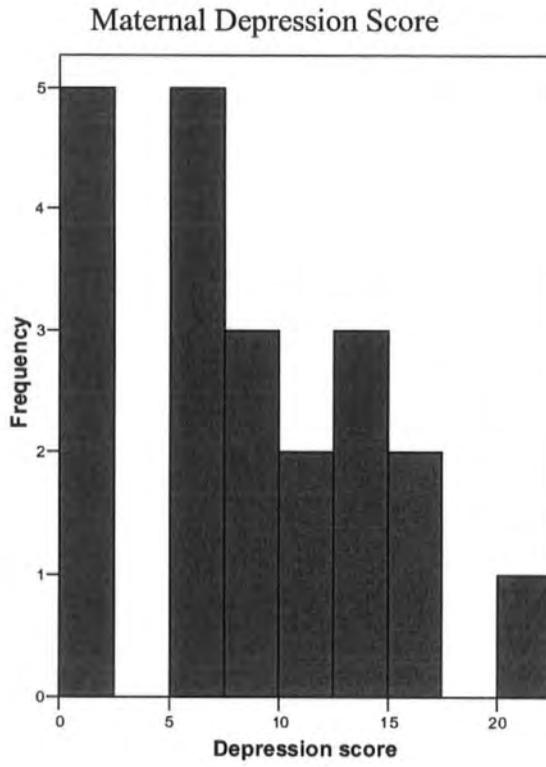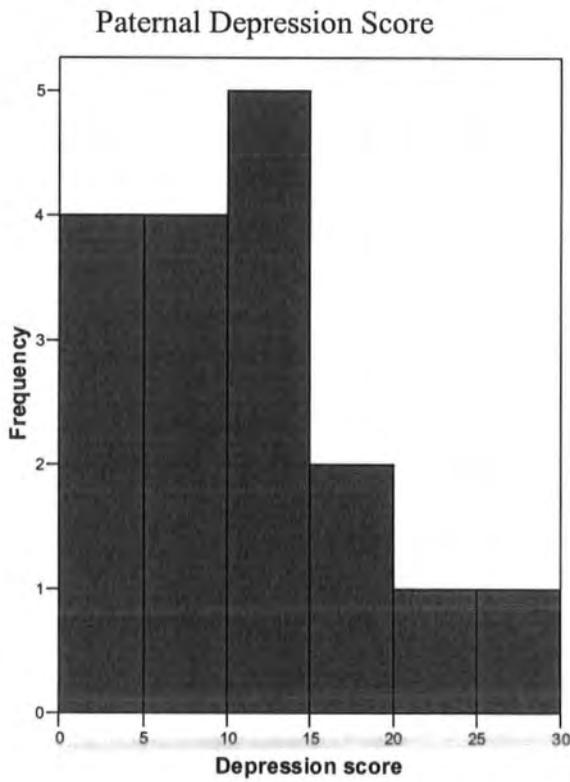
12-15 Months Postnatal Variables

Figure 39:

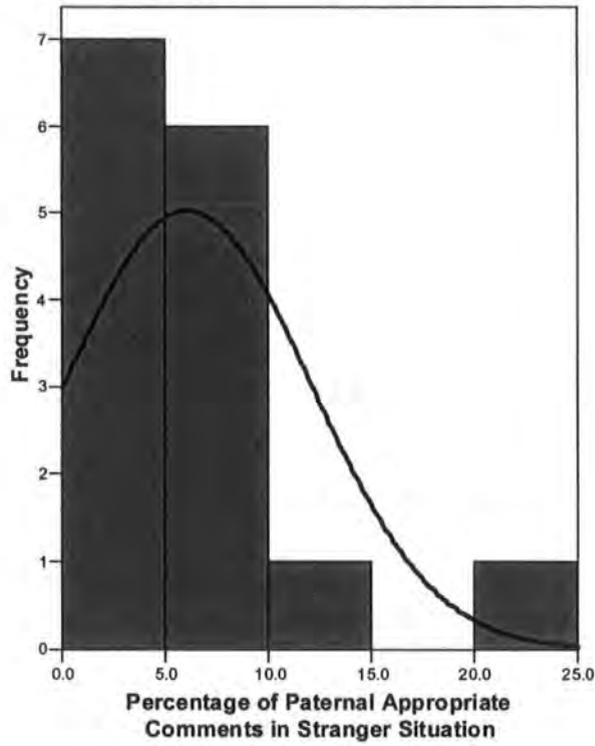Maternal Appropriateness in the Strange Situation
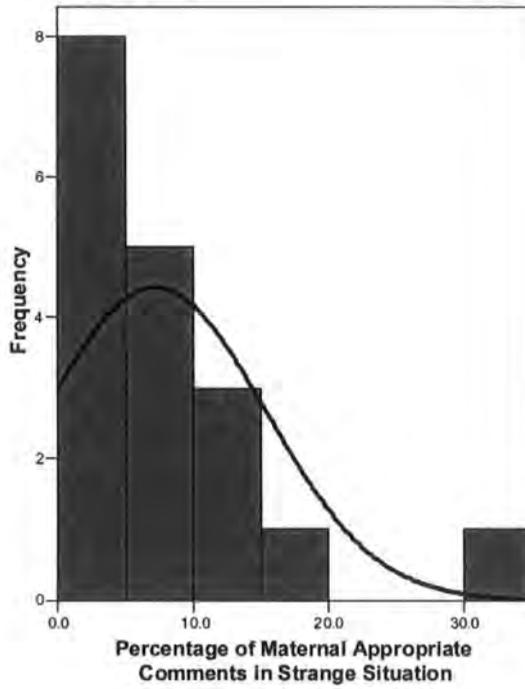
Figure 40:

