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Centre for Family Research**

**Publications on Surrogacy
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Surrogacy families 10 years on: relationship with the surrogate, decisions over disclosure and children's understanding of their surrogacy origins

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BACKGROUND: This study aimed to prospectively examine families created using surrogacy over a 10-year period in the UK with respect to intending parents' and children's relationship with the surrogate mother, parents' decisions over disclosure and children's understanding of the nature of their conception.

METHODS: Semi-structured interviews were administered by trained researchers to intending mothers, intending fathers and children on four occasions over a 10-year period. Forty-two families (19 with a genetic surrogate mother) participated when the child was 1-year old and by age 10 years, 33 families remained in the study. Data were collected on the frequency of contact with the surrogate mother, relationship with the surrogate, disclosure of surrogacy to the child and the child's understanding of their surrogacy birth.

RESULTS: Frequency of contact between surrogacy families and their surrogate mother decreased over time, particularly for families whose surrogate was a previously unknown genetic carrier ($P < 0.001$) (i.e. where they had met through a third party and the surrogate mother's egg was used to conceive the child). Most families reported harmonious relationships with their surrogate mother. At age 10 years, 19 (90%) children who had been informed of the nature of their conception had a good understanding of this and 13 of the 14 children who were in contact with their surrogate reported that they liked her.

CONCLUSIONS: Surrogacy families maintained good relationships with the surrogate mother over time. Children felt positive about their surrogate mother and their surrogacy birth. The sample size of this study was small and further, larger investigations are needed before firm conclusions can be drawn.

Key words: genetic surrogacy / gestational surrogacy / disclosure / surrogate

Introduction

Recent years have seen a growth in the use of surrogacy to help couples start a family. Despite this increase, surprisingly few studies have attempted to examine the outcomes for families created in this way. Surrogacy is permitted in the UK but illegal in many other European countries including France, Germany, Italy and Spain. Some countries allow surrogacy but have particular regulations on its use. For example, in Israel each case has to be authorized and supervised by a public committee, only married infertile couples are able to use surrogacy and the surrogate mother must be single or divorced (Benshushan and Schenker, 1997). India and

some states in the USA allow commercial surrogacy (Tieu, 2009; Crockin and Jones, 2010) where the surrogate mother is paid by the intending parents (IPs). The USA has commercial surrogacy organizations to facilitate contact between couples and surrogates and legal contracts are drawn up between the parties involved (Braverman *et al.*, 2012). In the UK, commercial surrogacy is prohibited and only reasonable expenses may be paid to the surrogate mother by the commissioning couple (Surrogacy Arrangements Act UK, 1985; Brazier *et al.*, 1998). It is also illegal for individuals to advertise that they are in need of, or are willing to act as, a surrogate mother and surrogacy contracts are not legally binding (Human Fertilization and Embryology Authority HFEA Act, 1990). Thus, UK

legislation on surrogacy can be viewed as being on a middle path internationally (Gamble, 2009).

There are two types of surrogacy: genetic and gestational. Genetic surrogacy, also known as traditional, partial or straight surrogacy, is where the surrogate mother is also the genetic mother of the child. Conception usually occurs by artificial insemination using the intending father's (IF) sperm and can be carried out without attending a clinic. With gestational surrogacy, also known as full or host surrogacy, conception takes place at a clinic using IVF. The transferred embryo may be created using either the intending couple's gametes or the IF's sperm and a donor egg. Surrogate mothers may have either been previously known or unknown to the IPs. Previously known surrogate mothers may be family members or friends, and previously unknown surrogate mothers include those who met the IPs through a third party (either a surrogacy organization or a mutual friend). This manuscript will refer to the parents of children born using surrogacy as IPs.

The relationship between the surrogate mother and the resultant child has been an issue of great interest, particularly in cases where the surrogate mother is also the genetic mother of the child, and where the surrogate mother was previously known to the commissioning couple (Braverman *et al.*, 2012). British surrogacy arrangements enable a strong relationship to develop between the surrogate mother and the IPs during the surrogacy pregnancy (van den Akker, 2007). This is partly because of the absence of commercial surrogacy agencies, which means that IPs and their surrogate are in direct contact (van den Akker, 2007). The relationship is typically maintained between the intending mother (IM) and surrogate mother rather than the IF (Ragoné, 1994; MacCallum *et al.*, 2003; Teman, 2010). A positive relationship is viewed by some as important for encouraging the surrogate mother to take her moral obligations to the unborn child seriously (van Zyl and van Niekerk, 2000) and to enable successful surrogacy experiences for those involved (Teman, 2010). Some surrogate mothers maintain contact with the IPs as the child grows up (MacCallum *et al.*, 2003; Golombok *et al.*, 2004, 2006a,b). However, very little is known about the nature of this relationship, what effect it has on the individuals concerned, and whether it continues as the child becomes old enough to understand the circumstances of their conception and birth. Whereas contact with the surrogate mother is thought to give the child a better understanding of their origins, it is also possible that this may undermine the relationship between the IM and the child.

In 2000, Golombok and colleagues initiated a longitudinal study of 42 families created by surrogacy. These families have been followed up to age 10 and have been found to be functioning well with respect to the quality of the parent-child relationships and psychological adjustment of the child (Golombok *et al.*, 2004, 2006a,b, 2011, submitted for publication).

This paper focuses on the parents' and child's relationship with the surrogate mother from age 1 to age 10. It also examines whether parents disclose the surrogacy to their child by age 10 and, for the first time, presents accounts from the children themselves about their understanding of, and feelings about, their surrogacy birth.

Materials and Methods

Families with a child born through surrogacy were recruited through the General Register Office of the United Kingdom Office for National

Statistics (ONS), which covers England and Wales. In the UK, details of all families created through a surrogacy arrangement are recorded when the IPs become the legal parents of the child. Legal parentage is granted to the IPs by a court of law and this usually occurs within the child's first year of life. During the initial phase of the study, all parents of children aged ~1 year who obtained legal parenthood between March 2000 and March 2002 were asked to participate in the study. A total of 58 families were contacted. Thirty families agreed to take part, representing 60% of those who responded to the request by ONS, with 20 (40%) declining to take part. A further eight families did not respond. As IPs who had not yet become their child's legal parents would not have been identified by the ONS, all parents on the register of the surrogacy agency Childlessness Overcome Through Surrogacy (COTS) with a child in the same age range were also asked to participate. Of the 34 families contacted, 26 agreed to take part, representing a response rate of 76%. As 14 families responded to invitations from both the ONS and COTS, the final sample size was 42.

The sample consisted of families who had used genetic surrogacy, where the surrogate mother had used her own egg, and gestational surrogacy, where the IPs embryo was implanted in the surrogate mother. Sample sizes at each phase were as follows: Age 1 year, $N = 42$ (26 genetic, 16 gestational); Age 3 years, $N = 34$ (21 genetic, 13 gestational); Age 7 years, $N = 33$ (21 genetic, 12 gestational); Age 10 years, $N = 33$ (21 genetic, 12 gestational). Semi-structured interviews were carried out with IMs during each visit, with IFs when the child was aged 1, 7 and 10 years, and with the children themselves at ages 7 and 10 years. A section of the interview collected information on (i) the frequency of contact between IPs (and child) and the surrogate mother in the past year (measured on a four-point scale ranging from 'not at all', rated 0, to 'more than once a week', rated 4); (ii) the quality of the relationship between IPs and the surrogate mother (coded on a three-point scale as either 'harmonious', 'some dissatisfaction or coldness' or 'major conflict or hostility'). 'Harmonious' was coded when parents described a warm or friendly relationship with co-operation on both sides; 'some dissatisfaction or coldness' was coded when minor disagreements had arisen between parents and the surrogate mother or when little communication or warmth was apparent and a coding of 'major conflict or hostility' was made when arguments or a breakdown in communication was reported); (iii) whether or not IPs had told their child about their surrogacy birth (coded as either 'told', 'plans to tell', 'uncertain' or 'plans not to tell').

At the age 7-year and age 10-year visit, data were also collected from the children about their understanding of surrogacy and their feelings towards the surrogate. The questions asked included 'Your mum/dad told me that a 'woman' helped them to make you. Can you tell me more about that? Do you see (surrogate)? Do you wish you could see her more often? Do you wish you could see her less often? Ratings were made on (i) the child's understanding of their surrogacy birth (coded as either 'no understanding', 'some understanding' or 'clear understanding'). A rating of 'no understanding' was made when the child was unable to demonstrate any understanding of their surrogacy birth. A rating of 'some understanding' was made when the child mentioned terms and phrases that helped explain their conception, e.g. 'tummy not working'. A rating of 'clear understanding' was made if the child showed an accurate awareness of their conception); (ii) whether they were happy with the level of contact with their surrogate mother (coded as either 'wish to see more', 'just right' or 'wish to see less' and (iii) their feelings towards the surrogate mother (coded as 'likes', 'ambivalent' or 'does not like'). At age 10, data were collected on the child's feelings about their birth (coded as either 'positive', 'neutral' or 'negative'). To assess inter-rater reliability, a third of the interviews were coded by a second interviewer. Percentage agreement ranged from 88 to 100% for these variables.

Where possible data were analysed separately for the different types of surrogacy used, i.e. genetic versus gestational, and previously known (i.e. a family member or friend) versus previously unknown (i.e. met through a mutual friend or surrogacy agency) surrogate. Ethical approval for the earlier phases of this study (ages 1 and 3 years) was obtained from the City University London Ethics Committee and ethical approval for the later phases (ages 7 and 10 years) was obtained from the University of Cambridge Psychology Research Ethics Committee. Written consent for the child's participation was obtained from IPs and verbal assent was obtained from the child. IPs were shown the children's questions relating to their conception and were told that they could change the terminology to match that used when discussing surrogacy with their child.

Statistical analysis

Data were analysed using the software package PASW statistics (version 18). Friedman Tests, a non-parametric test for repeated data, were carried out to examine changes over time. Where test results were significant, post hoc analyses were conducted using Wilcoxon Signed-Rank Tests to identify where the difference occurred. A $P < 0.05$ was considered statistically significant.

Results

Not all families remained in the study over time.

Frequency of contact

A Friedman Test was carried out to examine whether the frequency of contact with the surrogate mother changed over time. The majority of families were in contact with their surrogate (38/42 at age 1, 27/34 at age 3, 19/33 at age 7 and 20/33 at age 10). There was a statistically significant difference in the frequency of contact with the surrogate mother over time for IMs ($\chi^2(3) = 30.12, P < 0.001$), IFs ($\chi^2(3) = 28.50, P < 0.001$) and children ($\chi^2(3) = 28.41, P < 0.001$), with the median values indicating less frequent contact by age 10. To

examine if the frequency of contact differed by surrogacy type (genetic-known, genetic-unknown, gestational-known and gestational-unknown), the analyses were repeated for each subgroup (Table 1).

For IMs, there was a statistically significant decline in the frequency of contact with genetic-unknown surrogate mothers ($\chi^2(3) = 18.39, P < 0.001$). Post hoc analyses with Wilcoxon Signed-Rank Tests showed that there was a significant decline between age 1 year and age 7 years ($Z = -2.546, P < 0.05$) and age 1 year and age 10 years ($Z = -2.428, P < 0.05$) showing less frequent contact at the later ages.

For IFs, there was a statistically significant difference in the frequency of contact with genetic-unknown surrogate mothers ($\chi^2(3) = 30.80, P < 0.001$). Post hoc analyses showed a significant decline between age 1 year and age 3 years ($Z = -2.84, P < 0.01$), age 1 year and age 7 years ($Z = -3.56, P < 0.001$) and age 1 year and age 10 years ($Z = -3.49, P < 0.001$), indicating that contact declined most rapidly between IFs and genetic-unknown surrogate mothers after the first year of the child's life.

For children, a statistically significant difference was found in the frequency of contact with genetic-unknown surrogate mothers ($\chi^2(3) = 14.10, P < 0.01$) and genetic-known surrogate mothers ($\chi^2(3) = 10.36, P < 0.05$). Post hoc tests revealed a significant decline in children's contact with genetic-unknown surrogate mothers between age 1 year and age 7 years ($Z = -2.33, P < 0.05$), age 1 year and age 10 years ($Z = -2.60, P < 0.01$), age 3 years and age 7 years ($Z = -2.00, P < 0.05$) and age 3 years and age 10 years ($Z = -2.24, P < 0.05$), with contact decreasing over time. Post hoc tests revealed no differences for genetic-known surrogates.

Of the 20 IMs whose children were in contact with the surrogate mother, 25% (comprising 1 gestational-known and 4 genetic-unknown) reported that they would like their child to have more contact with the surrogate mother and 75% (comprising 5 gestational-known, 3 gestational-unknown, 4 genetic-known and 3 genetic-

Table 1 The frequency of contact with the surrogate mother in the past year, as reported by mothers.

Year	Age 1	Age 3	Age 7	Age 10	χ^2	P-value
Mothers						
Gestational-unknown	2	1.5	0.5	0.5	7.73	0.052
Gestational-known	4	4	4	4	0.82	n.s.
Genetic-unknown	1	1	0	0	13.4	<0.001
Genetic-known	4	4	4	4	6.23	n.s.
Fathers						
Gestational-unknown	1.5	1	0.5	0.5	6.27	0.099
Gestational-known	3	4	4	3	5.08	n.s.
Genetic-unknown	1	0	0	0	30.8	<0.001
Genetic-known	3	3	2.5	1.5	7.76	0.051
Children						
Gestational-unknown	2	1.5	0.5	0.5	7.64	0.054
Gestational-known	4	4	4	4	1.43	n.s.
Genetic-unknown	1	0	0	0	14.1	<0.01
Genetic-known	3.5	3.5	2.5	1.5	10.35	<0.05

Values indicate the median frequency of contact on a scale ranging from 0 (not at all) to 4 (more than 1 × week). Data were analysed using the Friedman Test.

Table II Relationships of the mother, father and children with the surrogate mother.

Year	Age 1		Age 3		Age 7		Age 10	
	N	Percentage	N	Percentage	N	Percentage	N	Percentage
Mother's relationship with the surrogate mother								
Harmonious relationship	38	90	30	88	26	79	24	73
Dissatisfaction/coldness	4	10	2	6	0	0	2	6
Major conflict/hostility	0	0	0	0	1	3	1	3
No contact	0	0	1	3	5	15	4	12
Missing	0	0	1	3	1	3	1	3
Total	42	100	34	100	33	100	33	100
Father's relationship with the surrogate mother								
Harmonious relationship	25	89	–	–	18	75	15	68
Dissatisfaction/coldness	3	11	–	–	0	0	1	5
Major conflict/hostility	0	0	–	–	0	0	1	5
No contact	0	0	–	–	6	25	5	23
Total	28	100	–	–	24	100	22	100
Child's relationship with the surrogate mother ^a								
Harmonious relationship	–	–	–	–	21	66	24	75
Dissatisfaction/coldness	–	–	–	–	0	0	0	0
Major conflict/hostility	–	–	–	–	0	0	0	0
No contact	–	–	–	–	11	34	8	25
Total	–	–	–	–	32	100	32	100

^aReported by mothers.

unknown) felt that the amount of contact was just right. None of these IMs reported that they would prefer less frequent contact between their child and the surrogate mother.

Relationship quality

For IPs who were in contact with the surrogate mother, the majority reported a harmonious relationship with her. The quality of their relationship with the surrogate mother did not change significantly as the child grew up and did not differ by the type of surrogacy. By age 10 years, only 9% of IMs (one gestational-unknown, one genetic-unknown and one genetic-known) and 9% of IFs (one gestational-known and one genetic-known) reported some dissatisfaction or hostility in their relationship with the surrogate mother. All children who were in contact at ages 7 and 10 years were reported by IMs to have a positive relationship with their surrogate mother (Table II).

Disclosure

At age 1 year, all 42 families reported that they were planning to tell their child about their surrogacy birth. By age 10 years, 91% (30/33) of IPs had done so, and 3 (9%) (two gestational-known and one gestational-unknown) were still planning to tell. All families with a genetic surrogate mother had told their child about surrogacy by age 10 years. Telling status at each assessment is shown in Table III. Of those IPs who had told the child, around half did so before the age of 3 and the other half between the ages of 3 and 7 years. The one set of IPs (with a gestational-unknown surrogate mother) who

were uncertain about telling their child when seen at age 3 years did not take part in subsequent phases.

At age 10 years, the 19 families who had used genetic surrogacy were asked whether they had told their child about the use of the surrogate mother's egg; 58% (11) had done so, 32% (6) planned to do so in the future and 10% (2) had decided not to tell. Of the two IMs who had decided not to disclose the use of the surrogate mother's egg, one felt that this information was irrelevant and the other said she would only tell if the child asked.

Children's views on surrogacy

Children's views on surrogacy at ages 7 and 10 years are shown in Table IV. The majority of the children showed at least some knowledge of the nature of their conception, illustrated mainly through an awareness of having been born to someone other than their mother: for example,

Well my Mum's womb, I think . . . well it was a bit broken, so [. . .] [surrogate mother] carried me instead of my Mum.

Fourteen children at ages 7 and 10 years had seen their surrogate mother in the past year and most were either happy with their level of contact with her or would have liked to see her more. Most children at ages 7 and 10 years reported that they liked their surrogate mother describing her as 'nice' or 'kind'. Examples include:

[She] was really kind about [. . .] like carrying me in her tummy.

I think she is kind and she's lovely and funny.

Table III Status of disclosure by parents of the use of a surrogate, according to age of the child.

	Age 1		Age 3		Age 7		Age 10	
	N	Percentage	N	Percentage	N	Percentage	N	Percentage
Told	0	0	15	44	29	88	30	91
Plans to tell	42	100	18	53	4	12	3	9
Uncertain	0	0	1	3	0	0	0	0
Plans not to tell	0	0	0	0	0	0	0	0
Total	42	100	34	100	33	100	33	100

Table IV Children's views of surrogacy.

