

**VOLUME I**

**THESIS: THE TRANSACTIONAL NATURE OF MATERNAL  
PERSONALITY AND INFANT FACTORS IN PARENTING**

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## **Abstract**

Process models have highlighted the important role personality plays in shaping parenting style (Belsky, 1984). However, surprisingly little research has been conducted on the impact of personality on parenting in non-clinical populations. One aim of this study, therefore, is to increase our understanding of how parenting is influenced by personality in the general population. Theory also highlights the importance of child effects on parenting as well as the interactive nature of parent and child effects (Belsky, 1984, Thomas & Chess, 1977). The current research consequently examines the main effects of maternal personality and infant factors on parenting, as well as the interacting effects of parent and infant effects on parenting.

Using an affect-based personality measure (Positive and Negative Affect Scale - PANAS; Watson, Clark, & Tellegen, 1988), an infant temperament scale (Infant Behaviour Questionnaire - IBQ; Rothbart & Gartstein, 1999), and an objective measure of infant behaviour (NICHD, 1999) the main and interactive effects of maternal personality and infant factors on parenting were investigated. Maternal sensitivity, indexed by maternal intrusiveness and detachment, was assessed during a semi-structured observation period (NICHD, 1999).

Observed infant behaviour was found to predict both maternal detachment and intrusiveness. Results also indicated preliminary support for the joint prediction of maternal detachment by maternal negative affect and infant positive emotionality. This highlights the contribution of child effects and provides some support for the interactive relationship between parent and infant factors in parenting. Contrary to expectations, maternal personality and infant temperament did not consistently predict parenting. However, there was some association between maternal positive affect and increased intrusiveness, and infant temperament and detachment. The meaning of these results is discussed in light of relevant literature. Due to various limitations, results have to be interpreted with caution. Further work is necessary in order to verify these results and to further elucidate the multiple factors that shape the process of parenting.

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## 1. Introduction

### 1.1 Overview

Within developmental psychology, research on the determinants and effects of parenting has been a central focus for the past two decades (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Over this period, substantial developments in understanding the significance and context-related determinants of parenting behaviour occurred. However, efforts at empirically delineating the influence of parental personality on parenting differences have been scarce (Belsky, Crnic, & Woodworth, 1995; Belsky & Pensky, 1988; Goldstein, Diener, & Mangelsdorf, 1996; Kendler, Sham, & MacLean, 1997; Kochanska, Clark, & Goldman, 2000). This is particularly true of research into individual differences in 'normal', as opposed to 'clinical' populations (Belsky et al., 1995 and Kochanska et al., 2000). Within the clinical population, depression has received the majority of attention, and its effects on parenting and child development are well established (Belsky et al., 1995). However, within 'non-clinical' populations, research into parenting has emphasised the importance of parental contexts, such as education, socio-economic status, marital relations and social support, rather than the influence of parental personality, on parenting (Belsky & Barends, 2002). The relative dearth of data on relationships between parental personality and parenting is particularly striking when considering the prominent role parental personality holds in models of parenting (Belsky, 1984).

When adopting an historical perspective, however, reasons for this research omission come to light. The general neglect of research into personality and parenting, is



largely a result of historical developments within personality research which brought disrepute to the field (Belsky & Barends, 2002). However, personality psychology has, more recently, managed to re-establish itself. A consensus around personality dimensions in the form of the 'Big Five' has helped consolidate research within this area. The 'Big Five' dimensions of personality consist of extraversion, neuroticism, conscientiousness, agreeableness, and openness. The cross-cultural consistency and relative stability of these constructs has been empirically demonstrated (John & Srivastava, 1999). The gradual consolidation of personality research through such consensus has led to renewed collaboration with, among other disciplines, developmental psychology (Baumeister, 1999). Evidence of such collaboration comes from several recent investigations into the effects of personality on parenting (Belsky & Pinsky, 1988; Kochanska et al., 1997; Clark, Kochanska, & Ready, 2000). Empirical work conducted in this area has made preliminary links between certain personality traits and more supportive and sensitive parental care (Belsky & Barends, 2002). However, existing literature points out the need for further empirical work to consolidate findings resulting from the recently developed collaboration.

As part of this emerging trend, the current study aims to contribute to the preliminary empirical foundation established to date. However, in addition to investigating the effect of personality on parenting, the current study also takes into account the importance of child effects that Bell (1968, 1979) initially, and Belsky (1984) and Lytton (1990) more recently, have highlighted. In particular, literature on the bi-directionality of parent-child effects frequently implicates temperament as an important variable (Bates, 2001). Thomas and Chess (1977) provide a theoretical basis for interactive processes between child temperament and parent effects with

their notion of ‘goodness of fit’. Although the concept of temperament has been widely used in the study of child development and parent-infant interaction, definitions of this construct remain diverse (Belsky, Hsieh, & Crnic, 1996). A consensus around a definition of temperament as referring to a rubric of traits based in neural and genetic differences, which relate to reactivity and self-regulation is, however, emerging (Goldsmith et al., 1987). In addition, the majority of studies converge in their focus on negative dimensions of temperament such as infant ‘difficultness’ (Belsky et al., 1996).

Although the interactional rather than linear relationship between parent- and child-effects has dominated theory, few findings of interaction effects have been demonstrated empirically (Bates, 2001). Some studies have, for instance identified more adverse outcomes for temperamentally difficult or fearful children in impoverished or stressful environments (Wachs, 1992 cited in Bates, 2001). However, studies with established and replicated interaction effects are rare. The current study consequently seeks to address this, as well as the aforementioned gap in the literature, by exploring the effects of parental personality on parenting style as well as the interacting effects of personality and infant characteristics on parenting.

The subsequent section will present the theoretical context in which this personality and parenting research is embedded. Developments in personality research are then described, followed by a presentation of empirical evidence resulting from the recent collaboration of personality and parenting research. Finally, the literature review on infant effects is succeeded by a summary of research on temperament-environment interactions.

## 1.2 Theories of personality and parenting – Belsky's (1984) process model

Various developmental researchers point out that we know surprisingly little about the influence of personality on parenting, despite the fact that Belsky (1984) explicitly highlighted the significance of personality as a determinant of parenting. As part of his influential process model on the determinants of parenting, personality has been identified as a factor of paramount significance.

Belsky's (1984) process model of parenting emerged from research on the aetiology of child abuse. Drawing on his empirical work of child abuse, Belsky (1984) extrapolated a general model of determinants of parental functioning within the 'normal' range. He proposed a model which includes 1) the parent's personality or psychological resources, 2) the child's characteristics, and 3) contextual factors of support and stress, such as marital relations, social networks and occupational experience. Of the multiple determinants, Belsky (1984) argued that personality is the most important variable. Identified partially as the outcome of the parent's developmental history, personality is thought to be instrumental not only in its direct effects on parenting, but also in recruiting contextual support. According to Belsky's model, direct effects of personality on parenting manifest themselves through variations in sensitive responding, impulse control, perspective taking, and the provision of security. Although this model has served as a conceptual basis for research into the determinants of parenting, most work on parenting has neglected the important role of a parent's personality and focused on contextual determinants instead (Belsky et al., 1995; Clark et al., 2000; Kochanska et al., 1997).

### 1.3 Historical context of work on the construct of personality

In the 1940s and 1950s, efforts by individuals such as Allport and Odbert (1936) represented the first attempt to define and organise the field of personality psychology based on the lexical hypothesis (Allport & Odbert, 1936 cited in Winter & Barenbaum, 1999). This hypothesis posits that socially relevant and salient personality characteristics have become encoded in natural language. The efforts to define a systematic psychology of personality, led to a renewed emphasis on *traits* as the fundamental unit of study for personality researchers. Allport defined traits as neuropsychic systems with dynamic or motivational properties (Winter & Barenbaum, 1999).

Criticised as arbitrary in their selection of categories, Cattell (1943) sought to refine the system of taxonomy by factor analysing extant data (Cattell, 1943 cited in John & Srivastava, 1999; Winter & Barenbaum, 1999). Believing that the essence of a trait was 'covariation', Cattell's analysis yielded 12 factors that he identified as the primary traits (Cattell, 1943 cited in Winter & Barenbaum, 1999). Although Cattell's particular methods of factor analysis were subject to heavy criticism, his general approach to the field of personality shaped the future of subsequent personality research, with its emphasis on measurement and factor-analytic methods (Cattell, 1943 cited in Winter & Barenbaum, 1999). Debate around the measurement of personality constructs dominated the field, yielding prolific amounts of work on measurement issues in the 1950s and 1960s (MacAdams, 1997).

Work in the area of personality psychology consequently flourished until the late 1960s (Maccoby, 1992). However, growing discontent culminated in the publication of Walter Mischel's book *Personality and Assessment* (1968). Mischel questioned the usefulness of broad dispositional personality variables, claiming that such variables did not show cross-situational and temporal consistency and that they did not correlate highly with behavioural outcomes (Winter & Barenbaum, 1999). The ensuing internal crisis, characterised by an ideological battle between the 'trait psychologists' and the 'situationists', persisted well into the late 1970s and early 1980s (Maccoby, 1992). Trait psychologists sought to account for human behaviour in terms of personality traits, whereas 'situationists' focused on the role of the environment.

A series of rebuttals to Mischel's indictment of trait psychology gradually helped revive the field of personality research (MacAdams, 1997; Winter & Barenbaum, 1999). The debate around the relative contributions of traits and situations in the prediction of behaviour gradually subsided in the 1980s, as many psychologists settled on a position of compromise (MacAdams, 1997). Although differences in emphasis are still evident, many psychologists acknowledge the relative contributions of both traits and situations.

Further developments occurred in the 1980's as researchers sought to formulate a single systematic taxonomy for personality traits (MacAdams, 1997). Although this endeavour raised its own controversies, a general consensus in the form of the 'Big Five' is being approached.

The 'Big Five' are typically labelled:

- I. Extraversion (gregarious, assertive and energetic)
- II. Neuroticism (anxious, self-critical, emotionally labile)
- III. Conscientiousness (orderly, responsible, dependable)
- IV. Agreeableness (good-natured, cooperative, trustful)
- V. Openness (intellectual, imaginative, independent-minded)

(Watson, Clark, & Harkness, 1994; MacAdams, 1997; John & Srivastava, 1999).

The 'Big Five' represent part of the movement towards 'modern' personality research. Empirical work dramatically increased in the mid 1980s as many researchers replicated the factor structure and developed new measures (John & Srivastava, 1999). This general taxonomy of personality traits, however, does not represent a particular theoretical perspective. It serves an integrative function by providing a common framework representing diverse systems of personality description (John & Srivastava, 1999). Watson, Clark and Harkness (1994) point out that not all trait psychologists endorse this model, but that most would acknowledge it captures some important psychometric truths that have emerged from decades of research.

Although initially identified by Tupes and Christal (1961) by factor analysing the personality variables identified by Cattell (Tupes & Christal, 1961 cited in MacAdams, 1997), it was not until the work of McCrae and Costa (1987) that a modern consensus around this personality structure occurred during the 1980s. The robustness of this model has been confirmed in studies involving diverse conditions, populations and languages (Watson et al., 1994). In addition, various biological

(genetic) and physiological explanations have been invoked in support of these dimensions. The atheoretical nature of the Big Five dimensions, however, continues to compromise their appeal to some psychologists (John & Srivastava, 1999). Consequently, the quest for a refined understanding of personality structures and theoretical explication continues. The Big Five structure, nevertheless, must be credited for capturing the commonalities among most of the existing systems of personality, and providing an integrative descriptive model for personality research.

#### **1.4 Recent developments in personality research – affective dimensions of personality**

One way of refining the understanding of personality constructs has been through an increased focus on the emotional/affective components of personality (Clark & Watson, 1999). The integration of research on personality, affect and mood, has led to a considerable body of research that has helped elucidate the understanding of these constructs (Wilson & Gullone, 1999). Research into affect-based dimensions of personality has subsequently become an area of inquiry in its own right (Larsen & Ketelaar, 1991; Tellegen, Watson, & Clark, 1999).

Affective experience has been the subject of inquiry in the mood literature since the 1980s (Watson & Clark, 1997). Seminal research in this field has been conducted by Costa and McCrae (1980) and Tellegen (1985). In an attempt to delineate the structure of affect, two dominant dimensions have been identified. Positive Affect (PA) and Negative Affect (NA) are the two higher order dimensions that emerge consistently in factor analyses of self-rated affect (Watson & Tellegen, 1985; Watson

& Walker, 1996). Watson and Tellegen (1985) acknowledge that, while these emerge as dominant dimensions, not all emotional experience can be reduced to only two variables.

Broadly speaking, PA represents the extent to which a person avows a zest for life, whereas NA reflects feelings of being upset or unpleasantly aroused (Watson & Tellegen, 1985). Although the terms PA and NA might suggest that these two dimensions are opposites (i.e. negatively correlated), it has in fact emerged that they are highly distinctive dimensions that can be meaningfully represented as orthogonal dimensions in factor analytic studies of affect (Watson, Clark, & Tellegen, 1988). Both NA and PA have been studied as state (short-term affect or current/momentary mood) and trait (dispositional mood) dimension of affect (Clark, Watson, & Mineka, 1994; Watson, Wiese, Vaidya, & Tellegen, 1999). States are viewed as comparatively short-lived, intra-individual fluctuations in affect (Tellegen, 1985). Traits, on the other hand, are conceptualised as durable dispositions and response tendencies that reflect individual differences.

Clark and colleagues (1994) describe trait NA and PA as stable, heritable, and highly general dimensions relating to affective disposition and behaviour. Trait measures of NA reflect stable individual differences in the tendency to experience aversive emotional states, such as fear, guilt, sadness, hostility, anger and depression. High-NA individuals tend to be distressed, tense, upset and have a negative view of self, whereas those low on the dimension are relatively relaxed, content, secure and satisfied with themselves (Watson & Clark, 1984). A variety of non-mood variables have been related to specifically this affective disposition, including negative



cognitions, negative appraisals of self and others, frequency of unpleasant events and somatic complaints (Watson, 1988; Watson et al., 1999). Trait measures of PA have been related to stable individual differences in the experience of positive states such as enthusiasm, confidence, and dominance (Clark et al, 1994). At its high end PA is thought to describe one's propensity to experience states of energy, activity and vigour, and the propensity for lethargy and weariness at its low end (Watson et al., 1999). Variations in PA, but not NA, are broadly related to the frequency of pleasant events and to indices of social activity and interpersonal satisfaction (Watson & Clark, 1992a).

The confluence of research on personality dispositions and trait affect has established the existence of robust relationships between these dimensions (Clark et al, 1994; Nemanick & Munz, 1997; Watson & Clark, 1997). Investigators have found that measures of trait NA are strongly correlated (0.80) with Neuroticism, whereas measures of trait PA are strongly correlated (0.70) with Extraversion (Clark & Watson, 1999; Watson et al., 1999). This pattern of correlations has been demonstrated across diverse samples, time frames, response formats, languages and cultures (Watson & Clark, 1994; Wilson & Gullone, 1999).

The empirically demonstrated relationship between PA and Extraversion and NA and Neuroticism has generated debate about the direction of the relationship. The debate involves the question of whether PA and NA and Extraversion and Neuroticism are separate constructs existing at different levels of behavioural explanation, or whether they are essentially the same traits being measured and labelled differently (Larsen & Ketelaar, 1989, 1991; Nemanick & Munz, 1997).

Two competing theoretical models have emerged in relation to the former question. The trait perspective suggests that Neuroticism and Extraversion are directly responsible for regulating individual differences in the experience of negative and positive affect respectively (Wilson & Gullone, 1999). Proponents of this perspective argue that Neuroticism and Extraversion either predispose individuals to characteristically respond in a distressed or cheerful way; or alternatively predispose individuals to participate in activities that induce positive or negative emotions (McCrae & Costa, 1991). The emotion perspective, on the other hand, recognises the influence of personality on emotion, but invokes the argument that emotions also organise the development of personality traits. According to this view, an individual's genetically determined emotion threshold interacts with experience to produce personality traits. As such, this perspective advocates a bi-directional relationship between emotions and personality traits. Preliminary evidence for this perspective has been provided by a study demonstrating that the strength of correlation between personality and affect measures increases with age (Wilson & Gullone, 1999). The strength of the study, however, is compromised, among other things, by the cross-sectional nature of the study design.

Other researchers, however, have treated both sets of traits as interchangeable, in both theory and measurement (Nemanick & Munz, 1997). On the basis of the strong and robust correlations between NA and neuroticism and PA and extraversion, researchers such as Watson & Clark (1984, 1997) suggest that they must be considered measures of the same construct. Similarly, Tellegen (1985) has argued that Neuroticism and Extraversion could be relabelled Negative Affectivity (NA) and Positive Affectivity (PA), respectively. Support for this perspective has come from numerous reports

linking both NA and neuroticism to reported health complaints as well as evidence of similar neurophysiological underpinnings of the constructs (Clark & Watson, 1999). Based on current research on personality and parenting using the terms interchangeably, e.g. Belsky & Barends, 2001; Clark et al., 2000; Goldstein et al., 1996; Kochanska et al., 1997, the interchangeable use of these terms was also adopted for purposes of this study.

### **1.5 Renewed interested in personality and parenting**

Despite a preliminary interest in the personality characteristics of parents in the early 1970's, the alliance between the fields was severed by the historical developments in personality research described above (Belsky et al., 1995). However, the resurging enthusiasm in the field of personality psychology had an impact on the study of parental determinants (Belsky & Barends, 2001). The renewed interest brought the notion of personality back to the attention of developmental psychology (Baumeister, 1997). Nevertheless, a rapprochement between the fields of personality and developmental psychology has been slow to develop (Belsky et al., 1995). The revival of interest in personality factors has led to work focusing primarily on the parenting of adults suffering from psychological disorders, particularly depressive symptoms (Belsky et al., 1995; Clark et al., 2000). As mentioned previously, depressive symptoms are a feature of neuroticism/NA, which constitute one of the 'Big Five' dimensions.

## Research within the 'Big Five' framework – the case of neuroticism/ NA and depression

As pointed out above, most of the knowledge on personality and parenting, to date, comes from research on parental depression (Belsky et al., 1995; Kochanska et al., 1997). Observations of the depressed mother's interaction with her infant have revealed different styles of maternal behaviour characterised either by withdrawal or intrusion (Field, 1995). The multiple negative effects of maternal depression on child development are now well documented (Cummings & Davies, 1994; Field, 1995, 2000). Children of depressed parents are at increased risk for the development of psychopathology, behaviour problems, and affective dysregulation. Although few studies have focused on building a theory of the processes and mechanisms that are responsible for the increased risk of psychopathology in children of depressed parents, several models have been formulated. Depression is thought to affect child outcomes through parental characteristics such as emotional unavailability and depressive thinking processes. In addition the nature of parent-child interaction is thought to be compromised through impairments in child management techniques and attachment styles (Cummings & Davies, 1994).

Although research on parental psychopathology is of great interest and value, and has contributed some understanding to processes of personality and parenting, it is limited in its potential for generalisation to non-clinical samples. The following section will therefore examine non-clinical depression in community samples.

In 1985, Zaslow, Pedersen, Cain, Suwalsky and Kramer observed that mothers' reports of feeling 'blue' subsequent to the birth of their 4 month old infants, were linked to lower levels of smiling, touching and speaking with the infant. Similarly, Crockenberg (1986) found, in a study of teenage mothers, that those reporting more psychological distress cared for their infants in a more simple and unstimulating manner. On observing Latino mothers with their 3-12 month old infants, Diener, Smith and Fujita (1995) found that, in addition to undermining positive involvement with the infant, non-clinical depression may actually induce negative and intrusive maternal behaviour. In a large-scale, longitudinal study carried out by the NICHD Early Child Care Research Network (1999), maternal depressive symptoms and sensitivity towards infants were repeatedly measured over a period of 3 years in a community sample of more than 1,000 mothers. Results indicated that, even in non-clinical samples, mothers who experienced relatively more depressive symptoms provided less sensitive care to their infants.

