

## The European study of assisted reproduction families: family functioning and child development

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**Findings are presented of a European study (conducted in the UK, Italy, Spain and The Netherlands) of family relationships and the social and emotional development of children in families created as a result of the two most widely used reproductive technologies, in-vitro fertilization (IVF) and donor insemination (DI), in comparison with control groups of families with a naturally conceived child and adoptive families. Mothers of children conceived by assisted reproduction expressed greater warmth towards their child, were more emotionally involved with their child, interacted more with their child and reported less stress associated with parenting than mothers who conceived their child naturally. Similarly, assisted reproduction fathers were found to interact more with their child and to contribute more to parenting than fathers with a naturally conceived child. With respect to the children themselves, no group differences were found for either the presence of psychological disorder or for children's perceptions of the quality of family relationships. The findings relating to the quality of parenting and the socio-emotional development of the children were similar in each of the four countries studied.**

**Key words:** child development/donor insemination/family functioning/IVF

### Introduction

Since the introduction of in-vitro fertilization (IVF), advances in assisted reproduction technologies have resulted in the creation of family types that would not otherwise have existed. With IVF using the father's spermatozoa and the mother's egg, the child is genetically related to both parents, whereas children conceived by donor insemination (DI) are genetically related to the mother but not the father, and children conceived using donated eggs are genetically related to the father but not the mother. When both egg and spermatozoa are donated, the child is not genetically related to either parent. This latter group of children are similar to adopted children in that they

are genetically unrelated to both parents, but differ in that the parents experience a pregnancy and develop a relationship with the child from birth. In the case of surrogacy, the child may be genetically related to neither, one or both parents, depending on the use of a donated egg and/or spermatozoa. As Einwohner (1989) points out, it is now possible for a child to have five parents: the egg donor, the sperm donor, the birth mother, and the two social parents whom the child knows as mother and father. The creation of these new types of family raises important questions about the psychological consequences for the children who result, and for this reason it has been recommended that follow-up studies of these families should be carried out (European Commission Working Party on Ethical and Legal Aspects of New Reproductive Technologies, 1989)

It has often been argued, particularly by researchers and practitioners in the field of adoption, that children have a need for knowledge about their biological parents, and that children who are not given such information will become confused about their identity and at risk for emotional problems (Sants, 1964; Triseliotis, 1973; Hoopes, 1990; Schechter and Bertocci, 1990). In the field of assisted reproduction, parallels have been drawn with the adoptive situation and it has been suggested that a missing genetic link between the child and a parent may pose a threat to the relationship between the non-genetic parent and the child (Warnock, 1984). It has been proposed that it is the secrecy which surrounds DI and egg donation that may undermine family relationships, and cause children conceived by gamete donation to feel confused about their identity (Snowden *et al.*, 1983; Clamar, 1989; Snowden, 1990; Daniels and Taylor, 1993). Secrets are believed to be detrimental to family functioning because they create boundaries between those who know and those who do not, and cause anxiety when topics related to the secret are discussed (Karpel, 1980). Whether or not children conceived using donated gametes should be told about their genetic origins remains one of the most disputed ethical issues raised by the practice of assisted reproduction. Whereas parents have generally not been encouraged to tell their children, there is a growing body of opinion which believes that it is not justifiable to keep such information secret, either because it is argued that children have a right to know, or because of concern about the effect of secrecy on family relationships.

More general concerns regarding the consequences of assisted reproduction for family functioning and child development have also been expressed, such as the potential negative impact on family relationships of the parents' experience of infertility investigations and treatment, often lasting over a period of several years. It has been suggested that couples who

have not come to terms with their infertility may experience difficulties in relating to their children (Burns, 1990). This has been reported to be a problem for some adoptive parents (Brodzinsky, 1987; Humphrey and Humphrey, 1988). In addition, whereas some couples find that the experience of infertility has no deleterious effect on their marriage, for others the stress of infertility as well as the stressful nature of the procedures involved in infertility treatment result in marital difficulties (Cook *et al.*, 1989). For couples whose relationship difficulties persist, problems are likely to develop for the child (Cox *et al.*, 1989; Howes and Markman, 1989).

Nevertheless, there is a growing body of empirical evidence to show that the course of a child's socio-emotional development is closely related to the quality of the child's attachment relationships with its parents (Rutter, 1995) and, from the perspective of attachment theory (Bowlby, 1969, 1973; Main *et al.*, 1985), it is parental responsiveness and not biological relatedness that is considered to be important for the development of secure attachment relationships. As the majority of children conceived by gamete donation are not told about their origins, any difficulties they may experience cannot be attributed to the overt knowledge that they are genetically unrelated to one or both parents. Instead, conception by gamete donation would only be expected to have negative consequences to the extent that the lack of genetic ties interferes with the quality of the relationship between the parents and the child.