Year	Age 7		Age 10	
	N	Percentage	N	Percentage
Understanding of surrogacy				
No understanding	2	9	2	9
Some understanding	17	77	17	81
Clear understanding	3	14	2	9
Total	22	22	21	100
Happy with the level of contact with the surrogate mother ^a				
Wish to see more	9	64	9	64
Just right	4	29	5	36
Wish to see less	1	7	0	0
Total	14	100	14	100
Feelings towards the surrogate mother ^a				
Likes	14	100	13	93
Ambivalent	0	0	1	7
Does not like	0	0	0	0
Total	14	100	14	100
Feelings about surrogacy birth				
Positive	–	–	5	24
Neutral/indifferent	–	–	14	67
Negative	–	–	0	0
Missing	–	–	2	9
Total	–	–	21	100

^aOf the 14 who had seen their surrogate mother in the past year.

At age 10 years, most children (14, 67%) felt neutral/indifferent about being born through surrogacy. An example of a neutral/indifferent response was:

Um, I feel fine. I don't feel bad or cross in anyway. It's just pretty much nature so I can't do anything about it. I wouldn't like to do anything about it. . .

Discussion

This study is the first to examine the views and experiences of surrogacy from the perspective of the children themselves. The findings show that most children who are aware of their surrogacy conception

are able to show some understanding of surrogacy by age 7 years. This is in contrast to data from 7-year-old children ($n = 12$) born using gamete donation who showed little understanding of their birth (Blake et al., 2010), suggesting that surrogacy may be easier for children to understand than gamete donation, although these numbers are small and further data are required before firm conclusions can be reached. For those who were in contact with their surrogate mother, the majority said that they liked her and most children were positive about their surrogacy birth at age 10 years. These findings are in line with studies of families who used sperm donation, where parents reported either positive or neutral feelings about donor insemination from children aged up to 8 years (Rumball and Adair, 1999) and adolescents aged 13–18 years who had been told during childhood (Scheib, 2003).

The findings from this study show that the majority of families who kept in contact with their surrogate mother maintained a good relationship with her over the course of the first 10 years of the child's life, thus allaying commonly voiced concerns that this relationship would present difficulties as the child grows up. The frequency of contact with the surrogate mother decreased over time, particularly when the surrogate mother was a genetic-unknown carrier. The most frequent level of contact that remained stable over time was maintained between IMs and previously known surrogate mothers. It is perhaps unsurprising that the most regular contact was maintained with surrogate mothers who were relatives and friends as they may live in close proximity to the family and these relationships were well established before the surrogacy took place. For children, the least amount of contact was maintained with genetic-known and genetic-unknown surrogate mothers. It is possible that this type of contact was being restricted by the adults involved (i.e. either the parents or the surrogate mother) and may result from a deliberate attempt to distance the surrogate mother from a genetically related child. The interviewer did not directly ask the parents or the child about the reasons for less frequent contact and the surrogate mother herself was not interviewed for this study.

For families with previously unknown surrogates, surrogacy arrangements in the UK allow close relationships to develop partly because surrogates and the couple maintain direct contact during pregnancy. This is likely to be a factor in families maintaining contact with their surrogate over time. With the increase in the number of couples seeking surrogacy abroad, it remains to be seen whether such families maintain similar levels of contact, particularly if the surrogate speaks a different language and contact is mediated through a clinic or a surrogacy agency. The children in the present study were all born

using non-commercial surrogacy, as payment to surrogates is prohibited in the UK. These children spoke of the surrogate's altruistic motivations for helping their parents, which raises questions about how children will feel in situations where their surrogate mothers were reimbursed financially.

In contrast to families who use gamete donation to have a child, this study shows that families who use surrogacy are more open with their child about their use of assisted reproduction, with over 90% of families having explained surrogacy to their child. Findings from our study of egg and sperm donation families found that only 47% of egg donation families and 29% of sperm donation families had told their child about their donor conception by age 10 (Blake *et al.*, submitted for publication). Such a high rate of disclosure in surrogacy families compared with gamete donation families most probably results from the fact that couples have to explain the arrival of a baby in the absence of a pregnancy (van den Akker, 2007). It is worth noting that just under half of those who were involved in genetic surrogacy had not disclosed the use of the surrogate mother's egg and thus the child was unaware that the surrogate mother was their genetic mother. Findings from a study of infertile women planning on using surrogacy to start a family also showed that most women would disclose the use of surrogacy but not the use of gamete donation (van den Akker, 2000), suggesting that IPs find it more difficult to disclose the use of third party gametes than the use of third-party gestation. Parents may also feel that they have to explain the use of third-party gestation to their child as there is a chance of their child finding out from someone else, whereas the use of third-party gametes is easier to conceal. Although the majority of the parents in the present study were planning to tell the child about the use of the surrogate mother's egg, it remains to be seen whether parents' intention to tell their child will translate to actual disclosure in the future. By withholding this information, parents are creating a potentially difficult situation whereby they feel they have disclosed the nature of the child's birth but the child does not know the full story.

Participants for this study only included those who responded to the invitation to take part. Therefore, it is not possible to evaluate the experiences of those who did not respond to the invitation or who declined to take part. However, all parents who had had a child through surrogacy within a 2-year time frame were contacted for this study and an additional sample was recruited from COTS, which was the largest surrogacy organization at the time. It is also important to point out that not all families remained in the study over time and thus the experiences of families who did not continue to take part are unknown. However, the participation rate of nearly 80% 10 years after the initial phase is high for a longitudinal study of this type. This paper presents data from the IPs perspective. The surrogate mother was not interviewed and therefore her views and experiences cannot be evaluated. However, an ongoing study is interviewing surrogate mothers 10 years after the birth of a surrogacy child, which aims to investigate the experiences of surrogacy from the perspective of the surrogate and her family (Imrie *et al.*, 2012). The findings of our study are of relevance to practitioners and counsellors working with couples who are considering surrogacy. With the increasing emphasis on the importance of disclosure of children's biological origins, it is important that families are aware that most children feel either indifferent or positive about their birth using surrogacy. However, our data should be confirmed in further studies with

larger groups. Furthermore, the fact that most parents who used a genetic surrogate mother had not yet disclosed the use of the surrogate mother's egg is notable, as children who later find out may wonder why this information was deliberately withheld from them. This may have a negative impact on the relationship with their parents. By the age of 10 years most children have a basic understanding of their surrogacy birth referring to terms such as 'broken tummies' and 'bad belly'. At this age, children's narratives of their birth are likely to be influenced by the way in which their parents have explained surrogacy to them. It is perhaps not until they are much older that they will be able to form their own views about the nature of their conception and use of a surrogate. It is essential to explore how these children feel as they enter adolescence when issues relating to identity become of prime concern.

Authors' roles

All authors contributed to the acquisition and interpretation of data for this study. V.J. drafted this manuscript and all authors contributed to its revision and have approved the final version for publication.

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Conflict of interest

None declared.

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Children of surrogate mothers: psychological well-being, family relationships and experiences of surrogacy

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STUDY QUESTION: What impact does surrogacy have on the surrogates' own children?

SUMMARY ANSWER: The children of surrogate mothers do not experience any negative consequences as a result of their mother's decision to be a surrogate, irrespective of whether or not the surrogate uses her own egg.

STUDY DESIGN, SIZE AND DURATION: Participants were recruited as part of a study of the long-term effects of surrogacy for surrogates and their family members. Data were collected from 36 children of surrogates at a single time point.

PARTICIPANTS/MATERIALS, SETTING, METHODS: Participants whose mother had been a surrogate 5–15 years prior to interview and who were aged over 12 years were eligible to take part. Thirty-six participants (14 male and 22 female) aged 12–25 years were interviewed (response rate = 52%). Questionnaires assessing psychological health and family functioning were administered.

MAIN RESULTS AND THE ROLE OF CHANCE: Forty-four per cent (15) of participants' mothers had undergone gestational surrogacy, 39% (14) had used their own egg (genetic surrogacy) and 19% (7) had completed both types of surrogacy. Most surrogates' children (86%, 31) had a positive view of their mother's surrogacy. Forty-seven per cent (17) of children were in contact with the surrogacy child and all reported good relationships with him/her. Forty per cent (14) of children referred to the child as a sibling or half-sibling and this did not differ between genetic and gestational surrogacy. Most children (89%, 32), reported a positive view of family life, with all enjoying spending time with their mother. Mean scores on the questionnaire assessments of psychological health and self-esteem were within the normal range and did not differ by surrogacy type.

LIMITATIONS, REASONS FOR CAUTION: The sample size for this study was relatively small and not all children chose to take part, therefore their views cannot be known. Nevertheless, this is the first study to assess the experiences of surrogacy from the perspective of the surrogates' own children. There may be some bias from the inclusion of siblings from the same family.

WIDER IMPLICATIONS OF THE FINDINGS: Findings of this study show that family relationships within the surrogate's own family are good and that the children are not negatively affected as a result of their mother's decision to be a surrogate. These results are of importance to counsellors and support groups offering advice to surrogates and intended parents.

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Key words: surrogacy / children / surrogate mothers / surrogates' family

Introduction

The use of surrogacy as a means to parenthood has increased in recent years yet nothing is known about the impact that surrogacy may have for the children of surrogate mothers. In the UK, a surrogate can either be a genetic or a gestational surrogate. A genetic surrogate (also referred to as

traditional, straight or partial surrogate) achieves pregnancy using artificial insemination of the intended father's sperm, a process that can occur at a clinic or at home. In this case, the surrogate uses her egg and is therefore the genetic mother of the child. The surrogate's children are therefore genetic half-siblings to the surrogacy child. A gestational surrogate (or host or full surrogate) achieves pregnancy using *in vitro*

fertilization. The implanted embryo is created using either the intended parents' gametes or donor gametes or a combination of both, and therefore the surrogate and her children are not genetically related to the resulting child. What little research has been carried out on surrogate mothers has so far examined their psychological well-being and experiences of surrogacy. These studies have found that most surrogate mothers have positive experiences of surrogacy and do not experience psychological problems as a result of carrying a child for someone else (Jadva *et al.*, 2003; van den Akker, 2007; Braverman *et al.*, 2012).

Compared with other forms of third-party reproduction, surrogacy families have been found to be more open about their child's conception. Many parents disclose surrogacy to the child by the age of 3 years and remain in contact with the surrogate during the first 10 years of the child's life (Jadva *et al.*, 2012). This continued contact raises questions about how the surrogate's own children may feel towards the intended parents and the surrogacy child. Yet, the impact of ongoing contact or lack of contact, on the surrogate's children, has so far not been explored.

Surrogate mothers have been found to tell their own children about surrogacy. Jadva *et al.* (2012) found that of the 32 surrogates in their study who had children, all reported that their child was aware of the surrogacy. Surrogate mothers also reported that the majority of children felt positive during the pregnancy, at the time of the handover, and a year following the birth of the surrogacy child, with no children feeling negative about the surrogacy during this time. However, we do not know whether genetic surrogates tell their children that they used their egg for the surrogacy nor do we know how their children feel about having half-siblings who in some instances may not be aware that they are genetically related to them.

The welfare of the child born as a result of fertility treatment is a central consideration for clinics in assessing whether or not treatment should be provided to patients (Pennings *et al.*, 2007). In the UK, clinics are also required to consider the welfare of any other children who may be affected by the birth of a child using fertility treatment (Human Fertilization and Embryology Act, 1990). It is therefore surprising that the welfare of the children of the women who are acting as surrogates has received little discussion. To this end, the present investigation aimed to examine the psychological health, family relationships and experiences of surrogacy from the perspective of the children of surrogates. The children of surrogates are referred to, in this paper, as surrogates' children and the child born as a result of the surrogacy arrangement is referred to as the surrogacy child.

Materials and Method

Participants

The present study reports data from a larger investigation of 34 surrogate mothers and their families [20 surrogates were from the original sample of the Jadva *et al.* (2003) study]. Surrogate mothers who had children over the age of 12 years were asked whether their child wished to take part in the present study. Children must have been aware of their mother's involvement in surrogacy in order to be asked to take part (none of the surrogates reported having children aged over 12 years who were not aware of their involvement in surrogacy). The surrogates in this sample had a total of 105 children, 60 of whom were aged over 12 years. Forty-four children were living at home at the time of the interview. A total of 36 children (seven of whom were no longer living at home) took part in the study comprising a response rate of 52% of the total number of eligible children. Using the numbers for children who were currently living at home yielded a

response rate of 66%. Children took part from 23 different families [In 9 families, two siblings took part ($n = 18$) and in 2 families three siblings took part ($n = 6$), the remaining 12 participants were from different families]. Sample characteristics shown in Table 1.

A significant association was found between parents' marital status and surrogacy type (Fishers exact = 0.006). A higher proportion of gestational surrogates had a married/cohabiting partner (11, 73%) compared with genetic surrogates (2, 14%) and gestational and genetic surrogates (3, 43%). There was a significant difference in the number of surrogacies carried out by the surrogate between the different categories for type of surrogacy ($H = 7.348$; $df = 2$, $P = 0.025$) with genetic surrogates (mean = 4) having completed more surrogacies compared with gestational surrogates (mean = 2; $H = 6.202$, $df = 1$, $P = 0.013$).

Procedure

Surrogates' children were visited at home and interviewed using an in-depth semi-structured interview that was digitally recorded. They were also asked to complete a booklet of questionnaires assessing psychological health and family functioning. Participants were asked questions about a target surrogacy child, the same one that their mother was asked about in the original 2003 study. The mean age of the target surrogacy child was 9 years.

For participants aged 12–17 years, written informed consent was obtained from their mother and written assent was obtained from the child. For participants aged 18 years and over, written consent was obtained from them directly. Ethical approval for the study was obtained from the University of Cambridge's Psychology Research Ethics Committee.

Table 1 Sample characteristics.

	Median (mean)	Range	
Age at time of study (years)	17 (17)	12–25	
Age at mother's first surrogacy (years)	6 (7)	2–15	
Number of surrogacy arrangements	3 (1.94)	1–8	
	<i>n</i>	%	
Male	14	39	
Female	22	61	
Parents' relationship status			Per family ($n = 23$)
Married/cohabiting	16	44	9
Divorced/separated	20	56	14
Type of surrogacy			
Genetic (traditional)	14	39	9
Gestational	15	44	9
Genetic and gestational	7	19	5
Surrogate known to intended couples?			
Unknown to intended parents (e.g. met through surrogacy organization)	31	86	19
Known to intended parents			
Family member	2	5.5	1
Friend	2	5.5	2
Both unknown and known	1	3	1

Measures

Psychological well-being

Participants were asked to complete the Rosenberg's Self-Esteem Scale (RSES, Rosenberg, 1965) to assess global self-esteem. This 10 item self-report questionnaire provides a total score for self-esteem where high scores indicate higher self-esteem and has been validated for use with adolescents (Bagley and Mallick, 2001). The General Health Questionnaire-30 (GHQ-30, Goldberg, 1978) was also completed. The GHQ-30 is a 30 item questionnaire used for detecting minor psychiatric disorders in the general population. Both measures are widely used and have good reliability and validity.

Family relationships

Family relationships were assessed using the Family Assessment Measure III (FAM III) brief version (Skinner et al., 1995), which has three scales: (1) General scale, a measure of the family as a system. (2) Self-rating scale, a measure of the individual's perception of his or her functioning in the family. (3) Dyadic scale, a measure of the relationship between each dyad within the family. This was completed twice, first to assess surrogates' children's relationship with their mother and secondly to assess their relationship with their father. The interview also obtained information on the child's family relationships using the following codes: (i) overall view of family life, coded on a three-point scale ('negative', 'neutral/ambivalent', 'positive') and (ii) enjoyment of family, coded on a four-point scale ('none', 'some', 'quite a lot', 'a great deal').

Feelings about handing over the surrogacy child

Data were collected on (i) whether surrogates' children were informed that the baby would be handed over to the intended couple (coded as either 'yes', 'no' or 'cannot remember'), (ii) whether they were present at the time the baby was handed over (coded as 'yes', 'no' or 'cannot remember'), (iii) whether they experienced difficulties about the child being handed over (coded as 'no difficulties', 'child had doubts', 'child reluctant to hand over the child') and (iv) child's feelings following the handover initially, a few months later and currently, i.e. at the time of interview. (These responses were coded into the following categories 'No difficulties', 'some difficulties', 'moderate difficulties' and 'major difficulties'.)

Contact with the surrogacy child, intended mother and intended father

Data were collected on the (i) current frequency of contact with the surrogacy child, the intended mother and the intended father. (Responses were coded into the following categories: '>1 x week', '1 x week - 1 x month', '1 x month - 1 every 3 months', '1 or 2 times a year' and 'not at all'), (ii) the overall relationship with the child, (coded as 'negative', 'neutral/ambivalent' or 'positive') and (iii) whether the level of contact with the surrogacy

child was enough (categorized as either 'not enough', 'about right' and 'too much').

Disclosure of surrogacy to the surrogacy child

Participants aged 18 years or over were asked whether the surrogacy child knew who their surrogate was (responses were coded as 'yes', 'no' or 'don't know'). They were also asked whether they felt the child should be told the identity of their surrogate (responses were coded as 'yes', 'no', 'uncertain', or 'intended parents' decision). Their reasons for whether or not the child should be told were also obtained and these responses were transcribed and later coded and categorized.

Children's views on mother's involvement in surrogacy

Surrogates' children were asked how they felt about their mother being a surrogate (coded as 'positive', 'neutral/ambivalent' or 'negative'). Data were collected on what the difficult aspects of surrogacy were, what the most rewarding aspects of surrogacy were and whether there was anything that would have made surrogacy easier for them and their family. Surrogates' children were also asked what they called the surrogacy child. These responses were transcribed and later coded into categories based on the responses given.

