

## Articles

# A special path to parenthood: parent–child relationships in families giving birth to singleton infants through IVF



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## Abstract

Infertility and its treatment are increasingly viewed as public issues as well as a private concern. Treatments such as IVF draw on public resources and pose psychological and ethical dilemmas for the community. The current paper integrates findings from a prospective longitudinal study that assessed the quality of parenting in families conceiving through IVF from an attachment theory perspective. Seventy families who conceived singleton infants through IVF and a naturally conceiving control group of 63 couples were seen during pregnancy and at 4 and 12 months postpartum. Two observational procedures were used to assess maternal sensitivity to the baby, infant responsiveness and security of attachment at 4 and 12 months respectively. There were no IVF control group differences in maternal sensitivity at 4 months or in security of attachment at 12 months. Implications of the findings for clinicians and contemporary controversies requiring further research are discussed.

**Keywords:** attachment, IVF children, relationships

## Introduction

As many as one couple in seven in our community may have trouble conceiving a child when they want to (Daniels and Stjerna, 1993) and almost 2% of children in the Western World are now conceived through assisted reproductive technologies. Walker and Broderick (1999) noted that infertility is a public issue as well as a private problem. They justified this claim by observing that the treatment of infertility ‘draws on public resources; requires legislation and policy to regulate it; and poses psychological, sociological and ethical dilemmas for the community’ (p. 38). Fundamental to the issues raised over treatment for infertility is the best interest of the potential offspring and their parents. While many studies have demonstrated that couples do experience psychological distress and are confronted by a range of social issues as a

result of infertility, individual reactions vary and can be difficult to quantify (Daniels, 1999). Others have argued that infertility is primarily a physical problem and that assumptions that infertile people will have psychological problems are unwarranted and often unsubstantiated by empirical research (Walker and Broderick, 1999; Van Balen, 2002). In addition to the psychological difficulties reported to be associated with infertility, concerns have also been expressed that the treatment process itself may also have an adverse impact on the adjustment of prospective parents. Mahlstedt *et al.* (1987) concluded from their interviews with women undergoing treatment that, ‘The in vitro experience was a miniature of the whole infertility experience. The emotional rollercoaster kept patients on edge as they tried to manage their worry, elation, stress, confidence, frustration and relief.’ (p. 235).

During the 1980s when IVF technology first became available, clinical writings about parenting after IVF speculated about possible adverse psychosocial outcomes. It was argued that the stress of infertility and infertility treatment combined with the considerable emotional and financial investment these couples had made in pursuit of a child could compromise both their subsequent adjustment to parenthood and the development of their child. In particular, it was suggested that IVF parents may approach parenthood with very high expectations of themselves and consequently experience excessive concern about their performance as parents (Mushin *et al.*, 1985). Lesley Brown (1979), the mother of the first child conceived through IVF, expressed this in the following way: 'Having a miracle was a lot to live up to. I felt as if the whole world expected me to be a perfect mother... It really shocked me once when I shouted at the baby because she was crying... it wasn't a question of not loving her. It just seemed as if I didn't deserve her if I behaved like that. There were so many childless women who would have been better mothers if they'd been given the same chance.' (p. 180). In addition to having high expectations of themselves as parents, couples conceiving through IVF were thought likely to view their child as 'special' and, as a consequence develop unrealistic expectations and concerns about the child, which may result in overprotective parenting (Colpin, 1994; Colpin *et al.*, 1995).

While anecdotal reports identified potential difficulties for IVF families, so far empirical research has not revealed evidence of problematic parental adjustment, parent-child relationships or child development (Van Balen, 1998). The majority of studies, however, were limited to examining assisted reproductive technology families at one point in time and in general there has been a reliance on self-report measures, in particular concerning parent-child relationships. While parental perceptions of adjustment are important, there is also a need for research that corroborates parent report through the use of independently rated observational measures. This may be particularly important in the case of IVF parents, who may be inclined to report positively on their own adjustment (Blenner, 1990). In a review of the development of IVF children, Van Balen (1998) stressed the need for research embedded within a theoretical framework to examine parent-child relationships following IVF. Many factors influence why parents parent the way they do and the advantage of a theoretical framework is that it can provide an integration of the impact of specific experiences such as infertility and IVF relative to other known influences on parenting and child development.