In view of the conflicting opinions regarding the predicted outcomes for children conceived by assisted reproduction, and the absence of empirical data on the actual consequences for these families, the aim of the present study was to examine the quality of parent-child relationships and the social and emotional development of children in families created as a result of the two most common assisted reproduction methods, IVF and DI, and to compare these families with two control groups; a group of families with a naturally conceived child and a group of adoptive families. Families with a child conceived by egg donation were not included, as only a small number of very young children had been born as a result of this technique when the investigation began.

Growing attention has been paid in recent years to the social context of families and to the processes through which social environments affect family relationships. It is important to remember, therefore, that negative attitudes may exist towards the reproductive technologies, with procedures such as IVF and DI sometimes considered to be immoral or unnatural. As a result, families with a child conceived by assisted reproduction may experience overt prejudice not only from the wider community but from relatives and friends as well. The inclusion in the present investigation of countries from northern and southern Europe allows an examination of culturally determined attitudes towards assisted reproduction, as well as an examination of the influence of prevailing attitudes on the functioning of families which have resulted from these new reproductive techniques. For example, it might be expected that DI parents in the predominantly Protestant northern European countries would be more likely to tell their children about their genetic origins than DI parents in the predominantly

Catholic countries of the south, and that children who had been told would be better psychologically adjusted than those who had not. A more detailed analysis of data from the UK has been presented elsewhere (Cook *et al.*, 1995; Golombok *et al.*, 1995).

## Materials and methods

### Subjects

Two northern European countries (the UK and The Netherlands) and two southern European countries (Spain and Italy) took part in the study. As shown in Table I, 116 families with a child conceived by IVF and 111 families with a child conceived by DI were recruited through infertility clinics. In each country, total populations of IVF and DI families with a child aged 4–8 years from each participating clinic were asked to take part in the research. The response rate for IVF and DI families respectively was 76% and 47%. The control group of 115 adoptive families was recruited through adoption agencies by approaching families with a 4–8 year old child who had been adopted in the first year of life. The response rate was 72%. The 120 families with a naturally conceived child were recruited through the records of maternity wards and through schools, and matched as closely as possible to the other family types with respect to the age and sex of the child, the age of the mother, social class and family size. The response rate for families with a naturally conceived child was 65%. Children with major congenital abnormalities, children who had experienced obstetric or perinatal complications that were thought likely to involve brain damage or risk of persisting disability, and children of a multiple birth were not included in the study.

In each country, there were similar proportions of boys and girls in each group of families. A two-way analysis of variance (ANOVA), with group at four levels (IVF, DI, adoptive and naturally conceived) and country at four levels (UK, Spain, Italy and The Netherlands), was conducted for each of the following dependent variables: age of the target child, age of the mother, social class and number of children in the family. For the age of the target child, a significant main effect was found for group [ $F(3,446) = 10.84, P < 0.0001$ ], and the interaction was also significant [ $F(9,446) = 3.81; P < 0.001$ ]. Inspection of the means showed that the adopted children were the oldest, aged 6 years 4 months on average, and the IVF children the youngest, with a mean age of 5 years 5 months. The interaction effect reflected older adoptive and younger IVF children in The Netherlands. For the age of the mother, a significant main effect for group [ $F(3,446) = 9.48; P < 0.0001$ ], and a significant interaction [ $F(9,446) = 2.49, P < 0.01$ ], were also found. The adoptive mothers were the oldest (mean age 40 years) and the DI mothers were the youngest (mean age 37 years). The significant interaction resulted from younger mothers in the naturally conceived group in Spain. With respect to social class as measured by the father's occupation (1, professional/managerial occupations; 2, skilled non-manual occupations; 3, skilled manual occupations; 4, partly skilled/unskilled occupations) there was a significant difference between groups [ $F(3,446) = 11.54; P < 0.0001$ ], with the naturally conceived families receiving the highest ratings and the DI families the lowest, and between countries [ $F(3,446) = 12.97, P < 0.0001$ ], reflecting the higher social class of the Italian sample and lower social class of the UK sample. Significant differences were also identified for family size. The main effect for group [ $F(3,446) = 9.14; P < 0.0001$ ] showed that there were more children in naturally conceived families, and the main effect for country [ $F(3,446) = 6.78, P < 0.001$ ] showed that there were fewer children in Spanish and Italian families than in

