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Families Created Through Surrogacy Arrangements: Parent–Child Relationships in the 1st Year of Life

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Findings are presented of a study of families created through surrogacy arrangements. Forty-two surrogacy families were compared with 51 egg-donation families and 80 natural-conception families on standardized interview and questionnaire measures of the psychological well-being of the parents, the quality of parent–child relationships, and infant temperament. The differences that were identified between the surrogacy families and the other family types indicated greater psychological well-being and adaptation to parenthood by mothers and fathers of children born through surrogacy arrangements than by the natural-conception parents.

Developments in the field of assisted reproduction have resulted in the creation of new family types in which genetic parenthood is dissociated from social parenthood. Children conceived by egg donation lack a genetic relationship with their mothers, children conceived by sperm donation lack a genetic relationship with their fathers, and children conceived by embryo donation are genetically unrelated to both parents. Nevertheless, these children, conceived through the use of donated gametes, are born to the parents who will bring them up. In the case of surrogacy, in which one woman bears a child for another woman, the mother who gives birth to the child and the mother who parents the child are not the same. There are two types of surrogacy: (a) partial (genetic) surrogacy, in which the surrogate mother and the commissioning father are the genetic parents of the child, and (b) full (nongenetic) surrogacy, in which the commissioning mother and the commissioning father are the genetic parents. With partial surrogacy, conception usually occurs through artificial insemination, and in the case of full surrogacy, conception takes place through in vitro fertilization (IVF). Of all the assisted-reproduction procedures that have been practiced in recent years, surrogacy remains the most contentious. In many countries, including Germany and Sweden, surrogacy is illegal. Other countries, including France, Denmark, and the Netherlands, and some American and Australian states, have introduced regulation, in some cases prohibiting payment to surrogate mothers (Lee & Morgan, 2001).

There have been no systematic, controlled investigations of the consequences of surrogacy for family relationships. However, studies of other types of assisted-reproduction families show no evidence of adverse effects on parenting. Parents of genetically related children conceived by IVF have been found to have good relationships with their children (for reviews, see Golombok, 2002a; McMahon, Ungerer, Beaurepaire, Tennant, & Saunders, 1995; van Balen, 1998). When differences have been found between IVF parents and natural-conception parents, these have tended to reflect higher levels of anxiety about parenting by IVF mothers of infants and preschool children. For example, IVF mothers were more protective of their children (Hahn & DiPietro, 2001; Weaver, Clifford, Gordon, Hay, & Robinson, 1993), allowed their children less autonomy (Colpin, Demyttenaere, & Vandemeulebroecke, 1995), saw their children as more vulnerable and special (Gibson, Ungerer, Tennant, & Saunders, 2000), and reported lower maternal self-efficacy (McMahon, Ungerer, Tennant, & Saunders, 1997) than did natural-conception mothers. However, there were also more positive results for IVF mothers with respect to feelings toward (Weaver et al., 1993), and emotional involvement with (van Balen, 1996), their children. Moreover, parents of early school-age children were found to have warmer and more involved relationships with their children than were natural-conception parents (Golombok et al., 1996; Golombok, Cook, Bish, & Murray, 1995). Although this advantage had disappeared by early adolescence, the quality of parenting in IVF families continued to be good (Golombok, Brewaeys, et al., 2002; Golombok, MacCallum, & Goodman, 2001).

Fewer controlled studies have been carried out on families created by gamete donation. From the information that is currently available, there is no evidence to suggest that the quality of parenting in donor insemination families (Golombok et al., 1995, 1996; Golombok, Brewaeys, et al., 2002; Golombok, MacCallum, Goodman, & Rutter, 2002) or in egg-donation families (Golombok, Murray, Brinsden, & Abdalla, 1999; Raoul-Duval, Bertrand-Servais, Letur-Konirsch, & Frydman, 1994; Soderstrom-Antilla, Sajaneimi, Tiitinen, & Hovatta, 1998) is compromised by the absence of a genetic link between a parent and the child. Never-

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theless, there are no studies of such children beyond early adolescence. In addition, there has been much concern about the secrecy that surrounds gamete donation (Baran & Pannor, 1993; Daniels & Taylor, 1993; Landau, 1998; McWhinnie, 2001; Snowden, 1990). The large majority of parents of children conceived by gamete donation do not disclose the nature of the child's conception to the child (Brewaeys, 1996, 2001), and there is anecdotal evidence of difficulties for some individuals who find out about their donor conception at a later stage in life (Turner & Coyle, 2000).

It may be expected from the findings of existing research on assisted-reproduction families that parent–child relationships in families created through surrogacy arrangements will be equally positive. However, the characteristics that distinguish surrogacy from other types of assisted reproduction, resulting from the dissociation of gestational motherhood from social motherhood, may produce greater problems for surrogacy families than for families created by the more traditional assisted-reproduction procedures. In particular, commissioning parents must live throughout the pregnancy with the uncertainty of whether the surrogate mother will relinquish the child. In addition, commissioning parents must establish a mutually acceptable relationship with the surrogate mother during the pregnancy and ensure that this relationship does not break down. Not only is this situation likely to produce anxiety in the commissioning parents, but it may also result in marital strain, particularly for couples with one partner more in favor of the surrogacy arrangement than the other. From the perspective of the commissioning mother who is unable to give birth herself, the relationship with the fertile and often younger surrogate mother, to whom she is indebted, may result in feelings of inadequacy, depression, and low self-esteem. In addition, there is a great deal of prejudice against the practice of surrogacy, and commissioning couples are likely to experience disapproval from family, friends, and the wider social world. Unlike other forms of assisted reproduction in which the mother experiences a pregnancy and there is no need to be open about the circumstances of the child's birth, couples who become parents through surrogacy must explain the arrival of their newborn children.

All of these factors have the potential to have a negative impact not only on the commissioning parents' psychological well-being but also on their quality of parenting. It is well established that parental anxiety and depression (Downey & Coyne, 1990) and marital conflict (Cummings & Davies, 1994; Grych & Fincham, 1990) constitute risk factors for the child, operating both directly and indirectly by adversely affecting the parent–child relationship (Harold & Conger, 1997; Zahn-Waxler, Duggal, & Gruber, 2002). Parents' lack of social support from family and friends has also been shown to interfere with the quality of parent–child relationships (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983; Crockenberg, 1981). Moreover, the need to resort to surrogacy, in itself, may interfere with the quality of parenting of the commissioning parents. For example, couples whose children are born through surrogacy arrangements may view surrogacy as an inferior route to parenthood or may feel less confident as parents. Thus we predicted that surrogacy would have a detrimental effect on the psychological state and quality of parenting of commissioning parents.