## An attachment theory framework for evaluating parent-child relationships in IVF families

In order to evaluate the quality of parent-child relationships in IVF families, attachment theory (Bowlby, 1969; Ainsworth *et al.*, 1978) appeared to provide both a coherent theoretical and empirical framework. Implicit in attachment theory is a recognition of the importance of the quality of care-giving during the first year of life. Moreover, a relatively brief validated procedure known as the Strange Situation (Ainsworth *et al.*, 1978) allows the empirical investigation of aspects of relatedness in infants and toddlers, how they are transmitted, and how they affect future behaviour. There is a substantial body of evidence that the security of the

mother-child attachment is associated with the child's concurrent and subsequent social and emotional functioning (Sroufe, 1996). The first stage of our research involved a consideration of how speculative writings about parenting after IVF might be understood within the attachment theory framework.

### Trying too hard

A common theme in writings about IVF parents is the suggestion that having invested so much and waited so long, these parents may try too hard, overwhelming their children with intrusive parenting (Colpin *et al.*, 1995). According to attachment theory this parenting style, characterized by an emphasis on overly structured and achievement-oriented activity and care-taking, may lead to avoidant attachment behaviours in the child. Children with avoidant attachment relationships tend not to seek comfort from their mother even when subjected to an interactive stress, such as a separation, and on reunion are inclined to remain toy-focused rather than engaging in interaction with their mother. Avoidant attachment relationships characteristically display limited emotional closeness and expression (Sroufe, 1996).

### Overprotectiveness

On the other hand, some writers have suggested that assisted reproductive technology parents may come to parenthood feeling very anxious regarding their child's well-being. This may be due in part to their effort to conceive and subsequent concerns about the outcomes of the pregnancy (Greenfeld *et al.*, 1996), which may lead to overprotective parenting often associated with a perception of vulnerability in the child. According to attachment theory, an overly protective parenting style, characterized by inconsistency, distress around separations, and a reluctance to let the child progress to independence, may result in anxious/ambivalent attachment behaviours in the child. In contrast to avoidant children, ambivalently attached children usually show extreme distress during interactive stresses, such as separation from their mother, but are not readily comforted by her return and remain preoccupied with maintaining contact with their mother rather than resuming exploratory play. The striking feature of these parent-child relationships is heightened emotional expression, dependency, and an ambivalence about closeness.

### Optimal parenting

A third possibility is that IVF parents may be highly motivated and devoted parents who provide an optimal environment for their children (e.g. Golombok *et al.*, 1995; Van Balen, 1996). Optimal/sensitive parenting is characterized by warmth and responsiveness to the child's need for closeness as well as an acceptance of the child's need to move away and explore their environment. This parenting style is likely to engender secure attachment behaviours in the child. When distressed, securely attached children openly seek contact with their mother, are easily comforted by her, and readily resume exploratory play. In secure parent-child relationships the emotional closeness is apparent and feelings are openly expressed. This in turn provides a secure base from which the child is able develop optimally.

## Disorganized parenting

Finally, we considered the possibility that previously infertile parents may still be struggling with unresolved feelings regarding a loss or traumatic experience associated with their infertility or IVF treatment. An important recent development in attachment theory has been the identification of a subgroup of children who exhibit disorganized attachment to their caregiver. When distressed these children show poor regulation of emotion and contradictory and misdirected attachment behaviours towards their caregiver. These attachment relationships have been observed in maltreating families and in otherwise normal families where parents show behaviour that is confusing and frightening to their infants, as they involuntarily re-experience aspects of previous loss or trauma. Attachment disorganization has been found to be associated with child behaviour problems and later psychopathology (Van Ijzendoorn *et al.*, 1999).

This paper describes the process of adjustment during the transition to parenthood for IVF families through an integration of our findings from pregnancy through to 12 months postpartum. A particular emphasis is placed on a comprehensive observational investigation of the developing parent-child relationship. Although the quality of the parent-child relationship is our primary focus, it is acknowledged that other relevant contextual factors such as financial and educational resources, social support networks, parental adjustment, and child characteristics, may all influence this developing relationship. Where appropriate comment will be included concerning other family factors and the broader socio-cultural context in which the IVF families studied were placed.

