

A Mother's Attitude Towards Her Infant and Child Behaviour Five Years Later

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Abstract

Objective: The relationship between maternal attitude to the infant at 6 months of age and behavioural outcomes at 5 years is explored, controlling for numerous demographic, child and psychosocial family factors.

Method: Data was used from the Mater-University Study of Pregnancy, an Australian longitudinal study of over 7000 mothers and children followed from pregnancy to when the children were 5 years. Measures ranging from the key variables of maternal attitude and child behaviour as well as numerous confounders were dichotomised. Logistic regression analyses were performed to examine the relationship between maternal negative attitude toward the infant and clinically significant levels of child behaviour problems and other infant risks, early social risks, and concurrent social risks.

Results: The results suggest that maternal negative attitude towards the infant at 6 months is an independent predictor of child behaviour problems at 5 years. This association remained significant for boys' externalizing behaviours and girls' internalizing behaviours.

Conclusions: The findings lend support to the concept of a sensitive period in early infancy; the need for a broad perspective in the assessment of the mother-infant relationship and the need for early intervention with dysfunctional mother-infant dyads.

Keywords: child behaviour, early experience, postnatal maternal attitude.

There is debate over the capacity of early experiences (i.e. the period including fetal life, infancy and the pre-school years) to shape later child developmental and behavioural outcomes [1]. In particular research into maternal mental states during pregnancy and the post-natal period have found long-term effects on child behaviour and cognition [2–6]. For example Hay *et al.* [5] followed up a community cohort of women diagnosed with postnatal depression at 3 months. At 11 years, children of the affected women had greater frequency of lower intellectual scores as well as attentional and other learning problems. This finding remained robust after controlling for confounders, including chronic mental health problems. Further evidence of the adverse effect of postnatal depression on young children emerges from a study by Sinclair and Murray [7]. A prospective longitudinal study of a community sample of children of mothers depressed at 2–3 months postnatally was assessed by teachers 1 month after the child's school entry. Compared to a control group, the effect of postnatal depression, after controlling for the influence of later episodes of maternal depression, had most impact on boys from lower social class who experienced higher levels of disturbed behaviour.

Research beyond the early postnatal period has been shaped by the constructs of maternal sensitivity (maternal response to infant needs) and infant attachment style [7–9]. Maternal sensitivity has been found to be predictive of attachment style, which in turn has been found to influence later child outcomes. However a meta-analysis of parental antecedents of infant attachment [10] found only a moderately strong association between maternal sensitivity and infant attachment. Longitudinal research has underscored the variability in the capacity of attachment relationships to explain later development [9,11].

Many authors have noted the equal importance of other parenting constructs such as synchrony, mutuality, support, positive attitude and stimulation [10,12,13]. These constructs can be conceptualized as located within the paradigm of ‘the maternal care-giving system’ [14]. This paradigm has similar characteristics to Bowlby’s infant attachment system [7]. Research endeavours into components of ‘the maternal care-giving system’ have for example focused on maternal cognition within the context of fetus/infant development [15]. In addition there has been interest in mothers’ mental representation of the fetus, women’s childhood attachments and the subsequent link with infant attachment and later outcomes. At the broadest level, the conceptualization of maternal representations include ‘inferences, attitudes, goals, plans, feelings and defences that organize and regulate the smooth functioning of behavioural systems’ [16]. It is from this domain that attention to maternal attitude to the infant has emerged.

Attitudes can be distinguished from values and beliefs. Values are important outcomes that parents aspire to for their children, for example independence; while beliefs are ideas that are considered to be true [17]. An attitude can be defined as ‘a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour’ [18]. One of the key features of attitudes is their subjective quality.