It is also well established that children's behavior toward their parents influences the behavior of their parents toward them (Bell, 1968; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000), so that infants with easy temperaments experience a different pattern of interaction with their parents than do infants who are difficult to manage (Putnam, Sanson, & Rothbart, 2002; Van den Boom & Hoeksma, 1994). In addition, the behavior of parents has been found to influence the temperament of their infants, with maternal self-efficacy mediating the relationship between infant difficulty and low parenting competence (Putnam et al., 2002; Teti & Gelfand, 1991). As commissioning mothers may have low levels of self-efficacy, we predicted that infants born to surrogate mothers would show more difficult temperaments than infants born to mothers who brought them up.

There are also specific aspects of the surrogacy arrangement that may influence the psychological state and quality of parenting of commissioning couples. Greater difficulties may be expected in surrogacy arrangements in which the surrogate mother is also the genetic mother of the child because commissioning mothers who are neither the genetic nor the gestational mother may feel greater insecurity in their mothering role. Similarly, whether the surrogate mother is known or unknown to the commissioning parents prior to the surrogacy arrangement may have an impact on parenting. Better outcomes may be predicted when the surrogate mother is a relative or a friend of the commissioning couple because of the longevity and closeness of the relationship. A further factor that may influence parenting is whether the surrogate mother remains in contact with the family after the birth of the child. It has been argued that contact with the surrogate mother will benefit the child by providing a greater understanding of his or her genetic origins. However, the ongoing involvement of the surrogate mother with the family may have an undermining effect on the parenting of the commissioning couple. Although surrogate mothers who are relatives or friends of the commissioning couple are more likely to remain in contact with the family, a study of a representative sample of surrogate mothers in the United Kingdom found that more than two thirds of previously unknown surrogate mothers were in contact with their children 1 year following the birth (Jadva, Murray, Lycett, MacCallum, & Golombok, 2003).

The only existing studies of surrogacy families include (a) an investigation of the verbal and motor development of 2-year-old children born after IVF surrogacy that found no evidence for impairment (Serafini, 2001) and (b) interviews with eight sets of parents with children born through surrogacy (Blyth, 1995) in which it was reported that all parents planned to tell the children about their origins and to maintain contact with the surrogate mothers, although there was some fear of interference by the surrogate mothers in bringing up the children. Other studies by Van den Akker (2000) and Ragoné (1994) did not distinguish between commissioning couples who had already become parents and those who intended to have children through surrogacy. The aim of the present investigation was to examine the outcome of surrogacy for families with infants around 1 year of age in comparison with matched groups of egg-donation and natural-conception families. The egg-donation families were included as a comparison group in addition to the natural-conception families in order to control for the experience of female infertility and the involvement of a third party in the birth of the child. We predicted that the surrogacy families would show higher levels of psychological problems and lower levels of parenting quality than the egg-donation families because of the additional challenges presented by the involvement of surrogate mothers. The study focused

on the parents' psychological state, the quality of their parenting, and the temperament of the child.

Method

Participants

The surrogacy families were obtained through the General Register Office of the United Kingdom Office for National Statistics (ONS). In the United Kingdom, a record is kept of all families created through surrogacy arrangements when the commissioning couples become the legal parents of the children. Legal parentage is granted to the commissioning couple by a court of law, and these proceedings usually occur within the child's 1st year of life. In the present investigation, all parents of children approximately 1 year of age who obtained legal parenthood between March 2000 and March 2002 were asked to participate in the study. Thirty families agreed to take part, representing 60% of the surrogacy families who responded to the request by the ONS. Forty percent of those who responded declined to participate in the study, and no response was obtained by a further 8 families. As surrogacy families who had not yet become their children's legal parents would not have been identified by the ONS, all 34 parents on the register of the United Kingdom surrogacy agency known as Childlessness Overcome Through Surrogacy (COTS) with a child in the same age range were also asked to take part. Twenty-six of these families agreed to participate, representing a response rate of 76%. As 14 families who responded positively to the invitation by one organization also responded positively to the invitation by the other, the total number of surrogacy families recruited to the study was 42. It was not possible to calculate an exact cooperation rate because some of the families approached by both the ONS and the COTS agency either may have responded negatively to one request if they had already accepted the other or may not have responded at all to the second request. For reasons of confidentiality, we only had access to the names of those who agreed to take part, and thus we were unable to establish how many of those who refused or failed to respond to one request also did so to the other. However, it was possible to calculate minimum and maximum values for the cooperation rate. These were found to be 54% and 68%, respectively, with an estimated response rate of 61%.

Of the 42 surrogacy arrangements, 26 (62%) involved partial surrogacy and 16 (38%) involved full surrogacy. Twenty-nine (69%) of the surrogate mothers were unknown to the commissioning parents prior to the surrogacy arrangement. The other 13 (31%) comprised 6 friends and 7 family members. The majority of commissioning mothers (76%) had met with the surrogate mother following the birth with the child present, and almost two thirds (64%) had met with the surrogate mother with the child present at least once every 3 months. In 10 families (24%), there had been no contact between the surrogate mother and the child, either because the surrogate mother did not wish to have contact or by mutual agreement between the surrogate mother and the commissioning parents. With respect to the quality of the relationship between the commissioning parents and the surrogate mother following the birth, 38 mothers (91%) reported this to be harmonious, 4 (9%) reported some dissatisfaction or coldness, and none reported instances of major conflict or hostility.

The surrogacy families were studied in comparison with two control groups: (a) 51 families with children conceived by egg donation and (b) 80 families with naturally conceived children. The egg-donation families were recruited through seven fertility clinics in the United Kingdom. In each clinic, all families with a child conceived by egg donation who was around 1 year of age were asked to participate in the research. Seventy-five percent took part. Thirty-six (72%) of the egg donors were anonymous, and the remaining 14 (28%) were friends or relatives of the parents, a pattern that was similar to the proportion of known and previously unknown surrogate mothers.

The natural-conception families were selected through maternity ward records on the basis of stratification to maximize comparability with the surrogacy and egg-donation families. The inclusion criteria were as follows: The baby had to have been between 7 and 12 months old when the parents were invited to participate in the research; the baby had to have resulted from a singleton birth with a minimum of 30 weeks gestation; the baby had to have no congenital abnormalities; the mother had to be at least 30 years old; the baby had to be the mother's first or second child; the mother had to be married to, or cohabiting with, the baby's father; and the pregnancy had to have been planned. The cooperation rate was 73%.