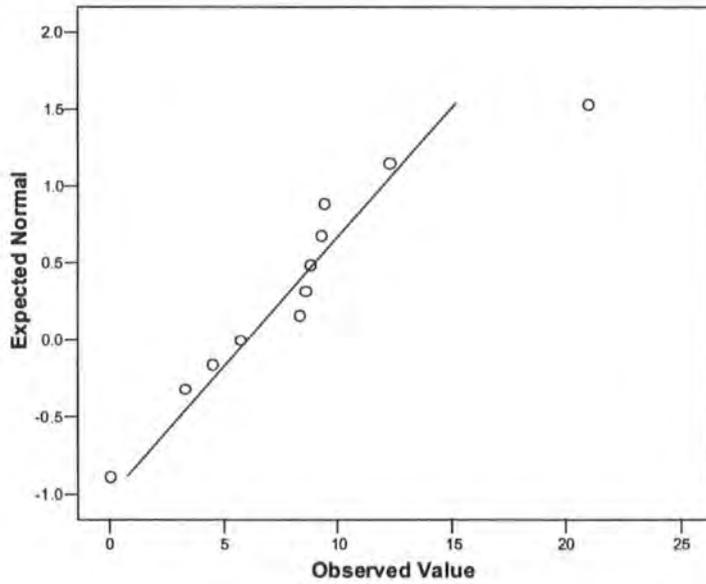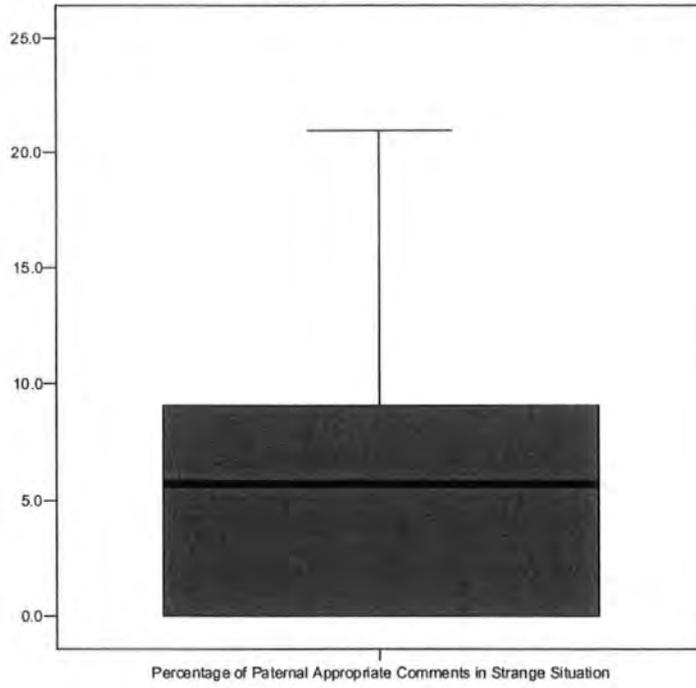**Normal Plot of Maternal Appropriate Comments in Strange Situation**