The present study extends research on early maternal influences on child development by exploring the independent effect of maternal positive attitude towards the infant. For the purposes of this study, an attitude is defined as in the previous paragraph. Central to the investigation of independent effects of positive attitude is the controlling of numerous contextual risk factors that can be grouped into broad categories of infant and child factors, parental psychopathology, and family/social risk factors [19]. This component of the study took place 20 years ago. The maternal attitude to the baby in part reflects extended contact between the dyad by 93.8% of the mothers. This does not reflect contemporary infantcare patterns. A recent Australian Bureau of Statistics survey found nearly 40% of mothers with infants had alternative care for their infants [20]. It is hypothesized that low levels of maternal positive attitude or negative attitude toward the 6 month-old infant would be an independent predictor of poor child mental health.

Method

Sampling and procedure

The data for this study were taken from the Mater-University of Queensland Study of Pregnancy (MUSP), a longitudinal study of 7661 women and their children born at one of two major obstetric hospitals in Brisbane, Australia. Procedural details are provided elsewhere [21]. Briefly, the pregnant women were enrolled in the study on average at 18 weeks gestation, then reinterviewed 3–5 days after the birth of their child, then again when the child was 6 months and 5 years of age. There were extensive efforts to achieve high levels of follow-up. Over 69% of mothers who gave birth were successfully located and participated in the 5 year follow-up. Data contained in the current study are taken from self-reports of mothers at each phase of the study.

The 4856 participants included in this study are those children in the cohort who were followed up through the age of 5 years and had complete data for the required analyses. Of these children, 2549 (52%) were male and 2307 (48%) were female. The majority (92%) was of Caucasian ethnicity. Mothers’ mean age at the time of birth was 25.4 years (SD = 5.0), and mean birth order of the target child was 2.0 (SD = 1.1). Mothers’ education was reported at a mean of 4.28 (SD = 1.09) on the following scale: 1 = opportunity school; 2 = primary school; 3 = started secondary school; 4 = completed grade 10; 5 = completed grade 12; 6 = completed business, nursing, secretarial college; and 7 = completed university.

The children who were included in this study represented approximately 63% (4856 of 7661) of the participants who were born into the cohort. Those children lost to follow-up differed significantly from the retained participants in terms of mothers’ age (lost mean = 24.4, retained mean = 25.4; $t = 7.88$, $p < 0.001$); birth order (lost mean = 2.2, retained mean = 2.0; $t = 3.75$, $p < 0.001$); and mothers’ education (lost mean = 4.12, retained mean = 4.28; $t = 6.14$, $p < 0.001$). Compared to those who remained in the study, mothers lost to follow-up also had a significantly lower score on maternal positive attitude (lost mean = 39.6, retained mean = 40.0; $t = 2.28$, $p < 0.05$). Due to this pattern of attrition, the results of this study may provide a conservative estimate of the true association between maternal attitude and child outcomes.

Measures

Risk variables assessed in this study were dichotomised to reflect high-risk status *versus* not. This dichotomization allows for the ready interpretation of odds ratios across risks, as well as a count of cumulative risk factors. Child behaviour problems at 5 years were examined as the outcome variable of interest. Maternal negative attitude toward the infant was the primary risk factor examined. We also examined the relative effects of: (i) other infant risks (prematurity, low birthweight, neonatal intensive care, infant temperament/behavioural problems, maternal prenatal smoking and alcohol use); (ii) early social risks (the presence during infancy of low family income, a teenage mother, parental marital dissatisfaction, maternal stress, maternal depression); and (iii) concurrent social risks (the presence at 5 years of low family income, parental marital dissatisfaction, maternal depression and harsh parenting) on behaviour outcomes at 5 years of age. As well we assessed the relationship between maternal attitude at 6 months and harsh parenting at 5 years to establish whether there was significant continuity between the postnatal and preschool periods.

Maternal attitude: When the infants were six months old, the mothers were asked about the degree to which they agreed with statements about their subjective feelings towards care of the infant. Table 1 presents these statements or items that we combined to create our maternal ‘attitude scale’. This scale was constructed by reversal of items 1 and 4 with higher scores representing a more positive attitude; the scale produced a reliability coefficient (Cronbach alpha) of 0.75. Mothers who scored in the lowest tenth percentile on this score were operationalized as having a negative attitude toward their infant.

Short gestation: The gestation in weeks was recorded and then dichotomised into infants born between 21 and 36 weeks (4%) and the rest between 37 and 44 weeks.