Sociodemographic information for each group is presented in Table 1. There were similar proportions of boys and girls in each family type, and the age of the children did not differ between groups. There was a

Table 1
Sociodemographic Information by Family Type

Variable	Surrogacy			Egg donation			Naturally conceived			F or χ^2
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	
Age of child (months)	10.52	1.99		10.78	1.85		10.84	1.92		$F(2, 170) = 0.38$, *ns*
Age of mother (years)	39.60	5.61		40.37	6.16		35.36	2.90		$F(2, 170) = 20.89$, $p < .01$
Child's sex										$\chi^2(2, N = 173) = 1.60$, *ns*
Boy			22			30			38	
Girl			20			21			42	
Social class										$\chi^2(6, N = 172) = 11.45$, *ns*
Professional managerial			32			38			68	
Skilled nonmanual			5			9			11	
Skilled manual			5			2			0	
Partly skilled/unskilled			0			1			1	
Mother working										$\chi^2(4, N = 173) = 2.84$, *ns*
No			20			31			38	
Part time			18			16			32	
Full time			4			4			10	
No. of siblings										$\chi^2(4, N = 173) = 40.69$, $p < .01$
None			25			40			23	
One			13			8			55	
Two			4			3			2	

significant group difference in the age of the mothers, $F(2, 170) = 20.89$, $p < .01$. The egg-donation and surrogacy mothers were the oldest, each group having a mean age of 40 years, and the mean age of the natural-conception mothers was 35 years. No group difference was found for social class as measured by the occupation of the parent with the highest-ranking position according to a modified version of the Registrar General's classification (OPCS and Employment Department Group, 1991); occupational classifications ranged from 1 (professional/managerial) to 4 (partly skilled or unskilled). Neither was there a difference between family types in the proportions of mothers who had returned to work following the births of their children. The number of siblings in the family differed significantly between groups, $\chi^2(4, N = 173) = 40.69$, $p < .01$, with fewer siblings in the surrogacy and egg-donation families than in the natural-conception families. As significant differences between groups were found for mother's age and number of siblings in the family, these variables were entered into all of the statistical analyses as covariates.

Researchers trained in the study techniques visited the families at home. Data were obtained from the mother and the father separately by tape-recorded interview and questionnaire. Information obtained by interview was rated according to a standardized coding scheme, and regular meetings were held to minimize rater discrepancy. Interviews were conducted with 100% of mothers and 66% of fathers. Questionnaire data were obtained from 92% of mothers and 78% of fathers. Fewer fathers than mothers were available for interviews because of work commitments. However, some of the fathers who were not interviewed completed the questionnaires.

Measures

Parents' Psychological State

Quality of marriage. The quality of the marital relationship was assessed both by interview and by questionnaire. From the interview with each parent, the following ratings were made for mothers and fathers separately according to a standardized procedure developed by Quinton and Rutter (1988): (a) Mutual enjoyment was rated on a 4-point scale from 1 (*a great deal*) to 4 (*none*) and was based on the enjoyment both partners experienced in shared activities; (b) confiding was rated on a 5-point scale from 1 (*all important matters discussed adequately*) to 5 (*no communication about matters of importance*) and took account of the ease of discussing important issues together; and (c) number of arguments was rated on a 4-point scale from 0 (*none or occasional*) to 3 (*more than 1 per month*) and measured the frequency of conflicts involving shouting and/or violence, denigration of each other or of each other's families, and/or not speaking after a difference for more than 1 hr. Pearson product–moment interrater reliability coefficients for these variables were .58, .64, and .73, respectively. Mothers and fathers also completed the Golombok Rust Inventory of Marital State (GRIMS; Rust, Bennun, Crowe, & Golombok, 1990), a questionnaire assessment of the quality of the marital relationship in which higher scores indicate poorer marital quality. The split-half reliability is .91 for men and .87 for women, and the GRIMS has been shown to discriminate significantly between couples who are about to separate and those who are not.

Psychological adjustment. The short form of the Parenting Stress Index (PSI/SF; Abidin, 1990), a standardized assessment of stress associated with parenting, was administered to mothers and fathers separately in order to produce a total stress score for each parent as well as scores on the Parental Distress, Dysfunctional Interaction, and Difficult Child subscales, with higher scores reflecting greater parenting stress. Test–retest reliability for the total score was found to be .96 over a 1–3-month interval and .65 over 1 year. Concurrent and predictive validity has been demonstrated for the full-length questionnaire, and the short form has been reported to correlate highly with the full-length version. The Trait Anxiety Inventory (Spielberger, 1983) and the Edinburgh Depression Scale (Thorpe, 1993) were also completed by both mothers and fathers to assess anxiety and depression, respectively. Both of these instruments, for which higher scores represent greater difficulties, have been shown to have good reliability and to discriminate well between clinical and nonclinical groups.

Social support. Ratings of social support were made from the mothers' interview data as follows: (a) Partner's help in child care was rated on a 6-point scale from 0 (*passive/unhelpful*) to 5 (*takes the major load*) and was based on the extent to which the father was a help or a hindrance to the mother in parenting; (b) emotional support from the mother's family and (c) emotional support from the father's family were rated on a 3-point scale from 0 (*cannot discuss problems*) to 2 (*discuss all problems*), and these measured the extent to which the mother received a listening ear or help or advice with problems relating to the child; (d) practical help from the mother's family and (e) practical help from the father's family were rated on a 4-point scale from 0 (*none*) to 3 (*regular help*), and these assessed the extent to which the mother received help such as babysitting or money to buy the children's clothes. Pearson product–moment interrater reliability coefficients for these variables were .83, .97, .95, .91, and .73, respectively.

Quality of Parenting

Parent interview. The mothers and fathers were interviewed separately with an adaptation of a standardized interview designed to assess the quality of parenting (Quinton & Rutter, 1988). Detailed accounts were obtained of the child's behavior and the parent's response to it, with reference to the child's feeding and sleeping patterns, babysitting, day care, the parent's feelings about the parental role, the parent's feelings about the child, and relationships within the family unit. This procedure has been validated against observational ratings of mother–child relationships in the home, demonstrating a high level of agreement between global ratings of the quality of parenting by interviewers and observers (Quinton & Rutter, 1988). In order to calculate interrater reliabilities, 40 randomly selected interviews were coded by a second interviewer who was unaware of family type. Agreement between raters ranged from 95% to 100% for all but one variable (for which agreement was 92.5%), with nonagreement defined as a greater than 1-point difference on any scale. Pearson product–moment correlation coefficients between raters are given in the relevant sections below.