In summary, our research aimed to examine the following questions about parenting styles after IVF conception: (i) Do IVF parents try too hard and demonstrate intrusive, overwhelming parenting? (ii) Do IVF parents display overprotective, anxious, and inconsistent parenting? (iii) Are IVF parents more likely to demonstrate sensitive and optimal parenting? (iv) Do IVF parents demonstrate confusing and disorienting parenting?

To address these questions we selected observational measures that were developmentally appropriate to two stages of our study (4 months and 12 months), and that were able to discriminate these different styles of parenting by providing an assessment of maternal sensitivity and attunement. In addition, acknowledging the contribution infants may make to the interaction, we included an assessment of infant responsiveness and difficultness at each age.

## Materials and methods

### Observational assessment at 4 months: the Still-Face procedure

The measure we chose at 4 months to assess the mother-child relationship was a videotaped observational measure, the Still-Face Procedure (Gianino and Tronnick, 1985). This is a videotaped procedure which provides the opportunity to assess (i) an infant's self-regulatory abilities in response to an age-appropriate moderately distressing event, that is, an

unresponsive mother, and (ii) the sensitivity of the mother in interacting with her infant. The procedure includes an initial period of free play, followed by a segment when the interaction between the mother and baby is challenged by the mother remaining still and unresponsive to her infant. During a final phase the mother resumes play with her infant. The validity of the measure has been demonstrated by research showing predictive associations between early infant still face behaviour and mother infant attachment security at 12 months (Cohn *et al.*, 1991) and by meaningful relationships between the mother's capacity to re-engage her infant following the still-face and maternal emotional availability (Kogan and Carter, 1996). Behavioural interaction between the mother and baby during the more stressful episodes was examined in detail because there is evidence that how mothers and babies manage these disruptions is a good indicator of the quality of the relationship (Del Carmen *et al.*, 1993).

### Assessment of infant behaviours

We identified three clusters of behaviours that the infants displayed in response to the stress of the Still-Face segment. The first, analogous to the avoidant behaviours described in attachment theory, included behaviours by which the infant tried to divert their attention from the stress of their unresponsive mother by becoming focused on objects. The second cluster included negative signalling behaviours that were indicative of distress such as fussing and crying. These can be seen as analogous to the ambivalent attachment behaviours described earlier. The final group of behaviours whereby the infant tried to engage with the mother and re-establish interaction was more analogous to secure attachment behaviours. Infant behaviours were coded by a trained scorer who did not know to which group the mothers and babies belonged.

### Assessment of maternal sensitivity

To assess maternal behaviours, we chose the final segment when the mother's task was to re-establish interaction with her infant after the disruption. In this case, the coders rated the mothers in the following three categories: intrusive behaviours when the mother may be physically overwhelming to the baby, over-riding behaviours where the mother ignores infant cues and fails to give the infant time to respond, and a final group of sensitive behaviours which seemed to reflect contingent responsiveness and attunement to the infant's needs.

### Observational assessment at 12 months: the Strange Situation procedure

When the infants were 12 months of age the Strange Situation provided a developmentally appropriate assessment of the quality of the mother-infant attachment relationship. Again, the procedure was videotaped for subsequent scoring by trained raters who were not aware of IVF status. The Strange Situation is conducted over about 20 minutes and parallels the Still Face procedure by incorporating an interactive stress, that is, brief separations of the mother from the baby, and subsequent re-unions. It is these separations within the context of an unfamiliar setting that place an interactive stress on the relationship. The infant's behaviour during the reunion episodes forms the basis for categorizing the mother-baby relationship and the four categories (avoidant, secure, ambivalent and disorganized) have been described above.

Before we present further details of our measures and results, the social context for the families studied and their adjustment during pregnancy will be briefly described.