In order to assess whether there were any differences between children of surrogates who had undergone genetic surrogacy to those who had undergone gestational surrogacy, we conducted non-parametric Kruskal-Wallis tests and Fishers exact tests. As a third group of surrogacy type was also present, i.e. children of surrogates who had undergone genetic and gestational surrogacy, these analyses were conducted twice. First, to compare the three groups of genetic, gestational and genetic/gestational surrogacy, and secondly, to compare genetic versus gestational surrogacy (omitting those children whose mothers had undergone both types of surrogacy).

Results

Psychological well-being

Median rank scores on the RSES and the GHQ-30 for children by type of surrogacy shown in Table II. No significant differences were found between the different groups for RSES. An examination of the individual total scores revealed that 10% (3) of children (one child of a genetic surrogate and two children of surrogates who had carried out both types of surrogacy) scored below the normal range (<15) for self-esteem. Forty per cent (12) of children (six of gestational surrogates, three of genetic surrogates and three of genetic and gestational surrogates) scored in the above average range (>25) for self-esteem.

Table II Median (interquartile range) scores on Rosenberg's self-esteem scale, general health questionnaire-30 and FAM III by surrogacy type.

	Genetic		Gestational		Genetic/gestational		n
	Median	Interquartile range	Median	Interquartile range	Median	Interquartile range	
Rosenberg self-esteem scale	22	5.5	25	7	20.5	13.75	30
General health questionnaire-30	0	1	0	0	2	15	27
FAM III: general scale	12	8.5	8	7	6.5	14	30
FAM III: self-rating scale	14.5	8	8	8	10	17.25	30
FAM III: dyadic-mother	12.5	5.5	8	9	5	21	30
FAM III: dyadic-father	14.5	4.5	9	10	10.5	21.5	27

For the GHQ-30 a non-significant trend was found indicating differences in median scores between the three groups ($H = 5.229$, $df = 2$, $P = 0.07$). As shown in Table I, the median score was higher for children of surrogates who had carried out both types of surrogacy in comparison to those who had carried out genetic or gestational surrogacy. An examination of the individual scores on the GHQ-30 showed that none of the children of gestational surrogates and genetic surrogates scored above the threshold of 5. Seven per cent (2) of surrogates' children (both of whom had mothers who had carried out both types of surrogacy) scored above the threshold of 5 indicating a 50% likelihood of having a psychiatric condition.

Family relationships

The median scores on FAM III shown in Table II. Comparisons for type of surrogacy found no differences between the children of surrogate mothers who had carried out genetic, gestational and both types of surrogacy. However, comparisons between children of genetic and gestational surrogacy, with children who had done both types removed, found a significant difference in the dyadic relationship with the father, with children of gestational surrogates (median = 9) scoring lower (indicating more positive relationships) than children of genetic surrogates (median = 14.5; $H = 5.101$; $df = 1$, $P = 0.024$). Scores on FAM III self-rating scale also approached significance with children of gestational surrogates (median = 8) scoring lower (indicating more positive perceptions of their role in the family) than children of genetic surrogates (median = 14.5; $H = 2.827$, $df = 1$, $P = 0.093$). No other differences were found.

The majority (89%, 32) of surrogates' children were coded as having a 'positive' view of family life with the remainder coded as having a 'neutral/ambivalent' view of family life. A significant association was found between participants' perceptions of family life and type of surrogacy (Fishers exact = 0.035). All 11% (4) of participants who had a neutral/ambivalent view of family life were children of genetic surrogates.

Table III Relationship with mother and father.

	Mother		Father	
	n	%	n	%
Interests/activities shared with parents				
None	0	0	2	6
Very little	3	8	10	28
A moderate amount	18	50	18	50
A large amount	15	42	6	17
Enjoyment of time spent with parents				
None	0	0	1	3
Very little	0	0	5	14
A moderate amount	16	44	17	47
A large amount	20	56	13	36
Parents' availability				
Completely unavailable	0	0	2	6
Pretty unavailable	0	0	4	11
Pretty available	6	17	10	28
Very available	30	83	20	56

In terms of enjoyment of family, 36% (13) were coded as experiencing 'a great deal' of enjoyment, 47% (17) as 'quite a lot' of enjoyment, with the remaining 17% (6) coded as 'some' enjoyment. None of the surrogates' children were coded as having no enjoyment of their family.

For surrogates' children's relationships with their mother and father, Table III shows that the majority of participants reported sharing interests with their parents and enjoyed spending time with them. Fishers exact tests revealed no association between interview ratings of family relationships and type of surrogacy.

Feelings about handing over the surrogacy child

Table IV shows the data on surrogates' children's feelings about handing over the surrogacy child. No significant associations were found for type of surrogacy and any of the variables assessing feelings about handing over the surrogacy child.

Table IV Surrogates' children's feelings over handing over the surrogacy child.

Feelings about handing over the surrogacy child	n	%
Informed of handover		
Yes	16	44
No	1	3
Cannot remember	19	53
Present at handover		
Yes	8	22
No	19	53
Cannot remember	9	25
Difficulties at handover		
No difficulties	20	56
Child had doubts	0	0
Child reluctant to handover the surrogacy child	0	0
Cannot remember	16	44
Feelings following the handover: initially		
No difficulties	17	47
Some difficulties	1	3
Moderate difficulties	0	0
Major difficulties	0	0
Cannot remember	18	50
Feelings following the handover: a few months later		
No difficulties	19	53
Some difficulties	1	3
Moderate difficulties	0	0
Major difficulties	0	0
Cannot remember	19	53
Feelings following the handover: currently		
No difficulties	35	97
Some difficulties	1	3
Moderate difficulties	0	0
Major difficulties	0	0

Contact with the surrogacy child, intended mother and intended father

Just under half (47%, 17) of the surrogates' children were in contact with the surrogacy child and 44% (16) were in contact with the intended mother and intended father. All of the surrogates' children who were in contact with the surrogacy child maintained face to face contact with him/her and all reported a positive relationship with them. Frequency of current contact with the surrogacy child and intended parents shown in Table V. No significant associations were found for frequency of contact and type of surrogacy. In terms of whether children were in touch with any other surrogacy children, 67% (24) of participants were in touch with at least one of the surrogacy children that their mother had carried.

Thirty-six per cent (13) of surrogates' children felt the level of contact with the surrogacy child was not enough [of whom 14% (5) had no contact and 22% (8) had contact and 63% (23) felt it was about right]. Of the 53% (19) of surrogates' children who were not in contact with the surrogacy child, 14% (5) felt that the level of contact was not enough and 39% (14) felt that it was about right.

Disclosure of surrogacy to the surrogacy child

Children aged 18 years and over ($n = 15$) were asked whether the surrogacy child knew about having been born using surrogacy. Forty-seven per cent (7) said the child was aware of their surrogacy birth, 7% (1) said

the child did not know and 53% (8) said they did not know whether the child had been told. In terms of whether they felt the child should be told about their surrogacy birth, 53% (8) said the child should be told, 27% (4) felt uncertain, 7% (1) said the child should not be told and 14% (2) said it was up to the parents.

Reasons for telling included 'medical reasons' (2); 'the child having a right to know' (4); 'the child would know who their mother is' (1); 'the child would not be here otherwise' (1); 'Trust, so that there is nothing to hide' (1) and one was unsure of a reason (note, some gave more than one reason). The reason given for not telling was that it would 'complicate life'.

Children's views on mother's involvement in surrogacy

Most (86%, 31) children of surrogates held a positive view of their mother's involvement in surrogacy with the remaining 14% (5) (three children of gestational surrogates and two children of genetic surrogates) reporting a neutral/ambivalent view.

Examples of positive views of surrogacy included:

I think it's amazing. . . It's quite, I dunno, it's like. . . difficult for a woman to like give away a child that she's given birth to and I just think it's. . . fantastic that my mum can, and make people so happy'. (Child of a genetic surrogate)

I think it's a really like nice thing to do for someone, obviously if they can't have children and they really want a child that's a bad thing, so if someone else is

Table V Frequency of contact with the surrogacy child, intended mother and intended father.

	Genetic		Gestational		Genetic/gestational		N
	n	%	n	%	n	%	
Frequency of contact with surrogacy child							
> 1 × week	1	7	2	13	0	0	3
1 × week – 1 × month	1	7	0	0	0	0	1
1 × month – 1 × 3 months	0	0	2	13	0	0	2
1 or 2 times a year	3	21	4	27	4	57	11
Not at all	9	64	7	48	3	43	19
Total	14	100	15	100	7	100	36
Frequency of contact with intended mother							
> 1 × week	0	0	2	13	0	0	2
1 × week – 1 × month	0	0	0	0	0	0	0
1 × month – 1 × 3 months	0	0	1	7	0	0	1
1 or 2 times a year	5	36	4	27	4	57	13
Not at all	9	64	7	47	3	43	19
Not applicable ^a			1	7			1
Total	14	100	15	100	7	100	36
Frequency of contact with intended father							
> 1 × week	0	0	2	13	0	0	2
1 × week – 1 × month	0	0	0	0	0	0	0
1 × month – 1 × 3 months	0	0	1	7	0	0	1
1 or 2 times a year	5	36	5	33	3	43	13
Not at all	9	64	7	47	4	57	20
Total	14	100	15	100	7	100	36

^a1 intended mother had died.

able to do that for you and help you through it then it's something that's compassionate really. (Child of a gestational surrogate)

An example of a neutral or ambivalent response was:

Um, I don't have a problem with it, if mum wants to do it that's her prerogative. (Child of a genetic surrogate)

Thirty-nine per cent (14) of the surrogates' children mentioned factors that were difficult during the surrogacy. These responses were later coded into the categories seen in Table VI. Sixty-nine per cent (25) of surrogates' children mentioned what they thought were the rewarding aspects of surrogacy and 19% (7) mentioned factors that would have made surrogacy easier for them and these are shown in Table IV. The way in which the surrogates' children referred to the surrogacy child was coded into categories shown in Table VII. Sibling terms included 'sister/brother', 'half-sister/half-brother' and 'tummy sister'. No significant associations were found between type of surrogacy and the terms used to describe the surrogate. Of the four children whose mother had helped known intended parents, the two whose mother had helped a family member referred to the child as a cousin and of the three whose mother had helped a friend, one referred to the surrogacy child by their name, one as 'like a cousin or a sister' and the other as a family friend.

Discussion

This is the first study to investigate the experiences of surrogacy and the psychological well-being of surrogates' children from the perspective of the children themselves. The findings show that overall the children of surrogate mothers do not experience negative psychological health or

family functioning. Some differences were found on measures of family functioning between children of genetic and gestational surrogates, indicating children of gestational surrogates to have better relationships with their fathers and better perceptions of family life than children of genetic surrogates. However, it is important to note that most of the children of genetic surrogates had experienced parental separation which could help explain this finding. It is not possible to determine whether genetic surrogacy caused these parental separations as the present study was not designed to address this. However, the rates of parental separation are not overly high when compared with UK norms where 42% of marriages are likely to end in divorce (Office for National Statistics, 2012). Some of the surrogates were in cohabiting relationships which have higher rates of separation than marital relationships (Kiernan (1999)). Furthermore, not all parental separations occurred after the surrogate entered into surrogacy and also the majority of surrogates' children had good psychological well-being, and thus genetic surrogates children's poorer views of family relationships did not affect their psychological health.

Prior to this study, we did not know how children feel about seeing their mother carry a pregnancy and subsequently relinquish the child to someone else. Findings from this study show that the vast majority of surrogates' children saw surrogacy as positive and felt proud of their mother for being able to help someone in this way. Only one child of a surrogate reported that handing over the child was difficult. Indeed some children valued the experience of surrogacy and the relationships they had with the intended couple and child, reporting this as one of the positive aspects of surrogacy. This is likely to be a reflection of the way in which surrogacy is conducted in the UK where surrogacy arrangements are managed directly between the intended parents and surrogates that enables a relationship to be built between them (van den Akker, 2007) that extends beyond the arrival of the child (Jadva *et al.*, 2012). Jadva *et al.* (2012) found that some intended parents and surrogacy children maintain contact with their surrogate up to the age of 10 years and have positive relationships with her. The present study shows that the surrogates' children may also maintain contact and develop positive relationships with the intended parents and the surrogacy child. It is

Table VI Difficulties and rewards of surrogacy.

Difficult aspects of surrogacy	n ^a
Maintaining a relationship with surrogacy child	5
Health complications for the surrogate	3
Negative comments from others	3
Surrogate not being able to take child out	1
Baby being handed over	1
Seeing surrogate upset	1
Rewarding aspects of surrogacy	
Relationship with the child and intended parents	7
Being proud of mum	6
Helping another family	5
Seeing mum happy	5
Travelling and meeting people	4
Positive effect on own family	2
What would make surrogacy easier?	
Surrogacy less taboo/more awareness	3
Living closer to intended parents	2
Having better relationship with intended parents	1
Surrogate having easier pregnancy	1

^aSome participants gave more than one response.

Table VII Terminology used to describe surrogacy child.

	Gestational	Genetic	Genetic/ gestational	Total
Sibling	5	5	4	14
Cousin	3	0	2	5
By their names	2	2	0	4
Family friend	1	0	0	1
Mum's surrogate child	2	2	1	5
Intended parents' child	0	1	0	1
Other	0	2	0	2
Total	13	12	7	32

important to note that just over half of the children mentioned that they were not in touch with the child, and some were unaware whether the child had been told about their surrogacy origins and the identity of their surrogate. However, most of the children who were not in contact with the surrogacy child were happy with this decision. This is likely to be a reflection of the way in which the surrogate feels about contact with the intended parents (and surrogacy child) as some surrogates make a mutual decision with the intended parents not to remain in contact following the birth of the child (Jadva *et al.*, 2003).

No clear patterns were found in the way terminology was being used by children of surrogates who were genetically related to the surrogacy child, and those who were not. That is, the terms related to familial relationships such as 'half-brother' or 'half-sibling' were being used by surrogates' children regardless of whether or not the surrogate's child was a genetic half-sibling to the surrogacy child (i.e. where the surrogate had used her egg for the surrogacy). It is possible that the terms used reflected the closeness of the relationships between the surrogate's family and the intended family which were not dependent on whether or not the surrogate used her egg for the surrogacy.

Few differences were found in the experiences of surrogacy between children whose mother had undergone genetic, gestational and both types of surrogacy. Finding a group of women who had undergone both types of surrogacy was unexpected as previous studies have found surrogates to act as either genetic or gestational surrogates (Jadva *et al.*, 2003; van den Akker, 2003). The importance that surrogates place on genetic relatedness has been found to differ between genetic and gestational surrogates, with genetic surrogates feeling that a genetic link is less important than gestational surrogates (van den Akker, 2003). The small proportion of surrogates whose children took part in this study whose mother had completed both genetic and gestational surrogacy suggests that surrogates' view on the role and importance of genetics is transitory. It is likely that the way in which the surrogate conceptualizes and understands her role as a surrogate, and the way in which she communicates this to her child, will have an impact on the way in which her child comes to view surrogacy.

Given that the target age of the surrogacy child was 9 years, this study demonstrated that the long-term impact of surrogacy for children of surrogates is generally positive. In terms of experiences at the time of the surrogacy, for those participants who could remember, most did not experience difficulties at the time of handing over the child. However, the data were obtained using retrospective questioning which asked participants to recall their feelings at the time of the surrogacy. Some participants were unable to remember their experiences as they were too young at the time. It is also possible that for those that did remember, their responses may have been prone to recall bias. We also cannot rule out the possibility of participants wishing to present their experiences in a positive light, given that they knew the study was looking at surrogacy. However, the in-depth interviews lasting ~1 h are designed to minimize the risk of socially desirable responding. Although the response rate may be considered low it is important to note that surrogates were acting as gatekeepers, and many surrogates did not wish to ask their children who had moved away from home. Adolescents living at home were more likely to take part (66%). A further possible limitation of this study is that some children belonged to the same family, which could bias the results as it is possible that these children are more likely to have similar experiences. However, not all children within each family gave

the same responses suggesting that children within the same family can have different experiences of surrogacy. Despite the limitations of the sample the findings provide new insight into the experiences of surrogacy for children whose mothers act as surrogates.

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Authors' roles

Both authors contributed to the acquisition and interpretation of data for this study. V.J. drafted this manuscript and S.I. contributed to its revision and has approved the final version for publication.

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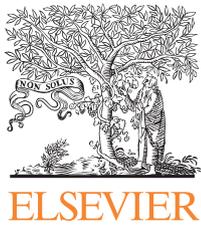
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Conflict of interest

None declared.

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ARTICLE

The long-term experiences of surrogates: relationships and contact with surrogacy families in genetic and gestational surrogacy arrangements



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Abstract This study examined the contact arrangements and relationships between surrogates and surrogacy families and whether these outcomes differed according to the type of surrogacy undertaken. Surrogates' motivations for carrying out multiple surrogacy arrangements were also examined, and surrogates' psychological health was assessed. Semi-structured interviews were administered to 34 women who had given birth to a child conceived through surrogacy approximately 7 years prior to interview. Some surrogates had carried out multiple surrogacy arrangements, and data were collected on the frequency, type of contact, and surrogate's feelings about the level of contact in each surrogacy arrangement, the surrogate's relationship with each child and parent, and her experience of, and motivation for, each surrogacy. Questionnaire measures of psychological health were administered. Surrogates had completed a total of 102 surrogacy arrangements and remained in contact with the majority of families, and reported positive relationships in most cases. Surrogates were happy with their level of contact in the majority of arrangements and most were viewed as positive experiences. Few differences were found according to surrogacy type. The primary motivation given for multiple surrogacy arrangements was to help couples have a sibling for an existing child. Most surrogates showed no psychological health problems at the time of data collection. 