Boxplot of Maternal Appropriateness
in the Strange Situation

Percentage of Maternal Appropriate Comments in Strange Situation

Maternal Inappropriateness in Strange Situation

**Percentage of Maternal Inappropriate
Comments in Strange Situation**

297
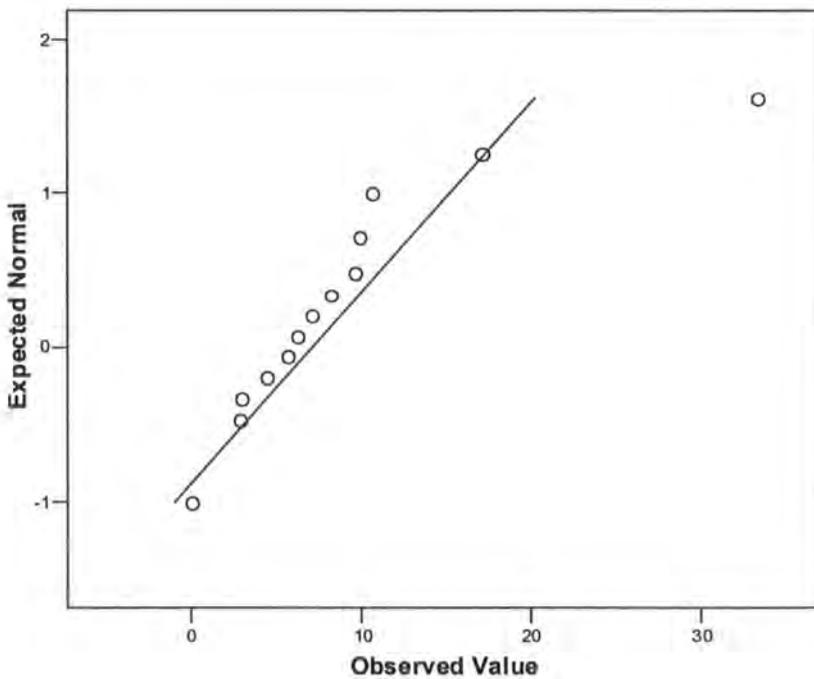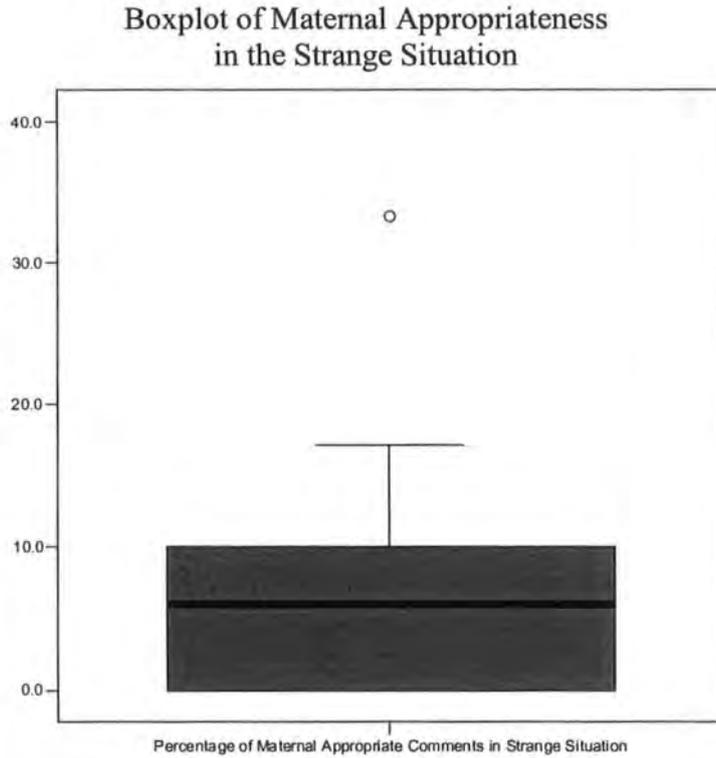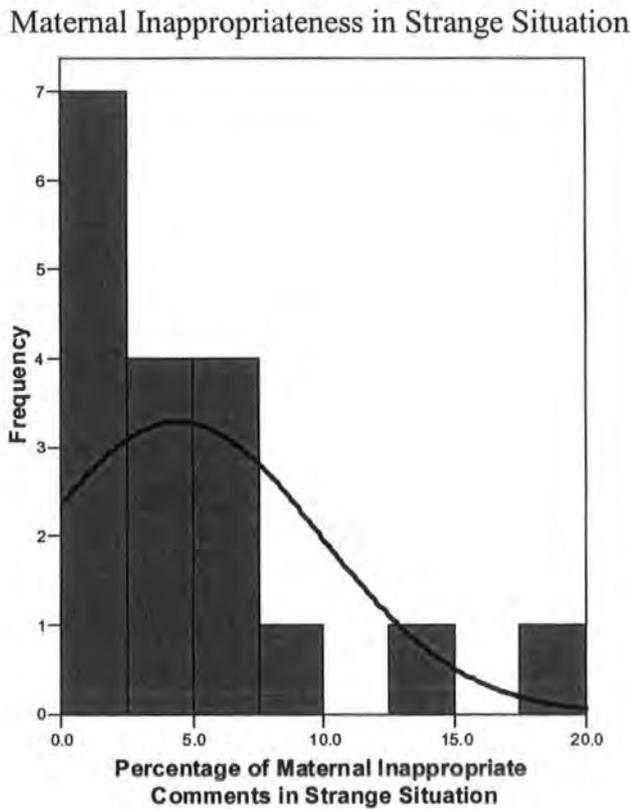
Figure 43:

Normal Plot of Maternal Inappropriate Comments in Strange Situation
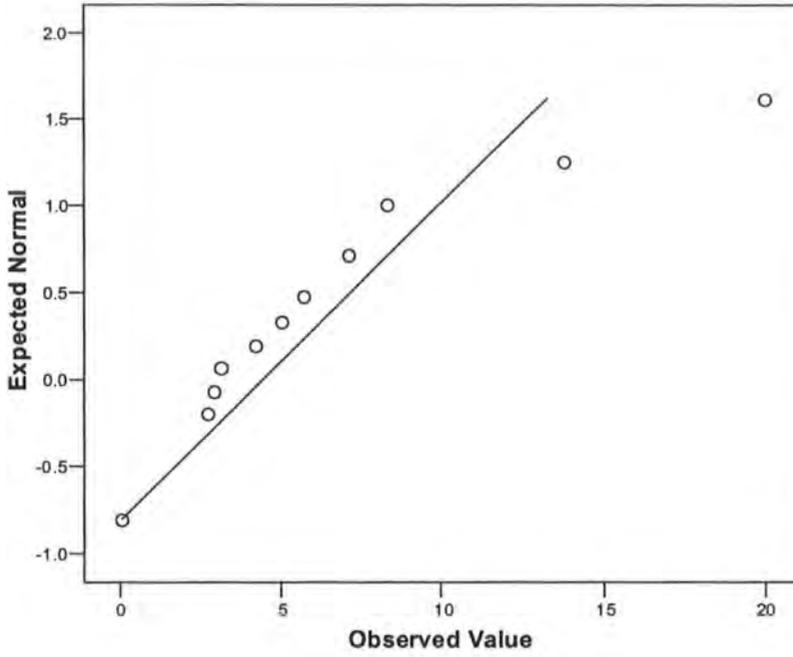
Figure 44:

Boxplot of Maternal Inappropriateness in the Strange Situation
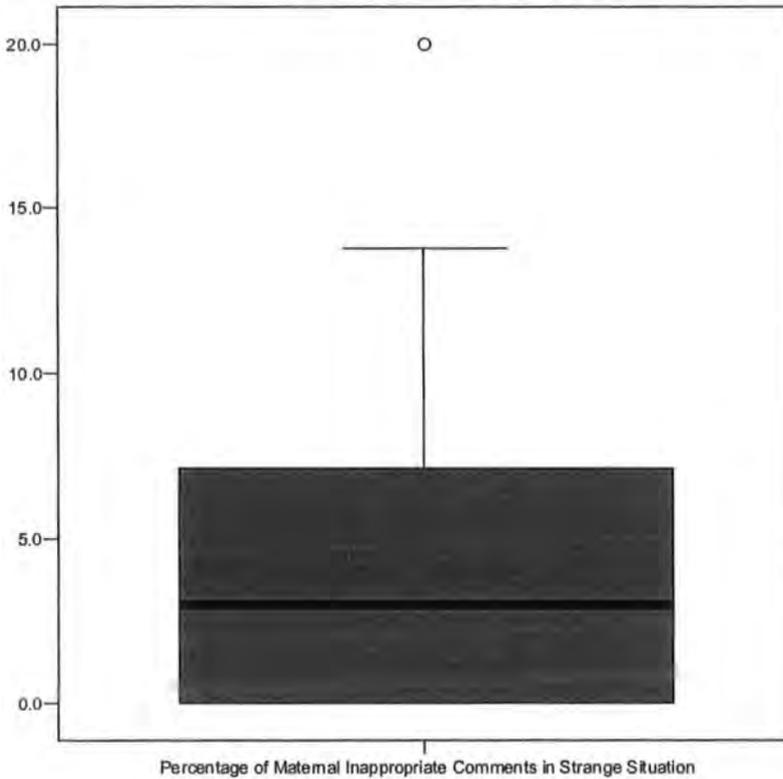
Percentage of Maternal Inappropriate Comments in Strange Situation

Paternal Appropriateness in the Strange Situation

Normal Plot of Paternal Appropriate Comments in Strange Situation

Boxoplot of Paternal Appropriateness in the Strange Situation

Percentage of Paternal Appropriate Comments in Strange Situation

Paternal Inappropriateness in the Strange Situation

Normal Plot of Paternal Inappropriate Comments in Strange Situation

Boxplot of Paternal Inappropriateness
in the Strange Situation

Percentage of Paternal Inappropriate Comments in Strange Situation

Scatterplots

Figure 1:

Scatterplot of Maternal AAS Scores and
Mothers' Overall Number of Comments

Figure 2:

Concordance Scatterplot of Maternal
and Paternal AAS Scores

Concordance Scatterplot of Maternal and Paternal Antenatal Predictions

Scatterplot of Paternal AAS Scores and Fathers' Overall Number of Comments

Figure 5:

Concordance Scatterplot of Appropriateness at 6 months

Figure 6:

Concordance Scatterplot of Inappropriateness at 6 Months
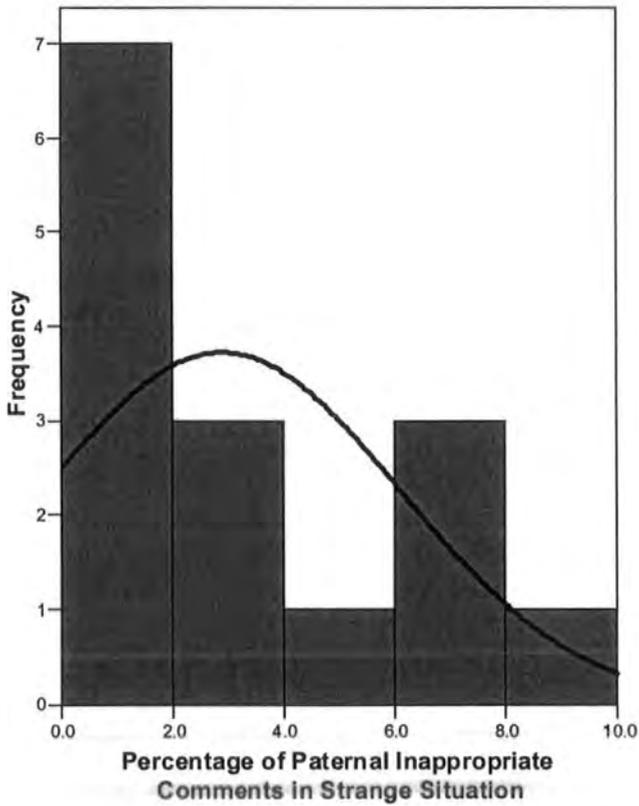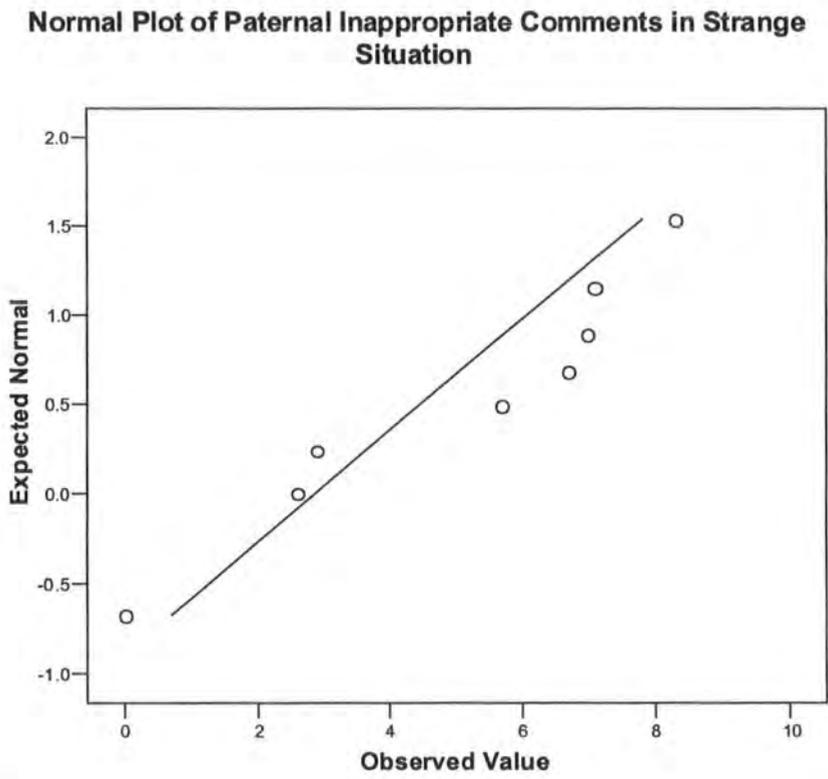