Low birthweight infants: Infants whose birthweight was below 2500 g (4%), were considered to be at-risk infants in this study.

Neonatal intensive care: 7.0% of the infants were placed in neonatal intensive care, and such placement was considered to be a risk factor in our analyses.

Infant behaviour problems: The mothers were asked at 6 months if the infant had experienced a range of behaviours that can be taken as a measure of infant behavioural problems (colic, sleeplessness, feeding problems, and overactivity). A scale was created that measured the number of behaviours reported by the mother. The reliability coefficient for the items in this scale was 0.63. Infants whose mothers endorsed three or more items on this scale (9.3% of sample) were considered to fall into the category of infant behavioural risk.

Maternal prenatal cigarette smoking: Smoking was assessed at the first clinic interview. Subjects were asked how many cigarettes they smoked per day. This was multiplied by the number of days per week on which subjects said they typically smoked. Subjects were classified as high risk on this variable if their mothers reported heavy levels of smoking during pregnancy (7.7% of subjects).

Table 1. Maternal attitude scale items

Caring for my baby is very satisfying.
Feel so angry that sometimes I could smack my baby.
My baby makes me too tired.
My baby is so good I hardly know he/she is there.
Sometimes feel like hitting my baby.
I feel fed up looking after my baby all day.

Item response scale: Strongly Agree/Agree/Neutral/Disagree/ Strongly Disagree.

Maternal prenatal alcohol use: A scale of alcohol use during the prenatal period was constructed from measures inquiring into the frequency and amount of consumption of alcohol during pregnancy. Subjects were placed into the risk category of this variable if their mothers reported drinking several times a week or more while they were pregnant (3.7% of the sample).

Poverty/social class: Rather than utilize a complex measure of socio-economic disadvantage (e.g. parental education, housing, occupation and income), a decision was made to use a dichotomised measure of low family income to assess the presence or absence of familiar ‘adversity’ or

‘disadvantage’ during the infancy and childhood periods. Based upon these considerations, the 25th percentile for each phase (infancy and age 5 years) was selected as the cut-off below which one’s gross family income was defined as ‘low family income’.

Maternal age: Mothers who gave birth as teenagers were considered to represent a high-risk group in this study. They comprised 10.3% of our sample.

Maternal subjective stress: In the prenatal assessment phase, mothers were asked to rate how they had been feeling recently on the following items: 1. ‘In general, I am usually tense and nervous’; 2. ‘There is great nervous strain connected to activities/always under pressure’; 3. ‘At the end of the day I’m completely exhausted mentally and physically’; 4. ‘Daily activities extremely trying and stressful’. Infants whose mother endorsed all four items of subjective stress (9.3% of sample) were considered to have evidenced this early social risk-factor.

Maternal depressive symptoms: These were assessed at each phase using the depression subscale from the Delusions Symptoms-States Inventory (DSSI) of Bedford and Foulds (1978) [22]. It is intended to detect signs and symptoms of mental illness that limit a person’s ability to function and maintain relationships. In the current study, the 7-item depression subscale had reliability coefficients ranging from 0.77 (prenatal) to 0.82 (6-month follow-up). At each phase, a yes/no symptom count (‘yes’ = all the time + most of the time + some of the time) was utilized to dichotomise the sample into depressed and non-depressed groups, with the presence of four or more symptoms classifying a subject as ‘depressed.’ Mothers who had scored as depressed either in the prenatal, birth, or 6-month phases (9.8% of the sample) were considered to have this risk factor during their child’s early development. Mothers who scored as depressed during the 5 year of age follow-up were considered to have a concurrent risk factor of maternal depression (6.3% of the sample).