## Background to the families

### Sample

The 70 IVF participants and their partners were recruited from an IVF unit attached to a Sydney University Teaching Hospital and only couples who were both genetically related to the child were included. A comparison group of 63 mothers who had conceived without assisted conception and their partners was also recruited from the same teaching hospital. Of all the mothers originally invited to take part in the study, 20% and 30% refused in the IVF and control groups respectively. The women in both groups were expecting their first singleton baby and were living with the father of the child. The mothers' ages ranged from 28 to 42 years and fathers from 27 to 56

years. Parents in both groups were highly educated with 40–50% having a college education. Although the IVF treatment was partly refundable through the public health system, the cumulative cost of combined private and public health facilities may explain the fact that only a minority of families in the study were from lower income groups. The retention rate in the study remained above 90%. Socio-demographic information, treatment history and infant perinatal characteristics of the sample are summarized in **Table 1**.

Families who conceived twins through IVF were also enrolled in the study. However, because of the additional developmental and parenting issues for these families, only parenting adjustment for singleton families will be reported here. In the next section we summarize our findings during pregnancy as a context for interpreting subsequent postnatal adjustment.

**Table 1.** Socio-demographic, treatment history and perinatal characteristics of the sample.

		<i>IVF group</i> (n = 70)	<i>Control</i> <i>group</i> (n = 63)	<i>P-value</i>
<i>Parents</i>				
Maternal age (years)	Mean	34.5	31.9	0.0001
	SD	3.0	2.4	
	Range	28–42	28–39	
Paternal age (years)	Mean	37.3	34.8	0.009
	SD	5.7	4.6	
	Range	28–56	28–55	
Education (% tertiary)		40	53	0.088
<i>Cause of infertility (%)</i>				
Female factor		40	NA	
Male factor		15	NA	
Mixed/idiopathic		45	NA	
Treatment cycles	Mean	5.0	NA	
	SD	3.8	NA	
	Range	1–23	NA	
<i>Infants</i>				
Gestational age (weeks)	Mean	39.1	39.8	0.036
	SD	1.9	1.5	
	Range	32–42	35–42	
Premature <sup>a</sup> n (%)		6 (9)	3 (5)	NS
Birthweight (g)	Mean	3291.7	3489.1	0.037
	SD	598.1	441.3	
	Range	1300–4353	2525–4530	
LBW <sup>b</sup> n (%)		5 (8)	0 (0)	0.027
NN <sup>c</sup> admission n (%)		12 (19)	4 (7)	0.045

Note: *t*-tests were used to compare group means and dichotomous data was analysed using chi-square.

<sup>a</sup>Premature = born <37 weeks of gestation.

<sup>b</sup>LBW = low birthweight (<2500 g).

<sup>c</sup>NN = admission to a special or intensive care neonatal nursery.



## Results and discussion

This section describes findings regarding group comparisons during pregnancy, at 4 and at 12 months postpartum. See **Table 2** for a summary of major findings.

### Adjustment during pregnancy

At 30 weeks of pregnancy, questionnaires and interviews with the mothers revealed no differences in marital satisfaction, reports of childhood experiences with their own parents, and on general measures of personality and mood state. The IVF and comparison mothers were comparable with respect to the number of terminations and miscarriages they had experienced. However, the IVF mothers did differ in having experienced more ectopic (tubal) pregnancies, which may have constituted a unique stress for this group.

While this suggests a very similar context for the transition to parenthood, there were some aspects of the pregnancy experience that may have made this transition more challenging for the IVF parents. IVF fathers differed from control fathers in reporting lower self-esteem, higher levels of trait anxiety and lower marital satisfaction. IVF mothers did not differ in reporting lower marital satisfaction, but they did report lower self-esteem and a more external locus of control. The most striking difference between the IVF and comparison mothers was their significantly higher level of anxiety concerning health and defects in the child and about damage to their babies during childbirth. The findings from this phase of our research have been described in more detail elsewhere (Cohen *et al.*, 2000; McMahon *et al.* 1997a, 1999). It is plausible that the concerns the IVF mothers expressed about their child's wellbeing may have been reality based and attributable to the relatively higher obstetric and perinatal risks that have been reported for women conceiving through IVF (Wang *et al.*, 1994). However, Van Balen *et al.* (1996) have also reported elevated stress during pregnancy for both couples conceiving through IVF and previously infertile couples who conceived naturally. They suggest that the stress is not necessarily attributable to the procedure *per se*, but rather to a spill-over effect from psychological issues to do with past infertility which have not been completely resolved and conclude that both IVF and previously infertile couples regard their pregnancy as very precious, and perhaps their one chance in a lifetime. Taken together, these findings regarding pregnancy stress suggest that as a consequence of their past infertility, IVF mothers may bring to parenthood a continuing tendency to be more anxious and overprotective towards their highly sought after child.