Similar effects of depressive symptoms on caregiving have been observed beyond the period of infancy as the following select review indicates. In a sample of mothers and their preschool age children, high levels of emotional distress (anxiety/depressive symptoms) were related to increased levels of negative parenting as indexed by physical force and negative statements, as well as low levels of positive parenting, as indexed by physical affection and praise (Conger, McCarty, Yang, Lahey, & Kropp, 1984). Gondoli and Silverberg (1997) observed interactions during a problem-solving task in a sample of mothers and teenagers. They established that mothers who experienced greater emotional distress were less accepting of their child's behaviour and psychological autonomy. In an extensive study of family interactions, Conger

and colleagues observed both direct and indirect effects of negative affectivity on parenting (Conger, Conger, Elder, Lorenz, Simons, & Whitbeck, 1993; Conger, Patterson, & Ge, 1995). Depressive symptoms predicted harsher and inconsistent disciplining in both parents and interestingly, less nurturant behaviour in interactions with sons, though not daughters. However, elevated levels of depressive symptoms also predicted increased marital conflict, and consequently reduced optimal parenting.

Collectively, these studies indicate that negative affect, in the form of neuroticism or depressive symptoms, are linked to non-optimal parenting. This manifests itself through parenting characterised by negative and intrusive maternal behaviour, reduced stimulation and praise, and increased, as well as, inconsistent physical force or punishment.

#### Research within the 'Big Five' framework – additional personality dimensions

As mentioned above, research on dimensions of personality other than neuroticism/NA has been comparatively limited. Nevertheless, researchers are gradually including additional personality traits, such as extraversion/PA, in their investigations. This is subsequently contributing to a still preliminary, but gradually more comprehensive understanding of the links between personality and parenting.

In a study of first-time fathers, Levy-Shiff and Israelashvili (1988) for instance, found that men scoring high on a construct virtually identical to extraversion exhibited more positive affect and playful behaviour when interacting with their nine month old infants than those with lower scores. Similarly, in a study involving parents with an

MZ or DZ twin, Losoya and colleagues found that parents identified as more extravert, reported engaging in more positive and affectionate parenting as well as encouraging independence (Losoya, Callor, Rowe, & Goldsmith, 1997).

Embedded in a study of maternal personality, infant temperament and attachment, Mangelsdorf and colleagues investigated the relation between personality and parenting in mothers and their nine month old infants (Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990). Maternal personality was assessed using Tellegen's (1982) Multidimensional Personality Questionnaire (MPQ), and focused on dimensions of PA, NA, and constraint. Infant temperament was measured using the Toddler Temperament Scale. They found that mothers who reported higher levels of PA were warmer and more supportive of their baby relative to mothers with lower scores. The other factors were not found to contribute to the prediction of maternal warmth and support in this study. Interestingly, however, they found that security of attachment could be predicted by an interaction between maternal personality and infant proneness-to-distress. More specifically, an insecure relationship was more probable when infants who were prone to distress had mothers who reported high levels of the MPQ constraint factor.

The findings of the above-mentioned studies were corroborated by Belsky, Crnic, and Woodworth's (1995) study of parental personality and parenting in a longitudinal study involving 10-month-old sons. Dimensions of maternal and paternal personality were assessed using the NEO Personality Inventory (McCrae & Costa, 1984 cited in Belsky et al., 1995). In accordance with previous work, findings for both mothers and fathers indicated that those with more extraverted personalities were more

affectionate, sensitive and cognitively stimulating in their interactions with their infants. Neuroticism/NA, on the other hand, was generally associated with parenting characterised by less sensitivity and stimulation. Some of these relations were mediated by state-mood and reports of daily hassles.

Goldstein, Diener, & Mangelsdorf (1996) assessed maternal personality prenatally using Tellegen's (1982) Multidimensional Personality Questionnaire. In examining the associations among personality, stress and social support and maternal behaviour, they found that prenatally assessed maternal personality was related to parenting. More specifically, higher scoring neuroticism/NA mothers were found to be less expressive with their infants.

In a large-scale, retrospective study, Kendler found similar associations between parenting and personality (Kendler et al., 1997). Parenting was assessed by a modified version of the Parental Bonding Instrument (PBI; Parker, 1979 cited in Kendler et al., 1997). In addition to finding that demographic variables, family characteristics and psychopathological symptoms affected parenting in various ways, they established that high levels of neuroticism/NA (Eysenck Personality Questionnaire; Eysenck & Eysenck, 1975 cited in Kendler et al., 1997) were associated with low parental warmth, with the opposite profile for high levels of extraversion/PA. In addition, higher levels of neuroticism/NA significantly predicted higher levels of both protectiveness and authoritarianism. However, the retrospective, paper-and-pencil measure of parenting suggests that results should be interpreted with caution.



In a longitudinal study, Kochanska, Clark, & Goldman (1997) investigated the influence of mother's personality on parenting and their children's developmental outcomes in a sample of 103 participants. Negative and positive emotionality were measured among other traits. Negative emotionality was represented by an aggregate of depression scores (Beck Depression Inventory; Beck & Steer, 1987), anxiety (Spielberger State-Trait Anxiety Inventory; Spielberger, 1968), neuroticism (Zuckerman-Kuhlman Personality Questionnaire III; Zuckerman et al., 1993), guilt (Self-descriptive Inventory; Kugler & Jones, 1992) and reactivity to stress (Physiological Reactions Questionnaire; Derryberry & Rothbart, 1988). Positive emotionality was composed of sociability, and reversed shyness. Measures of parenting included observations and self-reports on power assertion, responsiveness/warmth, guidance and control. Child outcomes were measured on scales of defiance/compliance and angry affect. In accordance with their hypotheses, the researchers found that mothers high in negative emotionality were less responsive and warm, and engaged in more power-assertive discipline. Maternal negative emotionality also related to maladaptive outcomes for children. Positive emotionality was indexed by a measure of sociability. In this case, researchers found that mothers high on the socialisation scale used less power assertion with their children and their children evidenced behaviour of greater compliance.

In one of the most recent studies, Clark and colleagues investigated the interacting effects of maternal personality and child temperament on parenting behaviour (Clark et al., 2000). Measures of maternal personality were obtained through the self-report NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992) and the Perspective-Taking (empathy) scale of the Interpersonal Reactivity Index (Davis, 1983). Parenting

was indexed by observed measures of maternal power and responsiveness. In terms of infant temperament, three early negative emotions (fear, anger, and discomfort) were assessed using the Laboratory Temperament Assessment Battery (Lab-Tab; Goldsmith & Rothbart, 1996). Significant correlations were found between some personality traits and parenting dimensions. Neuroticism and conscientiousness correlated with both power assertion and responsiveness, and agreeableness was associated with responsiveness only. Maternal extraversion showed a trend towards an association with responsiveness. In addition, child negative emotionality significantly moderated the relation between maternal personality and power assertion for two traits: perspective taking and extraversion. More specifically, the child's level of emotionality was irrelevant for power use in mothers high in perspective taking, whereas mothers low in perspective taking were more likely to use power assertion with children of high negative emotionality. Similarly, mothers low in extraversion responded with little use of maternal power regardless of their child's emotionality, whereas mothers high in extraversion used more power with 'difficult' children and less power with 'easier' children. It is of note that the positive association between extraversion and power-assertive parenting was not predicted, and lies in contrast to findings from previous studies.

Collectively, these studies provide preliminary evidence for associations between certain personality characteristics and parenting styles. Of particular interest to the current study is the relatively consistent association between more supportive and sensitive parenting and high positive and low negative affect. However, as research findings are not unequivocal, further investigations are needed to help elucidate the relationship between parenting and personality. In addition several studies mentioned

above provide some evidence for interactions between parent and infant effects. This issue will be further explored in a subsequent section.

### **1.6 Affect in parenting research**

The increased interest in the affective components of personality has been paralleled by an increased interest in the role of affect/mood in parenting (Dix, 1991; Kochanska et al., 1997). The neglect of research on affective processes in parenting, mirrors the situation between personality and parenting. Just as researchers have pointed out the poorly understood influence of personality on parenting, Dix (1991) similarly highlights that, despite the highly emotional experience entailed in parenting, the role of emotions in parenting processes are poorly understood. According to Dix (1991), extant research on affective processes in parenting often discriminates poorly among positive and negative emotion and is also generally uninformed by basic research on emotion. Research within this paradigm again emphasises how few researchers have investigated the effects of parental mood independent of the syndrome of depression (Jouriles & O'Leary, 1991; Dix, Zambarano, & Bryant, 1993; Jouriles & Thompson, 1993). They also emphasise that this scarcity of research is surprising, given that moods and emotions are also critical to parenting in the non-clinical population (Dix, 1991; Dix et al., 1993). In agreement with the research reviewed above, Dix (1991) highlights that, when conceptualised as stable individual-differences (personality dispositions), parents' emotions reflect the quality of the caregiving environment. As a consequence of available evidence, he comes to similar conclusions deduced from research on personality and parenting: more positive parental emotions are associated with more favourable caregiving environments.

### Mood and parenting

Jouriles, Piffner, & O'Leary (1988), found that three-quarters of their sample felt their parenting was affected by their mood. Zekoski, O'Hara, and Wills (1987) randomly assigned participants to one of three mood induction conditions (depressed, neutral or elated mood induction). Mothers and independent observers reported their perceptions of the mother-infant interaction subsequent to the mood induction. Mothers from the depressed mood induction group elicited fewer positive infant responses than mothers in the other two conditions. No differences, however, were found between the neutral and elated conditions.

In a study by Jouriles and O'Leary (1991), involving mothers and their preschool-age children, participants were subject to both positive and negative mood induction procedures. The order of mood inductions was counterbalanced across participants. Observations of mothers interacting with their children during a free-play period indicated that, relative to the positive mood condition, mothers issued fewer positive statements and generally engaged in less verbal interaction with their children subsequent to the negative mood induction. Children were also found to be less compliant with maternal commands during the negative mood condition.

Investigating possible mediators of the effects of mood on parenting, Jouriles and Thompson (1993), examined the effects of induced mood on mother's evaluations of their children's behaviour. Mothers in the positive mood condition were found to evaluate their children's behaviour as more favourable than mothers in the neutral and depressed mood conditions. In addition, mothers in the positive mood condition also

evaluated their children's behaviour as more favourable than independent raters of their child's behaviour. The study, however, did not support the hypothesis that mothers in the negative mood condition would evaluate their children's behaviour less favourably than mothers in neutral moods. These results counter the prevailing view that depressed mood negatively distorts a mother's perception of her child's behaviour. An exploration of theories of how mood affects parenting is offered in a subsequent section.

In a more naturalistic study, Dix, Zambarano, and Bryant (1993) investigated whether daily variations in maternal mood affected their dinnertime interaction with their children. Over a period of two weeks, mothers were requested to complete mood inventories and tape-record the family's dinnertime conversation. The researchers found that mother's naturally occurring negative moods increased their negative and conflictual behaviour. More specifically, bad moods led to an increased likelihood of responding negatively to a child's negative statements, and reduced positive responses to a child's positive statements.

In a multi-method study of depressed mood and parenting, Whitbeck and colleagues found support for a cyclical transmission process between generations (Whitbeck et al., 1992). Using a retrospective and prospective design, their study provided evidence for the negative consequences of parental depressed mood. Parents with depressed affect were found to interact in a more rejecting manner with their offspring. A history of such rejection increased the chance of these children experiencing depressed mood as adults. This affective state, in turn, increased the propensity for parental behaviour characterised by rejection.

Collectively, these findings provide empirical support for the suggestion that a parent's state mood affects the perception of a child's behaviour, as well as their interaction with their child. Given the association between 'state' and 'trait' mood, these findings are of interest as they corroborate research on 'trait mood' and parenting.

### Mediators of mood and parent behaviour

Several mechanisms by which parental moods, both state and trait, might influence parent-child interaction have been proposed. Emerging from an information-processing approach, one hypothesis suggests that mood enhances the perception and processing of mood-congruent material (Ingram, Smith, & Brehm, 1983; Smith Slep, & O'Leary, 1998). The employment of information-processing constructs has been particularly relevant in theories and research on depression. Beck (1967), for instance, proposed that depressed individuals process information in such a 'schema-consistent' manner. Schemas refer to cognitive patterns that guide the interpretation of a situation. Although Beck (1967) originally suggested that depressed individuals are characterised by 'stable and enduring' negative self-schema, recent research points to the existence of multiple self-schema, both positive and negative, in each individual. How information is processed therefore does not depend on which schemata an individual possesses, but rather depends on which of these schemata are active at a given time (Ingram et al., 1983). Mood has been identified as one of the main activators of schemata (Ingram et al., 1983). When an emotion is experienced, it activates an individual's cognitive networks and triggers the schemata most consistent

with the emotion. An individual's mood therefore activates a schema that guides information processing.

Applying this process to parenting means that parents in negative moods may selectively attend to negative aspects of their child's behaviour and therefore also respond more negatively to their children. Conversely, this reasoning suggests that parents in positive moods may predominantly attend to a child's positive behaviours and consequently be more likely to respond to their child in a positive manner (e.g. praise statement, compliments, etc.) (Jouriles et al., 1988; Dix, 1991; Jouriles & O'Leary, 1991).

Another potential mechanism relevant to the effects of mood on parenting emerges from research on mood and memory (Dix, 1991; Dix & Grusec, 1985; Jouriles & O'Leary, 1991). Empirical work has revealed the phenomenon of mood congruent memory. This phenomena suggests that the efficiency of mnemonic processing is influenced by the congruence between an existing mood and the affective tone of the material involved (Blaney, 1986). Negative moods are therefore hypothesised to create easier access to negative memories, relative to positive memories, whereas positive moods create easier access to positive memories. This suggests that parental moods may influence what they remember about their child's past behaviour.

This process may bias how parents interpret the child's current behaviour which relates to another mechanism invoked in the explanation of the effects of mood and parenting. The meaning attributed to information may also mediate the effect of mood on parenting. Patterson (1982) predicted that parents in negative moods are

more likely to make negative attributions to their children's behaviour. How parents view or interpret their child's behaviour will therefore be influenced by their mood i.e. while in a positive mood, parents are more likely to make positive inferences (Jouriles & O'Leary, 1991).

### **1.7 Infant effects**

So far, the literature has focused almost exclusively on how factors within an individual may affect their parenting. Apart from two studies, i.e. Clark and colleagues (2000) and Mangelsdorf and colleagues (1990), research presented so far has exclusively focused on the main effects of personality characteristics on parenting. Again this is somewhat surprising, given that Belsky's (1984) process model of parenting explicitly focuses on the multiply determined process of parenting. In addition to highlighting the significance of personality and contextual factors as important determinants of parenting, he includes the child's characteristics as an important influence. He therefore calls for an increased understanding of, not only the direct role of personality in parenting, but also potential moderating factors. As the subsequent reviews will indicate, however, the neglect of infant effects has been a general trend in developmental psychology. Research in this area has typically been dominated by a 'top-down' approach to effects, with interactive processes being researched only relatively recently (Bates, 2001; Maccoby, 1992). The following sections will briefly review the historical context of 'bi-directional' effects and subsequently detail more recent developments in this area, such as the recognised role of infant temperament.



### Historical context of 'infant effects'

Acknowledgement of the infant's contribution to parent-child interaction processes was initiated in the late 1960's. This recognition represented a major change in the history of research on childhood socialisation (Maccoby, 1992). Previous to this, a 'top-down' approach prevailed, in which parents were viewed as the agents of socialisation and infants as 'blank slates' upon which influence was inscribed. Bell's 1968 paper, however, redefined the process of socialisation as mutually influenced by parent and child. Citing predominantly available animal studies and the, at that time, meagre human data, Bell was able to offer a proposition which allowed for the reinterpretation of effects as bi-directional. He acknowledged the preliminary nature of his theorising and recognised that the data presented merely suggested rather than documented his proposition regarding child effects. Nevertheless, his work mobilised a developing recognition of infant effects. More recently, the work of Lytton (1990) has been central to establishing the importance of child effects. His work in the field of conduct disorder emphasises the child's own contribution to such disorders within an interactive parent-child system. Parental actions are viewed as responses elicited by or that exacerbate the child's behavioural tendencies. Lytton (1990) suggests that the child's temperament and behavioural tendencies predominate over parental characteristics.

### Infant effects – infant temperament as an important variable

With the growing recognition that interaction is a reciprocal process involving both parent and child effects, researchers have tried to identify which infant characteristics influence the dyadic relationship. Although this has been difficult to determine,

researchers such as Belsky and colleagues (1998), Clark and colleagues (2000), as well as Crockenberg (1981), have suggested that the infant's temperament in particular affects the quality of the parent-child relationship. Before exploring the research literature on this topic, conceptual and methodological issues surrounding temperament research will be addressed.

### Definition of temperament

The concept of temperament emerged as a popular construct in the mid to late 1960s (Hubert, Wachs, Peters-Martin, & Gandour, 1982). Since then diverse theories and measures of temperament have emerged, leading to diverse opinions regarding the content and definition of the construct (Belsky, Hsieh, & Crnic, 1996). This means that any particular 'working definition' of temperament in the literature, tends to be based on the particular instruments used (Goldsmith et al., 1987).

Although there is no clear consensus concerning the theoretical nature of the construct, ideas around some main points have converged. One point of consensus is that the term temperament refers to a rubric of related traits based in neural and genetic differences, and pertains to reactivity and self-regulation (Goldsmith et al. 1987; Wachs & Kohnstamm, 2001). Reactivity refers to the excitability or arousability of behavioural, endocrine, autonomic, and central nervous system responses, whereas self-regulation includes processes such as attention, approach, avoidance and inhibition, that serve to modulate reactivity (Derryberry & Rothbart, 1988). Temperament is widely believed to appear in its purest form in infants, while the expression of temperamental dispositions becomes increasingly subject to context

and experience (Costa & McCrae, 2001; Goldsmith et al., 1987). Upon reviewing relevant literature, it becomes evident that certain types of childhood temperament variables predominate developmental and clinical research. Studies primarily focus on dimensions of fearful distress and inhibition, difficult temperament, negative emotion, emotion dysregulation, reactivity and resistance to control (Goldsmith et al., 1987).

### Methodological considerations in temperament research

Parent reports, in particular maternal reports, are the most widely used measures in childhood temperament research (Mangelsdorf et al., 2000). Although, until recently, almost all temperament research relied on parental reports, there is considerable controversy about the use of such measures (Bates & Bayles, 1984; Mangelsdorf et al., 2000; Mednick, Hocevar, Schulsinger, & Baker, 1996; Rothbart, 1981; Wolk, Zeanah, Garcia Coll, & Carr, 1992).

Parent reports have the advantage of using the parents' vast experience of child behaviours themselves and behaviours across a wide variety of situations and across extended periods of time (Mangelsdorf et al., 2000). In addition, parent-report measures are easily administered and economical to use (Goldsmith & Rothbart, 1991; Wolk et al., 1992).

However, there are also a number of disadvantages, which make the use of parent-reports a controversial research method. Some investigators highlight studies that indicate that parent reports may be biased, and may in fact reflect more about the

parent's characteristics than the child's (Mangelsdorf et al., 2000). Bates and Bayles (1984), however, propose a more comprehensive model by suggesting that parent reports of temperament contain subjective and objective components, as well as a component of psychometric error.

### **1.7.1 Theoretical basis of interaction effects**

Research on the interacting effects of infant temperament and environment is theoretically grounded in the works of Thomas and Chess (1977), Wachs and Gandour (1983) and Brofenbrenner (1993). Thomas and Chess (1977) suggest that the interaction between temperament and specific features of the environment, provide the dynamic influence for the process of development. 'Goodness of fit' exists when the person's temperament and other characteristics (e.g. motivation, intellect), are compatible with the demands and expectations of the environment. Wachs & Gandour's (1983) notion of 'organismic specificity' suggests similar dynamics. They argue that the effect of any particular environment is dependent on the characteristics of the organism. More specifically, the 'organismic specificity' hypothesis stipulates that environmental influences will differentially affect children as a function of their own characteristics, such as their cognitive, behavioural, or emotional attributes. Further emphasising the importance of context and child effects, Brofenbrenner (1993), proposes a person-process-context model of development. This model suggests that, just as parenting or other environmental factors may vary as a function of race, ethnicity or neighbourhood in their developmental influence, they may also vary as a function of the child's attributes. The renewed emphasis on child

effects, echoes the sentiment of Bell's previously mentioned 1968 paper, in which the importance of child effects was initially raised.