Marital dissatisfaction: Maternal dyadic satisfaction and adjustment was assessed at each phase using the Dyadic Satisfaction items from the Spanier Dyadic Adjustment Scale (Spanier, 1976) [23]. Reliability coefficients on this scale ranged from 0.82 (postnatal) to 0.86 (6-month and 5-year follow-up). To assess early social risk, we calculated the lowest score obtained on these DAS items across the prenatal, birth, and 6-month phases of assessment. Individuals whose lowest DAS score indicated marital dissatisfaction were categorized as at-risk on this variable (5.6% of sample). DAS scores that indicated marital dissatisfaction at the 5-year follow-up were considered to represent concurrent social risk on this variable (2.9%).

Low affection/harsh parenting: Mothers were asked about their displays of affection and their discipline practices toward their 5-year-old child. Mothers who reported both a low level of affectionate behaviours (i.e. at times too busy to comfort the child and not wanting to cuddle the child), as well as a tendency to use physical punishment to discipline the child were operationalized as having a ‘harsh parenting’ style (10% of the sample).

Child behaviour problems: Child behaviour problems were measured at the 5-year follow-up using items selected from the Child Behaviour Checklist (CBCL) [24], a 118-item checklist with established validity and reliability. Due to resource constraints a 33-item shortened version of the CBCL was utilized in the current design. The more commonly occurring behaviour problems were included in the shortened form of the scales. Following Achenbach [24], subscales utilized in the current study included: (i) externalizing behaviour (comprising aggressive behaviours); and (ii) internalizing behaviour (consisting of items tapping withdrawn behaviour, somatic complaints, and anxious/depressive behaviour). Using a selected subsample of 76 parents of 5-year-old children the following correlations were obtained between the long and our short forms of the CBCL: externalizing scale $r = 0.94$; internalizing scale $r = 0.89$; total behaviour problems $r = 0.98$. In the shortened version of the CBCL utilized in the current design, internal reliability was calculated as Cronbach’s $\alpha = .83$ for externalizing behaviour problems, and Cronbach’s $\alpha = .76$ for internalizing behaviour problems. Cases of behaviour problems have been selected using cut-offs consistent with the percentage of cases for each syndrome identified in a community sample by Achenbach [24]. This constitutes approximately 10% of children in the current design defined as reaching clinical significance within each sub-scale/ syndrome.

Results

Logistic regression analyses were performed to examine the relation-ship between maternal negative attitude toward the infant and clinically significant levels of child behaviour problems. Additional logistic regression analyses examined the relative predictive effect of maternal negative attitude on these child outcomes, in comparison with other infant risks, early social risks, and concurrent social

risks. Finally, maternal negative attitude was tested as a potential moderator in the relationship between cumulative infant, early, and concurrent risk factors and child outcomes. All analyses were performed separately for male and female participants. Alpha levels were set at 0.05.

Table 2. Logistic regression models of the relationship between maternal negative attitude during infancy and child behaviour problems in boys and girls at age five

	Externalizing Exp(β)[†] (95% CI)	Internalizing Exp(β) (95% CI)
Boys (n = 2549)	2.66* (1.94–3.65)	2.40* (1.73–3.32)
Girls (n = 2307)	2.10* (1.36–3.24)	1.95* (1.32–2.89)

[†]Exp(β) is the factor by which the odds for negative behavioural outcome change when the independent variable increases by one unit; *p < 0.001.

Maternal negative attitude toward the infant was found to be significantly related to externalizing and internalizing problems for both male and female participants (see Table 2).

For boys, maternal negative attitude was significantly related to externalizing and internalizing problems even when other infant risks, early contextual risks, and concurrent risks were controlled (see Tables 3,4). Odds ratios suggest that maternal negative attitude is a relatively strong predictor of child behaviour problems, particularly externalizing problems, for boys. No other early contextual risk variable had an OR higher than the ones obtained for maternal negative attitude in the prediction of externalizing behaviour problems. Concurrent maternal depression and concurrent marital dissatisfaction evidenced higher ORs than maternal negative attitude in the prediction of internalizing problems for boys. In examining concurrent social risks, maternal attitude and concurrent maternal depression were significantly related to externalizing behaviour problems in boys.