### Adjustment at 4 months

#### *Family context: parental adjustment and child characteristics*

At 4 months both parents completed a range of questionnaires assessing general adjustment (anxiety, depression, self-esteem, marital adjustment), and feelings more specific to parenting: competence as a parent, satisfaction with parenting, concerns about separation from the baby, and extent of utilization of parent support services. These findings have been reported previously, however, they are briefly summarized to provide

**Table 2.** Summary of findings during pregnancy, 4 months and 12 months postpartum. Maternal age and education were controlled for in all analyses. Continuous data were analysed using multivariate analyses of variance and categorical data using logistic regression.

	<i>Differences between IVF and control groups according to parent</i>			
	<i>Mothers</i>	<i>P-value</i>	<i>Fathers</i>	<i>P-value</i>
<i>Pregnancy</i>				
Terminations, miscarriages	No		NA	
Ectopic pregnancies	Yes	0.026	NA	
Childhood experiences with parents	No		No	
Personality	No		No	
Self esteem	No		Yes	0.040
Depression	No		No	
Trait anxiety	No		Yes	0.036
Locus of control	Yes	0.023	No	
Marital satisfaction	No		Yes	0.030
Anxiety concerning health and defects of child	Yes	0.002	NA	
Fears about damage to baby during birth	Yes	0.001	NA	
<i>4 months postpartum</i>				
State anxiety	No		No	
Depression	No		No	
Marital satisfaction	No		No	
Self-esteem (sexuality)	Yes	0.023	No	
Competency in parenting skills	Yes	0.010	No	
Reported difficult infant temperament	Yes	0.017	No	
Reported attachment	No		No	
<i>12 months postpartum</i>				
Parental employment	No		No	
Use of childcare	No		No	
State anxiety	No		No	
Depression	No		No	
Marital satisfaction	No		Yes	0.007
Self-esteem	No		Yes	0.007
Reported child temperament	Yes	0.018	No	
Concerns about child behaviour	Yes	0.005	No	

NA = measure not taken for fathers, e.g. miscarriages, or not given to fathers, e.g. any concerning health and defects of child.

the larger family context (McMahon *et al.*, 1997b, 1999). At 4 months postpartum, there were no differences between IVF and comparison fathers on any of the measures. The IVF mothers did not differ from comparison mothers on anxiety, postnatal depression, marital satisfaction or utilization of support services. However, they did report lower self-esteem (on a measure focusing on self-acceptance, womanliness and sexuality) and they reported feeling less competent in a range of mothering skills (e.g. ability to soothe their baby when distressed, to understand their baby's signals and to elicit responses from their babies during play). These feelings of lower self-esteem and less confidence with the baby may be a carry-over effect from their past experience of infertility, where they may have felt a failure as a woman due to their inability to conceive.

### *The mother-child relationship*

Interestingly, the mothers conceiving through IVF also differed from the comparison mothers in that they reported their infants to be more temperamentally difficult. Consistent with the maternal reports, the observational measure of infant behaviour revealed that the IVF infants engaged in significantly higher levels of fussing during the stressful Still-Face segment (Table 3). There were no differences in any of the other categories of infant behaviour. Furthermore, there were no differences in any of the categories of observed maternal behaviour when the mothers resumed play with their infants. In this instance the observed findings were in contrast to the mother's reports of their own mothering skills (McMahon *et al.*, 1997b). One possibility is that their reports of less competence may have resulted from caring for a fussier group of babies who were more difficult to soothe. In this context, it is interesting to consider the possibility that the mother's anxiety during pregnancy may have had a direct physiological influence on infant behaviour. On the other hand, the observed fussiness in the IVF infants may have been attributable to a less than optimal parenting style. However, the finding of no differences in observed maternal behaviour did not support a causal explanation involving impaired parenting. There are of course limitations to the interpretation of findings based on one short observation of maternal behaviour. More detailed home observations across a range of care-taking activities would help to clarify the role of parenting style in this group. Nonetheless, our prospective

design provided the opportunity to observe the evolving mother-child relationship over time.