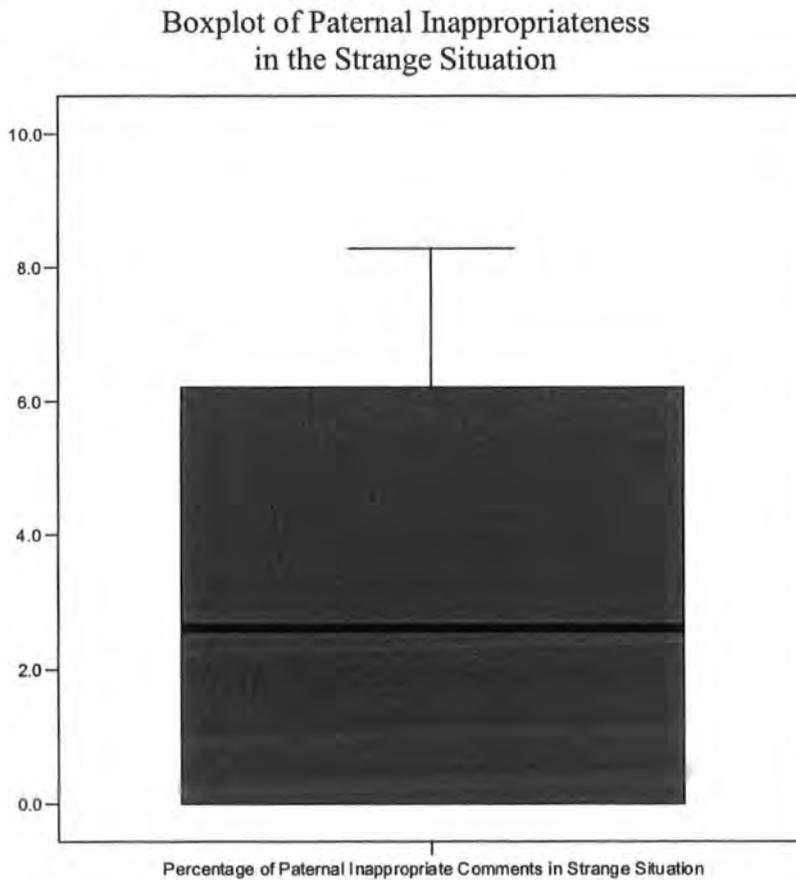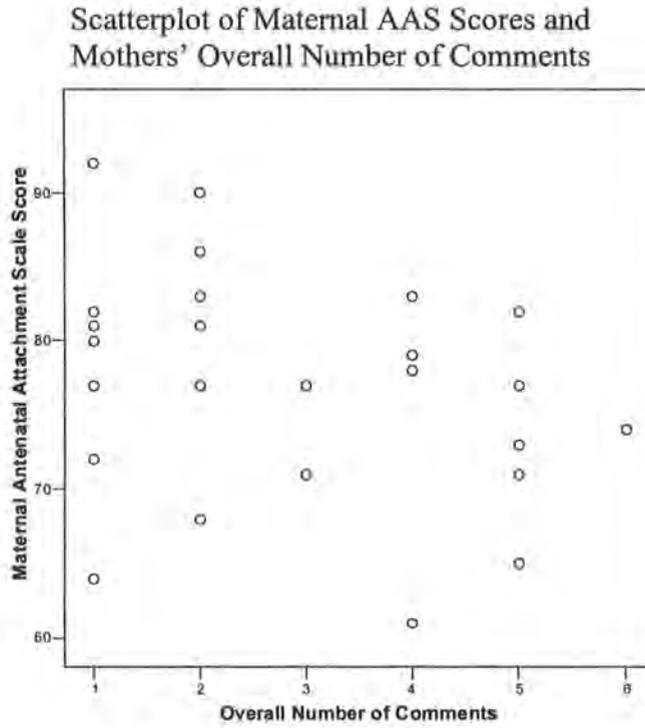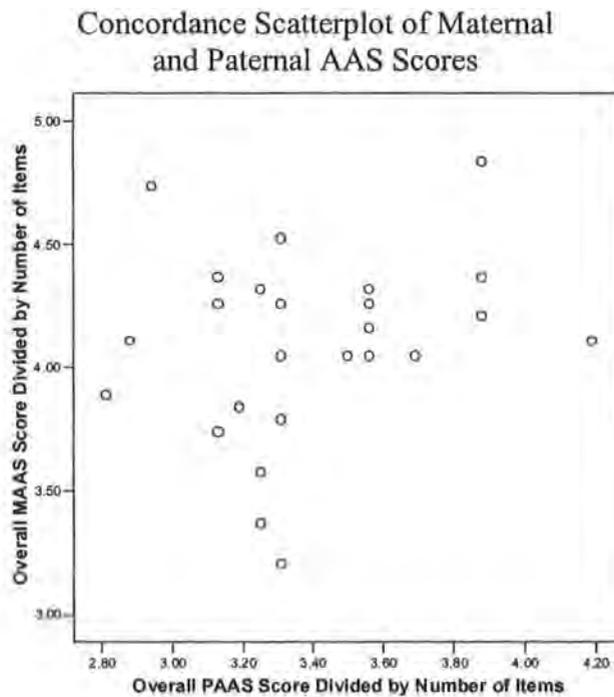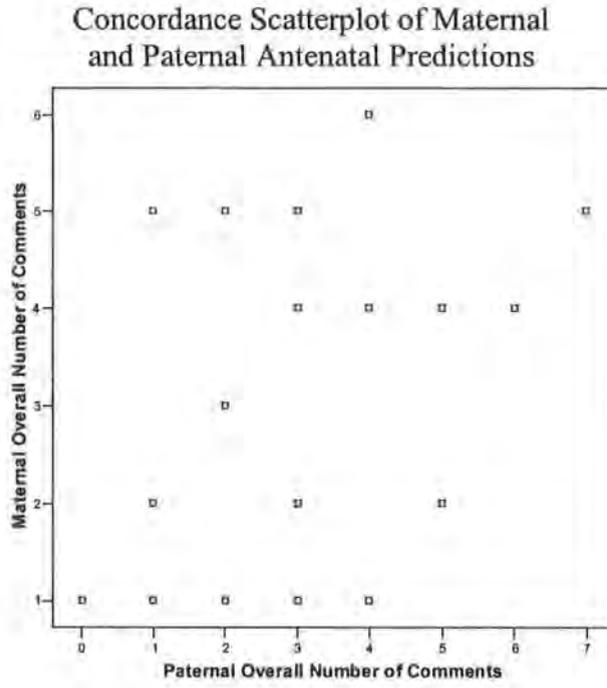