Overall ratings of the quality of parenting were made for mothers and fathers separately according to strict coding criteria that took into account information obtained from the entire interview, as follows: (a) Expressed warmth was rated on a 6-point scale from 0 (*none*) to 5 (*high*) and was based on the parent's tone of voice, facial expression, and gestures when talking about the child, spontaneous expressions of warmth, sympathy, and concern about any difficulties experienced by the child, and enthusiasm and interest in the child as a person. (b) Emotional overinvolvement was rated on a 4-point scale from 0 (*little or none*) to 3 (*enmeshed*) and measured the extent to which family life and the emotional functioning of the parent were centered on the child, the extent to which the parent was overconcerned or overprotective toward the child, and the extent to which the parent had interests apart from those relating to the child. (c) Parent–child interaction was rated on a 5-point scale from 0 (*very poor*) to 4 (*very high*) and measured the extent to which the child and the parent spent time together, enjoyed each other's company, and showed affection to one another. (d) Sensitive responding was assessed for mothers only on a 5-point scale from 0 (*none*) to 4 (*very sensitive responding*) and represented the mother's ability to recognize and respond appropriately to her infant's needs. Pearson product–moment correlation coefficients between raters for expressed warmth, emotional overinvolvement, parent–child interaction, and sensitive responding for mothers were .63, .54, .69, and .47, respectively, and the coefficients for expressed warmth, emotional overinvolvement, and parent–child interaction for fathers were .82, .70, and .59, respectively.

In addition to these overall ratings, the following individual variables were rated from the interview material: (e) Feelings about the parental role, rated on a 5-point scale from 1 (*rejecting*) to 5 (*happy*), assessed feelings about being a parent. (f) Enjoyment of parenthood was rated on a 4-point

scale from 0 (*none*) to 3 (*a great deal*) and measured expressed enjoyment as well as reservations about parenthood. Pearson product–moment correlation coefficients between raters for feelings about parental role and enjoyment of parenthood, respectively, were .96 and .60 for mothers and .63 and .73 for fathers.

Attachment Questionnaire. The Attachment Questionnaire (Condon & Corkindale, 1998), an instrument designed to measure parenting variables relevant to infant attachment, was also administered to both parents. This questionnaire has been shown to have acceptable levels of internal consistency (α = .78), test–retest reliability (Pearson r = .86), and construct validity as assessed by an examination of the factor structure and by correlations with related measures. Different mother and father subscales resulted from factor analyses of the original questionnaire. The mother's questionnaire assesses tolerance, pleasure in proximity, competence as a parent, and acceptance, and the father's questionnaire assesses absence of hostility, quality of attachment, and pleasure in interaction, with higher scores representing more positive feelings.

Infant Temperament

The infant's temperament was assessed with the Infant Characteristics Questionnaire (ICQ; Bates, Freeland, & Lounsbury, 1979), which was completed by mothers. This instrument produces scores on Fussy/Difficult, Unadaptable, Dull, and Unpredictable subscales, with higher scores representing more difficult temperaments. The questionnaire has been shown to have content and convergent validity, and test–retest reliabilities for the above subscales were .70, .54, .57, and .47, respectively.

Results

Multivariate analyses of covariance (MANCOVAs) were conducted for the quality of marriage variables, the parental psychological problems variables, the social support variables, the quality of parenting variables, and the infant temperament variables, with separate MANCOVAs for mothers and fathers where relevant. The covariates were mother's age and number of children in the family. When the MANCOVA was significant, one-way analyses of covariance (ANCOVAs) were then carried out for each variable included in the MANCOVA. The covariates were mother's age and number of children in the family.[1] When a significant group difference was found, the following contrast analyses were carried out to address specific questions: (a) surrogacy versus natural conception (S vs. NC) and (b) surrogacy versus egg donation (S vs. ED).

Parents' Psychological State

Mothers

With respect to the quality of the marriage, the mutual enjoyment, confiding, and number of arguments variables and the GRIMS scores were entered into a MANCOVA. Wilks's λ was not significant (see Table 2).

For psychological problems, scores on the Parental Distress, Dysfunctional Interaction, and Difficult Child subscales of the PSI and on the Trait Anxiety Inventory and the Edinburgh Depression Scale were entered into a MANCOVA. Wilks's λ showed a nonsignificant trend, $F(10, 294) = 1.73$, $p < .10$. With one-way ANCOVAs, a significant difference between groups was found for the Edinburgh Depression Scale, $F(2, 153) = 3.29$, $p < .05$, reflecting lower scores among the surrogacy mothers than among both the natural-conception (S vs. NC, $p < .05$) and egg-donation (S vs. ED, $p < .05$) mothers. Regarding the PSI subscale scores, a significant group difference was found for parental distress, $F(2, 153) = 6.68$, $p < .01$. The surrogacy mothers obtained significantly lower scores than both the natural-conception (S vs. NC, $p < .01$) and egg-donation (S vs. ED, $p < .05$) mothers (see Table 2).

The MANCOVA for the social support variables included partner's help in child care, emotional support from the mother's family, emotional support from the father's family, practical help from the mother's family, and practical help from the father's family. Wilks's λ was not significant (see Table 2).

Fathers

Regarding the quality of the marriage, the mutual enjoyment, confiding, and number of arguments variables and the GRIMS scores were entered into a MANCOVA. Wilks's λ was not significant (see Table 2).

With respect to psychological problems, scores on the Parental Distress, Dysfunctional Interaction, and Difficult Child subscales of the PSI and on the Trait Anxiety Inventory and the Edinburgh Depression Scale were entered into a MANCOVA. Wilks's λ showed a nonsignificant trend, $F(10, 254) = 1.79$, $p < .10$. One-way ANCOVAs showed group differences for the Parental Distress, $F(2, 130) = 6.02$, $p < .01$, and Dysfunctional Interaction, $F(2, 130) = 3.60$, $p < .05$, subscales of the PSI. For both of these subscales, the surrogacy fathers obtained lower scores than both the natural-conception (S vs. NC: parental distress, $p < .01$; dysfunctional interaction, $p < .05$) and the egg-donation (S vs. ED: parental distress, $p < .05$; dysfunctional interaction, $p < .05$) fathers (see Table 2).

Quality of Parenting

Mothers

The expressed warmth, emotional overinvolvement, parent–child interaction, sensitive responding, feelings about parental role, and enjoyment of parenthood variables and the subscale scores from the Attachment Questionnaire were entered into a MANCOVA. Wilks's λ was significant, $F(20, 282) = 1.93$, $p = .01$. As shown in Table 3, one-way ANCOVAs revealed a significant difference between family types for expressed warmth, $F(2, 168) = 5.74$, $p < .01$, reflecting a higher level of warmth among the surrogacy mothers than the natural-conception mothers (S vs. NC, $p < .01$). There was also a significant difference for emotional overinvolvement, $F(2, 168) = 6.12$, $p < .01$, which showed greater emotional overinvolvement among the surrogacy mothers than the natural-conception mothers (S vs. NC, $p < .01$). In addition, enjoyment of parenthood differed according to family type, $F(2, 167) = 7.63$, $p < .01$, with greater enjoyment shown by the surrogacy mothers than the natural-conception mothers (S vs. NC, $p < .01$). There were no differences between groups for parent–infant interaction, sensitive responding, or feelings about parental role.