The ecological context in which Brofenbrenner places his theory of development is further developed by Belsky (1997a, 1997b) by incorporating an evolutionary perspective. According to this perspective, it makes sense for not all children to be similarly affected by the same rearing experience in order to optimise reproductive fitness through diversity. It is proposed that such diversity may be manifesting itself in children's differential susceptibility to rearing influences, with children of 'difficult' temperament being most susceptible.

### **1.7.2 Temperament-environment transactions**

Although theoretically dominant, Bates (2000) points out that, as recently as 10 years ago, hardly any studies investigating interaction effects existed. The number of temperament-environment interaction studies has increased since then, however, outcomes are still equivocal, with non-replicated and inconsistent interaction effects dominating the literature. According to Bates (2000), the reason for the relative shortage of interaction effects is largely due to the statistical difficulties of finding such effects. Existing studies nevertheless evince interesting preliminary findings.

The following section presents seminal and recent research on temperament-environment interactions. Though presented in detail earlier, additional mention will be made of two studies that have specifically investigated the interacting effect of maternal personality and infant temperament on parenting.

Crockenberg's (1981) study on social support and mother-infant attachment represents one of the earliest findings on the contribution of temperament. This investigation revealed that it was only in the case of infants high in negativity that social support forecasted secure attachment. Further investigations of temperament within the arena of attachment research have since been conducted.

Additional preliminary work on temperament-environment interactions suggested that the development of active infants was less impaired by an unstimulating environment than inactive infants, and that the later outcomes for infants high on negative emotionality were more susceptible to environmental stress than outcomes for easier infants (Bates & McFadyen-Ketchum, 2000).

Also venturing beyond a main effects model, Brody, Stoneman & Gauger (1996) examined a transactional model of family relations and temperament. The authors investigated whether difficult child temperament moderates the effects of parent-child relationships and family problem-solving behaviours on the development of sibling relationships. Results indicated that the links among mother-older child relationship quality, father-older child relationship quality, and sibling relationship were moderated by difficult temperament in child. More specifically, when older siblings' difficultness was high, the affective quality of mothers' relations with these older children had a stronger, positive association with the affective quality of the older siblings' relations with the younger sibling than when the older sibling's temperament was easier.

Within the arena of research on conscience and internalisation, Kochanska (1997) notably replicated her previous findings in a longitudinal study with larger samples. On the basis of her earlier work, Kochanska (1991, 1995) proposed that the temperamental quality of fearfulness is an important factor in the development of conscience. Her most recent study confirmed evidence for the moderating effect of child temperament on socialisation in the development of conscience. Kochanska (1997) replicated evidence that indicated that for children varying in fearfulness, different socialisation strategies promote internalisation. In particular, fearful children respond more to subtle and gentle discipline that capitalises on internal discomfort rather than on power assertion. Less fearful children, on the other hand, respond more to positive motivation originating within a positive parent-child relationship, rather than to discomfort at subtle discipline.

A study conducted by Deater-Deckard & Dodge (1997) on parenting and externalising problems, found that it was elementary school children whose mothers rated them (retrospectively) as being more resistant to intrusion and persistent in pursuing forbidden objects (indexed by protest) at 6 months whose externalising problems were most strongly linked to harsh maternal discipline.

Focusing on children's temperamental unmanageability, parents' control efforts and externalising behaviour problem outcomes, Bates and colleagues (1998) found interesting temperament-environment interactions. The trait of temperamental unmanageability was operationalised as parental reports on a scale of resistance to control. The researchers established that effects of restrictive parenting were stronger in the low- rather than high-resistant children.

Further support for the moderating role of temperament in the process of socialisation was found by Feldman, Greenbaum & Yirmiya (1999). In a study investigating the proposed link between mother-infant face-to-face reciprocity and the emergence of self-regulatory mechanisms during toddler years, the authors found that maternal synchrony with infant affect at 3 months and mutual synchrony at nine months were each related to self-control at 2 years. Notably, it was also established that infant temperament moderates the relations of synchrony and self-control. In addition, closer associations were found between synchrony and self-control for difficult infants.

In addition to these studies, recall that research conducted by Clark and colleagues (2000) and Mangelsdorf and colleagues (1990) presented earlier, also found interaction effects. Investigating the interacting effects of maternal personality and child temperament on parenting, Clark and colleagues found that child negative emotionality significantly moderated the relation between maternal personality and power assertion for the traits of 'empathy' and 'extraversion' (Clark et al., 2000). More specifically, the child's level of emotionality was irrelevant for power use in mothers high in empathy, whereas mothers low in empathy were more likely to use power assertion with children of high negative emotionality. Similarly, mothers low in extraversion responded with little use of maternal power regardless of their child's emotionality, whereas mothers high in extraversion used more power with 'difficult' children and less power with 'easier' children.

Despite a number of studies that underscore the moderating role of temperament, research does not yield unequivocal results (Bates, 2000). Some findings have been



difficult to replicate and others explicitly report failures to detect interaction effects (e.g. Shaw, Keenan, & Vondra, 1994). Given that research on temperament-environment interactions is still at an early stage, Park and colleagues point out that further studies examining the moderating effects of infant temperament on parental influences should be conducted in order to establish more conclusive results (Park, Belsky, Putnam, & Crnic, 1997).

### **1.8 Aims of the study**

Given the dearth of research on personality and parenting, the aim of this study is to contribute to our understanding of the relation between these two constructs in a non-clinical population. The concurrent rise of interest in affective dimensions of personality (Clark & Watson, 1999; Watson & Clark, 1997; Tellegen, 1985) and the role of affect in parenting (Kochanska, et al., 1997; Maccoby, 1992), provide the theoretical framework within which these topics will be explored. Consequently, in accordance with Dix's (1991) recommendation to use standardised affect/mood inventories in parenting research, Watson, Clark, and Tellegen's (1988) Positive and Negative Affect Schedule (PANAS) will be administered as a measure of two emotion-based dimensions of maternal personality: neuroticism/NA and extraversion/PA.

Parental sensitivity has been identified as one of the most critical qualities of early parenting, which has acquired a particularly privileged status in attachment research (Clark et al., 2000). Within the attachment paradigm, sensitive parenting has been given a central place in the aetiology of secure attachment and hence adaptive child

outcome (George & Solomon, 1999). Parents who perceive and evaluate their children's signals appropriately and who respond quickly and contingently, are considered to display sensitive parenting. Because sensitivity is considered critical to optimal parenting and adaptive child outcomes, it will be used as an index of parenting in this study.

In addition to investigating the impact of personality on parenting, this research will also investigate the role of child effects. The notion of a bi-directional influence, initially highlighted by Bell (1968), has been reiterated by Belsky, (1984). Apart from emphasising the significance of personality in determining parenting, he includes the child's characteristics as an important component (Belsky, 1984). Research on the bi-directionality of influence of effects implicates child temperament and concomitant behaviours as factors that moderates the impact of parent effects (Clark et al., 2000). Consequently, this research will not only examine the direct influence of personality on parenting, but also whether personality and infant temperament have a joint effect on parenting.

## **1.9 Research questions and hypotheses**

This section presents research questions and hypotheses.

1. How does maternal personality influence parenting?
  - Mothers high on extraversion/PA will be more sensitive in their interactions with their children relative to mothers with lower scores.
  - Mothers high in neuroticism/NA will be less sensitive in their interactions with their children relative to mothers with lower scores.
  
2. How do infant effects influence parenting?
  - Negative infant temperament will have a main effect on parenting.
  - Negative infant behaviours will have a main effect on parenting.
  
3. Under what conditions does the effect of maternal personality on parenting interact with infant effects?
  - The effect of maternal personality on parenting will be moderated by negative infant temperament and behaviours.

## **2. Methods**

### **2.1 Overview**

This chapter describes the recruitment of participants for the study, the measures used and finally the procedures employed to investigate the research questions. Participants consisted of mother-infant dyads that volunteered to take part in studies carried out in the Birkbeck College 'Centre for Brain and Cognitive Development'. During their approximately 1 hour visit, mothers completed various questionnaires, were observed and video-recorded during a semi-structured play session with their infant and participated in an activity that constituted part of another study.

### **2.2 Design**

The study adopted a cross-sectional, correlational design. In addition to investigating the relationship between maternal personality and parenting, the study examines how infant factors interact with parental personality to moderate the relationship between personality and parenting.

### **2.3 Setting**

The data was collected at the Centre for Brain and Cognitive Development based in central London. The centre is part of Birkbeck College, University of London. This centre has become a well-established research unit, investigating various aspects of child development.

## **2.4 Participants**

Participants consisted of 102 mother-infant dyads recruited through advertisements placed in Family Newsletters, Baby Express, London Baby Directory and by word of mouth. Sixty of the infants were male (59%), and 42 were female (41%). Participants were predominantly white (96%). Mothers of approximately 7 month-old infants were invited to participate in the study at the Baby Laboratory in the Centre for Brain and Cognitive Development. Participation relied on voluntary self-selection. Mothers were informed that, as part of a larger study, information on maternal mood, infant temperament and parent-infant interaction would also be collected.

## **2.5 Ethical approval**

Ethical approval for this part of the study was obtained under the auspices of a larger project conducted at the Centre for Brain and Cognitive Development, Birkbeck College. A copy of the ethical approval form is found in Appendix 1.

## **2.6 Measures**

The study used one self-report measure: Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988); one maternal-report measure: Infant Behaviour Questionnaire (IBQ) (Rothbart 1981); and a coding scheme to rate the video-recorded mother-infant interaction on sensitivity and child behaviour, devised

by the National Institute of Child Health and Human Development in America (NICHD, 1991).

### 2.6.1 Maternal personality

Maternal personality was measured by using the PANAS developed by Watson, Clark, & Tellegen (1988) (see Appendix 2). The PANAS contains two self-report scales – Negative Affect and Positive Affect – that assess the higher order dimensions that emerge consistently in factor analyses of self-rated affect (Watson & Walker, 1996). The scales consist of ten words describing emotions, which have been selected as ‘pure’ markers of positive and negative affect.

The ‘markers’ of positive and negative affect consist of:

#### PA (Positive Affect)

- interested
- excited
- strong
- enthusiastic
- alert
- proud
- inspired
- determined
- attentive
- active

#### NA (Negative Affect)

- distressed
- upset
- guilty
- scared
- hostile
- irritable
- ashamed
- nervous
- jittery
- afraid

The PANAS represents one of the most widely used measures of self-rated affect, exhibiting high internal consistency and test-retest reliability (Watson, Clark, & Tellegen, 1988; Watson & Walker, 1996; Mackinnon et al., 1998). According to Watson and colleagues, the PANAS scale internal consistency reliabilities

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(Cronbach's  $\alpha$ ) range from .86 to .90 for PA and from .84 to .87 for NA (Watson, Clark, & Tellegen, 1988).

The PANAS can be used to measure mood in a wide range of time frames. Which time frame is measured depends on how the question is asked i.e. how do they feel 'right now', how they felt 'today', 'past few days', 'past few weeks', during past 'year', and in 'general, on average' (Watson, Clark, Tellegen, 1988). The PANAS scales exhibit a significant level of retest stability in every time frame, even in the moment ratings. However, test-retest reliability increases as the rated time frame lengthens. Of particular relevance to this study are the reliability coefficients for the 'in general, on average' time frame, which are .68 for the PA scale and .71 for the NA scale. These correlation coefficients have led Watson, Clark, and Tellegen (1988) to conclude that *"the stability coefficients of the general ratings are high enough to suggest that they may in fact be used as trait measures of affect"* (p. 1065, Watson, Clark, Tellegen, 1988). For purposes of this study, participants were therefore assessed on trait forms of the PANAS. An 'average' level of each affect was therefore obtained, taking into account both the frequency and intensity of the emotion. Participants made a global rating of the extent to which they *generally* felt each emotion on a 5-point scale (1 = not at all, 2 = a little, 3 = moderately, 4 = quite a bit, 5 = extremely).

Correlations between the PANAS scales and measures of related constructs, such as anxiety, depression and general psychological distress have also been analysed in several studies. External validity was examined in relation to commonly used measures such as the State-Trait Anxiety Inventory State Anxiety Scale (A-State;

Spielberger, Gorsuch, & Lushene, 1970), and the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI is substantially correlated with the PANAS NA scale (.58) and negatively correlated with the PANAS PA scale (-.36). However the coefficients are not so high as to indicate interchangeability of the BDI and NA scale. Correlations between the NA and PA scales and the A-state are .51 and -.35 respectively. Watson, Clark, & Tellegen (1988) suggest that the PANAS may be used in conjunction with measures such as the BDI and A-State as it provides a reliable and independent measure of both the negative and positive affective components which, in combination produce complex affective symptomatology.

As mentioned in the introduction, correlations between the PANAS and various personality measures (e.g. Eysenck's Personality Questionnaire (EPQ, Eysenck & Eysenck, 1975), Neuroticism, Extraversion, and Openness Personality Inventory (NEO-PI, Costa & McCrae, 1985) have also been examined. Correlation coefficients ranging between .65-.80 and .64-.70 have been demonstrated between NA and neuroticism, and PA and extraversion respectively (Wilson & Gullone, 1999)

### **2.6.2 Maternal sensitivity and infant behaviour**

Parenting and infant behaviour were measured by the mother-child interaction measure reproduced in Appendix 3. This measure was devised for several large scale studies carried out by the National Institute of Child Health and Human Development in the United States (NICHD, 1999). The measure taps into various manifestations of maternal sensitivity (8 scales) and child behaviour (5 scales).



The NICHD studies derived maternal sensitivity and infant engagement composites based on individual subscales. Cronbach's alphas for maternal sensitivity composites ranged between .75, and .78 when infants were between 6 to 36 months old. Correlations of maternal sensitivity composites over time are moderately strong ranging from .39 (rated when infants were 6 and 15 months) to .48 (from 24 to 36 months) (NICHD, 1999). The correlation between composites of maternal sensitivity at 6 and 36 months was .42. Cronbach's alphas for the child engagement composites at 15, 24, and 36 months were .58, .74, and .78, respectively. Correlations between this composite at different ages (e.g. 15 and 24 months, 24 and 36 months, etc.) indicated modest relations over time, ranging from .15 to .27 (NICHD, 1999).

The coding scheme consists of the following scales:

**Maternal Behaviour:**

- 1) maternal sensitivity to distress: this item focuses on how the caregiver responds to the child's cries, frets, or other instances of negative emotions
- 2) maternal sensitivity to nondistress: this item focuses on how the caregiver observes and responds to the child's social gestures, expressions, and signals. The defining feature of sensitive interaction is that it is child-centred.
- 3) intrusiveness: this item focuses on interaction which is adult-centred rather than child-centred. This essentially involves caregivers imposing their agenda on the child despite signals that a different activity, level, or pace of interaction is needed.
- 4) detachment/disengagement: this item assess the extent to which the caregiver may appear emotionally uninvolved or disengaged, and unaware of the child's needs for appropriate interaction. It is characterised by a lack of contingency

to the child's vocalisations or actions, and a lack of 'scaffolding' needed for the child to explore objects.

- 5) stimulation of cognitive development: this item measures the degree to which the caregiver tries to encourage the child's cognitive development. This may even include simple activities, such as feeding, which can facilitate learning.
- 6) positive regard for the child: this item rates the caregiver's positive feelings toward the child, such as, warm tone of voice, physical affection, smiling/laughing, and praise.
- 7) negative regard for the child: this item rates the caregiver's negative regard for the child such as, disapproval, abruptness, harshness, tense expression, etc.
- 8) flatness of affect: this item measures the degree to which flatness of affect is expressed. This may be exhibited by a blank, impassive facial expression, flat tone of voice, distinct lack of animation, etc.

#### Child Behaviour:

- 1) Positive mood: this item assesses the extent to which the child is satisfied, content, and pleased with the situation. Measures of this item include smiles and laughter. Lack of positive affect indicates neutrality or negative mood.
- 2) Negative mood: assesses the extent to which the child cries, fusses, frowns or otherwise expresses discontentment. Lack of negative affected indicates either strong positive affect of contentment.
- 3) Activity level: assesses the child's motor activity in terms of speed, frequency, and intensity.
- 4) Sociability: assesses the extent to which the child actively participates in the social world.

- 5) Sustained attention: measures the child's sustained involvement with the world, including objects and people.

These dimensions were rated on a 4-point scale (1 = not at all characteristic, 2 = minimally characteristic, 3 = moderately characteristic, and 4 = highly characteristic). Rating involved a two-step process. The first step consisted of asking whether a dimension is 'characteristic' (a 3 or 4 rating) or 'not characteristic' (a 1 or 2 rating). Once this decision has been made, finer discriminations between 3 or 4 and 1 or 2 ratings needed to be made. Ratings of the dimensions were based on both the quality and quantity of behaviour.

In the current study, coders received training to establish comparable coding expertise. Inter-rater reliability was established by initially coding 25% of the mother-infant tapes separately, with joint coding carried out at regular intervals. Correlations (Spearman's  $r$ ) for each individual maternal sensitivity and child behaviour scale were calculated in addition to overall scale correlations. The following correlations were obtained for the maternal sensitivity rating scales: sensitivity to nondistress (.66), intrusiveness (.62), detachment (.78), stimulation of development (.66), positive regard (.65), flat affect (.66). Correlation ratings for sensitivity to distress and negative regard were not conducted because behaviours relating to these scales were rarely observed. The following correlations were obtained for the child behaviour rating scales: child positive mood (.70), child positive mood (.90), activity level (.90), sociability (.79), and sustained attention (.60). The creation of maternal sensitivity and child behaviour composites is described in the methods section, under data reduction procedures.

### 2.6.3 Infant temperament

Infant temperament was measured using the Infant Behaviour Questionnaire (IBQ) (Rothbart & Gartstein, 1999). This measure relies on caretaker report of infant behaviour. The controversy surrounding such measures has been reported in the introduction. Despite this controversy, a recent review states that, evidence to date is in support of the use of parent-report measures (Rothbart & Bates, 1998)

The IBQ was developed to include not only the Thomas and Chess' (1977) dimensions mentioned previously, but also to tap into other aspects of reactivity and self-regulation that had been identified as involving individual differences with a possible constitutional basis (Rothbart, 1981). Compared to other measures of infant temperament, the IBQ demonstrates one of the highest levels of internal consistency, with a mean correlation of .80 (Slabach, Morrow, & Wachs, 1991). Levels of inter-rater reliability range between .45 and .69, and test-retest reliability range between .48 and .81 for the different temperament scales which comprise the IBQ. Slabach, Morrow, and Wachs, (1991) also state that the IBQ can be used as a predictor of infant behaviour in laboratory situations.

The IBQ consists of 64 questions assessing the following dimensions of temperament:

- 1) activity level: refers to the child's gross motor activity, including movement of arms and legs, squirming, and locomotor activity
- 2) smiling and laughter: smiling or laughter from the child in any situation
- 3) fear: refers to the child's distress and/or extended latency to approach an intense or novel stimulus

- 4) distress to limitations: includes the child's fussing, crying or showing distress while in various situations, such as waiting for food or being dressed
- 5) soothability: refers to the child's reduction of fussing, crying, or distress when soothing techniques are used by the caretaker
- 6) duration of orienting: includes the child's vocalisation, looking at/or interaction with a single object for extended periods of time when there has been no sudden change in stimulation
- 7) approach: refers to the child's initiation of contact or general 'approach' behaviour.

These dimensions were assessed by a series of questions tapping into the constructs. The questions were rated on a 7-point scale (1 = never, 2 = very rarely, 3 = less than half the time, 4 = about half the time, 5 = more than half the time, 6 = almost always, 7 = always, including a 'does not apply' option).

Rothbart (1986) suggests that two second-order dimensions can be created by compositing some of the above dimensions. 'Positive Emotionality' consists of smiling and laughter, high pleasure, and approach, whereas 'Negative Emotionality' consists of distress to limitations and fear. These second order dimensions reportedly have good internal consistency (.82-.87) across different caregivers (Belsky, Hsieh, & Crnic, 1996). An analysis of internal consistencies in the current study, however, revealed low correlations of .24 for negative emotionality. As fear and distress to limitations were internally consistent at .92 and .80, respectively, they were used as separate temperament variables, in addition to positive emotionality (Cronbach's  $\alpha = .60$ ) in the current study.