Maternal negative attitude toward the infant is still significantly related to internalizing problems for girls when other risk factors were controlled; however, ORs for early and concurrent maternal depression and maternal age were higher than those noted for maternal negative attitude (see Tables 3,4). In addition, the control of early social risk factors rendered the maternal negative attitude and child behaviour problem relationship non-significant for externalizing problems in girls (see Table 4). Maternal prenatal smoking, infant behavioural problems, maternal prenatal stress, family income and concurrent maternal depressive symptoms were all positively related to externalizing problems in girls. Interestingly, neonatal intensive care significantly decreased the risk for externalizing behaviour problems in girls.

Next we completed logistic regression analyses to test for the inter-action between maternal negative attitude and cumulative infant, early contextual, or concurrent contextual risks in the prediction of child behaviour problems. We calculated cumulative infant risks as the sum of low birth-weight, short gestation, neonatal care, smoking in pregnancy, alcohol in pregnancy, and infant behavioural risks. We calculated cumulative early social risks as the sum of income, maternal age, marital dissatisfaction, maternal stress, and maternal depression risks. Cumulative concurrent social risks were calculated as the sum of income, marital dissatisfaction, and maternal depression risks present at the 5-year follow-up. In the first block of analyses assessing for interaction effects, we entered the separate variables of cumulative risks and maternal negative attitude. Next we tested whether the interaction term produced by combining these two variables produced a significant change in the χ^2 in the prediction of the child behavioural outcome. None of the interaction terms were significant; suggesting that maternal negative attitude was not a moderator of cumulative infant or social risks in this sample.

Separate analyses of the relationship between maternal negative attitude toward the infant and harsh parenting style at age 5 years were significantly, but not strongly correlated ($r = 0.06$). In addition, maternal harsh parenting style did not significantly mediate or moderate the effect of maternal negative attitude toward the infant on either boys' or girls' internalizing or externalizing behaviour problem outcomes.

Conclusion

Maternal negative attitude towards the infant at 6 months has been shown, in boys and girls, to be an independent predictor of child behavioural outcomes at 5 years. This is especially the case for externalizing behaviours in boys. During all three phases of measurement, maternal negative attitude at 6 months remains the most powerful predictor of externalizing behaviour in boys. This remained the case for internalizing behaviours except at the 5-year phase where concurrent maternal depression was a more powerful predictor than maternal attitude.

Table 3. Logistic regression models of the relationship between maternal negative attitude during infancy, infant risks, and child behaviour problems in boys and girls at age five

	Externalizing		Internalizing	
	Exp(β)	95% CI	Exp(β)	95% CI
Boys				
Maternal attitude	2.43*	(1.75–3.37)	2.26*	(1.61–3.17)
Low birthweight	1.48	(0.74–2.94)	1.60	(0.79–3.24)
Short gestation	1.22	(0.62–2.38)	0.91	(0.45–1.85)
Neonatal care	1.15	(0.69–1.91)	1.36	(0.83–2.23)
Smoking in pregnancy	1.91**	(1.29–2.82)	1.55***	(1.02–2.36)
Alcohol in pregnancy	0.79	(0.41–1.51)	0.88	(0.46–1.67)
Infant behaviour problems	1.63**	(1.13–2.34)	1.33	(0.90–1.96)
Girls				
Maternal attitude	1.83**	(1.16–2.89)	1.71***	(1.13–2.58)
Low birthweight	1.66	(0.76–3.63)	1.62	(0.81–3.22)
Short gestation	1.71	(0.68–4.27)	1.13	(0.49–2.58)
Neonatal care	0.33***	(0.15–.91)	0.66	(0.34–1.28)
Smoking in pregnancy	2.09*	(1.36–3.20)	1.28	(0.83–1.96)
Alcohol in pregnancy	0.65	(0.26–1.64)	1.06	(0.54–2.10)
Infant behaviour problems	1.69***	(1.09–2.60)	1.63***	(1.11–2.39)

* $p < 0.001$, ** $p < 0.01$, *** $p < 0.05$.

For girls the picture was somewhat different. Despite the weakening of the relationship between maternal attitude at 6 months and child behaviour, negative attitude still remained an independent predictor in girls. In all three phases the relationship remained for internalizing behaviours and in two of the three phases the relationship remained for externalizing behaviours.