[1] The results were more significant with analyses of variance that did not include covariates. However, we present the more conservative ANCOVAs to avoid overstating the findings.

Table 2
Means and Standard Deviations for Parents' Psychological State and Comparisons Between Family Types

Psychological state variable	Surrogacy (S)		Egg donation (ED)		Natural conception (NC)					Contrasts	
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*df*	*p*	S vs. NC	S vs. ED
Mothers											
Quality of marriage											
Mutual enjoyment	1.78	0.73	1.68	0.62	1.78	0.73					
Confiding	1.68	0.66	1.60	0.78	1.67	0.73					
No. of arguments	0.79	0.92	0.78	0.89	1.03	1.07					
GRIMS	21.62	10.54	23.44	10.44	23.25	10.87					
Psychological adjustment											
PSI Parental Distress	20.13	5.83	24.02	7.93	25.04	6.62	6.68	2, 153	$< .01$	$p < .01$	$p < .05$
PSI Dysfunctional Interaction	15.68	3.76	16.53	4.13	16.12	3.46	0.53	2, 153	*ns*		
PSI Difficult Child	19.26	5.25	20.31	6.15	20.93	5.33	1.55	2, 154	*ns*		
PSI Total	55.07	11.64	60.86	14.66	62.13	12.88	4.31	2, 155	$< .05$	$p < .01$	*ns*
Trait Anxiety Inventory	34.71	6.53	37.41	9.41	36.69	7.32	1.26	2, 155	*ns*		
Edinburgh Depression Scale	3.80	2.79	5.71	4.39	5.89	4.06	3.29	2, 153	$< .05$	$p < .05$	$p < .05$
Social support											
Partner's help in child care	3.39	0.80	3.20	0.85	3.16	1.01					
Emotional support from mother's family	1.61	0.77	1.56	0.74	1.54	0.70					
Emotional support from father's family	1.12	0.93	1.02	0.90	1.05	0.80					
Practical help from mother's family	2.00	1.06	1.38	1.09	1.64	1.02					
Practical help from father's family	1.48	1.23	1.42	1.06	1.60	1.00					
Fathers											
Quality of marriage											
Mutual enjoyment	1.78	0.70	1.68	0.63	1.84	0.62					
Confiding	1.78	0.70	1.68	0.63	1.55	0.50					
No. of arguments	0.78	0.93	1.03	1.11	1.14	0.89					
GRIMS	21.51	10.87	23.67	11.87	22.20	9.73					
Psychological adjustment											
PSI Parental Distress	21.11	6.35	24.55	6.86	26.61	7.57	6.02	2, 130	$< .01$	$p < .01$	$p < .05$
PSI Dysfunctional Interaction	14.88	2.57	16.72	3.94	17.70	4.58	3.60	2, 130	$< .05$	$p < .05$	$p < .05$
PSI Difficult Child	19.77	4.67	21.25	5.55	22.96	5.79	2.75	2, 130	*ns*		
PSI Total	55.77	10.09	62.52	12.95	67.28	15.18	6.31	2, 130	$< .01$	$p < .01$	$p < .05$
Trait Anxiety Inventory	33.31	7.03	35.07	7.26	35.11	7.68	0.78	2, 130	*ns*		
Edinburgh Depression Scale	3.37	2.89	3.85	2.99	5.10	3.99	1.98	2, 130	*ns*		

Note. GRIMS = Golombok Rust Inventory of Marital State; PSI = Parenting Stress Index.

A significant difference between groups was found for the Pleasure in Proximity subscale of the Attachment Questionnaire, $F(2, 154) = 8.55$, $p < .01$, with the surrogacy mothers showing greater pleasure than the natural-conception mothers (S vs. NC, $p < .01$). A significant group difference was also found for the Acceptance subscale, $F(2, 154) = 4.61$, $p < .05$, reflecting greater acceptance by the surrogacy mothers than the natural-conception mothers (S vs. NC, $p < .05$). No differences between the surrogacy and egg-donation mothers were found for any of the parenting variables (see Table 3).

Fathers

The expressed warmth, emotional overinvolvement, parent–child interaction, feelings about parental role, and enjoyment of parenthood variables and the subscale scores from the Attachment Questionnaire were entered into a MANCOVA. Wilks's λ was significant, $F(16, 190) = 2.41$, $p < .01$. As shown in Table 3, one-way ANCOVAs showed a significant difference between groups for expressed warmth, $F(2, 109) = 5.71$, $p < .01$, with higher levels of warmth shown by the surrogacy fathers than the natural-conception fathers (S vs. NC, $p < .01$). Emotional overinvolvement differed between groups, $F(2, 109) = 5.34$, $p < .01$, reflecting greater emotional overinvolvement by surrogacy fathers than natural-conception fathers (S vs. NC, $p < .05$). In addition, there was a group difference for feelings about parental role, $F(2, 110) = 6.23$, $p < .01$, which showed more positive feelings among the surrogacy fathers than the natural-conception fathers (S vs. NC, $p < .01$). There was also a difference in enjoyment of parenthood according to family type, $F(2, 110) = 5.35$, $p < .01$, with greater enjoyment shown by surrogacy fathers than natural-conception fathers (S vs. NC, $p < .01$). The groups did not differ with respect to parent–infant interaction.

For the Attachment Questionnaire, a significant difference between groups was found for the Quality of Attachment subscale,

Table 3
Means and Standard Deviations for Quality of Parenting and Comparisons Between Family Types