## 2.7 Procedures

Mother-infant dyads were initially welcomed into the reception. After written consent was obtained and procedures were explained, mothers were asked to fill in the Infant Behaviour Questionnaire and the Positive and Negative Affect Schedule. They were subsequently asked to a different room, where they participated in investigations for a different study. During the final part of their visit, during which data was collected for the current study, mothers were asked into the centre's seminar room. A colourful mat (2x3 meters) was placed on the floor to create a boundaried play area. A variety of toys and magazines were placed on a nearby table. The toys presented were chosen on the basis of being developmentally appropriate. They consisted of items which children could manipulate and which stimulated multiple sensory systems. Mothers were given broad instructions in order not to influence their style of interaction. They were essentially told that during this part of the study, we were interested in whether or how seven-month-old infants differed in their play, as this would give us an opportunity to get an observation-based idea of the child's personality, which serves as an adjunct to the earlier completed Infant Behaviour Questionnaire. Mothers were not instructed in relation to the toys or magazines. A researcher video recorded this semi-structured play session. The video recorder was placed on a tripod approximately 4 meters from the play area, so as to minimise intrusion. While conducting the video recording, the researcher was instructed to avoid eye contact and provide minimal responses when mothers asked questions.

### **3. Results**

#### **3.1 Overview**

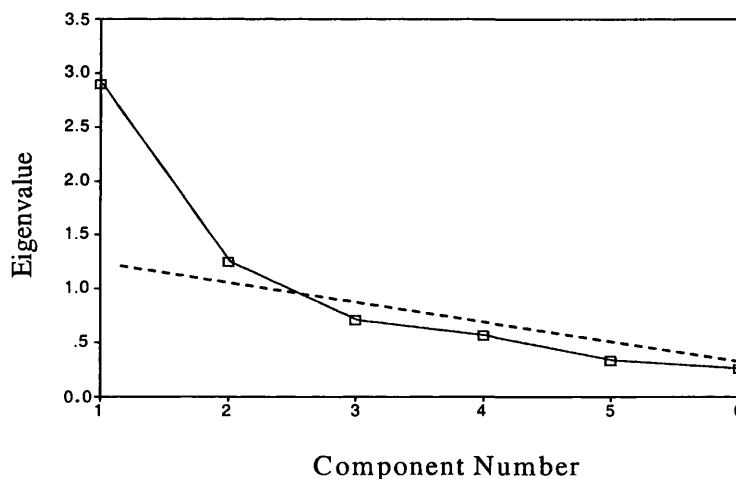
This chapter presents details of data preparation procedures and the results of statistical investigations. It opens with a description of data reduction by factor analytic methods. This is followed by a presentation of descriptive statistics. Subsequent to this, in a descriptive analysis, correlations among the predictor variables will be presented. This provides an overview of the associations between variables and helps interpret results of subsequent multiple regression analyses. Hierarchical multiple regressions are then reported to assess the hypotheses outlined in the introduction. Several multiple regressions are conducted on maternal personality, infant temperament and infant behaviour to examine their main and interaction effects in the prediction of parenting.

#### **3.2 Data reduction - factor analyses**

The maternal sensitivity coding scheme consists of 8 individual scales. As behaviours relevant to two of these scales were rarely observed, 'negative regard for the child' and 'sensitivity to distress' were not included in the analysis. Factor analysis was subsequently carried out in order to reduce the number of variables to be analysed, and to reduce redundancy/overlap between variables. A principal components extraction and varimax rotation was carried out on the following six variables: flat affect, detachment, stimulation of development (reverse score), positive regard (reverse score), intrusiveness, and sensitivity to nondistress (reverse score). Two

factors were extracted from this solution. The selection of factor numbers was based on Catell's (1966) scree test (cited in Tabachnick & Fidell, 2001). According to this criterion, a scree plot is used to identify the point where a line drawn through the points changes slope (see Figure 1 below). When a best-fitting straight line is drawn through the points starting with the last component (i.e. component 6), a slope change appears between components two and three. Two components remaining above the dotted line were thus extracted from this solution. Both of the extracted components had eigenvalues greater than 1, while none of the remaining components did.

Figure 1. Scree Plot



Varimax loadings are presented in Table 1 below. Loaded highly on the first factor were the variables flat affect, detachment and stimulation of development (reverse score), with intrusiveness and sensitivity to nondistress (reverse score) loaded highly on the second factor. The first factor accounts for 38% of the variance, and the second for 31%. Scores of variables loading highly on the 2 factors were standardised and summed to create two new variables. As variables loading on Factor 1 are characterised by maternal disengagement and understimulation, Factor 1 will be



re-named Insensitive-Detached (Detached) (Cronbach's  $\alpha = .69$ ). Factor 2 was named Insensitive-Intrusive (Intrusive) (Cronbach's  $\alpha = .76$ ), because variables loading on this factor reflect inappropriate maternal behaviour characterised by invasiveness. These factors were subsequently used as indices of parenting style and constituted the dependent variables. Given that the reverse score of 'positive regard' loaded almost equally on both components, it was not included in either of the two new parenting dimensions.

Table 1. Varimax-Rotated Factor Loadings of Maternal Sensitivity

Variable Name	Factor 1 'Insensitive-Detached'	Factor 2 'Insensitive-Intrusive'
Flat Affect	0.85	--
Detachment	0.83	--
Stimulation of Development (reversed)	0.63	--
Positive Regard (reversed)	0.62	0.49
Intrusiveness	--	0.93
Sensitivity to Non-distress (reversed)	0.31	0.81

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Further data reduction was carried out on the child behaviour rating scale. This included the following five dimensions: positive mood, negative mood, activity level, sociability, sustained attention. Using the same method described above, one factor was extracted on which 3 items loaded highly (see Table. 2). The composite 'child behaviour' consequently reflects dimensions of positive mood, sociability and activity level (Cronbach's  $\alpha = .68$ ) and was named 'infant positive engagement'.

Table 2. Varimax-Rotated Factor Loadings of Child Behaviour

Variable Name	Component 1 'Infant positive engagement'
Positive mood	.81
Negative mood (reversed)	--
Activity Level	.66
Sociability	.73
Sustained Attention	.48

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

### 3.3 Descriptive statistics

Table 3 summarises the distribution of variable scores after outliers (greater than 3SD, smaller than -3SD) were removed. The significance of distribution skewness was subsequently calculated. Skewness significant at or around  $p < .01$  was considered acceptable, given that parametric tests are robust to deviations from normality (Tabachnick & Fidell, 2001). On the basis of skewness calculations, 'infant positive engagement' (skewness = 3.08) was subject to a square root transformation and was subsequently reduced to 1.58 ( $p < .01$ ). Due to its more substantial positive skew (skewness = 4.58), a logarithmic transformation was applied to the PANAS Negative Affect variable. This transformation yielded a skewness value of 1.9 ( $p < .01$ ), and thus became a closer approximation of a normal distribution. A log transformation was also applied to the two dependent variables of parenting style. The skewness of 'passive' was subsequently reduced from 4.25 to the acceptable score of 2.33 ( $p < .01$ ). Transformed variables were subsequently used in all analyses. The skewness of 'detached' improved from 5.21 to 3.25 after a logarithmic transformation was applied but was nevertheless significant. A visual examination of the distribution was subsequently carried out. This indicated that, although skewness remained significant

at the .01 level, it did not deviate substantially from normality. The significance, in part, may have reflected the relatively large sample size ( $n = 102$ ). The variable was therefore included in the analysis as one of the dependent variables.

Table 3. Descriptive statistics.

Variable Name	Mean	SD	Range
PANAS PA <sup>a</sup>	38.20	4.3	29-47
PANAS NA <sup>b</sup>	1.2	0.12	1-1.5
IBQ PE <sup>c</sup>	155.8	21.73	93-210
IBQ Fear	33.46	8.81	5-64
IBQ Distress <sup>d</sup>	51.95	12.12	20-83
Infant Positive Engagement	2.52	.38	1.73-3.46
Insensitive-Detached	.46	.13	.23-.80
Insensitive-Intrusive	.46	.13	.22-.80

<sup>a</sup> PA = Positive Affect, <sup>b</sup> NA = Negative Affect, <sup>c</sup> PE = Positive Emotionality, <sup>d</sup> Distress= Distress to Limitations

### 3.4 Descriptive analysis

Bivariate correlations among variables are presented in Table 4. Although some statistically significant correlations are present, there are no high correlations among the independent variables. This absence of multicollinearity (correlations of  $>.8$ ) is an important consideration in relation to the subsequent multiple regressions, because results may otherwise be difficult to interpret (Tabachnick & Fidell, 2001). As expected, a low, albeit significant negative correlation exists between PANAS positive affect and negative affect. In addition, PANAS positive affect and negative affect are also significantly correlated with IBQ positive emotionality and IBQ distress, respectively. Infant positive engagement is significantly correlated with IBQ positive emotionality, and significantly negatively correlated with both dependent

variables. Missing data indicated in Table 4 resulted either from the removal of outliers (PANAS negative affect) or absence of parental response (IBQ fear).

Table 4. Bivariate Correlations between variables

<u>Bivariate Correlations</u>								
Variable Name	1	2	3	4	5	6	7	8
N	101	98	102	102	98	102	102	102
1. PANAS PA <sup>a</sup>	1	-.332**	.292**	-.159	.002	.140	-.096	.130
2. PANAS NA <sup>b</sup>		1	-.145	.372**	.173	-.061	.002	.033
3. IBQ PE <sup>c</sup>			1	-.096	.157	.234*	-.077	-.018
4. IBQ Distress <sup>d</sup>				1	.145	-.007	-.163	.075
5. IBQ Fear					1	-.090	-.029	.036
6. Infant positive engagement						1	-.346**	-.381**
7. Detached							1	.029
8. Intrusive								1

\*  $p < .05$ ; \*\*  $p < .01$ , <sup>a</sup>PA = Positive Affect, <sup>b</sup>NA = Negative Affect, <sup>c</sup>PE = Positive Emotionality, <sup>d</sup>Distress = Distress to Limitations

### 3.5 Hierarchical multiple regressions

A series of hierarchical multiple regressions were performed to address the research hypotheses. The first four hypotheses were addressed by examining the main effects of maternal personality, infant temperament and behaviour in predicting parenting. The fifth hypothesis was addressed by carrying out a series of two-step regressions to examine whether there is a gain in prediction of parenting by adding interaction terms to the regression. In all cases, continuous variables were entered as centred scores. Centering the scores (i.e. converting original values to deviation scores) ameliorates potential difficulties that can arise from correlated independent variables (Tabachnick & Fidell, 2001).

### 3.5.1 Predicting parenting from maternal personality, infant temperament and infant positive engagement– main effects

The initial set of multiple regressions was carried out in order to assess the main effects of maternal personality, infant temperament and infant positive engagement on the two parenting dimensions. The first set of regressions examine the main effect of maternal personality while controlling for gender. In each regression, gender, maternal positive affect and negative affect were entered in one block to predict maternal detachment and intrusiveness. Neither of the regressions was significant (maternal detachment ( $F(3,94) = .673, p = .570$ ); intrusiveness ( $F(3,94) = .936, p = .427$ )). Regression coefficients from this analysis are presented in Table 5.

Table 5. Predicting Maternal Detachment and Intrusiveness from Maternal Personality

<u>Multiple Regression Statistics for the prediction of Detachment</u>			
Predictor	Beta-value	T-value	p-value
Gender	.099	.955	.342
Maternal PA <sup>a</sup>	-.101	-.921	.360
Maternal NA <sup>b</sup>	.007	.065	.948

<u>Multiple Regression Statistics for the prediction of Intrusiveness</u>			
Predictor	Beta-value	T-value	p-value
Gender	-.059	-.572	.569
Maternal PA	.152	1.395	.166
Maternal NA	.106	.975	.332

<sup>a</sup> PA = Positive Affect, <sup>b</sup> NA = Negative Affect

The next set of regressions examined the prediction of parenting by infant temperament (with gender partialled out). Gender and the levels of infant

temperament were entered as one block to predict maternal detachment and intrusiveness in separate regressions. In neither case was the regression significant: detachment ( $F(4,93) = 1.221, p = .307$ ); intrusiveness ( $F(4,93) = .212, p = .931$ ). However, infant distress to limitations shows a trend towards significance in the prediction of detachment ( $p = .073$ ). Regression coefficients from the analysis examining whether infant temperament predicts maternal detachment or intrusiveness are presented in Table 6 below.

Table 6. Predicting Maternal Detachment and Intrusiveness from Infant Temperament

<u>Multiple Regression Statistics for the prediction of Detachment</u>			
Predictor	Beta-value	T-value	p-value
Gender	.028	.262	.794
IBQ PE <sup>a</sup>	-.124	-1.188	.238
IBQ Distress <sup>b</sup>	-.193	-1.811	.073
IBQ Fear	.011	.101	.920

<u>Multiple Regression Statistics for the prediction of Intrusiveness</u>			
Predictor	Beta-value	T-value	p-value
Gender	-.070	-.633	.528
IBQ PE	-.051	-.482	.631
IBQ Distress	.019	.179	.858
IBQ Fear	.058	.523	.602

<sup>a</sup> PE = Positive Emotionality, <sup>b</sup> Distress = Distress to Limitations

The next regressions examined the prediction of parenting by infant positive engagement (again while controlling for gender). Gender and infant positive engagement were entered as one block to predict maternal detachment and intrusiveness in separate regressions. Regression coefficients from this analysis are

presented in Table 7 below. The p-value of the overall regressions indicates that the regressions account for significant variance in detachment (12.1%,  $F(2,99) = 6.799$ ,  $p = .002$ ) and intrusiveness (16.9%,  $F(2,99) = 10.046$ ,  $p < .001$ ). Infant positive engagement emerges as a highly significant (negative) predictor in both regressions ( $p = .001$ ) and accounts for approximately 11.42% (partial  $r^2$ ) of variance in both regressions. This analysis indicates that positive infant engagement predicts less detached and less intrusive parenting.

Table 7. Predicting Maternal Detachment and Intrusiveness from Infant Engagement

<u>Multiple Regression Statistics for the prediction of Detachment</u>			
Predictor	Beta-value	T-value	p-value
Gender	.033	.344	.731
Infant positive engagement	-.341	-3.576	.001*

<u>Multiple Regression Statistics for the prediction of Intrusiveness</u>			
Predictor	Beta-value	T-value	p-value
Gender	-.156	-1.687	.095
Infant positive engagement	-.404	-4.362	<.001*

### 3.5.2. Predicting parenting from maternal personality and infant temperament – interaction effects

The regressions carried out so far indicate that infant positive engagement emerges as the only significant main effects predictor of both maternal detachment and intrusiveness. The infant temperament ‘distress to limitations’, however, approaches significance with  $p = .073$ . Having established the main effects of these variables on

parenting, the next set of regressions examine whether interaction terms improve the prediction of parenting over main effects.

The subsequent analyses consist of two-step hierarchical regressions. These were carried out in order to examine the interaction effects of maternal personality and infant effects set out in the fifth hypothesis. In these regressions, main effect variables consisted of both dimensions of maternal personality and the three infant temperament dimensions. Gender was also controlled. Main effect variables were entered as one block in the first step. In the second step, all interaction terms were added. Interaction terms were created by multiplying the two original independent variables. The resulting new variable can be interpreted as any other independent variable in a multiple regression analysis (Cohen & Cohen, 1983). Results of regressions are presented in tables displaying two Models. In each case, Model 1 presents standardised regression coefficients for the main effect variables, whereas Model 2 contains standardised regression coefficients for main and interaction effects. The tables also include t- and p-values for individual predictor items, as well as F-change statistics indicating whether Model 2 significantly improved prediction over Model 1. The significance of individual regressions and the percentage of variance accounted for will be presented in the text.



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### Predicting Maternal Detachment

The initial set of multiple regressions included the following predictor variables: maternal personality (PANAS PA and PANAS NA), infant temperament (IBQ Positive Emotionality, IBQ Distress, and IBQ Fear) and gender. Gender, maternal personality and infant temperament were entered as a block in Step 1. Interaction effects were entered in Step 2. In this case, interaction terms were created by multiplying the dimensions of maternal personality with the infant temperament variables. Table 8 displays regression coefficients for the main and interaction effects. The results indicate that gender, maternal personality and infant temperament (Model 1) do not significantly predict variance in detachment ( $F(6,86) = 1.047, p = .401$ ). A combination of main and interactions effects between maternal personality and infant temperament (Model 2) is also not significant overall ( $F(12,80) = 1.085, p = .384$ ). The F-change value indicates that Model 2 is not significantly better ( $F(6,80) = 1.115, p = .361$ ) at predicting maternal detachment than Model 1. Hence, overall the interaction terms did not significantly predict detachment.

It is notable, however, that in Model 2, IBQ distress to limitations was a significant (negative) predictor of detachment ( $p = .044$ ). A significant interaction effect also emerged between maternal negative affect and infant positive emotionality ( $p = .017$ ) in Model 2. This interaction term on its own accounted for 6.9% of the variance in detachment. Both results need to be interpreted with caution because they may reflect a Type 1 error. Nevertheless, to examine the form of the interaction, the slope of the final equation was computed at points that corresponded to scores at the 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> %ile of each predictor variable in the interaction, while holding all other variables

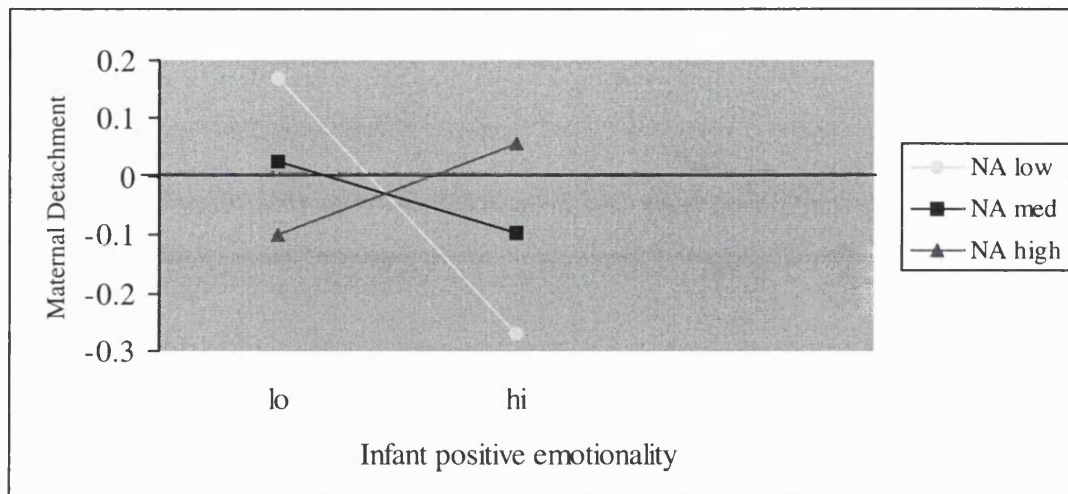
constant at the 50<sup>th</sup> %ile. Figure 2 below illustrates the direction of the interaction. It suggests that mothers higher in negative affect engage less with children of higher positive emotionality than mothers lower in negative affect.