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KEYWORDS: contact, psychological health, relationship, surrogacy family, surrogacy, surrogate mother

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Introduction

Surrogacy, the process whereby a woman carries and gives birth to a baby for a couple who cannot conceive naturally, has become an increasingly popular means of building a family in the UK in recent years (Crawshaw et al., 2012). Surrogacy is legal in the UK on an altruistic and non-commercial basis, and surrogacy arrangements can be either gestational or genetic. In genetic surrogacy (also known as straight, traditional or partial surrogacy), the surrogate uses her own egg and becomes pregnant through artificial insemination usually using the intended father's sperm. In gestational surrogacy (also called host or full surrogacy), the surrogate gestates the couple's embryo, or an embryo created using donor gametes, and becomes pregnant using IVF. Recent figures suggest that 46% of reported IVF cycles for surrogacy in the USA involve donor eggs (Bernstein, 2013).

Although both types of surrogacy arrangements are currently practised in the UK, medical practitioners and surrogacy agencies in the USA generally recommend gestational surrogacy as the preferred method; however, genetic surrogacy arrangements do occur and are legal in four states (Bernstein, 2013). This preference for gestational surrogacy is partly due to the lower risk it presents in terms of certainty over legal parentage in some states (American Society for Reproductive Medicine, 2012a). There is also a perception that genetic surrogacy has the potential to be more complicated psychologically, genetic surrogates being thought more likely to change their minds about handing the baby over to the intended parents (Bernstein, 2013; Trowse, 2011), despite a lack of empirical evidence to support this view. Concerns have also been raised about the lack of involvement of mental health professionals in genetic surrogacy arrangements as the procedure sometimes occurs without a clinic's involvement (although a clinic's involvement does not guarantee that mental health professionals will always be involved). This lack of involvement, coupled with the surrogate being the genetic mother of the child, may increase the risks of problems occurring (Edelmann, 2004). These concerns are shared by some UK fertility clinics (Balen and Hayden, 1998) and have been reflected on the international stage by the publication of a report on surrogacy by the International Federation of Gynecology and Obstetrics (FIGO) Committee for the Ethical Aspects of Human Reproduction and Women's Health stating that only gestational surrogacy is acceptable (FIGO Committee Report, 2008). Studies of surrogates have found, however, that the type of surrogacy does not seem to influence satisfaction with the surrogacy experience (Ciccarelli, 1997; Jadva et al., 2003), with most surrogates reporting positive experiences and few regretting their decision to become a surrogate (Blyth, 1994; Ciccarelli, 1997; Jadva et al., 2003; van den Akker, 2003).

To date, psychological research into surrogacy has focused on the motivations, experiences and psychological wellbeing of UK and US-based surrogates taking part in domestic surrogacy arrangements, with a minority of studies considering whether these variables differ according to surrogacy type. Studies looking at the psychological wellbeing of UK surrogates have found that surrogates do not experience psychological health problems as a result of the surrogacy arrangement 6 months after birth (van den Akker, 2005) or 1 year after birth (Jadva et al., 2003). Clinical evaluations of

American women applying to become gestational surrogates showed no psychopathology (Braverman and Corson, 1992) and found lower levels of anxiety and tension and higher resilience to stress in surrogate candidates compared with a normative female sample (Pizitz et al., 2013). Little is known, however, about surrogates' psychological health over the longer term.

Surrogates in the UK have been reported as being motivated by altruistic reasons, primarily the desire to help childless couples (Blyth, 1994; Jadva et al., 2003; van den Akker, 2003). Similar motivations have been reported by American surrogates, with the desire to help others have children often influenced by surrogates' own positive experiences as parents (Hohman and Hagan, 2001; Ragoné, 1994). The only study to consider surrogates' motivations for undertaking additional surrogacy arrangements suggested that surrogates may explain the decision as wanting to help their couple have a sibling for their first child (Ragoné, 1994), although little is known about the motivations of surrogates carrying out multiple surrogacy arrangements or how many surrogacy arrangements surrogates undertake.

The relationship between surrogates and couples has been found to play a crucial role in the surrogacy experience (Braverman and Corson, 1992; Fisher, 2013; Roberts, 1998), with the surrogate's satisfaction with her experience largely determined by the quality of the relationship (Baslington, 2002; Ciccarelli, 1997; Hohman and Hagan, 2001). Some studies have suggested that it is the relationship between the surrogate and the intended mother that is central to the surrogacy process (MacCallum et al., 2003; Ragoné, 1994; Teman, 2010). It has been argued that relationships between surrogates and couples are shaped by cultural ideals around the importance of family, the preciousness of children, and intent as central to parenthood (Berend, 2010, 2012), but little is known about how surrogates view these relationships over time.

Most surrogates and surrogacy families have been found to remain in contact in the short-term in studies of UK and US-based surrogates (Blyth, 1994; Braverman and Corson, 2002; Jadva et al., 2003). One study of 34 UK surrogates found that surrogates maintained contact with 79% of couples and 76% of children 1 year after the birth of the child, although the level of contact varied greatly (Jadva et al., 2003). Surrogates saw just under one-third of surrogacy families at least once a month, with contact varying in the remainder of arrangements between once a month and once a year. Finding a level of contact with which they feel comfortable has been found to be an important factor for surrogates (Baslington, 2002). A study of US surrogates found that, although only one surrogacy resulted in a social friendship, most surrogates and couples remained in contact by phone, and only two reported feeling any regret about their lack of contact (Hohman and Hagan, 2001). Similarly, most UK surrogates (94%) reported being happy with their level of contact with the child in the year after the birth (Jadva et al., 2003).

In terms of the surrogate's relationship with the child conceived through surrogacy, surrogates report that they do not view the child as their own child (Jadva et al., 2003; Ragoné, 1996; Roberts, 1998), although 41% report feeling a 'special bond' towards the child, a finding that does not differ according to surrogacy type (Jadva et al., 2003). It is not known, however, how surrogates feel about the child as the child grows older, or how surrogates feel about the relationship (i.e.

whether the relationship is enjoyed, or whether it creates difficulties).

Whether it is feasible for relationships in surrogacy arrangements to be sustained over the longer term is an important question, and the period 5–10 years after birth has been identified as crucial in surrogate–couple relationships (Ciccarelli, 1997). Ciccarelli (1997) found that a minority of surrogates became increasingly dissatisfied with the surrogacy arrangement over this period, as contact with the couple tapered off. Some claim that surrogacy creates uncertainties in relationships (Appleton, 2001), and concerns have also been raised about the abilities of those involved to create and maintain clear boundaries, with the possibility that remaining in contact may undermine the relationship between the parents and the child, and that surrogates may find it difficult to be reminded about the child (Brazier et al., 1998). Conversely, in New Zealand, where all applications for surrogacy must be considered by the Ethics Committee on Assisted Reproductive Technology, the relationship between the couple and surrogate is one of the areas explored by the committee because it is believed that an ongoing relationship may contribute to the child's wellbeing (Anderson et al., 2012).

Little empirical evidence is available about long-term contact and relationships between surrogates and surrogacy families, and the studies that exist often have small sample sizes. One early study of 10 surrogates in the USA who gave birth before 1988 found that 60% had no contact with the surrogacy family 10–15 years after the birth, an arrangement determined by the couple rather than the surrogate, who felt some degree of disappointment about the loss of the relationship (Reame et al., 1998). Similarly, a study of 14 surrogates who were interviewed 3–10 years after the surrogacy found that dissatisfaction with the arrangement increased for a minority of surrogates as contact with the surrogacy family started to diminish (Ciccarelli, 1997). More recently, a study of 33 families created through surrogacy found that 61% remained in contact with their surrogate 10 years after the surrogacy and 75% were happy with the amount of contact they had (Jadva et al., 2012). Of those who were in contact, most reported a harmonious relationship, the quality of which had not changed significantly over the 10-year period, and did not differ according to surrogacy type (Jadva et al., 2012). How this contact is viewed from the surrogate's perspective, or whether this pattern remains when larger numbers of surrogacy arrangements are considered, is not known.

The present study aimed to establish whether surrogates maintained contact with surrogacy families over the long term, (mean = 7 years after the birth of the child), how surrogates viewed these relationships and whether these outcomes varied according to surrogacy type (genetic versus gestational). In addition, the study assessed surrogates' psychological health. Finally, this study for the first time examined surrogates' motivations for undergoing multiple surrogacy arrangements. Most of the surrogates had taken part in the study by Jadva et al. (2003), and, in order to increase the sample size, additional surrogates were recruited who had carried a surrogacy pregnancy around the same time as the original sample. As many surrogates in the sample had carried out multiple surrogacy arrangements, and some had also carried out surrogacy arrangements before the time period specified in the recruitment materials, all completed surrogacy arrangements were

included in the analysis in order to obtain a clearer impression of relationships and contact arrangements across multiple surrogacy arrangements.

Materials and methods

The study reports data from an investigation of surrogates, their partners and their children. Data from the children and partners are presented elsewhere (Jadva and Imrie, 2013, *in press*). This paper reports data from all 34 of the surrogates seen in this study. Twenty had taken part in an earlier study (Jadva et al., 2003) and 14 were recruited during the current phase of the study. Of the original 34 surrogates in the study by Jadva et al. (2003), two declined to take part in the current study for personal reasons, and the remaining 18 had moved home and could not be traced.

The 14 additional participants were recruited through two UK surrogacy organisations (Surrogacy UK and COTS) and two UK fertility clinics (Bourn Hall Clinic and CARE Fertility, Manchester). The additional participants had to have carried a surrogacy pregnancy 5–12 years before the interview in order to match the surrogates from the original sample who had completed their surrogacy arrangement 10 years previously. This resulted in the recruitment of 12 participants. The criteria were then extended to include 2–12 years in order to increase the sample size; this resulted in the recruitment of two additional participants. Participants were aged between 23 and 62 years, and all lived in the UK. Surrogates' characteristics are presented in Table 1. Surrogacy was defined as having occurred when the surrogate carried and gave birth to a child for intended parent(s), and legal parentage was transferred, though not necessarily through a Parental Order application. Data were collected between April 2011 and December 2012.

Ten surrogates had completed a single surrogacy arrangement and 24 had completed more than one surrogacy arrangement. Surrogates had completed between one and eight surrogacy arrangements each (mean = 3.06, SD = 2.03). The number of surrogacy arrangements each surrogate had completed is shown in Table 1. Five surrogates were pregnant with further surrogacy arrangements at the time of data collection.

In total, the 34 surrogates had completed 102 surrogacy arrangements, of which seven were twin births. Of the surrogacy births that had taken place, 61 were genetic surrogacy arrangements and 41 were gestational surrogacy arrangements. Six surrogacy arrangements were for couples who were previously known to the surrogate (i.e. a friend or family member), 75 were for couples who were previously unknown to the surrogate (i.e. met through a surrogacy organisation or third party) and 21 were for couples for whom the surrogate had previously completed a surrogacy arrangement. A detailed breakdown of how surrogates met the intended parents is shown in Table 2.

Surrogates had completed a total of 96 surrogacy arrangements for 76 heterosexual couples, four surrogacy arrangements for four same-sex male couples, and two surrogacy arrangements for one single gay man. A total of 87 surrogacy arrangements were carried out within the framework of a voluntary surrogacy organisation. Four surrogacy arrangements were carried out for couples who lived outside the UK.

Table 1 Sample characteristics.

Parameter	Surrogates (n = 34)
Age of surrogate (years) ^a	41 ± 6.63
Own children	
Yes	33 (97%)
No	1 (3%)
Marital status	
Married/co-habiting	22 (65%)
Non-co-habiting partner	3 (9%)
Divorced/separated	7 (21%)
Single	2 (6%)
Working status	
No	9 (26%)
Part-time	15 (44%)
Full-time	8 (24%)
Retired	1 (3%)
Full-time higher education	1 (3%)
Occupation	
Professional/managerial	12 (35%)
Skilled non-manual	12 (35%)
Skilled manual	6 (18%)
Partly skilled	4 (12%)
Type of surrogacy	
Genetic	12 (35%)
Gestational	14 (41%)
Genetic and gestational	8 (24%)
Number of surrogacy arrangements	
1	10
2-3	14
4-5	6
6+	4

^aValue is mean ± SD.

Table 2 How surrogates met intended parents.

How surrogate met intended parents	Number of surrogacy arrangements
COTS	52
Couple known from previous surrogacy	21
Surrogacy UK	14
Internet (e.g. Surromomsonline)	4
Couple were family members	3
Couple were friends	3
Introduced by family member	1
Introduced by colleague	1
Fertility show	1
Surrogacy Parenting Centre	1
Facebook	1

COTS and Surrogacy UK are UK-based voluntary organisations. The Surrogacy Parenting Centre was founded in 1993 as a voluntary organisation, and is no longer in existence.

Table 3 Age of child conceived through surrogacy at time of data collection.

Age (years)	Number of children
0-2	17
3-5	22
6-8	25
9-11	24
12-14	7
15-18	7

The age of the children born through surrogacy at the time of data collection is presented in **Table 3**. Children were aged between 0 and 18 years (mean = 7.11; SD = 4.36; median = 7.00).

Participants were visited at home and interviewed using a semi-structured interview that was digitally recorded. Written consent was obtained from participants, and ethical approval for the study was obtained from the University of Cambridge’s Psychology Research Ethics Committee (approval date 15 March 2011, reference number 2011.20).

Participants were asked about their motivations for each surrogacy and their experiences of each surrogacy. Information about their contact arrangements and relationship with the parents and child for each surrogacy arrangement were also obtained. The participants’ psychological wellbeing was also assessed. Data were coded using a strict coding manual used by a previous study (Jadva et al., 2003). One-third of the interviews were rated by a second interviewer. Mean Kappa was 0.80 (ranging from 0.402 to 1.0).

Contact with the surrogacy family

Data were collected on the following: (1) the current frequency of contact with the child and the child’s parents, measured on a four-point scale ranging from ‘once or twice a year’, rated 1, to ‘more than once a week’, rated 4; (2) the type of contact with the child born through surrogacy and the child’s parents; and (3) how the surrogate felt about her level of contact with the child and the child’s parents. This was categorised as ‘not enough’, coded when the surrogate wanted more contact, ‘about right’ coded when they were happy with the level of contact they had, and ‘too much’, when they reported that they had more contact than they would like.

Relationship with the surrogacy family

Data were collected on the surrogate’s overall relationship with the child and the child’s parents, coded as ‘positive’ (when the surrogate described a warm or friendly relationship), ‘neutral/ambivalent’ (when the surrogate described a relationship which was unproblematic but with a sense of emotional distance), or ‘negative’ (when evidence of arguments or a breakdown in communication were present). Quotations have been included in the paper to illustrate examples of the types of relationships, but the code for each relationship was assigned using the entire interview transcript.

Table 4 Surrogates' frequency of contact with the surrogacy family.

Frequency	Child (n = 79)		Mother (n = 62)		Father (n = 65)	
	n	%	n	%	n	%
Once or twice a year	42	53	13	21	30	46
Once a month to once every 3 months	29	37	19	31	24	37
Once a week to once a month	7	9	20	32	8	12
At least once a week	1	1	10	16	3	5

Table 5 Surrogates' feelings about level of contact with the surrogacy family.

Feelings about level of contact	Contact with child		Contact with mother		Contact with father	
	Yes	No	Yes	No	Yes	No
Not enough	7	8	3	5	3	5
About right	71	15	59	6	60	15
Too much	1	0	0	0	2	0

difference was found between surrogates' frequency of contact with children born through gestational surrogacy (median = 1) and with children born through genetic surrogacy (median = 1), (U = 671.50, P = 0.33).

Of the 21 surrogates who had completed more than one surrogacy arrangement for more than one family, most maintained different levels of contact with each family. That is, most surrogates (81% [17]) maintained different frequencies of contact for different children, different mothers (81% [17]) and different fathers (90% [19]). Three surrogates had completed two surrogacy arrangements for one family each, and all three surrogates had the same frequency of contact for both children born through surrogacy within each family.

Type of contact with the surrogacy family

Of the surrogates who maintained contact with the child, most maintained face-to-face contact (97% [77/79]). In the remaining two cases, the surrogate sent presents or communicated via Facebook. Of those who had remained in contact with mothers, most had face-to-face contact (89% [55/62]). Where surrogates remained in contact but did not have face-to-face contact, other types of contact with mothers included letters or email (5% [3]), phone (5% [3]) and receiving photos (with no letter) (1). Most contact with fathers was face-to-face (89% [58/65]) and in cases where surrogates and fathers had remained in contact but did not have face-to-face contact, types of contact included letters or email (6% [4]), phone (3% [2]) and receiving photos (1).

Surrogates' feelings about their level of contact with the surrogacy family

Surrogates' feelings about their level of contact with the surrogacy family are shown in Table 5. Surrogates were happy with their level of contact with the child in 84% (86) of surrogacy arrangements. Surrogates who had contact with the child, and who were happy with their level of contact,

reported that their level of contact felt natural, was comfortable for the surrogate, the child and his or her parents, and fitted into what were, in most cases, busy family lives. One surrogate described her feelings about her current level of contact: 'it's perfect, I mean we've all got children and we all pretty much live for the school holidays cos nobody gets any time so it's really nice that we all make the effort to get together in the school holidays.'

In seven of the 15 surrogacy arrangements where the surrogate had no contact with the child and was happy with her level of contact, the surrogate had remained in contact with the child's parents and received photos of the child, updates on the child's development, or both. In four surrogacy arrangements, the surrogate had chosen not to have any contact with the family, believing it was better for her or better for the child. In two cases, the surrogate planned to have contact when the child was older. In one case, the surrogate had agreed to no contact as this was the couple's preference, and, in another case, both the surrogate and the couple believed that no contact was the best option.