Quality of parenting variable	Surrogacy (S)		Egg donation (ED)		Natural conception (NC)					Contrasts	
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*df*	*p*	S vs. NC	S vs. ED
Mothers											
Parent interview											
Expressed warmth	4.64	0.48	4.59	0.57	4.24	0.68	5.74	2, 168	$< .01$	$p < .01$	*ns*
Emotional overinvolvement	1.00	0.83	1.02	0.88	0.41	0.63	6.12	2, 168	$< .01$	$p < .01$	*ns*
Parent–child interaction	3.67	0.48	3.57	0.54	3.49	0.50	2.77	2, 168	*ns*		
Sensitive responding	2.79	0.65	2.75	0.59	2.75	0.80	0.30	2, 168	*ns*		
Feelings about parental role	4.70	0.46	4.78	0.42	4.65	0.48	1.78	2, 165	*ns*		
Enjoyment of parenthood	2.88	0.33	2.78	0.42	2.53	0.55	7.63	2, 167	$< .01$	$p < .01$	*ns*
Attachment Questionnaire											
Tolerance	12.85	1.62	12.91	1.32	12.58	1.43	1.31	2, 155	*ns*		
Pleasure in proximity	36.51	3.03	36.25	3.21	33.76	4.02	8.55	2, 154	$< .01$	$p < .01$	*ns*
Competence as parent	22.91	1.94	22.68	2.13	22.22	2.19	1.37	2, 154	*ns*		
Acceptance	12.80	1.95	12.30	2.65	11.33	2.23	4.61	2, 154	$< .05$	$p < .05$	*ns*
Fathers											
Parent interview											
Expressed warmth	4.43	0.57	4.41	0.69	3.98	0.75	5.71	2, 109	$< .01$	$p < .01$	*ns*
Emotional overinvolvement	0.32	0.61	0.54	0.84	0.02	0.14	5.34	2, 109	$< .01$	$p < .05$	*ns*
Parent–child interaction	3.48	0.57	3.35	0.68	3.24	0.63	2.88	2, 110	*ns*		
Feelings about parental role	4.76	0.44	4.78	0.42	4.55	0.50	6.23	2, 110	$< .01$	$p < .01$	*ns*
Enjoyment of parenthood	2.79	0.41	2.81	0.40	2.45	0.54	5.35	2, 110	$< .01$	$p < .01$	*ns*
Attachment Questionnaire											
Absence of hostility	21.23	1.96	20.95	2.54	20.04	2.93	1.82	2, 130	*ns*		
Quality of attachment	23.83	1.17	23.47	1.77	22.65	1.75	5.82	2, 130	$< .01$	$p < .01$	*ns*
Pleasure in interaction	34.89	4.08	34.38	3.95	32.97	4.75	1.75	2, 130	*ns*		

$F(2, 130) = 5.82$, $p < .01$, reflecting greater attachment quality among the surrogacy fathers than the natural-conception fathers (S vs. NC, $p < .01$). The surrogacy fathers did not differ from the egg-donation fathers for any of the parenting variables (see Table 3).

Infant Temperament

The four subscales of the Infant Characteristics Questionnaire were entered into a MANCOVA. Wilks's λ was not significant (see Table 4).

Moderating Effects of Parents' Psychological State and Infant Temperament on Quality of Parenting

In order to explore whether the quality of parenting in surrogacy families was influenced by parents' psychological state, the moderating effects of marital satisfaction as assessed by the GRIMS, anxiety as assessed by the Trait Anxiety Inventory, depression as assessed by the Edinburgh Depression Scale, and parenting stress as assessed by the total score on the PSI/SF on expressed warmth and emotional overinvolvement were examined for mothers and fathers separately. The moderating effects of social support as assessed by the partner's help in child care and practical help from the mother's family on expressed warmth and emotional overinvolvement were examined for mothers only. In addition, the moderating effects of the four infant temperament subscales on expressed warmth and emotional overinvolvement were examined for mothers and fathers separately. For each of these analyses, 2×2 ANCOVAs were carried out with group (surrogacy vs. natural conception) and the moderating variable (using the median split) as the between-subjects factors and with mother's age and number of siblings as covariates. Maternal and paternal expressed warmth and emotional overinvolvement were chosen as dependent variables to represent a positive and a negative measure of parenting quality, respectively, and because they are robust variables that have been found to differentiate between assisted-reproduction and natural-conception parents in previous studies (Golombok et al., 1995; Golombok, MacCallum, et al., 2002). The presence of a moderating effect was indicated by a significant interaction according to the procedure established by Baron and Kenny (1986). For mother's expressed warmth, a significant moderating effect

Table 4
Means and Standard Deviations for Infant Temperament for Three Family Types

Infant Characteristics Questionnaire subscale	Surrogacy		Egg donation		Natural conception	
	M	*SD*	*M*	*SD*	*M*	*SD*
Fussy/Difficult	24.65	6.54	26.32	6.05	26.06	5.52
Unadaptable	12.26	4.60	12.78	4.55	12.90	3.93
Dull	8.52	2.60	8.30	2.80	8.85	2.29
Unpredictable	16.00	3.96	17.45	4.35	17.80	4.38

was found for depression, $F(1, 106) = 5.74$, $p < .05$, reflecting a significant difference between the surrogacy mothers and the natural-conception mothers for low levels of depression, $t(53) = 4.09$, $p < .01$, but not for high levels of depression. Thus, for mothers with low levels of depression, the surrogacy mothers showed higher levels of expressed warmth than the natural-conception mothers. For father's emotional overinvolvement, there was a moderating effect for the Dull subscale of the Infant Characteristics Questionnaire, $F(1, 69) = 3.82$, $p = .05$. A significant difference between the surrogacy and the natural- conception families was found for low levels of dullness, $t(32) = 2.7$, $p < .05$, but not for high levels of dullness. For infants with a low score on this variable, that is, infants who tended to smile and show pleasure in play and other activities, the surrogacy fathers showed higher levels of emotional overinvolvement than did the natural-conception fathers (see Table 5).

Factors Associated With Quality of Parenting in Surrogacy Families

For the surrogacy group only, the following aspects of the surrogacy arrangement were examined in relation to the quality of parenting: (a) full versus partial surrogacy, (b) whether the surrogate mother was previously known or unknown to the commissioning parents, and (c) whether or not the surrogate mother had contact with the child. Maternal and paternal expressed warmth and emotional overinvolvement were chosen as measures of parenting quality. There was no difference between full and partial