Table 8. Predicting Maternal Detachment from Maternal Personality and Infant Temperament

<u>Multiple Regression Statistics</u>				
Predictor	F-change	Beta-value	T-value	p-value
<b>Model I</b>				
Gender	--	.036	.314	.754
PANAS PA <sup>a</sup>	--	-.090	-.802	.425
PANAS NA <sup>b</sup>	--	.046	.399	.691
IBQ PE <sup>c</sup>	--	-.111	-.992	.324
IBQ Distress <sup>d</sup>	--	-.222	-1.938	.056
IBQ Fear	--	.036	.319	.750
<b>Model II</b>				
Gender	--	-.002	-.015	.988
PANAS PA	--	-.118	1.014	.314
PANAS NA	--	.006	.050	.960
IBQ PE	--	-.071	-.598	.552
IBQ Distress	--	-.249	-2.048	.044*
IBQ Fear	--	.104	.830	.409
PANAS PA x IBQ PE	--	-.012	-.101	.920
PANAS PA x IBQ Distress	--	.124	1.028	.307
PANAS PA x IBQ Fear	--	-.062	-.522	.603
PANAS NA x IBQ PE	--	.288	2.442	.017*
PANAS NA x IBQ Distress	--	.150	1.192	.237
PANAS NA x IBQ Fear	--	.011	.088	.930
Model II – Model I	1.115 <sup>e</sup>	--	--	.361

<sup>a</sup> PA = Positive Affect, <sup>b</sup> NA = Negative Affect, <sup>c</sup> PE = Positive Emotionality, <sup>d</sup> Distress= Distress to Limitations, <sup>e</sup> d.f. = (6,80),

Figure 2. Interaction between maternal negative affect and IBQ Positive Emotionality in predicting maternal detachment



### Predicting Maternal Intrusiveness

The same main and interaction effect variables described above were entered in steps one and two of the regression to predict maternal intrusiveness. Neither Model 1 ( $F(6,86) = .498, p = .808$ ) nor Model 2 ( $F(12,80) = .808, p = .641$ ) significantly predicted maternal intrusiveness. In addition, Model 2 did not improve the prediction of maternal intrusiveness over Model 1 ( $p = .361$ ). No individual main or interaction terms emerged as significant predictors of maternal intrusiveness in either of the Models. Regression coefficients and F-change values are presented in Table 9 below.

Table 9. Predicting Maternal Intrusiveness from Maternal Personality and Infant Temperament

Multiple Regression Statistics				
Predictor	F-change	Beta-value	T-value	p-value
<b>Model I</b>				
Gender	--	-.044	-.383	.702
PANAS PA	--	.156	1.362	.177
PANAS NA	--	.050	.426	.671
IBQ PE	--	-.102	-.894	.374
IBQ Distress	--	.027	.231	.817
IBQ Fear	--	.078	.676	.501
<b>Model II</b>				
Gender	--	-.094	-.774	.441
PANAS PA <sup>a</sup>	--	.212	1.789	.077
PANAS NA <sup>b</sup>	--	.026	.196	.845
IBQ PE <sup>c</sup>	--	-.062	-.507	.614
IBQ Distress <sup>d</sup>	--	.053	.428	.670
IBQ Fear	--	.079	.618	.538
PA x IBQ PE	--	.160	1.373	.173
PA x IBQ Distress	--	.084	.682	.497
PA x IBQ Fear	--	.152	1.248	.216
NA x IBQ PE	--	-.014	-.118	.907
NA x IBQ Distress	--	.216	1.686	.096
NA x IBQ Fear	--	.083	.680	.499
Model II – Model I	1.114 <sup>e</sup>			.361

<sup>a</sup> PA = Positive Affect, <sup>b</sup> NA = Negative Affect, <sup>c</sup> PE = Positive Emotionality, <sup>d</sup>Distress= Distress to Limitations, <sup>e</sup> d.f. = (6,80)

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### **3.5.3. Predicting parenting from maternal personality and infant positive engagement – interaction effects**

Given that infant positive engagement during the observation period may also influence parenting style, either directly or jointly with maternal personality, it was thought important to add this variable to the regression analysis. The main and interactions effects of maternal personality and infant positive engagement in accounting for variance in parenting style were consequently examined.

In the following regressions, gender, maternal personality and infant positive engagement were entered as a block in Step 1 to examine main effects. In Step 2, interaction effects were examined by creating new independent variables consisting of the multiplication of two independent variables. In this case, interaction terms were created by multiplying the dimensions of maternal personality with infant positive engagement. Interaction terms were entered into the regression equation as Step 2, after controlling for gender, and the relevant main effect terms in Step 1. Two separate regressions were conducted, one for maternal detachment and one for intrusiveness.

#### Predicting Maternal Detachment

Standardised regression coefficients for main and interaction effects and F-change statistics are presented in Table 10 below. The overall regression examining main effects of maternal personality and infant positive engagement (Model 1) was significant ( $F(4,92) = 3.027, p = .022$ ) and accounted for 11.6 % of variance in

maternal detachment. Model 2 approached significance ( $F(6,90) = 2.155, p = .055$ ) and accounted for .9% of variance in detachment. Model 2 did not, however, significantly improve the prediction of maternal detachment over Model 1 ( $F(2,90) = .481, p = .620$ ). Infant positive engagement was a significant predictor in both Models 1 and 2 ( $p = .002$  and  $p = .003$  respectively). The direction of the standardised regression coefficient indicates that infant positive engagement is negatively associated with maternal detachment, and on its own accounts for 9.7% (partial  $r^2$ ) of variance in maternal detachment.

Table 10. Predicting Maternal Detachment from Maternal Personality and Infant positive engagement

<u>Multiple Regression Statistics</u>				
Predictor	F-change	Beta-value	T-value	p-value
<b>Model I</b>				
Gender	--	.048	.478	.634
PANAS PA <sup>a</sup>	--	-.056	-.535	.594
PANAS NA <sup>b</sup>	--	-.004	-.038	.970
Infant positive engagement	--	-.316	-3.145	.002*
<b>Model II</b>				
Gender	--	.039	.388	.699
PANAS PA	--	-.056	-.530	.598
PANAS NA	--	.001	.011	.992
Infant positive engagement	--	-.316	-3.102	.003*
PANAS PA x Infant pos eng	--	-.103	-.978	.331
PANAS NA x Infant pos eng	--	-.044	-.410	.682
Model II – Model I	.481 <sup>c</sup>	--	--	.620

<sup>a</sup>PA = Positive Affect, <sup>b</sup>NA = Negative Affect, <sup>c</sup>d.f. = (2,90)

### Predicting Maternal Intrusiveness

Table 11 presents regression coefficients and F-change statistics for the main (Model 1) and interaction effects (Model 2) of maternal personality and positive infant positive engagement. Both regressions were significant at  $p < .001$ , and the F-change statistic indicates that there was no significant improvement of prediction with the addition of Model 2 ( $F(2,90) = .2.155$ ,  $p = .122$ ). Model 1 accounted for 20% and Model 2 for an additional 3.7% of unique variance. Maternal PA and Positive Infant Behaviour (negatively correlated) both emerged as significant main effect predictors in Model 1 ( $p = .038$  and  $p < .001$ , respectively) and Model 2 ( $p = .043$  and  $p < .001$  respectively). Individually, they accounted for approximately 4.5% (maternal positive

affect) and 17.2% (infant positive engagement) of variance in maternal intrusiveness. The significant prediction of intrusiveness by maternal positive affect did not emerge in previous analyses. Although the overall interaction effects were not significant, it is worth noting that the interaction between maternal positive affect and infant behaviour approached significance in Model 2 with  $p = .067$

Table 11. Predicting Maternal Intrusiveness from Maternal Personality and Infant positive engagement

<u>Multiple Regression Statistics</u>				
Predictor	F-change	Beta-value	T-value	p-value
<b>Model I</b>				
Gender	--	-.127	-1.333	.186
PANAS PA <sup>a</sup>	--	.211	2.105	.038*
PANAS NA <sup>b</sup>	--	.092	.918	.361
Infant positive engagement	--	-.424	-4.430	<.001**
<b>Model II</b>				
Gender	--	-.133	-1.404	.164
PANAS PA	--	.204	2.055	.043*
PANAS NA	--	.091	.918	.361
Infant positive engagement	--	-.411	-4.321	<.001**
PANAS PA x Infant pos eng	--	-.183	-1.857	.067
PANAS NA x Infant pos eng	--	.022	.219	.827
Model II – Model I	2.155 <sup>c</sup>	--	--	.122

<sup>a</sup>PA = Positive Affect, <sup>b</sup>NA = Negative Affect, <sup>c</sup>d.f. = (2,90)



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### **3.5.4. Predicting parenting from maternal personality, infant temperament, and infant positive engagement – interaction effects**

Up to this point, it has been established that higher levels of infant positive engagement are associated with lower levels of maternal detachment and intrusiveness. This was true even when other factors were controlled for. Furthermore, infant distress to limitations was found to be predictive of lower levels of maternal detachment. In addition, higher levels of maternal positive affect were associated with higher levels of maternal intrusiveness in some analyses. Finally, there was an interaction between maternal negative affect and infant positive emotionality. The direction of the interaction indicated that mothers higher in negative affect engage less with children of higher positive emotionality than mothers low in negative affect.

In these analyses there is evidence that child behaviour has an influence on parenting. Furthermore, another child variable, this time infant distress to limitations, showed some evidence of being associated with parenting (detachment) as well. Also, a third variable, infant positive emotionality was found to interact with maternal negative affect in predicting detachment. In all these analyses, however, temperamental variables were not entered into the same analyses as observational measures of child behaviour. Therefore, it remains unclear whether effects involving temperamental variables would remain significant after controlling for infant positive engagement, or conversely, whether child behaviour effects (infant positive engagement), remain significant after controlling for temperamental variables. In order to assess this, two final analyses combined all predictors included in the previous regressions. Main

effect variables were entered as one block in Step 1, whereas interaction terms were entered as one block in Step 2.

### Predicting Maternal Detachment

Examining Table. 12 below, we can see that the significant infant effects found earlier in relation to detachment, remained significant when all predictors were included. Infant positive engagement remained significant, after the temperament variables (main effects and interactions with maternal personality) were controlled for ( $p = .001$ , partial  $r^2 = 13.3\%$ ). The main effect of infant distress to limitations also remained significant when infant positive engagement was controlled for ( $p = .016$ , partial  $r^2 = 7.3\%$ ). Finally, the interaction between maternal negative affect and infant positive emotionality also remained significant after positive engagement (main effect and interactions with maternal personality) was controlled for ( $p = .003$ , partial  $r^2 = 10.6\%$ ). Indeed, this effect was substantially more significant in this analysis than previously. This suggests that the effects of the two child variables (temperament and behaviour) are not overlapping and represent distinct child influences on observed parenting. Due to the possibility of Type I error, however, these results have to be interpreted with caution.

Table 12. Predicting Maternal Detachment from Maternal Personality, Infant Temperament and Infant positive engagement

Multiple Regression Statistics				
Predictor	F-change	Beta-value	T-value	p-value
Gender	--	-.071	-.623	.535
PANAS PA <sup>a</sup>	--	-.094	-.857	.394
PANAS NA <sup>b</sup>	--	.027	.220	.827
IBQ PE <sup>c</sup>	--	.026	.229	.819
IBQ Distress <sup>d</sup>	--	-.295	-2.469	.016*
IBQ Fear	--	.082	.695	.489
Infant positive engagement	--	-.365	-3.444	.001**
PANAS PA x IBQ PE	--	.007	.063	.950
PANAS PA x IBQ Distress	--	.198	1.721	.089
PANAS PA x IBQ Fear	--	-.091	-.777	.440
PANAS NA x IBQ PE	--	.348	3.021	.003*
PANAS NA x IBQ Distress	--	.129	1.086	.281
PANAS NA x IBQ Fear	--	-.020	-.171	.865
PANAS PA x Infant pos eng	--	-.074	-.636	.527
PANAS NA x Infant pos eng	--	-.213	-1.864	.066

<sup>a</sup> PA = Positive Affect, <sup>b</sup> NA = Negative Affect, <sup>c</sup> PE = Positive Emotionality, <sup>d</sup> Distress = Distress to Limitations

### Predicting Maternal Intrusiveness

In terms of maternal intrusiveness, the only infant effect predictor previously found significant was positive engagement. As it nevertheless remains unclear whether this prediction remains significant after controlling for temperament variables, the following analysis was carried out. Table 13 below presents such regression, including all predictors examined so far.

The first thing to note is that infant positive engagement remains significant ( $p < .001$ , partial  $r^2 = 18.4\%$ ). This therefore indicates that there is no overlap with effects of infant temperament. As in a previous regression (see Table 11), maternal Positive

Affect also remains significant ( $p = .024$ , partial  $r^2 = 6.5\%$ ). Somewhat surprisingly, several interaction effects hitherto not significant became so in this analysis. Specifically, interactions between maternal positive affect and infant positive emotionality ( $p = .024$ ), and maternal positive affect and infant positive engagement ( $p = .038$ ) emerged as significant in this regression.

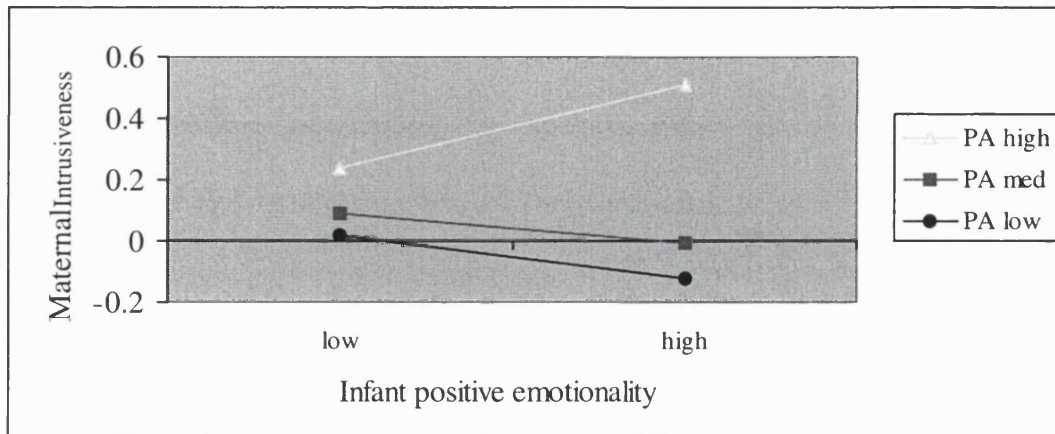
Table 13. Predicting Maternal Intrusiveness from Maternal Personality, Infant Temperament and Infant positive engagement

Predictor	Multiple Regression Statistics			
	F-change	Beta-value	T-value	p-value
Gender	--	-.155	-1.411	.162
PANAS PA <sup>a</sup>	--	.244	2.307	.024*
PANAS NA <sup>b</sup>	--	.001	-.002	.998
IBQ PE <sup>c</sup>	--	.040	.364	.717
IBQ Distress <sup>d</sup>	--	.116	1.008	.317
IBQ Fear	--	.031	.269	.789
Infant positive engagement	--	-.425	-4.165	<.001*
PANAS PA x IBQ PE	--	.275	2.495	.015*
PANAS PA x IBQ Distress	--	.133	1.204	.232
PANAS PA x IBQ Fear	--	.148	1.322	.190
PANAS NA x IBQ PE	--	-.047	-.425	.672
PANAS NA x IBQ Distress	--	.171	1.499	.138
PANAS NA x IBQ Fear	--	.043	.386	.701
PANAS PA x Infant pos eng	--	-.235	-2.111	.038*
PANAS NA x Infant pos eng	--	.041	.370	.713

<sup>a</sup> PA = Positive Affect, <sup>b</sup> NA = Negative Affect, <sup>c</sup> PE = Positive Emotionality, <sup>d</sup> Distress = Distress to limitations

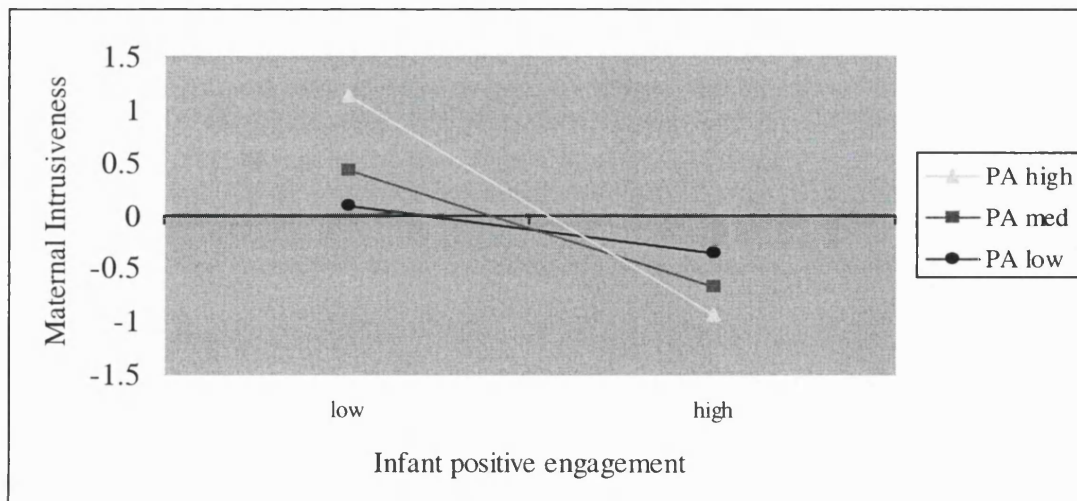
In relation to the interaction between maternal positive affect and infant positive emotionality, Figure 3 below indicates that mothers high in positive affect are more intrusive than mothers low in positive affect when children display higher positive emotionality.

Figure 3. Interaction between maternal positive affect and IBQ positive emotionality in predicting maternal intrusiveness



Furthermore, in relation to the interaction between maternal positive affect and infant positive engagement, Figure 4 below indicates that mothers high in positive affect become less intrusive with infants displaying higher positive engagement than mothers lower in positive affect.

Figure 4. Interaction between maternal positive affect and infant positive engagement in predicting maternal intrusiveness



Given that these interactions were not present in the analysis where infant temperament and infant positive engagement were analysed separately, these results should be interpreted with particular caution. The pattern of results suggests the influence of suppressor effects. Suppressor effects arise in the presence of variables that enhance the importance of other independent variables by suppressing irrelevant variance in other independent variables or in the dependent variable (Tabachnick & Fidell, 2001). This issue will be further explored in the discussion.

### **3.6 Summary of results**

The analyses have shown that child behaviour (infant positive engagement) is negatively associated with both maternal detachment and intrusiveness. In addition, maternal positive affect was associated with an increase in maternal intrusiveness. Another child variable, this time the temperament variable infant distress to limitations, was also negatively associated with maternal detachment. Maternal detachment was also predicted by the interaction between maternal negative affect and infant positive emotionality. The direction of the interaction indicated that mothers higher in negative affect are more detached with emotionally positive infants. Conversely, mothers lower in negative affect become more involved with infants of high positive emotionality. The final analysis showed that that none of the child effects overlapped with each other.

Furthermore, in the final analysis, two additional interaction effects emerged as significant. One interaction indicated that higher levels of maternal positive affect are associated with greater intrusiveness with infants of higher positive emotionality. The second interaction showed that mothers higher in positive affect display less

intrusiveness with infants of higher positive engagement. However, due to the possibility of Type I error, these results have to be interpreted with caution.

## 4. Discussion

### 4.1 Overview

The chapter begins with a review of the aims of the study. This is followed by a summary of results and an interpretation of findings in light of relevant literature. Limitations of the study will then be considered. In the two final sections, suggestions for future research will be made and the clinical relevance of this study will be highlighted.

One aim of this study was to increase our understanding of the impact of personality on parenting in non-clinical samples. Although personality has been implicated as the main determinant of parenting in addition to contextual factors and child effects, surprisingly little research has been conducted into this particular relationship (Belsky, 1984; Clark et al., 2000). The majority of available research focuses on parental psychopathology such as depression, and is thus largely limited to clinical samples. Incorporating recent theoretical developments in personality research, the current study therefore examined the influence of emotion-based dimensions of personality (positive and negative affect) on parenting in the general population (Clark et al., 1994).

Apart from having investigated the impact of personality on parenting, this research also investigated the role of child effects. The importance of child effects has also been highlighted specifically in relation to parenting. In addition to emphasising the importance of parental personality as a determinant of parenting, Belsky's (1984) process model of parenting also notes the contribution of infant effects to parenting.



Research on the bi-directionality of effects, implicates child temperament and concomitant behaviours as factors that contribute to the transactional nature of parent-infant interaction (Bates, 2000). Consequently, the aim of the current study was to investigate not only the main effects of maternal personality and infant factors on parenting, but also the transactional nature of parent and infant effects in shaping parenting.

## **4.2 Review and interpretation of results**

The following sections provide a discussion of data preparation procedures and a summary of results. Findings are interpreted in light of relevant literature. Given that some significant results emerged more consistently than others, emphasis will be placed on the interpretation of findings that were consistent across the analyses. Potential reasons for the inconsistent nature of some findings will be discussed in the section reviewing the study's limitations.