In seven of the eight arrangements where the surrogate had no contact with the child and wanted more contact, the surrogate and couple had agreed before the child was born that they would remain in contact, but contact had been stopped by the couple. The length of time since surrogates had last had contact with the child or received an update about the child ranged from 1 to 14 years. Surrogates in this situation expressed a desire to know how the child was doing.

No significant differences were found according to surrogacy type with regard to surrogates' feelings about their level of contact with the child (in 80% (33/41) of gestational surrogacy arrangements and 88% (53/61) of genetic surrogacy arrangements surrogates reported that their level of contact with the child was 'about right' ($\chi^2(1) = 1.19, P = 0.28$), with the mother (level of contact with the mother was reported as 'about right' with 85% (28/33) of mothers in gestational surrogacy arrangements and with 92% (37/40) of mothers in genetic surrogacy arrangements (Fisher's exact test, P = 0.46)), or with the father (level of contact with the father was reported as 'about right' with 86% (31/36) of fathers in

gestational surrogacy arrangements and with 90% (44/49) of fathers in genetic surrogacy arrangements (Fisher's exact test, $P = 1.00$)).

Relationship with the surrogacy family

Relationship with the child

In surrogacy arrangements in which the surrogate and child had remained in contact, the surrogate reported a positive relationship with the child in 76% (60) of arrangements. In 11% (9) of arrangements the surrogate reported a neutral relationship, and in 10% (8) of arrangements the surrogate stated that she did not view herself as having a relationship with the child. In 3% (2) of arrangements surrogates were unable to describe their relationship with the child because they believed the child was too young. None of the surrogates reported a negative relationship with the child. No significant difference was found between whether surrogates reported a positive relationship or a neutral/no relationship with the child and the type of surrogacy undertaken (surrogates reported a positive relationship with 85% (28/33) of gestational surrogacy children and with 70% (32/46) of genetic surrogacy children ($\chi^2[1] = 2.92$, $P = 0.09$)).

The transcripts of the interviews revealed that surrogates frequently describe close, happy relationships with the child. The child was often described as 'lovely' and much warmth was evident in the surrogate's description of the child, for example: 'she's absolutely wonderful, she's a gorgeous child', and the relationship is 'nice, it's really close, she gets really excited when we come down to see her'. Many surrogates also mentioned enjoying watching the child grow up and receiving updates on the child's life: 'it's really good to get a letter to say their first day at school, get a picture of them in their school uniform, all those sorts of things'. A further theme that emerged was surrogates' enjoyment of the time they spent with the child, with many laughing and telling unprompted humorous stories to illustrate their pleasure in the relationship.

Surrogates who reported neutral relationships with the child described relationships that were more emotionally distant: for example, 'I think it's like any of my friends' children, I don't get personally involved with them even when they come to visit me'.

In terms of how the surrogate felt towards the child, surrogates reported feeling a 'special bond' towards the child in 39% (40) of surrogacy arrangements, and one surrogate reported that one child was 'like her own child'. No 'special bond' was reported in 60% (61) of surrogacy arrangements. Of the surrogates who had carried out multiple surrogacy arrangements, 75% (18) reported consistent feelings towards all the children, and 25% (6) reported different feelings for different children. Comparing genetic and gestational surrogacy arrangements, surrogates were significantly more likely to report feeling no 'special bond' towards children born through genetic surrogacy ($\chi^2[1] = 12.31$, $P < 0.001$), compared with children born through gestational surrogacy.

An example of a report of a special bond was 'I think the world of her, there's nothing maternal there but I love her to bits, so I mean she's, she'll always be a special little girl to me'.

An example of a report of no special bond was, 'I've got no real feelings for him, I mean like I say he was my first so I always remember that but apart from that, it, you know, nothing really'.

Relationship with the couple

Surrogates reported a similar pattern in their relationships with the couples. Of those surrogates and parents who had remained in contact, surrogates reported a positive relationship with 89% (55) of mothers and 85% (55) of fathers. Surrogates reported a neutral or ambivalent relationship with 8% (8) of mothers and 9% (6) of fathers, and stated they had no relationship with 3% (2) of mothers and 6% (4) of fathers. No surrogates who had remained in contact with the couples reported a negative relationship.

The primary theme that emerged from the analysis of relationships categorised as positive was that surrogates viewed the relationship as a genuine, close friendship, which felt 'natural' and 'easy': 'we can just all be ourselves and we know nobody's perfect, but having been through so much with the surrogacies you just get to see it all [laughs], and it's nice to have people around that you don't feel you need to put up any barriers, you can just be'. Many expressed warmth when speaking about the relationships, describing the couples as people they enjoyed spending time with and talking to, with many mentioning 'clicking' with a couple and describing them as people they would have been friends with irrespective of the surrogacy: 'we really clicked straight away, and that's really why I decided to choose [couple] because [mother] was just lovely, just really lovely and the more we, the more we chatted the more we got on, you know, and I think we would have been friends anyway regardless of the surrogacy, I think we would have just got on anyway'. The relationships were also characterised by openness, honesty and trust, with many providing mutual support, 'they'd be there for me anytime I need them and I'm there for them and yeah I can confide in them and talk to them, yeah they're good, they're good friends'.

Neutral relationships tended to be more emotionally distant, with surrogates expressing less warmth towards the mother or father, but not experiencing any problems with the relationship either: for example, '[father]'s fine, I don't tend to have a long conversation with him because he just doesn't, but that's not to say there's anything wrong with him, it's just he's not one for chatting, but he's perfectly ok'.

Overall experience of surrogacy

Surrogates reported that 87% (89) of surrogacy arrangements had been positive experiences. Eight percent (8) of surrogacy arrangements were categorised as neutral or ambivalent experiences, and 5% (5) were categorised as negative experiences. Of the five surrogates who reported one negative surrogacy arrangement each, three had completed one or more further surrogacy arrangements which had been positive experiences, and one was pregnant with a further surrogacy at the time of data collection. No significant

difference was found between whether a surrogate's overall experience of a surrogacy arrangement had been positive or not, and the type of surrogacy carried out 93% (38/41) of gestational surrogacies, and 84% (51/61) of genetic surrogacies were rated as positive experiences ($\chi^2[1] = 1.82$, $P = 0.18$)).

Motivations for first surrogacy arrangement

The most common motivation for a first surrogacy was 'wanting to help a childless couple', as reported by 59% (20) of surrogates. Fifteen per cent (5) of surrogates reported both 'wanting to help a childless couple' and 'enjoyment of pregnancy' as their reasons for surrogacy, 9% (3) wanted to help a relative and 6% (2) wanted to help a friend. Eleven per cent (4) of surrogates reported other reasons.

Several themes emerged when examining the role of surrogates' own experiences in explaining their motivations for surrogacy. Many surrogates had experienced seeing a friend or a relative struggle with infertility and had looked into surrogacy as a way of helping their friend or relative or other women in similar situations. One surrogate said: 'I had a friend who wanted to get pregnant and couldn't and I saw all the stuff that she went through and I just thought it's not fair that I can get pregnant when I'm trying not to and there are people who want children that can't.'

Another common theme that emerged was how much surrogates valued their own children, with many mentioning that they had been able to have their children relatively easily and recognising the pain they imagined other women felt who were unable to, for example: 'to be a mother is probably the greatest gift that anybody can give you. . .so for somebody to tell you at the age of 18 or 21 or whatever that you're never going to be able to have a child I just think that must be absolutely devastating, I can't imagine anybody saying that to me, so to be able to help a couple have a child it's just like giving life to somebody.'

Motivations for subsequent surrogacy arrangements

Across the cases of multiple surrogacy arrangements, the most common motivation given in 31% (21) of surrogacy arrangements was wanting to help a family have a sibling for an existing child, sometimes referred to by surrogates as 'wanting to complete a family'. In surrogacy arrangements where the surrogate had already completed a surrogacy arrangement for the same couple, the importance of having an established and positive relationship with a trusted couple was often mentioned.

An example of a motivation for a multiple surrogacy arrangement coded as 'wanting to help a family have a sibling' was: 'as soon as I got pregnant for them we talked about, you know, if everything goes well, would you like another one, and they would desperately like another one cos they wanted a proper family. So it just seemed natural . . .[. . .] it just felt like the right thing to do for them, just to make them a family, and they were such lovely people that it was no effort spending time with them at all, they were just great.'

Other motivations cited for multiple surrogacy arrangements included 'wanting to help a childless couple' (23% [16] of arrangements) and 'having previous positive experiences of surrogacy' (15% [10] of arrangements).

An example of a motivation for a multiple surrogacy arrangement coded as 'having previous positive experiences of surrogacy' was, 'because I loved it so much last time. I feel like I've always worked, I've always, since I've had children I've always worked around the children, I've never had, um, an important career or I've never made a massive difference that way, but I honestly felt that giving birth to [child born through surrogacy] was one of my greatest achievements, and so I just wanted to experience that one more time before I was forty.'

In 7% (5) of arrangements 'enjoyment of pregnancy' was reported as the main motivation for multiple surrogacy arrangements and in 6% (4) of arrangements 'unfulfilled expectations or aims from a previous surrogacy' was reported. Three per cent (2) were motivated by 'payment', 3% (2) were motivated by a request from a surrogacy organisation, and in 3% (2) of arrangements the surrogate had not intended to undertake a further surrogacy arrangement but had met a couple and the strength of the resultant relationship had changed her mind. In 9% (6) of arrangements other motivations for multiple surrogacy arrangements were reported; for example, 'wanting to try both types of surrogacy' or 'knowing that no one else would help the couple'.

Psychological well-being

Total scores on the Rosenberg Self-Esteem Scale and the Beck Depression Inventory ii can be seen in [Table 6](#). Most surrogates scored within the average range for self-esteem and depression. No difference was observed in psychological wellbeing between genetic surrogates, gestational surrogates and surrogates who had completed both types of surrogacy arrangement in either their Beck Depression Inventory ii scores ($H[2] = 2.65$, $P = 2.64$) or their Rosenberg Self-Esteem Scale scores ($H[2] = 2.24$, $P = 0.33$).

Psychological health history

Twenty-nine per cent (10) of surrogates reported having experienced psychological health problems prior to becoming a surrogate. Of these, seven reported having been diagnosed with postnatal depression after the birth of an own child, and three reported having experienced depression related to other events.

Twenty-three per cent (8) of surrogates reported having experienced psychological health problems since becoming a surrogate. Of these, two reported a 3-month period of postnatal depression (one after the birth of an own child, and one after the birth of a child born through surrogacy) from which they had recovered by the time of data collection. One participant reported a diagnosis of anxiety after one surrogacy arrangement, which was no longer causing her concern at the time of data collection. One participant reported experiencing an episode of depression related to a life event (not surrogacy-related), from which she had recovered. One

Table 6 Surrogates' scores on RSES and BDI-ii.

	n (%)			
	Gestational	Genetic	Gestational and genetic	Total
RSES				
Above average	4 (29)	1 (9)	1 (17)	6 (19)
Average	10 (71)	10 (91)	4 (66)	24 (77)
Below average			1 (17)	1 (3)
BDI-ii				
Minimal	14 (100)	9 (82)	5 (83)	28 (90)
Mild		2 (18)		2 (6)
Moderate			1 (17)	1 (3)
Severe				0 (0)
Total	14	11	6	31

BDI-ii, Beck Depression Inventory – ii; RSES, Rosenberg's Self-Esteem Scale.

participant reported experiencing two episodes of depression after surrogacy arrangements (one of which she attributed to a life event unrelated to the surrogacy), but had not experienced a major depressive episode in the 5 years prior to data collection. Four of these five surrogates had gone on to complete further surrogacy arrangements after they had recovered.

One participant reported a diagnosis of postnatal depression after her most recent surrogacy, which she attributed to not being able to do further surrogacy arrangements, and was receiving treatment at the time of data collection. Two participants reported a diagnosis of depression for which they were receiving treatment at the time of data collection (one attributed her depression to a surrogacy experience and the other did not).

Discussion

This study aimed to investigate the long-term impact of surrogacy by examining the psychological health, long-term relationships and contact arrangements of surrogates who had completed a surrogacy arrangement approximately 7 years previously. The findings show that in most surrogacy arrangements surrogates remained in contact with the surrogacy families and reported positive relationships. The findings fail to lend support to concerns about the possible negative outcomes of sustaining relationships over the longer term, and suggest instead that, in most cases, arrangements for frequency and type of contact were reached and maintained at a level with which surrogates were comfortable.

Of those surrogates who had remained in contact, most had face-to-face contact with the surrogacy family, although the frequency of contact varied greatly. Surrogates remained in more frequent contact with mothers than with either children or fathers, adding some support to previous findings suggesting that it is the surrogate-mother relationship that is central to the surrogacy experience (MacCallum et al., 2003; Ragoné, 1994; Teman, 2010), although surrogates maintained positive relationships with most mothers, fathers and children. In some cases, however, surrogates maintained contact primarily through fathers (e.g. in cases in which the relationship with the father was stronger than the

relationship with the mother, or in cases in which the mother had died since the surrogacy occurred), and some surrogates and fathers maintained contact independently of the contact surrogates had with mothers (e.g. by text or email).

Since April 2010, same-sex couples in the UK have been eligible to apply for a Parental Order, the legal device whereby legal parenthood is transferred from the surrogate to the intended parents, allowing same-sex couples to become legal parents of children born through surrogacy. Although this study reported four cases of surrogacy for same-sex couples, the numbers were too small to form any conclusions about surrogates' experiences with same-sex couples, and how this might compare with heterosexual couples. It remains to be seen how relationships will be negotiated in this relatively new surrogacy triad and this area would be an interesting topic for future research. Similarly, this study also revealed surrogates to be carrying out surrogacy arrangements for single men. As yet, Parental Orders cannot be granted to single people, and is it important for future studies to evaluate the prevalence of these arrangements and the effects on those involved.

In most surrogacy arrangements, surrogates felt content with the level of contact they had with the surrogacy family. Within these surrogacy arrangements, a wide variety of contact arrangements were found consisting of varying frequencies and types of contact. In a number of arrangements the surrogate had no ongoing contact with the child and/or the couple, thus highlighting the myriad of ways ongoing contact and relationships can be negotiated in UK surrogacy arrangements to the apparent satisfaction of the surrogates involved. This process involves a careful balancing act between the expectations and contact requirements of all the parties involved: surrogate, mother, father, child, and, in some cases, the surrogate's own children (Jadva and Imrie, 2013), and can be renegotiated as time passes and relationships develop. Surrogates spoke about the natural fluctuations in the frequency of contact that occurred depending on changing circumstances and life events, which can cause disruptions in relationships (e.g. moving house, family illness or bereavement). Surrogates and surrogacy families seemed adept at managing these changes and finding contact arrangements that suited them, a finding supported by research following these relationships from the surrogacy family's perspective (Jadva

et al., 2012). That these changes were managed well and most relationships were viewed as positive and were enjoyed is perhaps partly due to the surrogacy process itself in the UK, in which no commercial brokers exist to mediate relationships, and trusting relationships may often develop between the surrogate and the couple (Braverman et al., 2012).

Concerns have been raised about the ability of surrogates to maintain contact with the child born through surrogacy, as it has been suggested that it may prove too difficult to be reminded about the child (Brazier et al., 1998). The findings of the present study suggest that these fears are unfounded as most surrogates remained in contact with the child and enjoyed the relationships they had. Surrogates did not view the child as their own child, supporting previous findings (Jadva et al., 2003; Ragoné, 1996; Roberts, 1998). Interestingly, the type of surrogacy was not associated with whether or not the surrogate maintained contact with the child, their frequency of contact with him or her, whether they were happy with their level of contact or whether they viewed the relationship as positive. These findings thereby challenge assumptions that surrogacy is more problematic in cases where the surrogate is genetically related to the child, and suggest instead that surrogates were able to manage this relationship in a satisfactory and often rewarding manner.

The type of surrogacy was only significantly associated with the frequency of contact with the child's parents, with surrogates in genetic surrogacy arrangements maintaining less frequent contact than those in gestational surrogacy arrangements, in addition to being less likely to feel a 'special bond' with the child. These findings could be interpreted as suggesting more emotional distance in relationships involving genetic surrogacy, but the results should be interpreted with caution as genetic surrogates were also no less likely to remain in contact or to report positive relationships or positive surrogacy experiences. This suggests that both types of surrogacy can be seen as positive experiences by surrogates over the long-term, albeit possibly managed slightly differently (see Jadva and Imrie, *in press*), for a more detailed account of how surrogates and their families negotiated their genetic and gestational relatedness to the child conceived through surrogacy). Furthermore, the finding that nearly three-quarters of surrogates who had completed multiple surrogacy arrangements had different contact arrangements with different surrogacy families, and were happy with the majority of them, suggests that arrangements may be determined more by the relationship with each individual family than by the type of surrogacy *per se*. Identifying the factors that enable the relationship to be managed to the satisfaction of all the parties involved is an important area for future investigation.

The present study is the first to examine a large number of surrogacy arrangements and to investigate surrogates' motivations for undertaking multiple surrogacy arrangements. The findings support Ragoné's (1994) claim that surrogates undertaking multiple surrogacy arrangements are primarily motivated by the desire to help a couple have a sibling for an existing child, partly to 'complete a family' and partly due to the established relationships and trust already existing between the surrogate and couple, as well as the motivation of 'wanting to help a childless couple' which has been previously established as a frequently stated motivation for first entering into surrogacy (Jadva et al., 2003; Ragoné, 1994).

A further motivation was also identified, that of having experienced a previous positive surrogacy arrangement and wanting to repeat the experience. It is perhaps unsurprising that this has been found to be a motivation for undertaking multiple surrogacy arrangements given that most arrangements in the present study were perceived by surrogates as successful and were viewed as positive experiences.