Table 5
Means and Standard Deviations for Variables in Moderator Analyses

	Warmth				Emotional overinvolvement			
	Surrogacy		Natural conception		Surrogacy		Natural conception	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
				Mothers				
Low PSI	4.68	0.47	4.28	0.61	1.00	0.81	0.42	0.64
High PSI	4.62	0.50	4.21	0.76	1.15	0.80	0.46	0.64
Low anxiety	4.77	0.42	4.18	0.72	1.00	0.81	0.33	0.59
High anxiety	4.50	0.51	4.28	0.66	1.13	0.80	0.51	0.66
Low depression	4.83	0.38	4.13	0.75	0.96	0.82	0.34	0.60
High depression	4.38	0.50	4.32	0.63	1.23	0.72	0.50	0.66
Low GRIMS	4.70	0.47	4.20	0.74	1.25	0.85	0.39	0.58
High GRIMS	4.65	0.49	4.26	0.61	0.88	0.69	0.50	0.70
Low partner's help	4.61	0.50	4.19	0.57	0.89	0.83	0.45	0.65
High partner's help	4.70	0.47	4.30	0.81	1.04	0.82	0.36	0.60
Low practical help	4.83	0.40	4.48	0.59	1.00	0.89	0.52	0.66
High practical help	4.59	0.50	4.17	0.70	0.93	0.82	0.36	0.59
Low fussy/difficult	4.67	0.48	4.26	0.67	0.96	0.80	0.49	0.68
High fussy/difficult	4.64	0.49	4.19	0.71	1.21	0.80	0.33	0.53
Low unadaptable	4.70	0.47	4.23	0.73	1.13	0.81	0.43	0.60
High unadaptable	4.60	0.50	4.23	0.66	0.93	0.79	0.40	0.63
Low dull	4.65	0.48	4.42	0.62	1.15	0.81	0.32	0.54
High dull	4.67	0.48	4.09	0.70	0.94	0.80	0.48	0.66
Low unpredictable	4.69	0.47	4.27	0.71	1.08	0.84	0.36	0.54
High unpredictable	4.58	0.51	4.19	0.67	1.00	0.73	0.45	0.67
				Fathers				
Low PSI	4.61	0.50	4.35	0.60	0.33	0.68	0.00	0.00
High PSI	4.10	0.56	3.78	0.80	0.30	0.48	0.04	0.19
Low anxiety	4.56	0.51	4.33	0.68	0.37	0.71	0.00	0.00
High anxiety	4.25	0.62	3.77	0.76	0.25	0.45	0.04	0.19
Low depression	4.59	0.50	4.06	0.80	0.35	0.70	0.00	0.00
High depression	4.18	0.60	3.96	0.77	0.27	0.46	0.04	0.19
Low GRIMS	4.50	0.51	4.32	0.67	0.29	0.61	0.00	0.00
High GRIMS	4.36	0.63	3.76	0.77	0.36	0.63	0.04	0.20
Low fussy/difficult	4.47	0.62	3.95	0.86	0.29	0.68	0.00	0.00
High fussy/difficult	4.36	0.50	4.00	0.69	0.36	0.50	0.04	0.19
Low unadaptable	4.44	0.61	4.00	0.77	0.33	0.68	0.05	0.21
High unadaptable	4.40	0.51	3.96	0.77	0.30	0.48	0.00	0.00
Low dull	4.39	0.60	3.90	0.70	0.33	0.68	0.00	0.00
High dull	4.50	0.52	4.04	0.82	0.30	0.48	0.04	0.19
Low unpredictable	4.31	0.48	3.90	0.62	0.54	0.77	0.05	0.21
High unpredictable	4.53	0.64	4.04	0.87	0.13	0.35	0.00	0.00

Note. PSI = Parenting Stress Index; GRIMS = Golombok Rust Inventory of Marital State.

surrogacy arrangements for expressed warmth or emotional overinvolvement. However, commissioning mothers showed significantly higher levels of expressed warmth, $t(31) = -2.09$, $p < .05$, and a nonsignificant trend toward significantly higher levels of emotional overinvolvement, $t(26) = -1.71$, $p < .10$, in surrogacy arrangements in which the surrogate mother was a relative or a friend. There was also a nonsignificant trend toward higher levels of expressed warmth, $t(26) = 1.86$, $p < .10$, but not emotional overinvolvement, among commissioning mothers whose children had contact with the surrogate mother.

Discussion

Contrary to the concerns that have been expressed regarding the practice of surrogacy, the differences that were identified between the surrogacy families and the other family types indicated greater psychological well-being and adaptation to parenthood by mothers and fathers of children born through surrogacy arrangements than by the comparison group of natural-conception parents, with the exception of emotional overinvolvement, which is discussed below. Both mothers and fathers in surrogacy families reported lower levels of stress associated with parenting than did their counterparts with naturally conceived children, and the mothers also showed lower levels of depression. With respect to parent–child relationships, the findings were again more positive for the surrogacy parents than the natural-conception parents. Mothers and fathers in surrogacy families showed greater warmth and attachment-related behavior toward their infants, and greater enjoyment of parenthood, than did natural-conception parents. The surrogacy fathers were also more satisfied with the parental role.

It seems, therefore, that surrogacy results in a more positive experience of parenting in the child's 1st year of life than does the conception of children by natural methods. Why should this be? A possible explanation is that children born as a result of surrogacy arrangements are extremely wanted children who are being raised by highly committed and loving parents. This explanation is compatible with the lack of differences in the quality of parent–child relationships between the surrogacy families and the egg-donation families, who also went to great lengths to have children. In order to control for the level of desire for a child in the natural-conception comparison group, we used as a selection criterion that the pregnancy had to have been planned, so that the highly motivated surrogacy parents would not be compared with natural-conception parents who had become pregnant by accident. Nevertheless, it is likely that couples who pursue assisted reproduction in order to become parents have a stronger desire for children than do couples who are able to give birth without medical intervention or without the involvement of a third party; those couples who discover a fertility problem and who are not highly motivated to become parents are more likely to abandon their attempts to have children. Furthermore, the process of assisted reproduction, in itself, appears to strengthen the desire to have children. In the clinical literature, reports are to be found of couples undergoing repeated attempts of risky, costly, and highly stressful procedures such as IVF in spite of a low chance of achieving a successful pregnancy (Boivin, Takefman, Tulandi, & Brender, 1995; Leiblum, Kemmann, & Lane, 1987). It is not surprising, therefore, that those who do become parents at the end of this difficult process are highly involved with their much-wanted children. Although it has been argued that the experience of infertility may lead to dysfunctional patterns of parenting when a desperately sought baby is eventually born (Burns, 1990), the empirical evidence that exists so far suggests the opposite effect (Golombok, 2002a; McMahon et al., 1995; van Balen, 1998). In studies of other types of assisted-reproduction families, more positive parent–child relationships have been found to persist to early school age (Golombok et al., 1995, 1996).

The more positive outcomes for parent–child relationships among the surrogacy families than among the natural-conception families may also be associated with the greater psychological well-being of the parents. It is not known whether the differences in parental psychological state between the surrogacy and natural-conception families preexisted the decision to embark on surrogacy or emerged following the birth of the child. It may be expected that couples who decide to take this difficult route to parenthood, and who do not give up along the way, are less likely to have psychological problems in the first place and are less susceptible to the negative effects of stress. Interestingly, an examination of the moderating effects of anxiety, depression, parenting stress, marital satisfaction, and social support found that depression moderated the relationship between family type and maternal warmth such that mothers of children born through surrogacy arrangements showed greater warmth toward their infants than did natural-conception mothers when maternal depression was low.