## **Adjustment at 12 months**

### *Family context: parental adjustment and child characteristics*

As the infants turned 1 year of age, both parents were again sent a similar range of questionnaires to those completed at 4 months postpartum. In addition, the mothers were interviewed and a full developmental assessment and health review of the children was completed. Detailed results concerning parental adjustment and child development, behaviour, temperament, and health have been reported elsewhere (Gibson *et al.*, 1998, 2000a; Leslie *et al.*, 1998), but are noted briefly here again to provide the family context in which mother-child interaction was appraised. Neither IVF fathers nor mothers differed from the comparison parents in their work patterns or in their use of non-parental childcare at 1 year postpartum. Furthermore, both IVF mothers and fathers' reports of general adjustment including mood and overall marital satisfaction were in the community range and for IVF mothers no different to the comparison group mothers from a similar background. However, IVF fathers did differ from comparison fathers in reporting their spouses to be less caring and less involving, and they also reported lower self-esteem. While there was a tendency for IVF mothers to report lower self-esteem than the comparison group mothers, there were no longer differences in maternal reports of competence in the care-giving role as found at 4 months.

With regard to the children, there were no reported differences in health outcomes, development was in the normal range, and there were no observed differences in behaviour during developmental testing between the IVF and comparison 1-year-olds (Gibson *et al.*, 1998). Interestingly, although parental ratings of behaviour problems and temperament for IVF children were in the average community range, the IVF mothers reported more behaviour difficulty and more difficult temperament in their children relative to the controls.

### *Mother-child relationship*

A detailed analysis of infant behaviour during reunions of the Strange Situation revealed comparable numbers of secure and insecure relationships amongst IVF and comparison children. Sixty-five per cent of IVF infants and 56% of their comparison peers showed secure attachment relationships with their mothers and only a small number of children (10%), across both groups showed a disorganized attachment relationship (Gibson *et al.*, 2000b). This is in keeping with the proportions expected in the context of a socially stable, non-clinical population. Thus, while IVF mothers, as a group, reported more baby-focused anxiety in pregnancy, feelings of lower self-esteem in the early months of parenthood and more behavioural difficulty in their children at both follow-ups, these factors were not reflected in the observed quality of the mother-child attachment relationship at 12 months postpartum.

While similar trends to report more difficult infant temperament at both 4 and 12 months were noted for fathers, it

**Table 3.** Observational measures assessed in IVF and control groups.

	<i>Difference between groups</i>	<i>P-value</i>
Infant behaviour (fussing in still-face, 4 months)	Yes	0.024
Maternal sensitivity 4 months	No	NS
Mother-child attachment security	No	NS
Child health and development	No	NS

was not possible to evaluate whether these perceptions had an impact on their sensitivity in their interactions with their babies, since observational assessments were not conducted with fathers at either follow-up. Given the increasing recognition of the importance of the father's relationship with their child, this would be an important direction for future research.

## Conclusions

Overall, this research showed more similarities than differences when the IVF mothers were compared with other older first-time mothers, and both groups demonstrated predominantly normal adjustment to parenthood during the first postpartum year. Despite our findings that IVF mothers reported lower self-esteem early in parenthood and more behaviour difficulty in their children at both follow-ups, there were no differences in the observed quality of the mother-child relationship on either occasion. Indeed, the IVF mothers showed predominantly secure attachment relationships as would be expected in a non-clinical population. While these findings are positive and encouraging to both families who have conceived through IVF and the professionals involved in their care, there are limitations in the extent to which the findings may be generalized.

The IVF children in our study were conceived by older first time mothers who were relatively well educated and living with the father of the child. Older parental age is usually associated with the social advantages of a higher level of education and more financial and domestic security, and these factors are widely acknowledged to be salient predictors of positive parenting and child outcomes (Fergusson and Woodward, 1999). Perhaps because of the substantial and increasing costs of IVF treatment (Sauer, 1999), these characteristics have been observed commonly in IVF families (Van Balen, 1998), and are likely to act as strong protective factors which buffer against the negative consequences that might be predicted due to a past history of infertility and treatment.