As the study was interested in the long-term experiences of surrogates the recruitment criteria for the study targeted surrogates who had completed a surrogacy arrangement approximately 7 years prior to interview. As some surrogates had completed multiple surrogacy arrangements it was decided to include data across all of the surrogacy arrangements rather than just the target surrogacy for which the surrogate was recruited, in order to give a more complete picture of the variation in contact arrangements. In doing so, this study highlights the variability with which surrogates in the UK manage their ongoing relationships with families created through surrogacy and suggests that this variance may be related to the unique surrogate-couple grouping that is formed, rather than to either the surrogate or the intended parents independently.

Most surrogates in this study showed no psychological health problems at the time of data collection as assessed by the questionnaire measures, adding some support to the finding that surrogates are psychologically resilient (Pizitz et al., 2013). In terms of surrogates' psychological health history, 10 participants reported having experienced depression in the time before they became surrogates. It is particularly interesting that seven out of the 10 women who had experienced postnatal depression had later gone on to have successful surrogacy arrangements (and six had no further signs of mental health problems), given that the screening process used by some US surrogacy agencies may consider an episode of depression as a criterion for rejection of a surrogacy candidate (American Society for Reproductive Medicine, 2012b). This finding challenges the assumption that women who have experienced postnatal depression cannot go on to have positive surrogacy experiences.

The study did raise some concerns about the psychological health problems experienced by a minority of surrogates in the time since giving birth to the child. It is important to note, however, that not all of the reported psychological health problems were attributed to surrogacy. Given the number of years that had passed since some participants first became surrogates, coupled with national prevalence rates for psychological health problems (The Office for National Statistics, 2001), it is perhaps unsurprising that psychological health problems were reported by some participants. Furthermore, several of the surrogates who reported diagnoses of psychological health problems recovered fully and went on to complete further successful surrogacy arrangements. More concerning, however, are the small number of cases in which surrogates directly attributed their psychological health problems either to some aspect of the surrogacy experience or to not being able to undertake further surrogacy arrangements. Although the number of cases in which surrogates reported psychological health problems associated with surrogacy was small, the possibility of surrogacy causing psychological problems merits further investigation to uncover the specific aspects of the surrogacy experience that may contribute to the presence of psychological health problems.

Given the scarcity of research on both surrogacy in general, and the changing international context of surrogacy, further research is urgently needed. Numbers of couples travelling abroad for surrogacy are thought to be increasing (Crawshaw et al., 2012), and little is known about the contact arrangements or relationships between surrogates and intended parents in cross-border surrogacy arrangements (Braverman et al., 2012). Given the differing procedures and legislation on surrogacy between countries in which surrogacy is legal, the current study's findings can only be interpreted in the context of UK-based surrogacy arrangements. Furthermore, most surrogacy arrangements examined in this study involved a surrogacy organisation, and although the extent of the organisation's involvement and support varied between surrogacy arrangements, it is possible that this involvement could have played a role in assisting surrogates and couples in building and maintaining relationships. It is not known what proportion of current surrogacy arrangements occur with and without the involvement of surrogacy organisations in the UK, or the effect of this for those involved, and this warrants further investigation. Furthermore, no data are currently available on the proportion of surrogates who undertake multiple surrogacy arrangements and this also merits further examination.

As some surrogates were lost to follow up, the current sample cannot necessarily be considered representative of the surrogates who carried out surrogacy arrangements in the UK within the timeframe of the study. Nor is it possible to determine how generalisable the findings are to other surrogacy arrangements completed in the period. Four surrogacy arrangements in the current sample were carried out outside of the timeframe for which published numbers of granted Parental Orders are available. A comparison of the total number of completed surrogacy arrangements in the current sample with the number of Parental Orders granted in a similar period (880 between 1995 and 2011 (Crawshaw et al., 2012)) suggests that around 11% of surrogacy arrangements during the period may be included in our sample. This estimate in fact ranges from 2–37% when each year is considered individually, although not all Parental Orders will have been granted in the same year that the child was born. Furthermore, not all of the surrogacy arrangements in our sample involved a Parental Order application. Concerns have been raised about the uncertainties of using the number of granted Parental Orders as an accurate representation of the number of surrogacy arrangements taking place in the UK (Crawshaw et al., 2012). Future studies using representative samples are much needed, although with the difficulties in monitoring the number of surrogacy arrangements taking place this may prove particularly challenging. Furthermore, this study examined the long-term impact of surrogacy. Surrogacy practice has changed dramatically in recent years, with a greater number of intended parents accessing surrogacy abroad and an increase in the number of surrogates and intended parents meeting online without the involvement of a surrogacy organisation. A more detailed examination of current surrogacy arrangements with a large representative sample is needed to evaluate the current practice of surrogacy in the UK.

As surrogacy can be portrayed as a particularly controversial method of assisted reproduction, a view that surrogates may well be aware of, it is difficult to rule out the

possibility of socially desirable responding. The interviews, however, lasted for up to 2.5 h, and involved detailed questions about many aspects of the surrogacy experience, a process that is designed to minimize socially desirable responding. Furthermore, some participants recounted negative experiences of surrogacy and many spoke about the aspects of surrogacy they had found challenging, suggesting an authenticity of responses and the willingness of participants to discuss all aspects of the surrogacy process. As surrogates were interviewed about the current state of their relationships and contact arrangements with surrogacy families, the risk of recall bias in most areas, apart from recollections of motivations for surrogacy, should be minimal. Although the sample size was relatively small, it is comparable with other studies using a similar methodology to study this hard-to-reach population (Baslington, 2002; Jadva et al., 2003; Ragoné, 1994). Furthermore, the current study examines a larger number of surrogacy arrangements than any other study, and thus provides new insights into how surrogates manage contact and relationship with surrogacy families over time and with multiple families. Moreover, all of the surrogates had given birth to children conceived through surrogacy, whereas some investigations report data from surrogate candidates, rather than those who have completed a surrogacy arrangement.

Conclusion

Overall, in the majority of surrogacy arrangements surrogates remained in contact with surrogacy families, and viewed most of the relationships formed through surrogacy as positive. The variety of contact arrangements maintained, and surrogates' high levels of satisfaction with the amount of contact they had with surrogacy families, suggests that, in most cases, the parties involved in UK surrogacy arrangements managed to negotiate this potentially problematic relationship with a high degree of success and create relationships that were sustained over time and enjoyed. The lack of significant differences in variables according to surrogacy type goes some way to challenging commonly held assumptions that genetic surrogacy is inherently more problematic, and more likely to fail, than gestational surrogacy. Instead, genetic and gestational surrogates generally reported positive experiences of surrogacy, suggesting that factors other than the presence or absence of a genetic link to the child are more important in determining the success and long-term outcomes of a surrogacy arrangement.

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Surrogate mothers 10 years on: a longitudinal study of psychological well-being and relationships with the parents and child

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STUDY QUESTION: How do the psychological health and experiences of surrogate mothers change from 1 year to 10 years following the birth of the surrogacy child?

SUMMARY ANSWER: The psychological well-being of surrogate mothers did not change 10 years following the birth, with all remaining positive about the surrogacy arrangement and the majority continuing to report good mental health.

WHAT IS KNOWN ALREADY: Studies have found that surrogates may find the weeks following the birth difficult, but do not experience psychological problems 6 months or 1 year later. Research has also shown that surrogates can form close relationships with the intended parents during the pregnancy which may continue after the birth.

STUDY DESIGN, SIZE, DURATION: This study used a prospective longitudinal design, in which 20 surrogates were seen at two time points: 1 year following the birth of the surrogacy child and 10 years later.

PARTICIPANTS/MATERIALS, SETTING, METHODS: The 20 surrogates (representing 59% of the original sample) participated in a semi-structured interview and completed self-report questionnaires. Eleven surrogates were gestational carriers and nine surrogates had used their own oocyte (genetic surrogacy). Four were previously known to the intended parents and 16 were previously not known.

MAIN RESULTS AND THE ROLE OF CHANCE: Ten years following the birth of the surrogacy child, surrogate mothers scored within the normal range for self-esteem and did not show signs of depression as measured by the Beck Depression Inventory. Marital quality remained positive over time. All surrogates reported that their expectations of their relationship with the intended parents had been either met or exceeded and most reported positive feelings towards the child. In terms of expectations for the future, most surrogates reported that they would like to maintain contact or would be available to the child if the child wished to contact them. None expressed regrets about their involvement in surrogacy.

LIMITATIONS, REASONS FOR CAUTION: The sample size of this study was small and the women may not be representative of all surrogates. Therefore the extent to which these findings can be generalized is not known.

WIDER IMPLICATIONS OF THE FINDINGS: Contrary to concerns about the potentially negative long-term effect of surrogacy, the findings suggest that surrogacy can be a positive experience for some women at least. These findings are important for policy and practice of surrogacy around the world.

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Key words: surrogacy / surrogate mother / psychological well-being

Introduction

Despite the concerns that have been raised about the long-term impact of surrogacy for surrogate mothers (Brazier *et al.*, 1998), there remains a

lack of empirical research in this area. Thus we do not know whether women come to regret being surrogates later in their lives, and for surrogates who maintain contact with the family as the child grows up, whether their relationships break down over time (Brazier *et al.*, 1998;

Golombok et al., 2004). Furthermore, the impact on the surrogate's psychological health and on relationships with members of her own family in the long-term are also unknown. Experiences may also be different for genetic surrogates (those who use their own oocyte for the surrogacy) compared with gestational surrogates (those who use the intended parents' gametes or donor gametes) or between known surrogates (family members and friends of the intended parents) and unknown surrogates (those who met the intended parents for the purpose of the surrogacy).

Most research carried out with surrogates has focused on their motivations. Studies have largely found that the majority of surrogates are primarily motivated by a wish to help a childless couple, with few mentioning financial motives; this finding has been found in both the UK, where only altruistic surrogacy is permitted (Blyth, 1994; Jadva et al., 2003; Van den Akker, 2003), and in the US, where commercial surrogacy is practised (Ragoné, 1994; Hohman and Hagan, 2001). In terms of psychological well-being, some surrogates have been found to report minor difficulties in the weeks following the birth. However, these appear to lessen over time (Jadva et al., 2003). Studies have shown that the majority of surrogates do not experience psychological problems either 6 months (Van den Akker, 2005) or 1 year (Jadva et al., 2003) following the birth. Studies examining the relationship between surrogates and the intended couple have found that surrogates can place a great deal of importance on this relationship which can determine how they perceive their surrogacy experience (Ciccarelli and Beckman, 2005). In the longer term, the satisfaction of surrogates with the surrogacy arrangement may similarly depend on the relationship with the intended couple with less frequent contact being associated with less satisfaction (Ciccarelli, 1997; Ciccarelli and Beckman, 2005). Whether or not contact is maintained may also be an important factor for the child and intended parents: whilst ongoing contact may help the child form a clearer understanding of their origins, it may also undermine the intended mother's role as a parent (Brazier et al., 1998; Golombok, 2004). Children born as a result of surrogacy (referred to in this paper as surrogacy children) and who are aware of their birth, have been found to have a good understanding of surrogacy by the age of 10 years, with those who were in contact with their surrogate reporting that they liked her (Jadva et al., 2012). The majority of surrogates believe either that the resultant child should be told about their surrogacy birth, or that this decision should be up to the intended parents and not that the child should not be told (Braverman and Corson, 2002; Blyth 1994; Jadva et al., 2003). Most intended parents tell their child about their birth using surrogacy by the age of 10 years, although not all parents who use genetic surrogacy mention the use of the surrogate's oocyte (Jadva et al., 2012). Thus it appears that parents may be more comfortable disclosing the absence of a gestational connection to their child than a genetic one.

The adoption literature can provide a useful framework for examining surrogacy. Research on openness in adoptive families has shown that contact between the birth mother and the adopted child can be positive for birth mothers by reassuring them about their child's well-being (Grotevant and McRoy, 1998; Henney et al., 2004). Whilst adoption theory can guide the study of surrogacy, it is important to remember that the two are not directly comparable. With adoption, the birth mother makes the decision to relinquish the child after she becomes pregnant whereas with surrogacy this decision is made before pregnancy is achieved. Indeed, the finding that birth mothers often feel a sense of

loss, sadness and guilt after relinquishment (Kelly, 2009) has not been replicated in studies of surrogate mothers. Also, with gestational surrogacy, the surrogate has no genetic relationship to the child and therefore may not feel that she has lost a part of herself. It is unknown whether in the longer term surrogates (particularly those who are the genetic parent of the child) feel a sense of loss similar to that of birth mothers who have given up their child for adoption and, if so, whether such feelings lead to increased levels of depression and anxiety similar to those observed in women who have experienced loss through adoption. It might be expected that surrogates who are genetically related to the child may experience a greater sense of loss compared with gestational surrogates.

In 2003, Jadva et al. carried out a study of the experiences of surrogacy in a sample of 34 surrogates who were interviewed approximately 1 year following the birth of the surrogacy child. The study found that the main motivation for women to become surrogates was to help a couple who were unable to become parents. The majority of surrogates reported having positive relationships with the intended couple throughout the pregnancy and many maintained contact with them and the child at the time of the interview. i.e. when the child was aged 1 year. In response to being asked how they felt towards the surrogacy child, just over half of the surrogates reported that they had no feelings towards the child, with the remainder reporting feeling that the child was special to them. However none felt that the child was 'their own'. There was no difference in feelings towards the child between genetic and gestational surrogates, however surrogates who were previously known to the intended parents, that is, either a family member or friend, were more likely to feel a special bond towards the child compared with surrogates who were previously unknown and had met the intended couple specifically for the purpose of surrogacy. One year after handing over the child to the intended parents, the large majority of surrogates were not experiencing psychological problems.

The current study re-visited the surrogates from the original study. This investigation is the first to prospectively examine the experiences of surrogacy and the psychological health of surrogate mothers longitudinally over a 10-year period.

Materials and Methods

The original sample of surrogates was recruited in two ways. Firstly, 19 women had acted as surrogates 1 year previously for intended parents who were participating in a longitudinal study of families created using surrogacy and secondly, 15 women were recruited through a surrogacy support organization called Childlessness Overcome Through Surrogacy (COTS). All surrogate mothers who were registered with COTS and had given birth to a baby ~1 year previously were asked to participate in the original study. There was some overlap between the two recruitment methods, which meant that an exact response rate was difficult to calculate. However, it was estimated that 68% of those approached by the intended parents agreed to take part and a response rate of 76% was obtained for those recruited through COTS.

From the original sample of 34 surrogates (Jadva et al., 2003), 20 surrogates took part in this follow-up, representing a response rate of 59% of the original sample. Of the 14 who did not take part, 12 could not be contacted and 2 declined to participate. In order to examine if any differences existed between those who took part at phase 2 and those who did not, comparisons were carried out between these two groups for the variables of interest in this study. No differences were found for any of the variables, including type of surrogacy undertaken, psychological well-being, relationship and contact

with the surrogacy family and feelings towards the child. Demographic information for the sample is shown in Table I. The majority of surrogates had carried out subsequent surrogacy arrangements during the 10-year period. In order to examine changes over time, the data presented here relate to the same surrogacy child about whom surrogates were interviewed in the 2003 study. Data on all the surrogacy arrangements carried out by these surrogates and for an additional sample of surrogates who had carried out surrogacy arrangements at a similar time are presented elsewhere (Imrie and Jadv, 2014).

The surrogates were interviewed at home using in-depth semi-structured interviews. The interviews were digitally recorded and later transcribed. Interviews were rated using the standardized coding criteria used in the original study. The original codes were adapted from a study of intended parents carried out by the same research team (MacCallum et al., 2003). Details of the codes are provided below. One-third of the interviews were rated by a second coder by listening to the audio recordings of the interviews. Interrater reliability between the two coders ranged from 0.40 to 1.0 with a mean Kappa of 0.80. Surrogates were also asked to complete a booklet of questionnaires which assessed psychological health and marital quality.

Table I Demographic information for all surrogates (N = 20) who took part in Phase I and Phase II.

	Phase I		Phase II	
	X	SD	X	SD
Age of surrogate (years)	34 ± 6		43 ± 6	
	<i>n</i>	%	<i>n</i>	%
Own children				
Yes	19	95	19	95
No	1	5	1	5
Marital status				
Married/cohabiting	14	70	11	55
Non-cohabiting partner	3	15	3	15
Single	1	5	1	5
Divorced/separated	2	10	5	25
Social class				
Professional/managerial	1	5	6	30
Skilled non-manual	7	35	7	35
Skilled manual	6	30	4	20
Partly skilled/unskilled	6	30	3	15
Surrogate working status				
No	9	45	8	40
Part-time	8	40	7	35
Full time	3	15	5	25
No. of surrogacy births				
1–2	18	90	9	45
3–5	2	10	7	35
6+	0	0	4	20
Type of surrogacy				
Genetic (traditional)	9	45		
Gestational	11	55		
Known surrogate	4	20		
Unknown surrogate	16	80		

Ethical approval for this study was obtained from the Cambridge University Psychology Research Ethics committee.

Measures

Psychological well-being

Surrogates completed the Rosenberg Self-Esteem Scale (RSES: Rosenberg, 1965), a widely used measure of global self-esteem. Internal consistency for the RSES was reported to be 0.92 (Rosenberg, 1979). Surrogates also completed the Beck Depression Inventory-II (BDI-ii) (Beck and Steer, 1987) which has been found to show high internal consistency (Cronbach α of 0.93 in college students and 0.92 in outpatients) (Beck et al., 1996). In addition, those surrogates who had a cohabiting partner completed the Golombok Rust Inventory of Marital State (GRIMS) (Rust et al., 1990). The GRIMS is a valid and reliable measure of the quality of a couple's marital or cohabitating relationship with higher scores indicating poorer relationship quality. The scale has good reliability with internal consistency of 0.90 for women and 0.92 for men. In terms of validity, the GRIMS has been shown to discriminate between couples who are about to separate and those who are not.