**Table 1.** Number of boys and girls in the groups that took part in the study from each country

Group	United Kingdom			Spain			Italy			The Netherlands		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
In-vitro fertilization	28	13	41	16	10	26	8	11	19	17	13	30
Donor insemination	25	20	45	14	9	23	9	5	14	19	10	29
Adoption	29	26	55	6	4	10	11	14	25	12	13	25
Naturally conceived	23	20	43	18	8	26	11	14	25	11	15	26

families in the UK and The Netherlands. The interaction between group and country [ $F(9,446) = 2.23$ ;  $P < 0.05$ ] resulted from smaller IVF and DI families and larger naturally conceived families in Italy. Although complete matching was not achieved, the group and country differences that were identified for the age of the child and the mother, and for social class and family size, were not large in real terms. For example, the difference between the mean age of the oldest group of children (adopted) and of the youngest group (IVF) was <1 year. Nevertheless, as significant group and country differences were found, these demographic variables were entered into all of the analyses as covariates.

All of the parents were contacted in the first instance by a letter from the clinic or adoption agency. Those who agreed to participate were visited twice at home by a researcher trained in the study techniques. At the initial visit, data were collected from the mother by interview, and from both parents by questionnaire. Some of the mothers and most of the fathers returned their questionnaires by post, and completed questionnaires were obtained from 88% of mothers and 78% of fathers. In addition, 68% of the children's teachers also completed questionnaires. In order to maintain confidentiality and minimize bias, the teachers were not informed about the precise nature of the research. Instead, they were told that the child was participating in a general study of child development. On the second visit, data were collected from the child using a battery of standardized tests. Assessments were carried out with 88% of the children.

### Measures

#### Parents' marital and psychiatric state

Both the mother and the father completed the Golombok Rust Inventory of Marital State (Rust *et al.*, 1988, 1990), a questionnaire to measure of the quality of the marital relationship. The Trait Anxiety Inventory (Spielberger, 1983) and the Beck Depression Inventory (Beck and Steer, 1987) were also completed by both parents to assess anxiety and depression respectively. All three of these instruments have been shown to have good reliability and to discriminate well between clinical and non-clinical groups.

#### Quality of parenting

The quality of parenting was assessed by standardized interview with the mother using an adaptation of the technique developed by Quinton and Rutter (1988). 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 (concurrent validity,  $r = 0.63$ ). The interview, which was tape-recorded, lasted for ~1.5 h and was conducted with the mother alone. Detailed accounts were obtained of the child's behaviour and the parents' response to it. The mothers were asked to describe the child's daily routine, focusing on waking, meal-times, leaving for school/day care, returning home, mother's and father's play activities with the child, and bed-time. Information was obtained on the parents' handling of any problems associated with these areas, and particular attention

was paid to parent-child interactions relating to issues of control and the child's fears and anxieties.

Four overall ratings of the quality of parenting were made, taking into account information obtained from the entire interview: (i) warmth was rated on a 6-point scale ranging from '0' (none) to '5' (high). This rating of the mother's warmth toward the child was based on the mother's tone of voice and facial expression 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; (ii) emotional involvement was rated on a 5-point scale from '0' (little or none) to '4' (extreme). This rating took account of the extent to which the family day was organized around the child, the extent to which the needs or interests of the child were placed before those of other family members, the extent to which the mother was over-concerned, over-protective or inhibited the child from age-appropriate independent activities, the extent to which the mother was willing to leave the child with other caretakers, and the extent to which the mother had interests or engaged in activities apart from those relating to the child; (iii) mother-child interaction and (iv) father-child interaction were each rated on a 5-point scale ranging from '0' (very poor) to '4' (very good). These ratings of the quality of interaction between the parent and the child were based on mothers' reports of the extent to which the parent and the child enjoyed each other's company, wanted to be with each other, spent time together, enjoyed joint play activities and showed physical affection to one another. While the validity of mothers' reports of father-child interaction has not been established using observational ratings of father-child relationships, a correlation of 0.4 was found for the UK data between mothers' reports of father-child interaction and fathers' reports of the child being difficult to manage as measured by the difficult child subscale of the Parenting Stress Index (Short Form, PSI/SF; Abidin, 1990). This gives some evidence for the validity of the mothers' reports of father-child interaction, particularly in view of the differences between these two constructs. A total of 27 randomly selected UK interviews were coded by a second interviewer who was 'blind' to family type in order to calculate inter-rater reliabilities. Pearson product-moment coefficients for warmth, emotional involvement, mother-child interaction and father-child interaction were found to be 0.75, 0.63, 0.72 and 0.69 respectively.