### **4.2.1 Factor analyses**

As factor analysis is a common method of reducing data, it was applied to scales constituting the maternal sensitivity and infant behaviour coding schemes. This analysis extracted two factors from the 8-scale maternal sensitivity scheme. In line with previous research, scales tapping into 'negative regard' and 'sensitivity to distress' were not included in the analysis, as relevant behaviours were rarely observed (NICHD, 1999). Two factors were extracted from the remaining six scales subject to the factor analysis. These factors reflected two facets of maternal

insensitivity: 'detachment' and 'intrusiveness', and were therefore named as such. The internal consistency levels (Cronbach's  $\alpha$ ) were .69 for detachment, and .79 for sensitivity.

It is of note that this two-dimensional aspect of insensitivity mirrors findings emerging from research with depressed mothers. Field (1995) reports the existence of different styles of asynchronous mother-infant interaction characteristic of depressed mothers. One style consists of a pattern of disengagement exhibited by affectively restricted behaviours. Another style is intrusive maternal interaction characterised by interfering, hostile and irritable behaviour (Field, 1995). The conceptual validity of maternal insensitivity factors that emerged from the current study are therefore supported by findings from research with depressed mothers. However, that is not to say that maternal negative affect can be equated with depression. The syndrome of clinical depression includes symptoms other than negative moods (Cummings & Davies, 1994). Clinical depression and negative affect in the general population are therefore differentiated by quantitative and qualitative factors (Kochanska et al., 1997). Nevertheless, it is interesting to note the parallels in styles of insensitive parenting in both populations. This points out the possibility of a continuum between parenting in the general and clinical population. Further research, however, is required to establish the validity of this finding and proposition.

The second factor analysis extracted one factor from the infant behaviour scheme, on which three of the five scales loaded highly. Two of the items loading highly on this factor (child positive mood and sociability) reflected child positive engagement composites used in previous studies (e.g. NICHD, 1999). In the current study, 'child

activity level' was added to the composite as a result of the factor analysis. The internal consistency of this composite (Cronbach's  $\alpha = .68$ ) was comparable to that in other studies (Cronbach's  $\alpha$  ranging from .58 to .78) (NICHD, 1999).

#### **4.2.2 Descriptive analysis**

The analysis of relationships between the predictor and dependent variables indicated the presence of some significant correlations. The low negative correlation between PANAS positive affect and negative affect reflects previous findings, although scale intercorrelations found in this study were slightly higher than typical for this measure (Watson et al., 1988). When establishing the discriminant validity of the PANAS, Watson, Clark, and Tellegen (1988), reported a positive and negative scale intercorrelation of  $-.17$  for the trait version of the inventory. Significant positive correlations existed between maternal personality and infant temperament. More specifically, maternal positive affect was correlated with infant positive emotionality, whereas maternal negative affect was correlated with infant distress. This pattern of correlations suggests the possible influence of parental personality on temperament ratings (Mangelsdorf, Schoppe, & Buur, 2000). However, in the case of the relationship between maternal and infant positive affect, the significant positive correlation between infant positive emotionality and infant positive engagement provides some objective observational validation of the parent report. This correlation therefore, in part, reflects genetically transmitted, observable characteristics (Kochanska et al., 1997). It may consequently be the case that the rating of infant temperament in this study reflects both subjective and objective

components. It is therefore important to control for potential confounding variables in order to achieve the most objective measure of infant temperament possible.

The correlation matrix also indicated that infant positive engagement was negatively correlated with maternal detachment and intrusiveness. Being the only variable correlating significantly with the dependent variables, their inverse relationship foreshadowed the important predictor effect of infant engagement in the regression analyses.

#### **4.2.3 Prediction of parenting by maternal personality, infant temperament, and infant behaviour – main effects**

The first four hypotheses proposed that maternal personality (positive and negative affect), and infant factors (infant temperament and behaviour) would be main effect predictors of parenting. Only in the case of infant behaviour, however, was the null hypothesis consistently rejected. In contrast, maternal positive affect significantly predicted intrusiveness and infant distress to limitations negatively predicted detachment only in some regression analyses. Interpretations of these findings are therefore made with caution.

In light of theoretical considerations and previous findings, the absence of consistent main effect findings for maternal personality and infant temperament were unexpected. In the case of maternal personality, a strong predictive effect on parenting was anticipated for various reasons. Belsky's (1984) process model highlights parental personality as a factor of paramount importance in shaping

parenting. Although studies investigating the influence of personality on parenting have been rare, recent research has provided empirical support for this (Clark, et al., 2000; Kendler et al., 1997; Losoya et al., 1997; Belsky et al., 1995; Mangelsdorf et al., 1990). Based on these studies, it was expected that high maternal positive affect and low negative affect would predict greater maternal sensitivity relative to lower positive affect and higher negative affect. The finding of an association between maternal positive affect and intrusiveness in the current study is therefore in contrast to the majority of literature (Mangelsdorf et al., 1990; Kendler et al., 1997, Belsky and Barends, 2001). There are, however, some findings indicating increased power assertion in mothers of high positive affect (Kochanska et al., 1997). This indicates that a degree of overstimulation and intrusiveness may characterise the parenting of mothers high in positive affect. The inconsistent nature of these findings might be a consequence of the multifaceted nature of positive affect. Given that positive affect is associated with features as diverse as warmth and affiliation and also assertiveness and dominance, the multifactorial nature of positive affect may explain the inconsistent finding reported here and in a limited number of other studies (Kochanska et al., 1997; Clark et al., 2000). Alternatively, the discrepancy in results may be due to particular sample characteristics or measures of personality used in different studies. Further research is needed to verify whether the cause of such inconsistency relates to the nature of the personality construct or to more mundane methodological reasons.

Results from the current study further suggest that infant behaviour, but not infant temperament, significantly predicts parenting. Infant positive engagement consistently predicted both maternal detachment and intrusiveness. The relationship with the

predictor variables was negative. This means that, as infant positive engagement increased, maternal detachment and intrusiveness decreased. It should be noted, however, that the significant association found between infant positive engagement and maternal detachment and intrusiveness may be an artefact reflecting situational factors. The correlation may reflect rapidly changing, situational factors such as whether the infant was hungry or tired. In addition, the fact that it is easier to establish significant correlations for variables measured concurrently means that this finding must be regarded tentatively.

Nevertheless, the infant effect identified in the current study is consistent with literature on the importance of child factors. Child main effects have been established particularly in research on children's behavioural adjustment (Lytton, 1990; Bates & McFadyen-Ketchum, 2000). In light of literature on infant effects, the result found in this study can be interpreted as infants eliciting more involved and attuned parenting from their mothers through positive engagement (Bugenthal & Goodnow, 1998). However, the finding is unusual to the extent that, in the current study, the focus was on positive infant behaviours rather than on the more commonly studied negative infant behaviours.

Although unexpected, the absence of consistent infant temperament main effects in this study reflects a minority of findings such as that obtained by Clark, Kochanska, and Ready (2000). In their research on predictors of parenting, the authors found that negative infant temperament showed only a trend towards predicting maternal parenting (Clark et al., 2000). Results of the current study may mean that infant temperament obtained from maternal reports does not reflect 'pure' enough scores.

This can be taken to suggest that mediators of temperament, such as observed infant behaviours, should remain the focus of research on infant effects. Conceptual limitations relating to the construct of infant temperament, however, might also explain this finding. The validity of this construct remains compromised by the absence of a clear consensus around the conceptual definition and content of temperament (Slabach et al., 1999). The lack of integration consequently means that temperament is defined on the basis of instruments used, and is thus reduced to an operational definition and dependent on the integrity of individual measures (Hubert et al., 1982).

#### **4.2.4 Prediction of parenting by maternal personality, infant temperament, and infant behaviour - interaction effects**

In the main, the hypothesis relating to the prediction of parenting by interactions between maternal and infant factors was not supported. The inclusion of interaction effects in regressions did not improve the overall prediction of parenting over main effects in any analyses. However, one interaction term consistently emerged as significant within the regressions. This finding should nevertheless be interpreted with caution due to the possibility of Type I error.

The current research identified that the interaction between maternal negative affect and IBQ positive emotionality emerged as a significant predictor of detachment. The direction of the interaction suggests that mothers high in negative affect became more detached as infant positive emotionality increased. Conversely, relative to mothers higher in negative affect, mothers low in negative affect became less

detached (more involved) as infant positive emotionality increased. The interaction remained significant even when infant behaviour was controlled for. Having controlled for infant behaviour means that the interaction cannot be readily explained as a function of infant behaviour observed during the interaction period. A different measure of infant engagement may have been more sensitive to behaviours that could have mediated the interaction. Alternatively, events occurring outside the observation period may account for the observed interaction.

The pattern found in this interaction (i.e. high negative affect mothers becoming more detached with increasing infant positive emotionality), however, reflects established links between the behaviour of depressed mothers and their infants. Field (1995) reports that, during an observation period, depressed mothers exhibiting withdrawn styles of interaction spend the majority of their time disengaged from their infants and respond to their infants only when they become distressed. As mentioned previously, maternal negative affect in the general population is not equated with clinical depression. It is nevertheless interesting to note some degree of similarity between the interactional styles of mothers from the general population and those with clinical depression.

Mood and parenting literature describes various mechanisms that help interpret the interaction found in this study. According to trait mood literature, mothers high in negative affect have a predisposition to being irritable, sad, nervous, dissatisfied with life and discouraged and lacking in self esteem (Clark et al., 1994). Given that affect triggers cognitive and behavioural process, maternal negative affect influences how mothers perceive their infants and how parenting behaviours manifest themselves. In



this case, the notion of schema-consistent processing may mediate maternal negative affect and explain the increased detachment as a response to increased infant positive emotionality (Ingram et al., 1983). Mothers higher in negative affect may find it easier to be affectively attuned and interested in infants displaying less positive mood i.e. a mood more consistent with that of their mother. High negative affect mothers may therefore become more detached when infants display emotions incongruous with maternal mood. In addition to the mediation of mood by schema-consistent processing, the attribution of meaning may be another processing bias explaining this interaction. Given the inclination towards low self-esteem, mothers high in negative affect may perceive their infant's positive mood as an indication of not needing maternal attention (i.e. my child is happy without me), therefore becoming more withdrawn.

As previous findings identify infant difficultness as an important factor, it was hypothesised that infant negative emotionality would be a stronger moderator than positive emotionality (Crockenberg, 1986; Clark et al., 2000). The moderating influence of positive emotionality in this particular interaction therefore comes as a surprise. The discovery of an interaction between maternal personality and child emotionality, nevertheless endorses the bi-directionality of parent-infant relationships, consistent with current socialisation theories (Bugenthal & Goodnow, 1998). In addition, this result suggests that the almost exclusive focus on the moderating effects of infant negative emotionality may be too limited and should examine the effects of positive infant temperament.

Two further interactions emerged as significant only in the regression examining the prediction of maternal intrusiveness by maternal personality, infant temperament, infant behaviour and their interaction terms. These results should be regarded with caution, however, due to the possibility of Type I error. The first interaction indicated that mothers higher in positive affect became more intrusive with infants displaying *less* positive engagement than mothers lower in positive affect. The second interaction conversely indicated that, mothers high in positive affect were more intrusive with infants of *higher* positive emotionality than mothers low in positive affect. Cumulatively, these interactions show that the response of mothers higher in positive affect was more influenced by child effects (both temperament and behaviour) than the response of mothers lower in positive affect. In addition, the level of intrusiveness displayed was generally higher for mothers of high positive affect. However, the results are inconsistent in that one interaction suggests that high positive affect mothers become *more* intrusive with increased infant positive emotionality, whereas the other suggests high positive affect mothers become *less* intrusive with increased positive engagement. Given the inconsistent nature of these findings, only very speculative interpretations can be made. The association between maternal positive affect and intrusiveness has been explored in a previous section. The fact that mothers higher in positive affect are more responsive to variations in infant temperament and behaviour than mothers lower in positive affect could be interpreted as a manifestation of greater social rather than maternal sensitivity per sé. This interpretation is consistent with descriptions of positive affect individuals as sociable and facile in social situations (Watson & Clark, 1997). However, as mentioned previously, the fact that these interactions were not consistently significant across analyses, in combination with the contradictory direction of the interactions, suggests

that these findings may be spurious. Further research needs to be conducted to verify these results.

### **4.3 Limitations**

Several methodological limitations of this study should be noted. The following section describes limitations in the sample, design, setting, procedure and measures used in the study. It also highlights potential difficulties emerging from the statistical analyses carried out in this study.

There was lack of variability in the demographic characteristic in this sample. The majority of women were middle-class Caucasians. The study also relied on self-selection and it is unknown whether the participants may differ from women who chose not to take part.

Although Belsky's (1984) process model also emphasises the importance of contextual sources of stress and support as one of the main determinants of parenting in addition to parental personality and child effects, such factors were not measured and controlled for in this study. This omission limits the interpretability of findings emerging from the current study, as such factors might also account for significant variance in parenting.

In addition, the measures used in this study warrant some caution. Information on maternal personality ('trait mood') obtained from the PANAS lacked variance in that most mothers obtained scores at the high end of positive affect and the low end of

negative affect. This sample characteristic may not reflect the general population. Furthermore, the analysis of variables restricted in range may have reduced statistical power. In addition, the PANAS is more commonly used to assess state, rather than trait mood. Given Dix's (1991) suggestion that mood inventories should be used in parenting research, the PANAS provided an opportunity to assess mood at the level of personality. However, the suitability of such measures in parenting studies remains to be established through further studies.

The NICHD maternal sensitivity and infant behaviour rating scale is limited in its 4-point Likert scale. Given that points 1 and 4 on the scale were restricted to observed behaviours of 'extreme' nature, these were rarely coded. The resulting information on maternal sensitivity and infant behaviour was thus very limited in range. The lack of observed variation indicates that this scale may not have been sensitive enough in detecting the full spectrum of maternal and infant behaviour.

Although Rothbart's (1986) Infant Behaviour Questionnaire (IBQ) is routinely used to establish second-order composites reflecting positive and negative emotionality, an examination of the internal consistency of scales revealed low values for negative emotionality. This suggests that the validity of the scales may be generally questionable. The scales constituting negative emotionality i.e. fear and distress to limitations were therefore investigated separately in the analysis.

The brief laboratory-based observation may not have been conducive to eliciting 'natural' parent-infant interaction. In fact, some mothers commented on how contrived their behaviour during the video recorded session of mother-infant

interaction felt. More extensive and naturalistic observations might give rise to representations of more 'typical' of mother-infant interaction between the dyads. However, it is of note that the assessments of mother-child interaction with this scale by NICHD studies have been reliable predictors of children's social and cognitive behaviour (NICHD, 1999).

The analysis of interaction effects (i.e. where the effect of one independent variable on the dependent variable depends on the level of another independent variable) using continuous variables is being increasingly conducted in social science research (Aiken & West, 1991). Despite their increased use, however, statistically significant interaction effects are infrequently found because of methodological problems that interfere with the reliable detection of such effects (see McClelland and Judd (1993) for details). For instance, despite following the convention of means-centering (i.e. using standardised scores), it is likely that main and interaction effect variables remain correlated with each other which reduces statistical power. In addition, common deviations from normal distributions, which are unproblematic for linear analyses, can cause extreme reductions in efficiency in detecting interaction effects (Bates, 2001). Such reasons make it likely that some interaction effects that exist will be undetected. This indicates that the current research might be limited by Type II errors. However, findings also have to be interpreted with caution due to the possibility of Type I error. In the case of multiple regression analyses, suppressor effects might lead to the detection of interaction effects that are spurious. Suppressor effects are caused by variables that inflate the importance of other independent variables by suppressing irrelevant variance in the other independent or dependent variables (Tabachnick & Fidell, 2001). This complicates the interpretation of

interaction effects identified in the current study. With this information in mind, the interaction between maternal negative affect and infant positive emotionality, which emerged as significant even when infant behaviour was controlled for could be interpreted as the following. The measure of infant temperament may be characterised by much statistical error; controlling for infant behaviour may be removing noise in the measure of temperament and thereby give rise to a significant interaction between maternal negative affect and infant temperament. Tabachnick and Fidell (2001) note that suppressor effects are notoriously difficult to interpret, as it is hard to identify what causes them.

#### **4.4 Suggestions for future research**

Research has yet to elucidate many processes relating to the role parental personality as well as parent-infant transactions play in parenting. Future studies examining the determinants of parenting should therefore include a less homogenous sample, as well as measures of other potential factors explaining variance highlighted in previous studies, such as maternal age, education, parenting experience, social support, marital status, marital satisfaction, etc. (Belsky, 1984; NICHD, 1999; Clark, Kochanska, & Ready, 2000). The impact of paternal personality on parenting should be also be included in future investigations, given that preliminary work has suggested differential links between personality and parenting for mothers and fathers (Belsky et al., 1995). Given the multifactorial nature of personality constructs, the differential impact of specific aspects of personality constructs should be examined in relation to parenting. Such research would help clarify the contradictory findings emerging from research on personality (particularly positive affect) and parenting. In addition, the

moderating influences of positive infant temperament and behaviour found in this study, suggest that the almost exclusive focus on negative infant temperament in the prevalent literature might be too limited.

#### **4.5 Clinical implications**

The relevance of parenting to child development has been well established (Maccoby, 1992). The importance of parenting to child outcome has been the particular focus of study within attachment research (George & Solomon, 1999). Within this paradigm, sensitive parenting has acquired a privileged status as a process facilitating secure attachment and therefore optimal child development. Across childhood, research into parenting has shown an association between sensitive parenting, secure attachment and favourable developmental outcomes including emotional security, social competence and intellectual achievement (Belsky, 1984). Although the influences of environmental contexts and child effects are recognised as contributing to child outcome, it is nevertheless accepted that parenting is one of the most central and unique influences on child development (Kochanska, Clark, & Goldman, 1997). Given the importance of parenting to child development, the significance of the current study lies in its attempt to elucidate determinants of parenting. The inclusion of child factors and the transaction between parent and infant factors which may combine to influence parenting processes, reflects the notion that parenting is a multiply determined construct (Belsky, 1984). Within Thomas and Chess's (1977) framework of 'goodness of fit', gaining an understanding which parent and infant characteristics and whether particular combinations of parent and child factors either facilitate or impede sensitive parenting, can be an effective approach to both the

prevention and treatment of parent-infant interaction and child-development problems. The current study produced some preliminary evidence for interactions between mother and infant factors, some of which are more conducive to sensitive parenting and thus also to optimal child development, than others.

This study therefore raises the possibility that parent and child factors interact in ways central to the understanding of the origins of developmental psychopathology. Further investigations are required to delineate the transactional nature of factors involved in such processes. Despite the complexities involved in conducting this kind of research, the far-reaching implications of understanding the forces that shape child development, make such research a worthwhile endeavour.



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**APPENDIX 1:**  
**ETHICAL APPROVAL**

## Departmental Ethical Committee

Department of Psychology  
Birkbeck College  
*University of London*

Malet Street  
London WC1E 7HX

0171 631 6207  
Direct 0171 631 6313  
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Ms Leslie Tucker  
Department of Psychology  
Birkbeck College

13 May 1998

Dear Leslie,

Thankyou for submitting your research for ethical scrutiny by the Departmental Ethical Committee. I enclose a certificate of approval. It will no doubt be helpful if I point out that the classification of your proposal and Routine carries with it the consequence that any future research similar to this current proposal need not be submitted for ethical approval. Should there be any change which might introduce new threats to ethical correctness then, of course, a new submission must be made.

The Committee request that you look at the information sheets again. They are impressive but seem variable in the level at which they are pitched. The one headed "Which neural mechanisms are involved in face processing" is very technical and we wonder if it will be comprehended by the target group. I should make clear that whether you decide to make changes to these sheets or not you need not notify the Ethical Committee.

Yours sincerely,



Vernon Gregg  
Chair  
Departmental Ethical Committee

*Departmental Ethical Committee*  
Department of Psychology  
BIRKBECK COLLEGE

**CLASSIFICATION OF RESEARCH PROPOSAL**

Date of Submission 8/5/98

Investigator Prof. M H Johnson et al.

Reference Number 9804

Title The development of the behavioural and brain bases of visual and auditory attention and perception in infancy through adulthood.

**The Ethical Committee has scrutinised your proposal and has given it ethical approval.**

Any further studies similar to this one should be classified as **ROUTINE**. Please see Section 3 part A of the Committee's 'Procedures' for the implications.