Interpretation of findings

Several important issues arise from these findings. First, the results suggest a need for a broad conceptualization of maternal psychological disorders in the postnatal period. Second, there needs to be consideration of how a mother's attitude at such an early period of life can have an effect on infants' behaviour 5 years later. Third, we need to explain the differential effect on gender. Finally we need to consider the implications in terms of intervention and social policy.

The finding that maternal negative attitude is independent of postnatal depression and many other con-founders, suggests that the experience of resentment towards the infant may be a clinical state in its own right. It is possible that negative maternal attitude is related to dysfunctional states (not measured in this study) such as personality disorder or continuing alcohol abuse, which have been found to have a negative impact on parenting [25–27]. The dominance of research into postnatal depression and maternal sensitivity may distract clinicians from inquiring into other forms of maternal affective disturbance. The findings of this study reinforce the need for clinicians to adopt a broad view of postnatal maternal functioning [12].

Possible explanations for the effect of maternal negative attitude on infant development may involve a complex range of mechanisms. Polygenetic causation of the clustering of mental illness in parents and children may be a factor. However, the variance explained by such processes is small [28]. Alternative explanations may involve multifaceted mechanisms occurring during a sensitive period of infancy. One such mechanism may be the development of a prototype representation of relationships, that is, the 'internal working model' as described by Bowlby [8,29]. Another mechanism is the direct

effect of maternal attitude via social referencing and visuo-affective interactions on the hardwiring during infancy of neural pathways that are critical to emotional regulation [30,31]. An alternative mechanism may occur through the growth of a demanding, disruptive infant strategy that secures parental attention and protection in the short-term. In the long-term the infant's behavioural style matures into a more formal behavioural pattern [30].

Additional analyses with this data set suggest that the results do not simply reflect the effect of mothers' parenting behaviours at age 5 years on concurrent behaviour problems. As outlined in the results section maternal affectionless/harsh parenting style did not significantly mediate or moderate the effect of maternal negative attitude toward the infant on either boys' or girls' internalizing or externalizing behaviour problem outcomes.

The study found differences in the effects of maternal negative attitude on boys and girls. In particular the relationship was strongest in boys with externalizing problems. Hay *et al.* [5] have outlined the sex differences in infants' responses to maternal depression. Some of these factors may include: maturational delays of male infants; the proposal that prenatal testosterone may disrupt infant emotional regulation; and that male infants have more difficulty regulating their emotions. These differences suggest male infants may be more vulnerable to developing long-term effects to maternal emotional dysregulation.

Table 4. Logistic regression models of the relationship between maternal negative attitude during infancy, early social risks, and child behaviour problems in boys and girls at age five

	Externalizing		Internalizing	
	Exp(β)	95% CI	Exp(β)	95% CI
Boys				
Maternal attitude	2.24*	(1.59–3.16)	2.08*	(1.46–2.96)
Family income (during pregnancy)	1.27	(0.95–1.70)	1.35***	(1.01–1.80)
Maternal age at birth of infant	1.27	(0.85–1.90)	1.00	(0.65–1.54)
Marital dissatisfaction	1.03	(0.61–1.73)	1.45	(0.89–2.36)
Maternal stress	1.78**	(1.22–2.59)	1.42	(0.96–2.12)
Maternal depression	1.52***	(1.03–2.23)	1.76**	(1.21–2.58)
Girls				
Maternal attitude	1.59	(0.99–2.54)	1.62***	(1.07–2.45)
Family income (during pregnancy)	1.38	(0.97–1.96)	1.11	(0.81–1.53)
Maternal age at birth of infant	1.32	(0.83–2.12)	1.70**	(1.15–2.52)
Marital dissatisfaction	1.55	(0.90–2.66)	1.21	(0.74–2.01)
Maternal stress	1.82**	(1.17–2.82)	1.43	(0.96–2.14)
Maternal depression	1.29	(0.81–2.05)	2.01*	(1.37–2.95)

*p < 0.001, **p < 0.01, ***p < 0.05.