The short form of the Parenting Stress Index was administered to both parents to provide a standardized assessment of stress associated with parenting for mothers and fathers. This measure produces a total score of the overall level of parenting stress an individual is experiencing. Test-retest reliability for this instrument has been shown to be high over a 6 month period. Concurrent and predictive validity has been demonstrated for the full-length questionnaire, and results from the short form have been reported to be correlated very highly with those from the full-length version.

Interview data were also used to make ratings of the father's contribution to parenting with respect to helping the mother with

child-rearing [rated on a 5-point scale from '0' (no help) to '4' (takes a major parenting load)] and disciplining the child [rated on a 7-point scale from '1' (exacerbates issues) to '7' (takes the load)], and of grandparents' feelings toward the child [rated on a 4-point scale from '1' (happy) to '4' (rejecting)], and the mother's child-rearing support from friends [rated on a 3-point scale from '1' (discuss all problems) to '3' (cannot discuss problems)].

In addition, mothers of children conceived by DI were interviewed about their openness about the circumstances of their child's conception. Systematic information was obtained from these mothers regarding whether or not they had told their child about his or her origins, and whether or not they had told members of their family or friends

#### *Children's emotions, behaviour and relationships*

The presence of behavioural or emotional problems in the children was assessed using the Rutter 'A' scale which was completed by the child's mother, and the Rutter 'B' scale, which was completed by the child's teacher. An overall score of psychiatric state was obtained from each scale. Both questionnaires have been shown to have good inter-rater and test-retest reliability, and to discriminate well between children with and without psychiatric disorder (Rutter *et al.*, 1970, 1975; Goodman, 1994).

A modified version of the Family Relations Test (Bene and Anthony, 1985) was administered to the children to obtain a standardized assessment of the children's feelings about their parents. The child chose an imaginary mother and father from a set of cut-out figures and these were placed in front of the child together with a neutral figure, 'Mr Nobody'. The child was then given a set of cards with an emotional message printed on each (e.g. [child] thinks you are nice) and was asked to give each card to the person for whom they felt it was most appropriate. The test was scored to produce a measure of positive feelings and a measure of negative feelings from the child to each parent, and a measure of positive feelings and a measure of negative feelings from each parent to the child. Acceptable test-retest reliability has been demonstrated, and validation studies have shown the test to discriminate between clinical and non-clinical groups of children (Kaufman *et al.*, 1972, Bean, 1976; Philip and Orr, 1978). Children's responses to the test have also been shown to reflect independent assessments of both mothers' and fathers' feelings towards them (Bene and Anthony, 1985). Significantly more children whose mothers had been categorized as 'accepting' (according to data obtained from interviews with the mother by a rater who was 'blind' to the child's test responses) attributed predominantly positive feelings to their mothers than children whose mothers had been categorized as 'neglecting'. Similarly, a small group of children whose fathers had been described by social workers or by the mother as hostile, punitive or disliking of them was found to attribute predominantly negative feelings to their fathers when administered the test. In the present investigation, the scores were combined to give two global ratings for each child: (i) positive feelings between child and mother [(positive feelings to mother + positive feelings from mother) - (negative feelings to mother + negative feelings from mother)], and (ii) positive feelings between child and father [(positive feelings to father + positive feelings from father) - (negative feelings to father + negative feelings from father)]. The higher the score, the more positive the feelings.

Each child was also administered the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (Harter and Pike, 1984). This is a measure of children's perceptions of their cognitive and physical competencies, and of their perceptions of acceptance by their mother and by peers, all of which have been shown to be associated with the development of self-esteem in later childhood. A score is obtained for each of the following subscales: (i) cognitive competence, (ii) physical competence, (iii) maternal

acceptance and (iv) peer acceptance. The higher the score, the more positive the child's feelings of competence and social acceptance. Satisfactory internal consistency has been demonstrated, with coefficient  $\alpha$  values ranging from 0.85 to 0.89 for the different age groups of children studied. The scale has been shown to discriminate between groups of children in predicted ways, for example between peer acceptance and length of time at a school, and between perceived cognitive competence and academic achievement at school, indicating that it is a valid measure.

## Results

Group comparisons were conducted using one-way analyses of covariance with age of child, age of mother, social class and family size as covariates. The following contrast analyses were then carried out to address specific questions: (i) assisted reproduction versus naturally conceived (AR versus NC). This contrast examined whether families with a child conceived by assisted reproduction (IVF and DI) are different from families with a naturally conceived child; (ii) assisted reproduction versus adoptive (AR versus A). This contrast examined whether families with a child conceived by assisted reproduction (IVF and DI) are different from families with an adopted child; (iii) IVF versus DI. This contrast determined whether IVF and DI families differ from each other and thus examined the consequences of one parent being genetically unrelated to the child. For each variable, a two-way ANOVA was also carried out, with group and country as factors, to identify significant group  $\times$  country interactions.