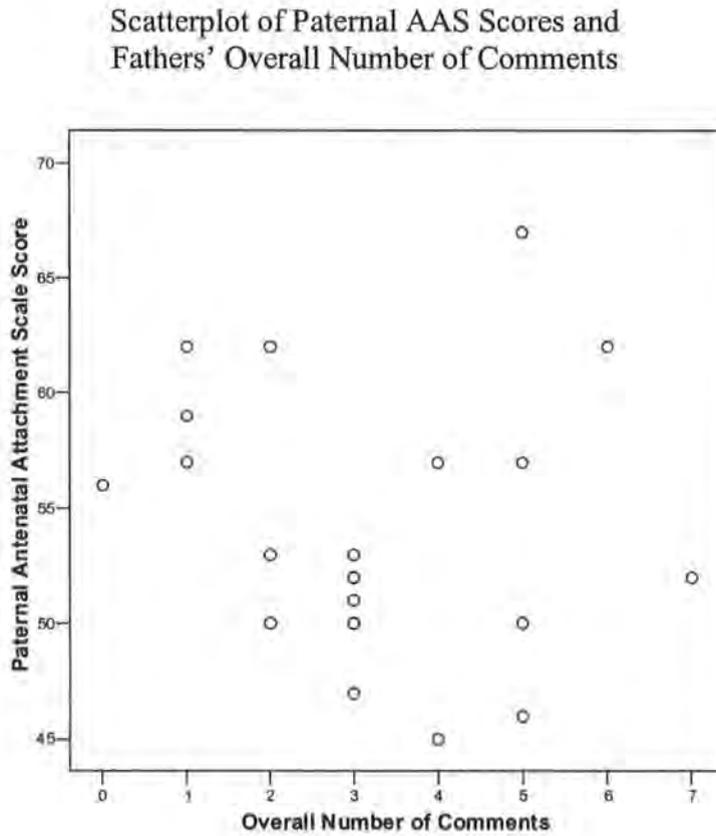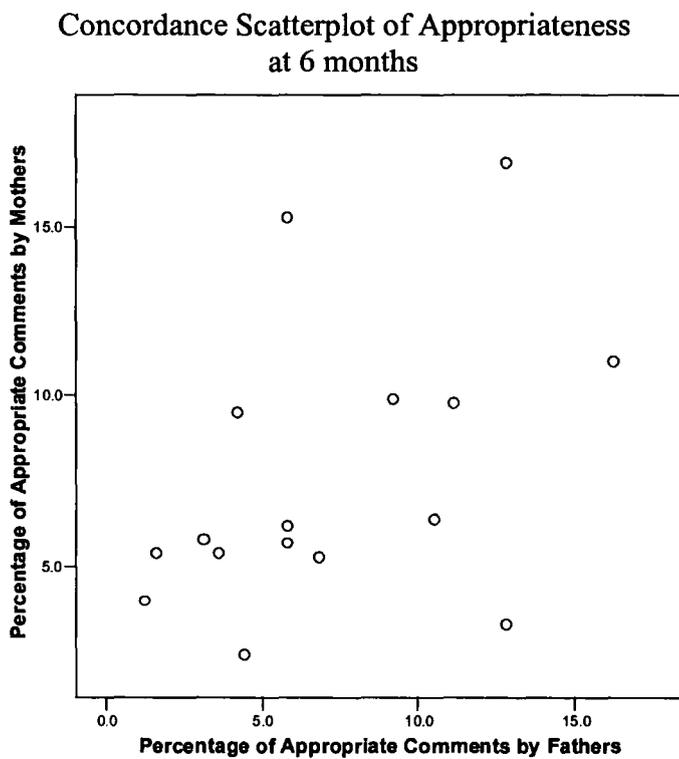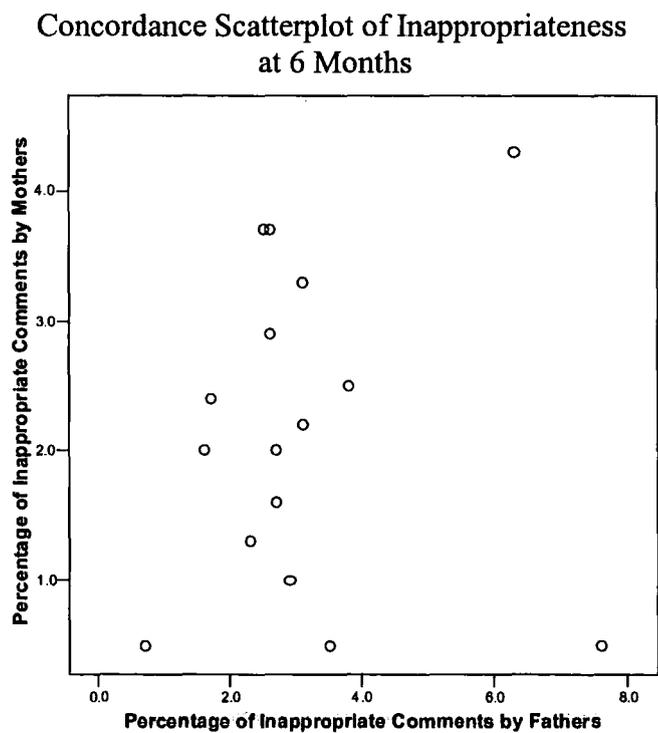
6 Month MM Reliability