Regarding the egg-donation families, it is noteworthy that these parents reported lower levels of psychological well-being than the surrogacy parents, but there were no differences between these two family types with respect to the parenting measures. It is conceivable that the high level of investment in parenting by egg-donation parents overrides any potentially negative influences of parental distress on parenting quality. The reason for the difference in psychological well-being between the egg-donation parents and the surrogacy parents is unclear but may again be associated with the specific characteristics of couples who opt for surrogacy. Egg donation is a much more widely available and more socially acceptable way of having children than is surrogacy, and thus egg-donation parents may be more similar to natural-conception parents than to surrogacy parents in terms of psychological well-being.

As no differences in infant temperament were identified according to family type, and infant temperament was not found to moderate the quality of parenting shown by commissioning parents, the differences in parent–child relationships between the surrogacy families and the natural-conception families cannot be attributed to the behavior of the children. The only exception was a moderating effect of the Dull subscale of the Infant Characteristics Questionnaire showing that having a responsive infant increased the degree of emotional overinvolvement of fathers in surrogacy families. It is conceivable that commissioning fathers are less likely than natural-conception fathers to engage with infants who are unresponsive toward them. Nevertheless, it is important to point out that only 2 of the 36 moderator variable analyses were statistically significant, and these may have been due to chance.

The older age of the surrogacy mothers and the smaller numbers of children in their families may also have contributed to the findings. However, these variables were included as covariates in

the statistical analyses, and in real terms, the differences were not large. The mean age of the mothers ranged from 35 to 40 years, and thus all were older mothers, and the large majority of parents had no more than two children. The lower levels of depression shown by the surrogacy mothers in comparison with both the egg-donation mothers and the natural-conception mothers are of interest. As the surrogacy mothers did not experience pregnancy, it is possible that their lower scores on this measure stemmed from the absence of biological factors associated with the onset of depression in women following the birth of a child (Nolen-Hoeksema, 1987). They may also have been in better physical shape and thus better able to cope with the demands of a newborn baby.

It was also possible to examine the relationship between certain aspects of the surrogacy arrangement and the quality of parenting. There was no difference in the level of maternal or paternal expressed warmth or emotional overinvolvement according to the presence or absence of a genetic link between the commissioning mother and the child. However, the nature of the relationship between the commissioning parents and the surrogate mother did appear to influence the parenting of commissioning mothers. It seems that surrogacy arrangements involving a relative or friend are associated with more positive outcomes with respect to the parenting of commissioning mothers. However, it must be stressed that the children in the present investigation were only around 1 year old. Although the process of surrogacy may affect the parenting behavior of the commissioning couple right from the start, it will be some time before the children themselves acquire any understanding of the nature of their birth. As they grow up and develop an awareness of their surrogacy origins, it is conceivable that the commissioning parents may then experience difficulties. What surrogacy means for children's sense of who their "real" mother is and for the type of relationship the child develops with each mother remains to be seen. A more detailed description of the commissioning parents' experiences of the surrogacy arrangement is presented in MacCallum, Lycett, Murray, Jadva, and Golombok (2003).

An alternative explanation for the more positive findings for surrogacy families is that because of the negative attitudes, and sometimes outright hostility, toward surrogacy, parents of children born in this way make a greater attempt than parents of naturally conceived children to present their families in the best possible light. There may be a feeling that they have to prove themselves to be good parents to overcome the prejudice against them, a phenomenon that has been reported by parents in other kinds of assisted-reproduction families. Although this explanation cannot be ruled out, the variables derived from the interview were rated by highly trained interviewers who took account of nonverbal aspects of the parents' answers, such as facial expression and tone of voice when talking about the child, and not just the content of what was said. The interviews lasted for 1.5–2 hr and involved detailed questioning about many different aspects of family functioning, a process that is designed to minimize socially desirable responding. In addition, no differences in parent–child relationships were identified between the surrogacy families and the egg-donation families. Had the findings resulted purely from the desire to present a positive picture of themselves as parents, then the parents of children born through the more controversial technique of surrogacy would have been expected to obtain higher scores on the parenting variables than would the parents of children born through the less controversial and more hidden technique of egg donation. This was not the case. Furthermore, defensive responding was assessed by the interviewers (rated on a 5-point scale ranging from *not at all defensive* to *extremely defensive* according to well-defined coding criteria) and by the Defensive Responding subscale of the Parenting Stress Index, and neither measure was found to differ between groups. It should also be pointed out that not all of the findings were positive. The mothers and the fathers in surrogacy families showed significantly higher levels of emotional overinvolvement with their children. This feature has been reported previously in relation to other types of assisted-reproduction families (Gibson et al., 2000; Golombok et al., 1995, 1996; Weaver et al., 1993) and indicates greater overprotectiveness by parents of children born as a result of assisted-reproduction procedures. It may be the case that emotional overinvolvement is less influenced by social desirability effects. It should be noted, however, that existing findings do not indicate higher levels of psychological problems associated with overprotectiveness in assisted-reproduction children (Golombok, 2002b; van Balen, 1998). Moreover, the mean level of emotional overinvolvement was not high, reflecting a slight degree of overinvolvement rather than a pathological level.

The surrogacy families in the present study constitute the first representative sample of families created through surrogacy arrangements. As all commissioning couples in the United Kingdom must apply to a court of law to become the legal parents of the child, and there is one centralized surrogacy agency (COTS), it was possible to contact the large majority of surrogacy families with a child around 1 year of age at the time of the study. It is conceivable that some families slipped through the net by neither approaching a court of law nor contacting the surrogacy agency. However, this seems unlikely except for a small minority of cases because it is in the interests of the commissioning couple to become the child's legal parents and also because most couples who consider surrogacy contact COTS for advice or for help in finding surrogate mothers. The cooperation rate was closely comparable to, or better than, that of previous studies of assisted-reproduction families with children conceived by gamete donation (Brewaeys, 1996; Golombok et al., 1995, 1996; Nachtigall, Tschann, Quiroga, Pitcher, & Becker, 1997). Because of the negative attitudes that exist toward some types of assisted reproduction, parents are sometimes unwilling to participate in research.

The "Baby M" case in the United States (New Jersey Supreme Court, 1987), in which a surrogate mother refused to hand over the baby and the court awarded custody to the commissioning father, brought surrogacy to the attention of the general public and sparked enormous controversy around the world. Those opposed to the practice of surrogacy have argued that surrogacy is unacceptable because it represents the commodification of children and the exploitation of economically disadvantaged women. From a psychological perspective, reservations about surrogacy have focused on the potentially negative consequences for family relationships and children's psychological well-being. In the absence of systematic information, there has been much speculation, usually negatively framed, about the outcomes of surrogacy for all of those concerned. The findings of the present study do not support these negative assumptions with respect to the child's 1st year of life.

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