### *Parents' marital and psychiatric states*

Almost all of the parents were married (four IVF couples and eight couples with a naturally conceived child were cohabiting), and only 15 sets of parents (3.3%) had separated or divorced (seven IVF, two DI, one adoptive and five natural conception). With respect to the quality of the parents' marital relationship for those couples who had not separated or divorced, group differences in GRIMS scores were found for mothers [ $F(3,387) = 6.02$ ;  $P < 0.001$ ], indicating a lower incidence of marital difficulties among adoptive mothers [user contrast (AR versus A),  $P < 0.001$ ], but not for fathers. No significant group  $\times$  country interactions were identified for GRIMS scores.

A significant difference in anxiety level as assessed by the Trait Anxiety Inventory was found for mothers [ $F(3,400) = 3.43$ ;  $P < 0.05$ ] but not for fathers, reflecting lower anxiety levels among mothers with an assisted reproduction child than among mothers with a naturally conceived child [user contrast (AR versus NC);  $P < 0.01$ ], as well as a significant group  $\times$  country interaction for fathers [ $F(3,342) = 2.29$ ;  $P < 0.05$ ], largely due to higher anxiety levels among natural conception fathers in all countries other than The Netherlands. Similarly, there was a group difference in depression as assessed by the Beck Depression Inventory for mothers [ $F(3,398) = 2.85$ ;  $P < 0.05$ ] but not for fathers, showing lower levels of depression among assisted reproduction mothers than among mothers with a naturally conceived child [user contrast (AR versus NC),  $P < 0.05$ ]. The group  $\times$  country interaction was not significant for either mothers or fathers.

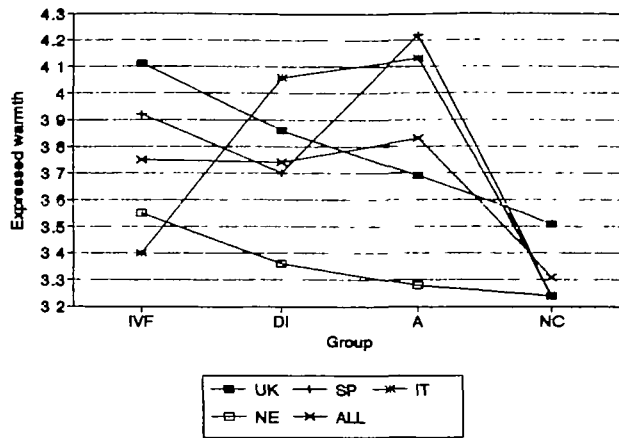


Figure 1. Mother's warmth to child

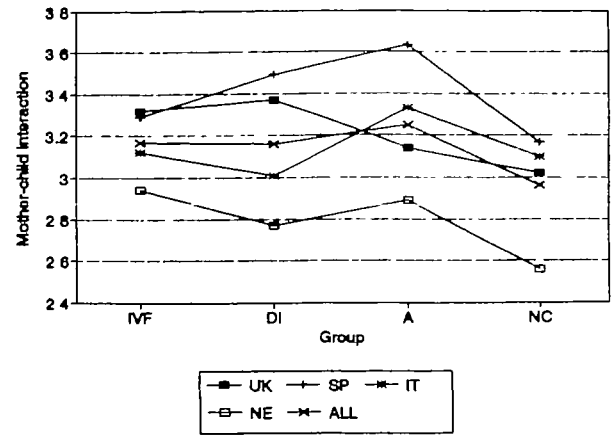


Figure 3. Mother-child interaction

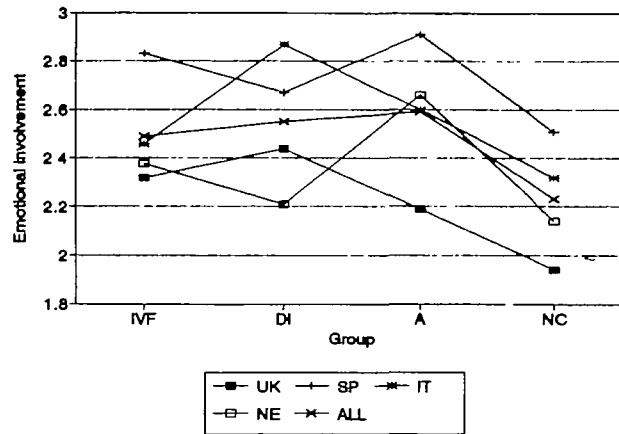


Figure 2. Mother's emotional involvement.