	Appropriate	Inappropriate	Total
Appropriate	155	9	164
Inappropriate	7	50	57
Total	162	59	221

Kappa = $\dfrac{\text{total agreements} - \text{total expected}}{\text{number of observations} - \text{total expected}}$

Total expected:

Appropriate = (162 x 164) / 221 = 26,568/221 = 120.22

Inappropriate = (162 x 57) / 221 = 9,234/221 = 41.78

= 162

Kappa = $\dfrac{205 - 162}{221 - 162}$

Kappa = 0.73

Sensitivity Reliability

	One	Three	Five	Seven	Nine	Total
One	0	0	0	0	0	0
Three	0	2	1	0	0	3
Five	0	1	2	0	0	3
Seven	0	0	0	2	0	2
Nine	0	0	0	0	0	0
Total	0	3	3	2	0	8

$$\text{Kappa} = \frac{\text{total agreements} - \text{total expected}}{\text{Number of observations} - \text{total expected}}$$

Total Expected:

One = (0 x 0) / 8 = 0/8 = 0.00

Three = (3 x 3) / 8 = 9/8 = 1.13

Five = (3 x 3) / 8 = 9/8 = 1.13

Seven = (2 x 2) / 8 = 4/8 = 0.50

Nine = (0 x 0) / 8 = 0/8 = 0.00

= 2.76

$$\text{Kappa} = \frac{7 - 2.76}{8 - 2.76}$$

Kappa = 0.62

CES-D

Circle the number for each statement that best describes how often you felt or behaved this way DURING THE PAST WEEK.

	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all the time (5-7 days)
1. I was bothered by things that usually don't bother me	0	1	2	3
2. I did not feel like eating	0	1	2	3
3. I felt that I could not shake off the blues even with help from my friends	0	1	2	3
4. I felt that I was just as good as other people	0	1	2	3
5. I had trouble keeping my mind on what I was doing	0	1	2	3
6. I felt depressed	0	1	2	3
7. I felt that everything I did was an effort	0	1	2	3
8. I felt hopeful about the future	0	1	2	3
9. I thought my life had been a failure	0	1	2	3
10. I felt fearful	0	1	2	3
11. My sleep was restless	0	1	2	3
12. I was happy	0	1	2	3
13. I talked less than usual	0	1	2	3
14. I felt lonely	0	1	2	3
15. People were unfriendly	0	1	2	3
16. I enjoyed life	0	1	2	3
17. I had crying spells	0	1	2	3
18. I felt sad	0	1	2	3
19. I felt people disliked me	0	1	2	3
20. I could not get "going"	0	1	2	3

Thank you for participating

Strange Situation Prediction

<u>How do you Think Your Child
Will Respond to the Strange Situation?</u>

Now that you have read the instructions for the Strange Situation procedure we are interested in how you think your baby will react to these episodes. Think about how your child usually responds to new places, to new people and to separations from you. Then choose one of the following that you think is a best fit description of how you expect your child to react. Do this by circling the letter beside the description. Read all of the descriptions carefully before making your choice. There are no correct answers we are only interested in your ideas.

A. My baby will explore the room and the toys readily on his/her own and will also play with a friendly stranger. My baby will not be very upset when I leave the room; he/she is quite independent now. When I return to the room, my baby will continue to play and will not be concerned with being comforted by me; as he/she is quite self-reliant.

B. My baby will explore the room after a little hesitation and return to me to show me things in between playing with the toys. He/She will play with a friendly stranger after gentle encouragement. When I leave the room my baby might well become upset, and will show signs of wondering where I am, but it's likely that he/she will be able to be distracted by toys or comforted by the stranger. When I return he/she will greet me, and if upset will want to be comforted, but will then explore the room/toys once more.

C. My baby will be distressed or subdued by this new experience and may be reluctant to play with the toys or with a friendly stranger. He/She will want to stay close to me. When I leave the room, my baby is likely to become pretty upset and will not be easily comforted by a stranger or distracted by toys. When I return, he/she may be upset with me for leaving, and it will be difficult for me to comfort him/her and re-engage him/her in play.

Strange Situation Reliability

	Avoidant	Secure	Resistant	Disorganised	Total
Avoidant	4	0	0	0	4
Secure	0	8	0	0	8
Resistant	0	0	2	1	3
Disorganised	0	0	0	1	1
Total	4	8	2	2	16

Kappa =   total agreements – total expected

Number of observations – total expected

Total Expected:

Avoidant = (4 x 4) / 16 = 1.00

Secure = (8 x 8) / 16 = 4.00

Resistant = (3 x 2) / 16 = 0.38

Disorganised = (1 x 2) / 16 = 0.13

= 5.51

Kappa = 15 – 5.51

16 – 5.51

Kappa = 0.90