Relationship and contact with the parents and the child

Surrogates were asked in detail about their relationship with each member of the surrogacy family. Data were obtained on the surrogate's frequency of contact with the mother, the father and the surrogacy child coded as '> 1 x week', '1 x week – 1 x month', '1 x month – 1 x 3 months', '1 or 2 times a year' or 'not at all'. In addition, surrogates were asked about the nature of their relationship with the parents and the child. Their responses were coded according to the following categories: 'negative', 'neutral/ambivalent' or 'positive'. 'Negative' was coded when there was evidence of arguments or a breakdown in communication, 'neutral/ambivalent' was coded for a relationship that was described as unproblematic but with a sense of emotional distance, and 'positive' was coded when the surrogate described a warm or friendly relationship. Surrogates were asked if their relationship with the intended couple and child had changed over the years and if so, in what way. Responses were coded as either 'negative change' or 'positive change'.

Feelings towards the child and the child's awareness of surrogacy

The surrogate was asked how she viewed the relationship between herself and the surrogacy child. This information was coded according to one of three categories: 'no special bond' (coded when the surrogate reported that she had no feelings towards the child); 'special bond' (coded when the surrogate reported that the child was special to her) and 'like own child' (coded when the surrogate saw the child as her own). Information was also obtained on whether the child was aware of their birth using surrogacy. Responses were coded as 'told', 'not told' and 'do not know'.

Expectations for the future

Surrogates were asked about their hopes and expectations for their future relationship with the child. These responses were transcribed and later coded into themes based on the responses given.

Data analysis

Data from phase II were examined to assess the impact of surrogacy 10 years following the birth of the child. Comparisons were carried out between surrogates who had undergone genetic surrogacy and those who had undergone gestational surrogacy to assess differences between the type of surrogacy involved using t-tests, Fishers Exact or Chi-square analyses. In order to examine changes over time, data from surrogates at Phase I (1 year following the birth of the surrogacy child) were compared with findings at Phase II

(10 years following the birth of the surrogacy child), t-tests were carried out to examine changes in marital quality and non-parametric Friedman tests were conducted to examine changes in the frequency of contact with the surrogacy family. Where appropriate, the interview transcripts have been used to help illustrate the quantitative findings.

Results

The psychological health and relationship quality of surrogates

At phase II, the average score for the 18 surrogates who completed the RSES was 23.6 which was at the upper end of the normal range for self-esteem (i.e. between 15 and 25). Looking at the individual scores, none of the surrogates scored below the normal range for self-esteem (i.e. below 15) and six scored above the normal range (25+) indicating higher than average self-esteem. The mean score for the 18 surrogates who completed the Beck Depression Inventory was 3.8, indicating no signs of depression. Examination of the individual scores showed that one surrogate scored within the range for mild depression with the remainder showing no signs of depression. Three surrogates had been prescribed stimulants/sedatives since Phase I. Two of these women were on medication at the time of the interview and one had taken antidepressants following the birth of her own child, but was no longer on medication.

The GRIMS questionnaire for the 12 surrogates who were in a relationship at both time points, yielded a mean score at Phase I of 22.6 and at Phase II of 20.16. This difference was not significant. The raw scores were converted to standardized GRIMS scores which range from 1 to 9, with higher scores indicating poorer relationship quality. The mean standardized score was 3 which corresponded to a good relationship. Looking at the standardized scores individually, all women obtained an average or above average score for relationship quality.

Frequency of contact with the parents and the child

Three mothers had died since Phase I. The majority of surrogates remained in contact with the mother (15, 75%), the father (16, 80%) and the surrogacy child (15, 75%). Contact was predominately maintained face-to-face. Thirteen surrogates (65%) reported face-to-face contact with the mother, 14 (70%) with the father and 15 (74%) with the child.

The frequency of contact with the surrogacy family at both time points can be seen in Table II. A significant difference was found for surrogates contact with the surrogacy child ($\chi^2(1) = 4.57, P < 0.05$), with less frequent contact at age 10 compared with age 1. No differences were found for the frequency of contact with mothers. Contact with fathers approached significance ($\chi^2(1) = 3.27, P = 0.07$), indicating less frequent contact at Phase II in comparison to Phase I.

At Phase I, two (10%) surrogates reported that they felt that the level of contact with the child was insufficient, with the majority being happy with their level of contact. At Phase II, two (10%) (different) surrogates reported that their level of contact with the child was insufficient. The remaining surrogates were happy with their level of contact with the child.

Table II Frequency of contact between surrogate and mother, father and surrogacy child.

	Phase I		Phase II	
	n	%	n	%
Frequency of contact with mother				
> 1 × week	5	25	2	10
1 × week – 1 × month	3	15	4	20
1 × month – 1 × 3 months	5	25	5	25
1 or 2 times a year	3	15	4	20
Not at all	4	20	2	10
Not applicable ^a	0	0	3	15
Total	20	100	20	100
Frequency of contact with father				
> 1 × week	2	10	0	0
1 × week – 1 × month	4	20	3	15
1 × month – 1 × 3 months	7	35	3	15
1 or 2 times a year	2	10	10	50
Not at all	5	25	4	20
Total	20	100	20	100
Frequency of contact with surrogacy child				
> 1 × week	5	25	1	5
1 × week – 1 × month	3	15	4	20
1 × month – 1 × 3 months	5	25	4	20
1 or 2 times a year	2	10	6	30
Not at all	5	25	5	25
Total	20	100	20	100

^aMother died since Phase I.

Relationship with the parents and child

Of the 15 surrogates who were in contact with the mother, 14 (93%) reported a positive relationships with her, and one (7%) reported that she had 'no relationship' with the mother. This mother maintained contact via letters once or twice a year. Eight (53%) surrogates stated that their relationship with the mother had changed over the years and all stated this change to be positive. Of the 16 surrogates who were in contact with the father, 15 (94%) reported a positive relationship with him and one (6%) (the same surrogate who reported no relationship with the mother) reported 'no relationship'. Seven (44%) reported that their relationship with the father had changed over time, and again all viewed this change as positive.

An example of a change in the relationship with the couple included:

Well because, you know, at the start, [...] it's always at the back of a couple's mind that you might change your mind and keep the baby, and also, when you're carrying the baby, you're still getting to know them. But you know, once I've given the baby up, it's, they're, it's like a different mask, their whole demeanour, it relaxes, and 'oh my god, we've got our son' and 'thanks [surrogate]', 'you're great', and so it's lighter, a lighter feel to the relationship, because there's no worries there anymore.

Another surrogate said:

... when I was being a surrogate for them we were very close and, you know, used to go out for dinner and talk on the phone several times a week so yeah it has changed, but I think for the better because I think it's better for the child.

Of the 15 surrogates who were in contact with the child, 14 (93%) reported positive relationships and one (7%) reported 'no relationship' (this surrogate, although in some contact with the child, did not see herself as having a relationship with him). Three (20%) reported that there had been a change in the relationship with the child; all three stated this change to be positive and most reflected age related changes, for example, 'I would say it's probably got a little bit closer the older she's got...'

Feelings towards the child and the child's awareness of surrogacy

Feelings towards the child remained relatively stable over time. At Phase I, twelve (60%) surrogates reported feeling no special bond to the surrogacy child. Nine of these surrogates, continued to feel no special bond 10 years later and the remaining three reported a special bond. Eight (40%) surrogates had reported feeling a special bond at age 1, six of whom continued to feel a special bond 10 years later and two reported no special bond. There was an association between type of surrogacy and whether or not surrogates felt a special bond to the child at phase II (Fisher's exact = 0.018). The majority (8 of 11) of gestational surrogates reported feeling a special bond towards the surrogacy child compared with most of the genetic surrogates (8 of 9) who reported feeling no special bond. Comparisons between known and unknown surrogates revealed no differences in their feelings towards the child. None of the surrogates reported feeling that the child was their own.

An example of a special bond included:

... to think that I was part of the reason she's here and I just think she's, you know, she'll always be really special, um, and just always a big part of what I did in my life.

An example of no special bond included:

... I don't feel for my surrogate children like I feel for my own. So, when we're on the phone and we have a little chat it's just a little friendly chat.

At Phase I, 17 (85%) surrogates had felt that the child should be told about the surrogacy. At phase II, 9 of these 17 surrogates reported that the child had been told, three said that the child had not been told and five surrogates did not know.

Expectations for the future

All 20 surrogates reported that their expectations of their relationship with the parents had either been met or exceeded. In terms of the future, 11 (55%) surrogates reported that they would like to have contact with the parents and/or the child. For example:

... hopefully if they just keep in contact or text some way along the line I'd like that...

Six (30%) surrogates mentioned being there for the parents and/or child if needed. For example:

... they know that I'm always here, they've got my number if they ever need me, if they ever need anything...

... I don't expect to have any relationship with him, if he came knocking on my door and wanted questions answered and was just curious, you know, he'd be welcome.

Discussion

This study enabled, for the first time, a prospective longitudinal examination of surrogates' well-being 10 years following the birth of the surrogate child. Contrary to the difficulties that had been expected for surrogates in the long-term, the majority of surrogates in this sample did not experience psychological problems in the decade following the birth of the surrogacy child. Indeed, these findings suggest that overall, surrogates report positive well-being as demonstrated by their high self-esteem, their lack of signs of depression and their good or above average relationship quality with their husbands/partners.

In most cases, surrogates maintained contact with the parents and the child. The frequency of contact with the parents did not change significantly over time. However it had lessened significantly with the child, with one quarter of the surrogates who took part in this phase having no contact with the child 10 years on. A great deal of variability was found in the frequency of contact that surrogates maintained with the parents and the child, and contrary to other findings (Ciccarelli, 1997), this was not related to how surrogates viewed their relationship with the parents and child. That is, nearly all surrogates reported positive relationships irrespective of the frequency of contact that they maintained. This is a similar finding to that found in a parallel longitudinal study of surrogacy families by the same research team. In the follow-up at age 10, the frequency of contact reported by mothers, fathers and the surrogacy child did not affect their relationship with the surrogate (Jadva *et al.*, 2012). Thus the amount of contact between the surrogate and the family she helped create does not appear to be associated with how those involved feel towards each other or towards the surrogacy process. Surrogates in this study felt positive about the child and the vast majority either wanted to continue contact or would be happy for the child to contact them in the future if they wished to do so. This finding could have important policy implications, as it would suggest that even those surrogates who have no contact with the parents and child may be willing to meet the child if the child wished this in the future. Of course, the extent to which children born using surrogacy feel the need to maintain contact, or to seek out their surrogate in cases where there is no contact, is not as yet known. Studies of surrogacy children are required to establish whether they wish to meet their surrogate and whether this differs for those born using genetic and gestational surrogacy. In the longitudinal study of surrogacy families mentioned above, most children at age 10 years felt either neutral or indifferent about their surrogacy birth (Jadva *et al.*, 2012). However, the children were still relatively young, and their understanding of surrogacy may have been heavily influenced by the narratives used by their parents when explaining surrogacy to them. In addition, some children born using genetic surrogacy were unaware of their biological link to the surrogate. It is important to understand how children feel about surrogacy and towards the surrogate as they grow older and are able to form and express their own opinions about their birth.

Gestational surrogates in the present study were more likely than genetic surrogates to feel a special bond to the child. This is contrary

to the finding from the original study which found no differences between genetic and gestational surrogates in their feeling towards the child. A possible explanation for this discrepancy is that genetic surrogates may be more likely to distance themselves from the child emotionally either because they do not wish to interfere with the surrogacy family or because they want to create a clearer boundary between their own children and the surrogacy child. Jadva et al. (2012) found that genetic surrogates who were previously unknown to the intended parents were the least likely to maintain contact with the surrogacy family in the 10 years following the birth of the child as reported by intended parents. The current findings show that genetic surrogates are also less likely to feel a special bond to the surrogacy child which could help explain why they are more likely to lose contact with the surrogacy family over time.

Limitations of this study are the small sample size and the loss of some surrogates from the original study. However, rather than actively withdrawing, the main reason for non-participation was that the surrogate had moved home and the research team was unable to make contact. Although surrogates who did not take part in this follow-up study may have had different experiences to those who did, comparisons between these two groups showed no differences in terms of their psychological well-being and experiences of surrogacy at age 1 year, suggesting there were no systematic biases.

One-third of the interviews were coded by a second coder. Only one variable which related to frequency of contact with the father yielded a low Kappa value of 0.4. The type of contact can be difficult to classify as contact may be sporadic. However, the discrepancy was never more than one point apart. Moreover, the same rating scale for contact with the mother and the child produced high kappa values of 0.86 and 1.0, respectively, suggesting the scale itself is a reliable measure.

The extent to which the findings from this study, where the surrogacy arrangement was carried out 10 years previously, can be extrapolated to surrogacy arrangements that are being carried out currently is unclear. Whilst legislation on surrogacy in the UK has largely remained the same, the social acceptance and visibility of surrogacy has increased. Indeed, some of the surrogates who had carried out subsequent surrogacy arrangements reported that surrogacy is easier now than it was 10 years ago, with some attributing this to surrogacy being more widely accepted, and there being more support available to surrogates. It is also unclear to what extent the findings from this study can be generalized to surrogates from other countries. The surrogacy arrangements reported in this study had all been for British intended parents. It has been suggested that surrogacy arrangements based on altruism rather than financial gain may be less likely to breakdown (Brazier et al., 1998) and it is possible that altruistic arrangements could lead to more beneficial outcomes in the longer term for all parties involved. However, more studies of the long-term impact of surrogacy in commercial settings would be required to fully assess this issue. In addition, with the greater increase in people going abroad for surrogacy, leading to intended parents and surrogates living in different countries, the impact on those involved is not known.

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Authors' roles

All authors contributed to the acquisition and interpretation of data for this study. V.J. drafted this manuscript and S.I. and S.G. contributed to its revision and approved the final version for publication.

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Conflict of interest

None declared.

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The role of age of disclosure of biological origins in the psychological wellbeing of adolescents conceived by reproductive donation: a longitudinal study from age 1 to age 14

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Background: The question of whether children should be told of their biological origins is one of the most controversial issues regarding the birth of children through donated eggs, sperm, embryos or surrogacy. **Methods:** In the sixth phase of this longitudinal study when the children were aged 14 years, family relationships and adolescent adjustment were examined in 87 families created through reproductive donation and 54 natural conception families. The quality of family relationships was assessed by standardised interview with mothers and by standardised questionnaires and an observational measure with mothers and adolescents. Adolescent adjustment was assessed using standardised questionnaires. Systematic information on whether and when parents had told children about their biological origins was obtained at earlier phases of the study. **Results:** There were no overall differences between disclosing families and either nondisclosing or natural conception families. However, within the disclosing families, more positive family relationships and higher levels of adolescent wellbeing were found for adolescents who had been told about their biological origins before age 7. **Conclusions:** The earlier children born through reproductive donation are told about their biological origins, the more positive are the outcomes in terms of the quality of family relationships and psychological wellbeing at adolescence. **Keywords:** Egg donation; donor insemination; surrogacy; disclosure; adolescence.

Introduction

The question of whether children should be told about their biological origins remains one of the most controversial issues in the practice of reproductive donation, the collective term used to refer to the donation of eggs, sperm or embryos or the hosting of a pregnancy for another woman (surrogacy) (Richards, Pennings, & Appleby, 2012). As a result of these procedures, children may lack a genetic and/or gestational connection to one or both of their parents. Although it is argued by some that children have a right to know their biological origins for both medical and psychological reasons, others believe that this is a private family matter that should be left to parents to decide (Nuffield Council on Bioethics, 2013). Based on research on adoption (Brodzinsky, 2006, 2011) and the family therapy literature (Imber-Black, 1998; Papp, 1993) as well as reports from donor-conceived individuals themselves (Turner & Coyle, 2000), there has been a growing shift in opinion towards the view that children born through reproductive donation should be informed of their biological origins.

This change in attitude towards greater openness has resulted in the removal of donor anonymity in some countries so that children born following the introduction of such legislation, and who are aware of their donor conception, may request the identity of their donor on reaching adulthood (Glennon, 2016).

In addition, professional guidelines in several countries including the United States and the United Kingdom support the early disclosure of biological origins to children born through reproductive donation (American Society for Reproductive Medicine, 2013; Nuffield Council on Bioethics, 2013).

In spite of these changes to policy and practice, it remains the case that many parents decide against disclosing the use of donor conception to their children (Tallandini, Zanchettin, Gronchi, & Morsan, 2016). Studies on heterosexual parents' reasons for nondisclosure have shown that they were concerned about jeopardising the positive relationship that had developed between the nongenetic parent and the child and also did not know what, how or when to disclose (Cook, Golombok, Bish, & Murray, 1995; Readings, Blake, Casey, Jadva, & Golombok, 2011). In addition, they were reluctant to disclose their infertility and the involvement of a third party in the birth of their child. Some parents regretted not telling their children but felt that they had left it too late. This is important as there is a growing body of research indicating that the age at which children discover that they were born through donor insemination influences how they feel about the circumstances of their birth, with those who find out later being more likely to experience psychological distress (Jadva, Freeman, Kramer, & Golombok, 2009; Turner & Coyle, 2000). However, these findings are based on retrospective reports of unrepresentative samples, and many of the participants were adults

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who had not found out about their donor conception until adolescence or beyond.

A major advantage of prospective research on child development is that it enables the impact of a specific event in time to be investigated and allows causal inferences to be made (Robins & Rutter, 1990). The aim of the present study was to investigate the psychological consequences of disclosure to children of their biological origins and of the age at which disclosure took place (Golombok, Lycett, et al., 2004; Golombok, Murray, Jadva, MacCallum, & Lycett, 2004). To this end, systematic information was collected at six time-points (ages 1, 2, 3, 7, 10 and 14) on whether or not parents had disclosed the nature of their conception to their child and, if so, the child's age at the time of the initial disclosure.