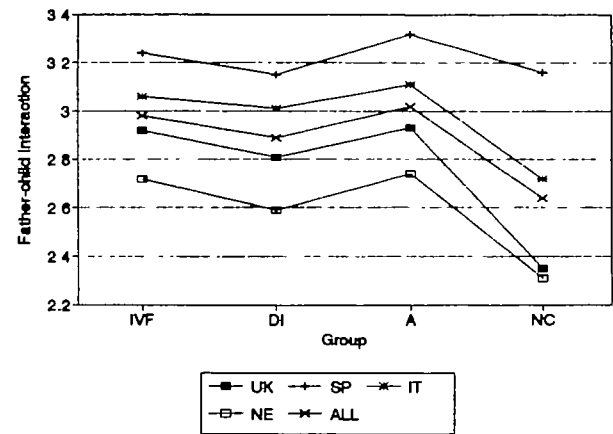


Figure 4. Father-child interaction.

**Quality of parenting**

A significant difference was found between groups for warmth [ $F(3,453) = 4.58; P < 0.01$ ]. Contrast analysis showed that mothers with a child conceived by assisted reproduction expressed significantly greater warmth toward their child than mothers with a naturally conceived child [user contrast (AR versus NC);  $P < 0.001$ ]. The assisted reproduction mothers did not differ from adoptive mothers for this variable, and there was no significant difference in expressed warmth to the child according to type of assisted reproduction (Figure 1).

The groups also differed in the level of mothers' emotional involvement with the child [ $F(3,453) = 4.93; P < 0.01$ ]. Mothers of children conceived by assisted reproduction showed greater emotional involvement than mothers with a naturally conceived child [user contrast (AR versus NC);  $P < 0.001$ ], with no difference between IVF and DI mothers. The level of emotional involvement shown by mothers of assisted reproduction children was similar to that of adoptive mothers (Figure 2).

A group difference was found for father-child interaction [ $F(3,443) = 3.96; P < 0.01$ ], but not for mother-child interaction. Fathers of children conceived by assisted reproduction showed greater interaction with their children than fathers of naturally conceived children [user contrast (AR versus NC);  $P < 0.01$ ]. There was no difference in the quality of interaction between IVF and DI fathers, and adoptive fathers did not

differ significantly from the fathers of children conceived by assisted reproduction (Figure 4). Although an overall group difference was not found for mother-child interaction, the contrast between assisted reproduction mothers and natural conception mothers did reach significance [user contrast (AR versus NC);  $P < 0.01$ ], indicating greater interaction between mothers and their children in assisted reproduction families (Figure 3).

When these analyses were repeated using a two-way ANOVA, with group and country as factors, no significant group $\times$ country interactions were found for any of the parenting variables derived from the interview. This showed that the pattern of group differences, i.e. greater warmth, emotional involvement and interaction shown by parents of assisted reproduction children, was similar in all of the countries studied.

Stress associated with parenting as assessed by total Parenting Stress Index (Short Form) scores was found to differ between groups for mothers [ $F(3,401) = 3.49; P < 0.05$ ] but not for fathers, with assisted reproduction mothers reporting significantly lower levels of stress than natural conception mothers [user contrast (AR versus NC);  $P < 0.05$ ]. A significant group $\times$ country interaction was found for fathers [ $F(9,343) = 1.92; P < 0.05$ ], with less parenting stress reported by DI fathers in Spain and more parenting stress reported by adoptive fathers in Italy.

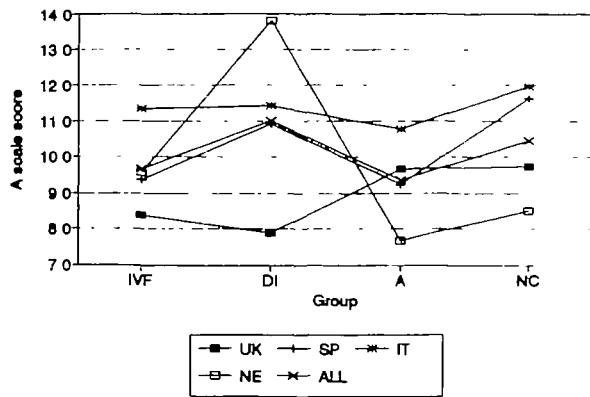


Figure 5. Child's emotional/behavioural problems assessed by mother (A scale).