Date approved 13/5/98

V H Gregg  
Chair  
Departmental Ethical Committee

**APPENDIX 2:**  
**POSITIVE AND NEGATIVE AFFECT SCALE (PANAS)**

ID# \_\_\_\_\_ (1-4)

**YOUR GENERAL FEELINGS  
(15-34)**

*Please indicate to what extent you generally feel this way using the following rating system; thus, indicate how you feel on average.*

	<b>Very Slightly or Not at All</b>	<b>A Little</b>	<b>Moderately</b>	<b>Quite a Bit</b>	<b>Extremely</b>
<b>Interested</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Distressed</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Excited</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Upset</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Strong</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<hr/>					
<b>Guilty</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Scared</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Hostile</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Enthusiastic</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Proud</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<hr/>					
<b>Irritable</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Alert</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Ashamed</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Inspired</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Nervous</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<hr/>					
<b>Determined</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Attentive</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Jittery</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Active</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Afraid</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>



**APPENDIX 3:**  
**MATERNAL SENSITIVITY AND CHILD BEHAVIOUR SCALES**

## NATIONAL INSTITUTE FOR CHILD HEALTH AND HUMAN DEVELOPMENT

### QUALITATIVE RATINGS OF MOTHER/CHILD INTERACTION (1999)

#### General Instructions for Applying the Qualitative Ratings

Each set of qualitative ratings is to be based on 16 minutes of semi-structured observation. The observation has two parts. In the first 8 minutes the parent plays on the floor with her baby using whatever toys she chooses. In the second 8 minutes the mother's toys are put away and she is given a standard set of toys to use in play with her baby. No specific instructions are given for her use of the toys in play with her baby. To help the observer he/she should take longhand notes of mother or child behaviors as they relate to each scale and organize the notes by coding category on the worksheet titled "Qualitative Notes." In addition the rater should make an interim rating following the first 8 minutes of play.

In assigning a rating, the observer should use a two-step process (borrowing from the logic used by Harter). The first step is to ask, "Is this dimension 'characteristic' (a 3 or 4 rating) or 'not characteristic' (a 1 or 2 rating) of the person being rated?" Once this decision is made, then the rater needs to make a finer discrimination between 3 or 4 and 1 or 2 ratings.

Ratings for most of these scales should be based on both the quality and quantity of behavior. Thus, evaluations should be made taking into account the quality of the observed behaviors in relation to the proportion of the time they were observed. Ratings of 1 and 4 should be reserved for those observations which could be considered either problematic or exceptionally advantageous, depending on the specific scale.

## MOTHER RATINGS

Sensitivity/responsiveness to distress (Adapted from Ainsworth et al., 1978)

This scale focuses on how the mother responds to the child's cries, frets, or other expressions of negative affect. It is judged in the following three ways:

1) Proportion of distress signals responded to. The mother consistently responds to all distress signals.

2) Latency of response. The mother responds promptly. Mild fussiness does not require the mother to respond as quickly as does the child's acute distress.

3) Appropriateness of response. Appropriateness of the adult's behavior can generally be inferred by its effectiveness in soothing the child. However, the completeness of the response should also be taken into account. For example, a mother who responds distally (e.g., using just her voice) should not be judged as sensitive as a mother who approaches and/or picks up the child. Mothers who do not acknowledge distress, even if the infant self-soothes quickly, should be judged as less sensitive than those who do acknowledge the distress, however short lived. Caregiving responses to infant distress generally involve speaking to the child, changing position, offering toys, changing toys, patting, tickling up, holding closely (especially in a ventral/ventral position), and rocking. Any of these or other behaviors can be considered appropriate if they appear to have the effect of soothing the child. If the mother's first response to the distressed infant does not soothe the child, the episode should be judged as insensitive/unresponsive (even if the response was immediate) unless the mother proceeds to offer a "fuller" response (i.e., more proximal soothing behaviors). Some response, however, even if ineffective, is more sensitive than none at all.

Ratings on this scale are composed of both qualitative and quantitative dimensions. The proportion of signals responded to and the latency of response time should be evaluated in relation to the quality (i.e. appropriateness) of the response. For example, if a mother responds slowly and infrequently to the child during the observation, but his/her responses when given are appropriate and sensitive, he/she should not receive a rating of 4 but instead would receive a rating of 2 or 3. The decision of a 2 vs. a 3 would be made on the basis of the overall percentage of signals (greater than half responded to being given a 3; fewer than half given a 2) and the relation between degree of distress and responsiveness. (If only the milder fusses are the ignored signals, even if fussing represents more than half of the distress signals emitted, then the observation would be coded 3; if the more distressed signals are the ignored or slowly responded to signals, then code 2. ) A mother might also receive a 2 or 3 for immediate and inappropriate responses throughout the observation. If the clear majority of responses were inappropriate/ineffective even though immediate, the rating should be a 2. A rating of 1 should be given for those mothers who are so unresponsive or delayed in their responding, and/or who respond so inappropriately that it could be considered problematic. A rating of 4 should be given to those mothers who exhibit immediate and exceptionally sensitive appropriate responses. (If the baby emits one fuss that receives a response, code a response.)

If the baby emits only a single fret that does not require intervention, score a 9. If the baby has two or more fussy bouts, then sensitivity to distress must be coded. If the mother does not respond to these frets, code a 2 for sensitivity to distress, not a 1. She is not given the lowest rating because we do not expect caregivers to respond as

immediately to a brief fret as to a full blown cry.

1 = Not at all characteristic. This rating should be given to mothers who are so insensitive and unresponsive that it is worrisome. When the child cries or frets, the mother responds not at all, or very slowly or inappropriately. If there is a response, it is only after the child becomes very demanding, and the response is so delayed that it cannot be construed as contingent upon the child's behavior. A mother who typically appears oblivious or entirely inappropriate or punitive to the child's distress would receive this score.

2 = Minimally characteristic. This rating should be given to mothers who display infrequent or weak sensitivity/responsivity. The mother responds slowly to child distress signals, and appears more unresponsive than responsive. The responses tend to be minimal or perfunctory and thus inappropriate or ineffective. For example, the mother may talk to or briefly pat a crying child, but he/she does not pick up the child. The mother does not typically bring the child to a ventral/ventral position. He/she seems minimally interested in providing genuine comfort.

3 = Moderately characteristic. This rating should be given to mothers who are predominantly sensitive/responsive. The mother typically responds promptly to child distress, demands, and signals, but there is some time in which clear child signals do not receive a response or in which the

response is somewhat delayed. Some of the mother's responses are mixed, i.e., some half-hearted or perfunctory, but the majority are full responses where the observer feels like "that was a good episode".

4 = Highly characteristic. This rating should be given to mothers who are exceptionally sensitive and responsive to distress. The mother responds quickly and appropriately to the child's distress. If the child is upset, the mother takes time to soothe and calm the child. There may be proportionally few instances of ignoring and/or minimally responding to the distress, but overall most responses are prompt, appropriate, and effective.

9 = No opportunity to observe. No instances of child distress are observed.

Sensitivity/responsiveness to nondistress (adapted from Fish, 1990)

This scale focuses on how the mother observes and responds to the child's social gestures, expressions, and signals. The key defining characteristic of sensitive interaction is that it is child centered. The sensitive mother is tuned to the child and manifests awareness of the child's needs, moods, interests, and capabilities, and allows this awareness to guide his/her interaction.

If the child initiates social gestures and expressions (looking at the mother, reaching toward the mother, waving, clapping hands, handing objects), or makes demands, desires, or requests known (stretching arms to be picked up, reaching for toys the mother is holding), the sensitive mother responds appropriately.

If the child is uninterested, the sensitive mother takes time to reengage the child in a manner that demonstrates sensitivity to the child's mood. When the child is bored or frustrated, the mother offers toys or other distractions. When the child is interested and involved with toys, the sensitive mother allows him/her to independently explore them. During play, the sensitive mother provides one toy or game at a time and bases continuation on the child's response. How and what they play is geared to whether or not the child seems to be enjoying the activity. The mother does not persist with an activity or toy which the child is obviously not enjoying. During feeding, the mother follows the child's signals (open mouth, reaching, etc.) as to when the child wishes more food.

A sensitive mother provides stimulation that is situationally appropriate. He/she provides the child with contingent vocal stimulation and acknowledges the child's interest, efforts, affect, and accomplishments.

Sensitive mothers can spend some time watching the child, but the difference

between them and the detached mother is that the sensitive mother seems to be actively taking an interest in the child's activities, as evidenced by comments and embellishments when the child loses interest. It is at these times--when the child loses interest or is distracted--that the difference between the sensitive mother and the detached, understimulating mother is most easily seen; the detached mother does not respond, responds in a listless manner, or responds with developmentally inappropriate comments and behavior. The insensitive mother could also be overstimulating/intrusive and might continue in his/her attempts to engage the child even when the child is providing clues that he/she is seeking to end the interaction.

A sensitive interaction is well timed and paced to the child's responses, a function of its child-centered nature. Such an interaction appears to be "in sync." The mother paces games or toy presentation to keep the child engaged and interested, but also allows him/her to disengage in order to calm down and reorganize his/her behavior. Sensitivity involves judging what is a pleasurable level of arousal for the child and helping the child to regulate arousal and affect. When the child loses interest, the sensitive mother switches to a new tactic or toy, and observes the child's reaction, or stops interacting entirely. In this way the sensitive mother can be distinguished from both an intrusive and a detached mother.

Markers of sensitivity include (a) acknowledging the child's affect; (b) contingent vocalizations by the mother; (c) facilitating the manipulation of an object or child movement; (d) appropriate attention focusing; (e) evidence of good timing faced to the child's interest and arousal level; (f) slowing the pace when the child appears overstimulated or tired (e.g. , demonstrates gaze aversion, fussiness); (g) picking up on



the child's interest in toys or games; (h) shared positive affect; (i) encouragement of the child's efforts; (j) providing a appropriate level of stimulation when needed; and (k) sitting on floor or low seat, at the child's level, to interact.

Thus, the sensitive mother demonstrates the ability to adapt interactions to the child's mood and level of development. The mother neither over- nor underestimates. The mother knows when it is time to increase or reduce the amount of stimulation the child is experiencing. For example, the mother discontinues an activity that is beyond the child's capacity for response or introduces a new activity when the child appears bored.

Ratings on this scale should be based on both quality and quantity of mother behavior.

1 = Not at all characteristic. This rating should be given to mothers who are so insensitive and unresponsive that it is worrisome. There are almost no signs of mother sensitivity. Thus, the mother is either predominantly intrusive or detached. The mother rarely responds appropriately to the child's cues, and does not manifest an awareness of the child's needs. Interactions are characteristically ill timed or inappropriate.

2 = Minimally characteristic. This rating should be given to mothers who display infrequent or weak sensitivity/ responsiveness. While the mother is sometimes sensitive, the balance is clearly in the direction of insensitivity through detachment or intrusiveness. The mother may give some delayed perfunctory responses to cues.

3 = Moderately characteristic. This rating should be given to mothers who are predominantly sensitive/responsive. The mother demonstrates sensitivity in most interactions but at times neglects to give a fuller response or a well-timed or appropriate response.

4 = Highly characteristic. This rating should be given to mothers who are exceptionally sensitive and responsive to nondistress. Instances of insensitivity are rare and never striking. Interactions are characteristically well timed and appropriate.

Intrusiveness (adapted from Fish, 1990)

Intrusive, insensitive interaction is definitely adult centered rather than child centered. Prototypically, intrusive mothers impose their agenda on the child despite signals that a different activity, level, or pace of interaction is needed. High arousal, vigorous physical interaction, or a rapid pace are not, by themselves, indicative of intrusive overstimulation--if the child responds positively with sustained interest and is not engaging in defensive behaviors. It is when the child averts his/her gaze, turns away, or expresses negative affect and the mother continues or escalates her/his activity that intrusive behavior is evident. Intrusiveness is also apparent when the mother does not allow the child a "turn" or an opportunity to respond at his/her pace. Some intrusive mothers persist in demonstrating toys to the child long after his/her interest has been gained and he/she obviously wants to manipulate the toy him/herself. These mothers appear unable to relinquish control of the interaction in order to facilitate the child's exploration or regulation of the activity. Another controlling, intrusive behavior is displayed by mothers who overwhelm the child with a rapid succession of toys or approaches, not allowing him/her time to react to one before another occurs. Extreme intrusiveness can be seen as overcontrol to a point where the child's autonomy is at stake. It should be kept in mind that a mother can become involved in play with the child without being highly intrusive.

Intrusiveness can also be displayed during routine care. During spoon feeding, a nonintrusive mother will wait for the child to open his/her mouth for food, whereas an intrusive mother will persist in trying to stick the spoon into the child's mouth, even as the child tries to turn away. An intrusive mother will tend to use any opening of the

mouth to give the child another bite of food, even when the open mouth clearly has a social interactive intent (e.g., open-mouth smile, vocalization). A rapid pace of feeding is not in itself a sign of intrusiveness if the pace appears to match the child's desired focus on food.

Specific behaviors characterizing intrusive interactions include (a) failing to modulate behavior that the child turns from, defends against, or expresses negative affect to; 1(b) offering a continuous barrage of stimulation, food, or toys; (c) not allowing the child to influence the pace or focus of play, interaction, or feeding; (d) taking away objects or food while the child still appears interested; (e) not allowing the child to handle toys he/she reaches for; (f) insisting that the child do something (play, eat, interact) in which he/she is not interested; and (g) not allowing the child to make choices.

Mother actions which are clearly in the child's best interests, such as removing a child from danger, administering medicine, or putting an obviously tired child to bed, are not included in considerations of intrusiveness. Similarly, bringing the child back to the mat for play when instructions to the mother are to do so, will not be judged intrusive unless the child is handled in an unduly perfunctory or rough manner.

Intrusiveness must be evaluated from the perspective of the child. If fast-paced stimulation is enjoyed by the baby, as shown by smiles and laughter, or seems a part of a game or ritual that is clearly enjoyed, maternal behavior that might otherwise be judged intrusive will not be counted as such. An important element in judging the behavior as intrusive or not is the degree to which the mother modulates her behavior in response to her infant's interest and enjoyment in the stimulation.

1 = Not at all characteristic. This rating should be given to mothers who

display almost no sign of intrusive behavior. A mother may show two instances of mildly intrusive behavior and still receive a 1 if the baby does not respond defensively in any way.

2 = Minimally characteristic. This rating should be given to mothers who display minimal intrusiveness. There is some evidence of intrusiveness, but it is not typical. The mother may initiate interactions with and offer suggestions to the child which occasionally are not welcomed. The mother sometimes continues his/her activity after the child engages in defensive behavior, but does not escalate the activity.

3 = Moderately characteristic. This rating should be given to mothers who are regularly intrusive. Mother intrusiveness occurs with moderate frequency.

4 = Highly characteristic. This rating should be given to mothers who are so intrusive that it is worrisome. The mother is consistently and typically intrusive. Most of the observation period is marked by the mother completely controlling the interaction, allowing the child little self-direction in his/her activities. The mother allows the child little autonomy, and essentially negates the child's experience.

### Detachment/disengagement (adapted from Fish, 1990 and Arnett)

The detached mother appears emotionally uninvolved or disengaged, and unaware of the child's needs for appropriate interaction to facilitate involvement with objects or people. This mother does not react contingently to the child's vocalizations or actions, and does not provide the "scaffolding" needed for the child to explore objects. Detached mothers "miss" the child's looks to them or reaches for a toy, and their timing is out of synchrony with the child's affect and responses (although not the overwhelming barrage of stimulation that intrusive mothers present). Simply allowing the child to play by him/herself is not necessarily a sure sign of detachment; this can be appropriate at times, such as when the child is playing happily or contentedly and the mother checks in with the child visually. The detached mother is passive, and lacks the emotional involvement that characterizes a sensitive mother. He/she appears uninterested in the child.

A mother receiving a high rating for detachment is considered to be insensitive. A low rating for detachment can signal either sensitivity or intrusiveness.

Detachment can be marked by (a) putting the child so he/she faces away from the mother, without attempts to visually "check in"; (b) presenting toys without first engaging the child or showing him/her how to manipulate them; (c) rarely making eye contact or rarely talking to the child; (d) not responding to the child's vocalizations, smiles, or reaches for toys; (e) an unawareness of the child's capabilities and appropriate activities; (f) positioning the child so that he/she cannot reach or manipulate a toy; (g) cleaning the child, rocking, diapering, or feeding in a mechanical, detached, distant way without social interaction; (h) ignoring the interesting things the child does; (i) letting the child play unsupervised without checking in; and (j) continually calling the child "baby"

instead of using his/her name. While an intrusive mother might persist in sticking a spoon into a child's mouth even if the child turns away, the detached mother does not respond to the child's bids to be fed (e.g., the child opens his/her mouth for the spoon and the mother neglects to then feed the child). Detached mothers tend to pay greater attention to the toys than their child's response to the toys, or they tend to pay greater attention to other objects or people outside of the play interaction, or they appear distracted, for whatever reason, from attending to the child's interests.

This scale contains both qualitative and quantitative components. A mother who interacts consistently with the child but does so in a perfunctory or indifferent manner with little or no emotional involvement would be rated high on detachment.

1 = Not at all characteristic. This rating should be given to mothers who display almost no signs of detachment or underinvolvement. When interacting with the child, the mother is clearly emotionally involved. These mothers can be sensitive or intrusive.

2 = Minimally characteristic. This rating should be given to mothers who display minimal detachment. While the mother is sometimes noninvolved, he/she is clearly more involved than not.

3 = Moderately characteristic. This rating should be given to mothers who are predominantly detached. The mother is relatively more noninvolved than involved, but the detachment is not so prevalent that it is problematic.

4 = Highly characteristic. This rating should be given to mothers who are so detached that it is worrisome. The child lies or sits without mother attention almost all of the time, even though the mother is physically present. In the minimal instances of involvement, the mother's behaviors are simple, mechanical, stereotyped, repetitive, and perfunctory. The mother is clearly not emotionally involved with the child, and appears to be "just going through the motions."



## Stimulation of development

This scale measures the degree to which the mother tries to foster the child's development. A stimulating mother may take advantage of even simple activities (like feeding and diapering) to stimulate development, and will consistently engage in a variety of activities that can facilitate learning. The mother will make deliberate attempts to encourage the child's development, achievement, and learning.

Behaviors characterizing stimulation include (a) attempting to focus the child on an object or task; (b) focusing the child's attention on the perceptual qualities (sounds, colors, movement, etc.) of objects; (c) verbally responding to or expanding on the child's verbalizations or vocalizations; and (d) encouraging the child to actively participate in activities. However, mothers who simply focus or encourage a child should not be given the highest scores. Higher scores should be reserved for those mothers who (a) describe or label toys or objects, or demonstrate how they work; (b) stimulate the child's verbalizations or vocalizations and expand on them; (c) read or recite to the child; (d) encourage and reinforce the child's attempts at mastery, or challenge the child to try something new; (e) present activities in an organized sequence of steps; (f) teach the child or give him/her an opportunity to experiment with materials that illustrate or teach concepts; (g) ask questions that require problem solving; (h) label and interpret the child's experiences, (e.g. "you think that's funny"); and so on.

Activities involving strictly physical stimulation such as rough and tumble play, bouncing, and tickling are not considered as stimulating development per se, but it is possible for a mother to provide stimulation in these contexts if the mother expands on these experiences with verbal labels. This scale does not measure those activities that are

only social (smiling) or caretaking (soothing), but stimulation can occur in these contexts as well.

The focus of this scale is on the amount and quality of activities that may ultimately enhance perceptual, cognitive, linguistic, and physical development. The caretaker's attempts may be less than perfect from a developmental psychologist's point of view, but they reflect the mother's belief that he/she is teaching the child. Simply placing objects in front of a child or handing him/her toys is not to be considered stimulating. Stimulation must involve effortful interaction with the child in the contexts described above.