While these socio-economic protective factors are common to families conceiving through assisted reproductive technology, other aspects of our IVF sample are less representative given an increasing diversity of family and social contexts making use of the technology. The children in the study were singletons and in the context of assisted reproduction the incidence for multiple births is higher than in naturally conceiving populations. It is acknowledged that parenting after multiple birth may raise unique mother-child relationship issues and the findings of this study have most relevance to families of singleton children. The children in this study were genetically related to both parents representing a 'traditional' family structure. However, recent developments in sperm, egg and embryo donation and gestational surrogacy have extended the application of reproductive technology to a range of alternative family contexts including older single women, lesbian couples, and heterosexual couples with non-genetically related offspring. The information to date has shown that parenting children who are not genetically related does not appear to affect the emotional, behavioural or relational development of children aged up to 8 years old (Brewaeys *et al.*, 1997; Golombok *et al.*, 2002). However, the implications of the current controversies around genetic uncertainty and disclosure are still unfolding. It is interesting that where

difficulties have been identified, they appear to be more often the consequence of an interaction between the mode of conception and prevailing social attitudes in a particular cultural context rather than genetic unrelatedness, type of family structure or secrecy over child origins (Golombok, 1997).

Different cultural perspectives on IVF are clearly important. This research from an Australian perspective included IVF families from a range of cultural backgrounds (Western and Eastern Europe, Asia and the Pacific region); however, the English-speaking Caucasian group were the largest single ethnic cluster and the results need to be considered as primarily representative of IVF families in similar cultural contexts. Other ethnic backgrounds are likely to hold a range of values in regard to infertility, the use of assisted reproductive technologies and attitudes to parenting. For example, in Eastern and other traditional societies the social pressures to have a family are enormous and consequently expectations about the child and parenting may be even stronger than identified in Caucasian samples (Shah, 1999; Zegers-Hoehschild, 1999). Bearing in mind the qualifications with respect to different family and cultural contexts, these findings have direct relevance to the earlier stages of parenthood following conception through the more conventional IVF procedures. They also contribute substantially to the general body of knowledge concerning family adjustment and parenting following assisted reproductive technologies in general.

The observational procedures employed in this study enabled objective examination of some of the speculative notions in the literature about parenting styles after assisted reproductive technologies within the broader context of other known influences on parenting and infant development. Specifically, no evidence was found that IVF mothers were likely to be intrusive, overwhelming or overprotective in the way they related to their children (Table 3).

While there were unique concerns for the parents who conceived through IVF during the transition to parenthood, these did not, in and of themselves, lead to impaired parenting. Furthermore, the finding regarding the predominantly secure attachment of the IVF children to their mothers suggests that they are likely to continue to demonstrate appropriate social and cognitive development.

However, these findings regarding the overall normality of the IVF parents should not blunt awareness to the special path they have taken to parenthood (Sandelowski, 1995). An important aspect of our research was the fact that our prospective design allowed us to explore the stresses and processes of adjustment from pregnancy through to 12 months postpartum. There were anxieties and concerns during pregnancy and to a lesser extent at 4 months postpartum that were unique to the IVF mothers. These seemed to lessen over time as the IVF mothers gained confidence in their parenting. Overall, the findings regarding the normal maternal adjustment for IVF families suggest that they may be resilient and resourceful in the face of the stresses inherent in becoming a parent given that their relationships and lifestyle have already been seriously challenged in the pursuit of biological parenthood. Perhaps the joy of a long awaited baby may have acted as a buffer and facilitated the capacity of

the IVF mothers to relate sensitively and effectively to their child's needs, despite the stresses and concerns we identified.

In conclusion, however, it is important to note that for many infertile couples the birth of their first, long-awaited child conceived through IVF is only the beginning of a complex and evolving story. Are they able to have more children? Does this involve further IVF treatment? What new issues do they encounter as a result of their involvement with IVF? Indeed it is likely that more dilemmas will emerge in the future as the implications of the IVF process, including disclosure issues, decisions regarding non-implanted frozen embryos, and long-term health outcomes for mothers unfold over time.

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