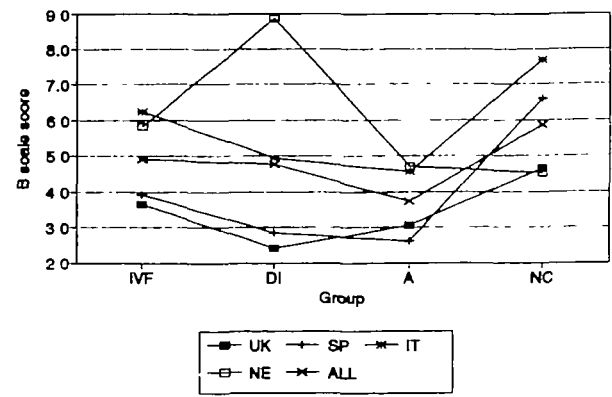


Figure 6. Child's emotional/behavioural problems assessed by teacher (B scale)

A significant group difference was found for father's contribution to parenting [ $F(3,438) = 3.90, P < 0.01$ ] such that assisted reproduction fathers were more involved in caregiving than fathers of naturally conceived children [user contrast (AR versus NC);  $P < 0.01$ ]. However, a significant group $\times$ country interaction was also identified [ $F(9,426) = 3.79, P < 0.001$ ] that showed this effect to be largely accounted for by the fathers from The Netherlands. The groups also differed significantly with respect to the father's help with controlling and disciplining the child [ $F(3,438) = 3.91, P < 0.01$ ]. Contrast analyses indicated that fathers of adopted children contributed more to child discipline than the assisted reproduction fathers [user contrast (AR versus A);  $P < 0.05$ ]. The group $\times$ country interaction was not significant. No group difference was found for mothers' childrearing support from friends.

With respect to the mothers' reports of the grandparents' feelings towards the child, no group differences, or group $\times$ country interactions, were identified for either maternal grandmothers and grandfathers, or paternal grandmothers and grandfathers.

**Children's emotions, behaviour and relationships**

There was no difference between groups for 'A' scale scores (Figure 5), showing that the children did not differ with respect to the presence of emotional or behavioural problems. However, the group $\times$ country interaction was significant [ $F(9,400) = 3.23; P < 0.001$ ] showing higher 'A' scale scores for DI children in The Netherlands. No significant difference between groups was identified for 'B' scale scores, indicating that teachers' ratings of the children's emotional and behavioural difficulties did not differ according to family type, but there was a significant group $\times$ country interaction [ $F(9,292) = 2.16, P < 0.05$ ], again reflecting higher scores among DI children in The Netherlands (Figure 6).

With respect to the Family Relations Test, no significant difference between groups was found for either the child's feelings towards the mother or the child's feelings towards the father, and neither were the group $\times$ country interactions significant for these variables. Similarly, no significant group differences and no significant group $\times$ country interactions were

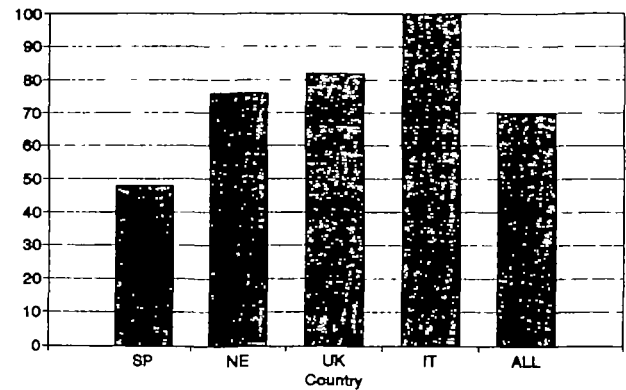


Figure 7. Telling children born as a result of donor insemination of their origins: percentage of parents who have decided never to tell

identified for any of the subscales of the Pictorial Scale of Perceived Competence and Social Acceptance.

**Telling children about DI**

Not one of the parents with a child conceived by DI in any of the four countries studied had told their child about his or her method of conception. When mothers were asked whether they planned to tell their child in the future, most (75%) reported that they had definitely decided not to tell, 13% were undecided, and only 12% planned to tell their child. A significant difference between countries was found with respect to attitude towards telling the child ( $\chi^2 = 20.56; P < 0.01$ ). The Italian parents were most against telling, with 100% having decided never to tell, followed by the British and Dutch parents, of whom 82 and 76% respectively had decided never to tell. In Spain, the parents seemed more open to considering the idea of telling, with only 48% having definitely decided never to tell (Figure 7).

Although the majority of DI parents had decided not to tell their child, more than half (56%) had told a friend or family member. A significant difference between countries was not identified for this variable. The mothers of DI children were asked about which members of the family had been told. Although the majority of parents had not told the child's grandparents, more than one-third (39%) of the maternal grandparents had been told compared with less than one-quarter (23%) of paternal grandparents. There was no significant

ant difference between countries with respect to telling either maternal or paternal grandparents. In addition, there was no significant difference between countries in telling friends. Overall, 71% of the sample had not told any friends, 28% had told a very few friends, and only 1% had told many friends.