All qualitative judgments must be considered in relation to the quantity of stimulation provided by the mother: How many of the available opportunities for stimulation were taken advantage of? A rating of 1 should be given to those mothers who provide so little stimulation that it could be considered problematic for development. If a mother spends a very brief portion of the time in high-quality interactions with a child and provides that child with no stimulation for the remainder of the time, he/she would receive a rating of 2. A mother might also receive a 2 if stimulation is continuous but minimally advantageous. A rating of 3 is generally given when the mother doesn't strive to offer cognitive stimulation for some small portion of the time or when she neglects some aspects of stimulation (e.g. demonstrates without language, or stimulates verbally but not in areas of manipulative skills). A rating of 4 should be given to those mothers who work at providing exceptionally advantageous stimulation.

1= Not at all characteristic. This rating should be given to mothers who provide so little stimulation that it is worrisome. The mother makes almost

no attempts to teach the child anything or provide any stimulation. The mother may ignore the child's activities or interact perfunctorily, providing no stimulation. The mother never does more than offer toys in a perfunctory, mechanical manner, without demonstration or labeling. She is typically silent.

2= Minimally characteristic. This rating should be given to mothers who provide infrequent or weak stimulation. The mother's conscious and purposeful attempts to engage the child in development-fostering experiences are limited. He/she may label or demonstrate materials, but does so perfunctorily and with minimal elaboration.

3= Moderately characteristic. This rating should be given to mothers who provide adequate stimulation but could reasonably be expected to provide more and higher-quality stimulation. The mother does make some effort to provide stimulation, but does not consistently take advantage of opportunities to do so. Stimulation is not the main agenda. The mother may find some new ways to engage the child with toys, for example, but these ways are limited in number. Actions are likely to be simply repeated rather than thoughtfully varied. Mothers who provide a rich linguistic environment but do not demonstrate the potential of toys or objects would receive this rating as well as mothers who demonstrate toys in a stimulating but non-vocal manner.

4= Very characteristic. This rating should be given to the mother who is consistently stimulating and takes advantage of many activities as opportunities for stimulation. The mother provides frequent stimulation through "lessons," explanations, activities, or toys. Teaching or fostering development is a primary intent of the mother's frequent interactions with the child. The mother thoughtfully varies and elaborates on these activities, providing numerous opportunities which are exceptionally advantageous to the child. He/she provides rich stimulation in terms of language, and embellishment of the potential of the physical world.

### Positive regard for the child

This scale rates the mother's positive feelings toward the child, expressed during interaction with him/her. Positive feelings are shown by (a) speaking in a warm tone of voice; (b) hugging or other expressions of physical affection; (c) an expressive face; (d) smiling; (e) laughing with the child; (f) enthusiasm about the child; (g) praising the child; and (h) general enjoyment of the child. Positive regard is evident when the mother listens, watches attentively, looks into the child's face when talking to him/her, has affectionate physical contact, and is playful.

Ratings on this scale are based on both quality and quantity of positive regard.

1 = Not at all characteristic. This rating should be given to mothers who display so little positive regard that it is worrisome. This rating can also be used for positive expressions (laughing, smiling) that appear to be inappropriate to the situation or an inaccurate reflection of the mother's feelings. The mother may be expressionless or flat, or negative.

2 = Minimally characteristic. This rating should be given to mothers who display infrequent or weak signals of positive regard. The intensity and frequency of behavioral indicators are both low.

3 = Moderately characteristic. This rating should be given to mothers who predominantly display positive regard. More frequent and intense positive affect is shown than in the 2 rating, but the mother is not as strongly or consistently positive as those scored as a 4.

4 = Very characteristic. This rating should be given to mothers who are exceptionally positive in terms of facial and vocal expressiveness, and behavior. Affect is positive and spontaneous. The mother shows a range of expressions and behaviors which are all clearly positive. He/she clearly "delights" in the child.

## Negative regard for the child

This scale rates the mother's negative regard for the child. Both frequency and intensity of negative affect toward the child are considered. Some markers of negative regard include (a) disapproval; (b) tense body; (c) negative voice when correcting; (d) abruptness; (e) tense facial muscles and strained expression; (f) harshness; (g) threatening the child or punishing without explanation; and (h) roughness in wiping the child's face, changing his/her diapers, or burping.

Ratings on this scale are composed of both qualitative and quantitative evaluations. The amount and intensity of negative affect exhibited is evaluated in relation to the duration of the observation period.

1 = Not at all characteristic. This rating should be given to mothers who do not display negative regard for the child either in words or in expressions. No evidence of anger, distrust, frustration, impatience, disgust, general dislike, or other indicators of negative regard is observed in the mother's face or voice. The mother may be expressionless or flat, or positive.

2 = Minimally characteristic. This rating should be given to mothers who display minimal negative regard. There is some evidence of low- intensity negative regard.

3 = Moderately characteristic. This rating should be given to mothers who predominantly display negative regard. Persistent evidence of low-

intensity negative regard or some evidence of more-intense negative regard is observed.

4 = Highly characteristic. This rating should be given to mothers who are so negative that it is worrisome. Feelings of negative regard are expressed strongly, or persistent moderate levels of negative regard are expressed. The overriding affect influencing the mother-child interactions is negative.



## Flatness of affect

This scale measures how animated the mother is. Flat affect may reflect boredom, depression, fatigue, or distraction. Flatness is exhibited by blank, impassive facial expression, and flat tone in vocal expression. It is marked by a lack of animation. If the mother is watching the child with interest (eyes "bright"), it is a sign that the mother's affect is not flat. This scale assesses the mother's overall demeanor, not just animation directed to her child.

1 = Not at all characteristic. This rating should be given to mothers who exhibit almost no flatness. There is consistent animation in the mother's demeanor and behavior

2 = Minimally characteristic. This rating should be given to mothers who exhibit some flatness. The mother is usually animated, but there is some time when facial expression is blank and impassive.

3 = Moderately characteristic. This rating should be given to mothers who are predominantly flat. Some periods of animation alternate with more clear periods of flatness than observed for a score of 2. Flat affect predominates.

4 = Highly characteristic. This rating should be given to mothers who are so flat that it is worrisome. There is consistent absence of animation.

## CHILD RATINGS

### Positive mood

This scale assesses the extent to which the child is satisfied, content, and pleased with the situation overall. Measures of child positive affect include smiles, laughter, and positive tone of voice, as well as enthusiasm expressed with arms, legs, and body tone. Lack of positive affect may be manifested by a neutrality or negative mood.

Ratings on this scale should be based on quality and quantity of behavior. Attempt to balance both the intensity of the child's positive affect and the relative amount of time positive behavior is shown. A rating of 1 should be given to those children who exhibit almost no positive affect. If a child spends a very brief portion of the total time exhibiting high positive affect and also displays negative affect, he/she would receive a rating of 2. A child might also receive a 2 for consistent weak positive affect (i.e., contentment). A rating of 3 is given if the child is regularly pleasant, with some strong positive affect. A rating of 4 should be given to those children who regularly display high-intensity positive affect, who "sparkle."

1 = Not at all characteristic. This rating should be given to children who display almost no signs of positive mood. The child's mood is either negative or no affect is displayed.

2 = Minimally characteristic. This rating should be given to children who display infrequent or weak positive affect. The child may show fleeting instances of strong positive affect paired with instances of negative affect, or the child may be characteristically pleasant, content, or satisfied

throughout the observation period, without exhibiting any strong indicators of positive mood.

3 = Moderately characteristic. This rating should be given to children who predominantly display positive affect. The child exhibits several instances of strong positive affect (expresses enthusiasm, playfulness, smiling and laughter) and is frequently pleasant.

4 = Highly characteristic. This rating should be given to children who are exceptionally positive. in terms of physical and vocal expressiveness. The child displays multiple instances of strong positive affect and is characteristically "pleasant" for most of the remainder of the observation period. The child should truly "radiate" or "sparkle. " For this rating, a child can have no episodes of strong distress.

## Negative mood

This scale assesses the extent to which the child cries, fusses, frowns, tenses body while crying, or otherwise expresses his/her discontentment. Lack of negative affect may be manifested as either strong positive affect or contentment.

Ratings on this scale should be based on both qualitative and quantitative assessments.

1 = Not at all characteristic. This rating should be given to children who display no negative affect. There are no signs of strong (intense crying, body stiffening) or weak (fussing) negative affect from the child during the observation period.

2 = Minimally characteristic. This rating should be given to children who display infrequent or weak negative affect. The child displays fleeting instances of mild negative affect, but negative affect is more absent than present.

3 = Moderately characteristic. This rating should be given to children who display stronger negative affect. The child displays one or two instances of strong negative affect or is moderately discontented with multiple instances of mild negative affect (fussiness).

4 = Highly characteristic. This rating should be given to children who display high levels of negative affect. The child displays several

instances of strong negative affect during the observation period and/or  
appears to be rarely contented.

## Activity level

This scale assesses how motorically active the child is during the observation. The rating should take into account these aspects of motor activity: speed (moving fast, whether walking, crawling, or squirming); frequency (spending a lot of time in high energy activities); intensity (how energetic the activity); involvement (tendency to engage in high-energy games and gross motor activities over small motor activities); and a negative reaction to enforced non-activity (reacting with restlessness).

1 = Not at all active. This rating should be given to children who are noticeably low key, passive, inactive, lethargic. The child typically stays in one place.

2 = Minimally active. This rating should be given to children who are minimally active. The child exhibits some activity.

3 = Moderately active. This rating should be given to those children who are predominantly active. Activity occurs frequently, and some or all movements are of high intensity.

4 = Highly active. This rating should be given to children who are overwhelmingly active. The child is constantly moving some body part; something is moving at all times. The child prefers active games and activities to non-active ones.

## Sociability

This scale assesses the degree to which the child actively participates in his/her social world (adults or peers). Behaviors which can be considered to indicate sociability include vocalizing to, smiling at, waving to, sharing toys with, and touching partners. These behaviors may be initiated by the child, or be responses to others' signals or initiations.

Initiative and responsive behaviors must be construed to have a positive social interactive intent; a child who spends most of the time demanding to be held, although technically initiating, should not receive a high sociability score.

Ratings on this scale should be based on both quality and quantity of behaviors.

1 = Not at all characteristic. This rating should be given to children who display almost no sociability. There are no social initiations by the child or responsiveness to others' overtures. The child seems oblivious to the social environment.

2 = Minimally characteristic. This rating should be given to children who display infrequent or weak sociability. Social initiations or responses by the child occur, but they are infrequent or ambiguous. The child is usually engaged in his/her own activity and seems to generally be uninterested in the mother and other children. Others must typically be persistent to gain the child's social interest, which tends to be brief and of low intensity (e.g., a look).

3 = Moderately characteristic. This rating should be given to children who are more sociable than not. The child initiates and/or responds, but the intensity and frequency of the child's behavior is less than a 4.

4 = Highly characteristic. This rating should be given to children who are very sociable. The child initiates and/or responds very frequently, using a variety of behaviors. There are multiple instances of the child directing clear, positive signals to other people and/or responding to others' initiations.

#### Sustained attention

This scale assesses children's sustained involvement with the world, including objects and people. The involved child focuses on the actions or interactions of others. The child's attention does not jump from one thing to another quickly. The child spends more than a minimal amount of time focusing on the object or person the child is in contact with. When focusing on an object or person the child really "focuses in.". All aspects of the baby's behavior is considered, including oral exploring; however, mouthing alone does not constitute attentive behavior, In order to receive a 4 the child must be involved with particular objects or the mother, not merely a cluster of objects, for extended periods of time. The uninvolved child may appear apathetic, bored, distracted, distressed, or aimless.

The focus of this scale is primarily quantitative. Ratings are based primarily on the duration of interactions with objects and individuals, and the overall amount of time spent in these interactions.



1 = Not characteristic, This rating should be given to children who display almost no sustained attention. The child moves from one thing to another in a nonsystematic way, without seeming to focus on what the objects/persons have to offer.

2 = Minimally characteristic. This rating should be given to children who are minimally involved with objects/persons and sustain attention for only brief periods.

3 = Moderately characteristic. This rating should be given to the child who spends more than the minimal amount of time involved in interactions with persons or things, but could reasonably be expected to attend longer.  
The child is more involved than not, and sustains this involvement.

4 = Highly characteristic. This rating should be given to the child who is clearly involved, and focused most of the time. When the child is playing with objects or persons, he/she is interested in playing with them and is engaged for extended periods of time.

**APPENDIX 4:**  
**INFANT BEHAVIOUR QUESTIONNAIRE (IBQ)**

### Infant Behavior Questionnaire

Age of Child Today : \_\_\_\_\_ (11-14)  
                            months    weeks

Today's Date: \_\_\_\_\_ (5-10)

Sex of Child: \_\_\_\_\_ (15)      Date of Baby's Birth: \_\_\_\_\_ (16-21)  
1=male                                      month      day      year  
2=female

**INSTRUCTIONS:**

Please read carefully before starting:

As you read each description of the baby's behavior below, please indicate how often the baby did this during the LAST WEEK (the past seven days) by circling one of the numbers in the left column. These numbers indicate how often you observed the behavior described during the last week.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(X)
Never	Very Rarely	Less Than Half the Time	About Half the Time	More Than Half the Time	Almost Always	Always	Does Not Apply

The "Does Not Apply" (X) column is used when you did not see the baby in the situation described during the last week. For example, if the situation mentions the baby having to wait for food or liquids and there was no time during the last week when the baby had to wait, circle the (X) column. "Does Not Apply" is different from "Never" (1). "Never" is used when you saw the baby in the situation, but the baby never engaged in the behavior listed during the last week. For example, if the baby did have to wait for food or liquids at least once but never cried loudly while waiting, circle the (1) column.

Please be sure to circle a number for every item.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(X)
Never	Very Rarely	Less Than Half the Time	About Half the Time	More Than Half the Time	Almost Always	Always	Does Not Apply

Please be sure to circle a number for every item.

### Sleeping

Before falling asleep at night during the last week, how often did the baby:

1 2 3 4 5 6 7 X (1) show no fussing or crying?

After sleeping, how often did the baby:

1 2 3 4 5 6 7 X (2) fuss or cry immediately?

1 2 3 4 5 6 7 X (3) play quietly in the crib?

1 2 3 4 5 6 7 X (4) cry if someone doesn't come within a few minutes?

How often did the baby:

1 2 3 4 5 6 7 X (5) seem angry (crying and fussing) when you left her/him in the crib?

1 2 3 4 5 6 7 X (6) seem contented when left in the crib?

1 2 3 4 5 6 7 X (7) cry or fuss before going to sleep for naps?

### Bathing and Dressing

When being dressed or undressed during the last week, how often did the baby:

1 2 3 4 5 6 7 X (8) smile or laugh?

When put into the bath water, how often did the baby:

1 2 3 4 5 6 7 X (9) smile?

1 2 3 4 5 6 7 X (10) laugh?

When face was washed, how often did the baby:

1 2 3 4 5 6 7 X (11) smile or laugh?

1 2 3 4 5 6 7 X (12) fuss or cry?

When hair was washed, how often did the baby:

1 2 3 4 5 6 7 X (13) smile?

1 2 3 4 5 6 7 X (14) fuss or cry?

### Play

How often during the last week did the baby:

1 2 3 4 5 6 7 X (15) laugh aloud in play?

1 2 3 4 5 6 7 X (16) smile or laugh after accomplishing something (e.g., stacking blocks, etc.)?

1 2 3 4 5 6 7 X (17) smile or laugh when given a toy?

1 2 3 4 5 6 7 X (18) smile or laugh when tickled?

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(X)
Never	Very Rarely	Less Than Half the Time	About Half the Time	More Than Half the Time	Almost Always	Always	Does Not Apply

Please be sure to circle a number for every item.

How often during the last week did the baby enjoy:

- 1 2 3 4 5 6 7 X (19) being tickled by you or someone else in your family?  
 1 2 3 4 5 6 7 X (20) being involved in rambunctious play?  
 1 2 3 4 5 6 7 X (21) watching while you, or another adult, playfully made faces?

When something the baby was playing with had to be removed, how often did s/he:

- 1 2 3 4 5 6 7 X (22) cry or show distress for a time?  
 1 2 3 4 5 6 7 X (23) seem not bothered?

When tossed around playfully how often did the baby:

- 1 2 3 4 5 6 7 X (24) smile?  
 1 2 3 4 5 6 7 X (25) laugh?

During a peekaboo game, how often did the baby:

- 1 2 3 4 5 6 7 X (26) smile?  
 1 2 3 4 5 6 7 X (27) laugh?

How often did your baby enjoy bouncing up and down:

- 1 2 3 4 5 6 7 X (28) while on your lap?  
 1 2 3 4 5 6 7 X (29) on an object, such as a bed or a bouncer chair or toy?

When your baby saw a toy s/he wanted, how often did s/he:

- 1 2 3 4 5 6 7 X (30) get very excited about getting it?  
 1 2 3 4 5 6 7 X (31) immediately go after it?

When given a new toy, how often did your baby:

- 1 2 3 4 5 6 7 X (32) get very excited about getting it?  
 1 2 3 4 5 6 7 X (33) immediately go after it?  
 1 2 3 4 5 6 7 X (34) seem not to get very excited about it?

### Daily Activities

How often during the last week did the baby:

- 1 2 3 4 5 6 7 X (35) cry or show distress at a change in parents' appearance, glasses off, shower cap on, etc.)?  
 1 2 3 4 5 6 7 X (36) protest being put in a confining place (infant seat, play pen, car seat, etc)?  
 1 2 3 4 5 6 7 X (37) startle at a sudden change in body position (for example, when moved suddenly)?

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(X)
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Please be sure to circle a number for every item.

How often during the last week did the baby:

- 1 2 3 4 5 6 7 X (38) startle to a loud or sudden noise?  
 1 2 3 4 5 6 7 X (39) move quickly toward new objects?  
 1 2 3 4 5 6 7 X (40) show a strong desire for something s/he wanted?  
 1 2 3 4 5 6 7 X (41) seem to get excited when you or other adults showed excitement?

When placed on his/her back, how often did the baby:

- 1 2 3 4 5 6 7 X (42) fuss or protest?  
 1 2 3 4 5 6 7 X (43) smile or laugh?

When the baby wanted something, how often did s/he:

- 1 2 3 4 5 6 7 X (44) become upset when s/he could not get what s/he wanted?  
 1 2 3 4 5 6 7 X (45) have tantrums (crying, screaming, face red, etc.) when s/he did not get what s/he wanted?

When placed in an infant seat or car seat, how often did the baby:

- 1 2 3 4 5 6 7 X (46) show distress at first; then quiet down?

### Two Week Time Span

When you returned from having been away and the baby was awake, how often did s/he:

- 1 2 3 4 5 6 7 X (47) smile or laugh?

When introduced to an unfamiliar adult, how often did the baby:

- 1 2 3 4 5 6 7 X (48) cling to a parent?  
 1 2 3 4 5 6 7 X (49) refuse to go to the stranger?  
 1 2 3 4 5 6 7 X (50) hang back from the stranger?  
 1 2 3 4 5 6 7 X (51) never "warm up" to the stranger?

When in the presence of several unfamiliar adults, how often did the baby:

- 1 2 3 4 5 6 7 X (52) cling to a parent?  
 1 2 3 4 5 6 7 X (53) cry?  
 1 2 3 4 5 6 7 X (54) continue to be upset for 10 minutes or longer?

When visiting a new place, how often did the baby:

- 1 2 3 4 5 6 7 X (55) show distress for the first few minutes?  
 1 2 3 4 5 6 7 X (56) continue to be upset for 10 minutes or more?  
 1 2 3 4 5 6 7 X (57) get excited about exploring new surroundings?  
 1 2 3 4 5 6 7 X (58) move about actively when s/he was exploring new surroundings?

When your baby was approached by an unfamiliar person when you and s/he were out (for example, shopping), how often did the baby:

- 1 2 3 4 5 6 7 X (59) show distress?

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Please be sure to circle a number for every item.

1 2 3 4 5 6 7 X (60) cry?

When an unfamiliar adult came to your home or apartment, how often did your baby:

1 2 3 4 5 6 7 X (61) allow her/himself to be picked up without protest?

1 2 3 4 5 6 7 X (62) cry when the visitor attempted to pick her/him up?

When in a crowd of people, how often did the baby:

1 2 3 4 5 6 7 X (63) seem to enjoy him/herself?

When familiar relatives/friends came to visit, how often did your baby:

1 2 3 4 5 6 7 X (64) seem indifferent?

*Thank you for your participation.*