Limitations

This study has a number of limitations. The cohort was drawn from a low socio-economic region of Brisbane, and therefore middle and high-income groups were under-represented. As well there was differential attrition, with most of the loss occurring in the young, low income, poorly educated mothers. As many of the risk factors relevant to this study often occur in mothers with the above characteristics, it is likely that the findings are a conservative estimate of the relationship between maternal attitude and later child behaviour.

All of the measures (independent and dependent variables) were based on maternal self-reports. No data was collected from the fathers or other observers of the child's behaviour. No observational data was available on the mother's behaviour towards the infant. Hence it is unclear as to what maternal behaviour for which the measure of attitude is a surrogate. Also the results of this study are heavily dependent on the maternal reports of child behaviour at 5 years. However, the modified CBCL highly correlates with the full instrument; as well there has been extensive validation of the CBCL [24]. In addition there is evidence that elevated scores on the CBCL correlate reasonably with diagnostic categories [32]. Equally, in the absence of observational data the findings may reflect a continuity of maternal negative perception from 6 months to 5 years. If this were the case we would expect that both mothers' reports of infant behaviour problems and affectionless/harsh parenting at age 5 years to mediate or moderate the relationship with child behaviour at 5 years. However, the significance of the maternal attitude variable was also noted even when the above factors were controlled for. This

suggests that the finding does not simply reflect a correlation between how the mother sees the child's behaviour during infancy and how she sees it age 5 years.

This study is unable to clarify whether the main conclusions represent a complex bi-directional relationship between a difficult infant and resentful mother. The presence of a difficult temperament as well as attachment style problems in the infant has been identified as important risk factors for future development [33,34]. The presence of persistence mismatch between maternal care giving responses and the infant's characteristic behavioural style may lead to later sustained mental health difficulties in the preschool years [35]. By con-trolling for a number of confounders at infancy and at age 5 years, the possibility of persistent negative bi-directional interaction has been minimized.

The likelihood of maternal bias in reporting negatively on the child's behaviour needs to be considered. Many of the self-report measures were drawn and modified from instruments utilized over 10 years ago. Contemporary measures of depression, for example the Beck Inventory, were not used due to the need for consistent profile of the mothers' mental states. However the prospective and longitudinal nature of the study and the use of instruments with good metric properties suggest that maternal attitude is an independent factor influencing later child behaviour. It is possible the results are due to chronic disturbance of maternal attitude over the 5 years rather than a specific effect in infancy. However, support for an explicit sensitive period during infancy also emerges from the work on postnatal depression during infancy and its effect on later child adjustment [3].

Implications

There are some implications for clinical practice and social policy based on the results of this study. First there needs to be public and professional awareness of the broad range of postnatal maternal psychological disturbances rather than exclusive focus on depression. The current understandable concern for the presence and later effects of postnatal depression may distract researchers and clinicians from this task. Second, as this research adds further support to the concept of a sensitive period in early infancy, it follows that there is a need for early intervention programs with dysfunctional mother-infant dyads. Fonagy has outlined the importance of developing the mothers' capacity to observe and view the infant as a mentalizing being as critical for future secure attachment [36]. The maternal attitude scale used in this study is quite brief and an updated (socio-culturally sensitive) version would be very cost-efficient to deliver. Such a measure could serve as an early screen of parent-infant relationship difficulties.

Finally, one of the possible unintended implications of the finding of this study is that it may reinforce 'monomathy.' Bowlby [37] coined this term to describe the centrality of the maternal relationship to infant develop-ment. The findings of this study support the growing understanding of the role of negative early experiences in so far as they have an effect on the development of the infant/child. However, McGurk *et al.* [38] have under-lined the fact that there is nothing natural or normative about infants being cared for over extended periods of time by their mothers. The anthropological evidence suggests that infants and children are cared for in a diverse number of arrangements. What may be important from a human developmental point of view is that the infant is socialized within an atmosphere of consistent affection irrespective of whether this care-giving task is a shared or an exclusive one.

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