## Discussion

The findings of the present study show that mothers of children conceived by assisted reproduction express greater warmth to their child, are more emotionally involved with their child, interact more with their child and report less stress associated with parenting than a comparison group of mothers who conceived their child naturally. Similarly, assisted reproduction fathers were found to interact more with their child and to contribute more to parenting (particularly in The Netherlands) than fathers with a naturally conceived child. Whether or not donor spermatozoa were used in order to conceive the child seemed to make little difference to the quality of parenting in assisted reproduction families as DI parents did not differ from IVF parents for any of these variables. Further evidence that the lack of a genetic link between one or both parents and the child does not have negative consequences for parent-child relationships comes from the finding that the adoptive families were similar to the assisted reproduction families with respect to the parenting measures. The only exception was that adoptive fathers contributed more to child discipline than assisted reproduction fathers. Where differences were found in relation to the emotional well-being of parents, these differences reflected better psychological adjustment among mothers of assisted reproduction children, and greater marital satisfaction among adoptive mothers. With respect to the children themselves, no overall group differences were found for either the presence of psychological disorder, as assessed by the 'A' and 'B' scales, for children's perceptions of the quality of family relationships as measured by the Family Relations Test, or for children's developing self-esteem as measured by the Scale of Perceived Competence and Social Acceptance. These findings confirm the results of earlier studies of families with an IVF child (e.g. Raoul Duval *et al.*, 1994; Colpin *et al.*, 1995).

For most of the measures in the investigation, significant group × country interactions were not identified, showing that the findings relating to the quality of parenting and the socio-emotional development of the children were similar in each of the four countries studied. The few exceptions were almost entirely associated with the psychological state of the parents rather than with the quality of family relationships. However, DI children in The Netherlands showed more evidence of emotional and behavioural problems than DI children in the other countries as rated both by mothers and by teachers. Although the reason for this remains unclear, it is conceivable that these differences were associated with the lower social class of the DI families compared with the other groups of families in The Netherlands.

Contrary to expectations, there was no evidence that attitudes towards assisted reproduction differed between northern and southern Europe. It is striking that not one of the 111 DI parents who participated in the research had told their child

about their genetic origins. This suggests that DI is not generally perceived as an acceptable route to parenthood in any of the countries studied. Whereas keeping the method of conception secret from a child aged 4–8 years does not appear to have a negative impact on family relationships or on the psychological development of the child, it remains to be seen whether secrecy leads to difficulties as the children grow up. It could be expected that problems are most likely to arise in adolescence, the time at which issues of identity, and difficulties in relationships with parents, become more salient. Certainly, it is the case that adopted children show a greater increase in behavioural and emotional problems at adolescence than non-adopted children (Maughan and Pickles, 1990), alongside an increased interest in their biological parents (Hoopes, 1990). It is important to point out that the response rate for DI families in this study was only 47%, and that those families that were experiencing problems may have been less likely to participate in the research. It was our impression, however, that the low response rate largely reflected the parents' concern that by taking part in the research they might jeopardize secrecy about their child's conception.

As a result of the complex ethical and legal issues raised by assisted reproduction, regulatory bodies have been established in some European countries to monitor and control the practice of these procedures. There has been widespread concern about the psychological consequences for children of being conceived by assisted procreation, particularly when gamete donation has been used in the child's conception. Whether or not children should be told about their method of conception, whether information about the donor should be made available to them and, if so, whether the identity of the donor should be disclosed, are questions that have been considered by policy makers in many European countries. In the UK, clinics licensed to conduct assisted reproduction are required to consider the welfare of the child in all decisions to offer treatment to potential parents, and it has now become law that non-identifying information about the donor may be given at age 18 years. Moreover, there is provision for a future change in legislation to enable adults conceived by gamete donation to make contact with their genetic parent. In The Netherlands, the issue of whether children conceived by DI should be told about their genetic origins is currently under debate, and legislation on the practice of assisted procreation is currently in preparation. In Spain, legislation exists to control some aspects of assisted procreation. Although there are no such laws in Italy, a system of self-imposed regulation has been instituted by practitioners in the field. Moreover, in a number of European countries it has become law, or will soon become law, that where assisted procreation using donated gametes is being considered, couples should receive counselling to explore the implications for the future family of having a child that is genetically unrelated to one or both parents. For informed decisions to be made by policy-makers, and for effective counselling to be provided to prospective parents, it is crucial that systematic data are obtained on the actual consequences for children, and their parents, of assisted reproduction procedures.



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