Research on children's developing understanding of biological inheritance has shown that children have an implicit understanding of biological inheritance of physical characteristics by age 4 but it is not until age 7 that they are able to explain this concept and understand the role of genetic mechanisms (Gregg, Solomon, Johnson, Zaitchik, & Carey, 1996; Williams & Smith, 2010). Related to the concept of inheritance, children's development of a biological concept of family emerges at age 7 but an understanding of degrees of biological relatedness is not apparent in the majority of children until age 14 (Richards, 2000; Williams & Smith, 2010). Similar developmental trends have been found in relation to adoption. Although 3-year-old children can label themselves as adopted it is not until around 6–7 years that they acquire an understanding of the meaning and implications of adoption, with a more sophisticated understanding developing at adolescence (Brodzinsky, 2011; Brodzinsky & Pinderhughes, 2002). Theoretical approaches to the understanding of adoption emphasise the importance of openness about adoption for positive family relationships and children's psychological wellbeing, especially at adolescence when adolescents need to integrate being adopted into their developing sense of identity (Brodzinsky, 2006; Grotevant, Perry, & McRoy, 2005; Grotevant & Von Korff, 2011).

To the extent that children born through reproductive donation benefit from openness about their origins in the same way as do adopted children (Brodzinsky, 2006; Cahn, 2009; Feast, 2003; Grotevant et al., 2005), less positive mother–child relationships and greater difficulties in child adjustment were hypothesised in the present phase of the study when the children were aged 14 years for families in which children had not been told about their biological origins compared with donor conception families in which children had been told and the comparison group of natural conception families. Furthermore, based on studies showing that the earlier children are informed about their adoption, the better the outcomes in terms of their psychological adjustment and relationships with parents (Brodzinsky &

Pinderhughes, 2002; Brodzinsky 2011), it was predicted that adolescents born through reproductive donation who had been told about their biological origins at a young age would show lower levels of emotional and behavioural problems and more positive relationships with their mothers than those told when older. More specifically, it was hypothesised from research on children's developing understanding of inheritance that adolescents who had been told by age 7 would show more positive mother–child relationships and lower levels of adjustment difficulties than those told later, and that those whose parents had started the process of telling by age 3 would show more positive mother–child relationships and lower levels of adjustment problems than those told between age 4 and age 6. Children told at an earlier age have the opportunity to gradually assimilate increasingly complex information about their origins according to their stage of sociocognitive development. In addition, it was hypothesised that the association between age of disclosure and adolescents' psychological adjustment would be influenced by the quality of family relationships. In particular, based on the finding that openness about adoption is associated with more positive family relationships and more positive adolescent outcomes (Brodzinsky, 2006; Grotevant et al., 2005; Grotevant & Von Korff, 2011), it was predicted that earlier disclosure would be associated with adolescents' perceptions of more positive family relationships which, in turn, would be associated with greater psychological wellbeing.

Methods

Participants

At the previous phase of the study when the children were aged 10 years, parents were asked for permission to contact them again for follow-up (see Golombok, Lycett, et al., 2004; Golombok, Murray, et al., 2004 for details of the initial recruitment procedures). Those who agreed were approached close to the child's 14th birthday. The present phase involved 87 families with a child born through reproductive donation (32 families with a child born through donor insemination, 27 families with a child born through egg donation and 28 families with a child born through surrogacy), and a comparison group of 54 families with a naturally conceived child, representing 92% of families seen when the children were aged 10 years. Of the surrogacy families, 10 (35.7%) mothers were genetically related to their children as they had used their own eggs to create the pregnancy and 18 (64.3%) lacked a genetic connection as the surrogates' eggs were used.

The families were categorised into three family types: 31 nondisclosing families; 56 disclosing families and the comparison group of 54 natural conception families. Within the disclosing families, 21 (37%) sets of parents had disclosed by age 3, 25 (45%) had disclosed between ages 4 and 6, and 10 (18%) had disclosed between ages 7 and 14. Data were obtained from all of the mothers in these families. There was no significant difference in age at disclosure between the different types of reproductive donation family, although there was a nonsignificant trend towards earlier disclosure in the surrogacy families. For ethical reasons, it was not possible to

obtain data from adolescents who had not been informed of the method of their conception. Thus, all of the naturally conceived adolescents and only those adolescents born through reproductive donation who were aware of the method of their conception were asked to participate. Of the 56 adolescents born through reproductive donation who were invited to participate, 50 (89%) agreed to take part (24 surrogacy adolescents, 16 egg donation adolescents and 10 donor insemination adolescents) and of the 54 natural conception adolescents who were invited to participate, 52 (96%) agreed to take part.

As shown in Table 1, there were no differences between family types in the age or gender of the children. A one-way analysis of variance (ANOVA) showed that the age of the mothers differed significantly between family types, $F(2, 138) = 7.76, p < .001$, reflecting the older age of the reproductive donation than natural conception mothers. There was also a significant difference between family types for number of siblings in the family, $\chi^2(4) = 22.62, p < .001$, with a greater number of siblings in natural conception than reproductive donation families. There were no differences between family types for the ethnicity or marital status of the mothers. However, the family types differed in the mothers' educational level, $\chi^2(2) = 16.06, p < .001$, reflecting a higher proportion of reproductive donation mothers with a university degree. As the demographic variables that differed significantly between family types were not correlated with the dependent variables, these were not entered into further analyses as covariates.

Procedure

A psychologist trained in the study techniques visited the families at home. Written informed consent to participate in the investigation was obtained from the mother. Mothers and adolescents also gave written informed consent for the adolescents to participate. Ethical approval for the study was granted by the University of Cambridge Psychology Research Ethics Committee. The mothers were administered a digitally audio-recorded standardised interview. In addition, the mothers and adolescents completed standardised questionnaires and participated together in a video-recorded observational task.

Measures

Quality of parenting. Interview with mother: The mothers were interviewed using an adaptation of a semistructured interview designed to assess the quality of parenting that has been validated against observational ratings of mother-child relationships in the home (Quinton & Rutter, 1988) and has been used successfully in previous studies of assisted reproduction families (Golombok, Lycett, et al., 2004; Golombok, Murray, et al., 2004). Detailed accounts are obtained of the child's behaviour and the mother's response to it, with particular reference to interactions relating to warmth and control. Examples of questions are: Do you find it easy to be affectionate with (child)? In what ways would you show affection to each other? Does s/he tell you what's bothering her/him or how s/he is feeling? How do you comfort or encourage him/her? Is there any arguing or bad feeling between you? How often does this happen? Do you shout or discuss the issue calmly? How does it end? A flexible style of questioning is used to elicit sufficient information for each variable to be rated by the interviewer using a standardised coding scheme based upon a detailed coding manual. Thus, ratings are carried out by the interviewers using in-depth information obtained from mothers rather than by the mothers themselves. Some variables are derived from frequency data, such as the frequency of conflict, and the ratings are based on the mother's responses to specific questions. Other variables, such as expressed warmth, are based on information gathered throughout the entire interview and take account of factors such as body language in addition to the content of what is said.

The following variables were coded: expressed warmth from 1 (little) to 5 (high expressed warmth) took account of the mother's tone of voice, facial expressions and gestures in addition to what the mother said about the child; sensitive responding from 1 (low) to 4 (high) represented the mother's ability to recognise and respond appropriately to her child's needs; quality of interaction from 1 (low) to 4 (very high) was based on the extent to which the mother and child enjoyed each other's company; frequency of battles from 0 (never/rarely) to 5 (a few times daily) assessed the frequency of mother-child conflict; level of battles from 0 (none) to 3 (major)

Table 1 Means, SDs and *F* values for comparisons between the demographic characteristics of the disclosing, nondisclosing and natural conception families

	Natural conception		Disclosing		Nondisclosing		<i>F</i>	<i>p</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>		
Mother's age (years)	48.28	2.74	51.30	5.1	51.19	5.22	7.76	<.001
Child's age (months)	169.17	4.24	167.52	6.21	167.64	5.10	1.61	.204
	<i>n</i> (%)		<i>n</i> (%)		<i>n</i> (%)		χ^2	<i>p</i>
Number of siblings								
0	4 (7)		27 (48)		9 (29)		11.62	<.001
1	41 (76)		23 (41)		18 (58)			
2+	9 (17)		6 (11)		4 (13)			
Child's gender								
Male	25 (46)		26 (46)		19 (61)		2.16	.345
Female	29 (54)		30 (54)		12 (39)			
Mother's education								
No university degree	18 (35)		39 (74)		14 (54)		16.06	<.001
University degree	34 (65)		14 (26)		12 (46)			
Mother's ethnicity								
White	47 (90)		50 (94)		24 (92)		0.58	.752
Not White	3 (19)		3 (6)		2 (8)			
Marital status								
Married/cohabitating	48 (89)		44 (80)		24 (80)		1.89	.394
Separated/divorced	6 (11)		11 (20)		6 (20)			

assessed the severity of mother–child conflict; and resolution from 0 (full resolution) to 3 (no resolution) assessed the attempt made to resolve the conflict. To establish interrater reliability, 47 interviews randomly selected equally across all family types, representing approximately one third of the families, were coded by a second interviewer. The interviewers were trained in the coding procedure by a researcher who was highly experienced in the coding of this interview (VJ). Training involved the rating of interviews from previous studies with similar samples. In addition, consensus meetings were held for the present study to iron out coding discrepancies. The interclass correlation coefficients were as follows: expressed warmth .70, sensitive responding .56, quality of interaction .79, frequency of battles .99, level of battles .96 and resolution .88. The average intraclass correlation coefficient was .81.

At all phases of the study, a section of the interview focused on issues relating to disclosure including whether or not the parents had decided to tell the child about their biological origins, whether or not they had actually done so, their reasons for or against disclosure, their current feelings in relation to this issue, and the child's response, if told. These variables were coded according to a standardised coding scheme.

Global family functioning. Index of Family Relationships: Mothers and adolescents completed this 25-item questionnaire designed to measure problems in family relationships (Hudson, 1989). Sample items are, 'There is a lot of love in my family' and 'There seems to be a lot of friction in my family'. The total score gives an assessment of family relationship difficulties, with higher scores representing greater difficulties. The cut-off score for clinical problems is 30. Internal consistencies for the original sample ranged from 0.91 to 0.98. The Index of Family Relationships (IFR) has been found to show good discriminant validity and to distinguish between families with and without clinical problems. In the present study, Cronbach alphas for the mothers' version for the total sample and the natural conception, nondisclosing and disclosing samples, respectively, were .91, .85, .92 and .93, and for the adolescents' version for the total sample and the natural conception and disclosing samples, respectively, were .93, .93 and .95.

Mother–child relationship. Parental Acceptance Rejection Questionnaire: The 24-item version of this questionnaire was administered to both mothers and adolescents to provide total scores of maternal acceptance/rejection, with higher scores representing higher levels of rejection (Rohner, 2001). Examples of items are, 'I say nice things about my child' and 'I hurt my child's feelings', reworded for the adolescent version. The Parental Acceptance Rejection Questionnaire (PARQ) has been reported to have good internal consistency, with alpha values of .91 and .84, respectively, for the parent and adolescent versions. In the present study, Cronbach alphas for the mothers' version for the total sample and the natural conception, nondisclosing and disclosing samples, respectively, were .66, .67, .50 and .71, and for the adolescents' version for the total sample and the natural conception and disclosing samples, respectively, were .82, .84 and .59.

Parental Control Scale: This 13-item measure was completed by mothers and adolescents to provide total scores of behavioural control, with higher scores reflecting higher levels of control (Rohner, 2001). Examples of items are, 'I let my child go out at any time s/he wants' and 'I believe in having a lot of rules and sticking to them', reworded for the adolescent version. The Parental Control Scale (PCS) has been shown to have good internal consistency with an average Cronbach alpha of .73 from a meta-analysis of studies using this

measure (Rohner & Khaleque, 2003). In the present study, Cronbach alphas for the mothers' version for the total sample and the natural conception, nondisclosing and disclosing samples, respectively, were .75, .76, .82 and .61, and for the adolescents' version for the total sample and the natural conception and disclosing samples, respectively, were .84, .85 and .81.

Mother–child interaction. Observational assessment: Mothers and adolescents participated together in a video-recorded observational assessment involving a vacation planning task in which they were given 5 min to plan a 2-week family holiday for which they had unlimited funds (Grotevant & Cooper, 1985, 1986). The session was coded using the Parent–Child Interaction System (Deater-Deckard & Petrill, 2004) to assess the construct of mutuality, that is, the extent to which the mother and adolescent engaged in positive dyadic interaction characterised by warmth, mutual responsiveness and cooperation. The following variables were rated on a scale ranging from 1 (no instances) to 7 (constant, throughout interaction): Mother's responsiveness to child assessed the extent to which the mother responded immediately and contingently to the child's comments, questions or behaviours; Child's responsiveness to mother assessed the extent to which the child responded immediately and contingently to the mother's comments, questions or behaviours; Dyadic reciprocity assessed the degree to which the dyad showed shared positive affect, eye contact and a 'turn-taking' quality of interaction; and Dyadic cooperation assessed the degree of agreement about whether and how to proceed with the task. To establish interrater reliability, 47 interviews randomly selected equally across all family types were coded by two researchers who were unaware of family type. Training involved the rating of video recordings from previous studies with similar samples. The intraclass correlations for child's responsiveness to mother, dyadic reciprocity and dyadic cooperation were .61, .71 and .69 respectively. It was not possible to calculate an intraclass correlation for mother's responsiveness to child as most dyads obtained scores at the top end of the scale.

Adolescents' psychological adjustment. Strengths and Difficulties Questionnaire: The presence of adolescent psychological problems was assessed with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 2001) administered to mothers and adolescents. The SDQ produces an overall score of adolescent adjustment with higher scores representing higher levels of problems. The cut-off score for clinical problems is 17 and 20 for mothers and adolescents respectively. Examples of items from the mothers' questionnaire are, 'Many fears, easily scared' and 'Often fights with other children and bullies them'. Examples of items from the adolescents' questionnaire are, 'I am often unhappy, downhearted or tearful' and 'I am often accused of lying or cheating'. The SDQ has been shown to have good internal consistency, test–retest and interrater reliability, and concurrent and discriminative validity (Goodman, 2001; Stone, Otten, Engels, Vermulst, & Janssens, 2010). In the present study, Cronbach alphas for the mothers' version for the total sample and the natural conception, nondisclosing and disclosing samples, respectively, were .58, .66, .55 and .49, and for the adolescents' version for the total sample and the natural conception and disclosing samples, respectively, were .72, .70 and .75.

Engagement, perseverance, optimism, connectedness and happiness measure of adolescent well-being: The 20-item engagement, perseverance, optimism, connectedness and happiness (EPOCH) was administered to adolescents to produce a total score of positive psychological

functioning, with higher scores representing more positive functioning (Kern, Benson, Steinberg, & Steinberg, 2016). Sample items are, 'I am optimistic about my future' and 'I have friends I really care about'. Internal consistency has been found to be high, ranging from .85 to .95. EPOCH scores have been shown to be negatively correlated with measures of emotional distress and behaviour problems indicating that the EPOCH is a valid measure of adolescent wellbeing. In the present study, Cronbach alphas for the adolescents' version for the total sample and the natural conception and disclosing samples, respectively, were .89, .92 and .85.

Analysis plan. Confirmatory factor analysis was carried out using the software Mplus v 7.4 (Muthén and Muthén, Los Angeles, CA). Model fit was considered good for CFI and TLI values of $\geq .95$ and RMSEA values $\leq .06$ (Bentler, 1992; Hu & Bentler, 1999). Confirmatory factor analysis was conducted with the interview variables relating to parenting quality (CFI = 1.00; TLI = 1.00; RMSEA = .03, 90% CI = .00–.11). Two factors were obtained, each with item loadings of at least 0.43 and all loadings were statistically significant. The first factor (comprising expressed warmth, sensitive responding and quality of interaction) was labelled positive parenting and the second factor (comprising frequency of battles, level of battles and resolution) was labelled negative parenting.

The statistical analyses were carried out in three stages. Firstly, comparisons between the disclosing, nondisclosing and natural conception families were carried out for the mothers' variables using univariate and multivariate analyses of variance ANOVAs. Secondly, the 56 disclosing families were categorised into three groups according to age at disclosure: 21 families in which parents had initiated disclosure by age 3; 25 families in which parents had initiated disclosure between age 4 and age 6; and 10 families in which parents had initiated disclosure at age 7 or older. Univariate and multivariate ANOVAs were carried out for both the mothers' and adolescents' variables to establish whether there were differences according to age at disclosure. Where significant overall differences were found between family types, effect sizes were calculated using the Partial eta squared (η^2) statistic according to Cohen's criteria (small .01, medium .06 and large .14), and the following Helmert contrasts were conducted (Field, 2013): disclosure before age 7 versus disclosure at age 7 or older to establish whether there were differences according to children's understanding of the concept of inheritance; and disclosure by age 3 versus disclosure between age 4 and age 6 to establish whether there were differences according to children's development of a rudimentary understanding of inheritance. Thirdly, mediation analysis using Mplus v 7.4 was carried out to examine whether the quality of family relationships mediated the effect of age of disclosure on adolescent outcomes.

Results

Disclosure versus nondisclosure

As shown in Table 2, MANOVAs were carried out for the variables relating to quality of parenting (positive parenting and negative parenting) and the quality of mother-child relationships (PARQ and the PCS), and univariate ANOVAs were carried out for the variables relating to global family functioning (IFR) and adolescent psychological adjustment (SDQ), with family type (nondisclosing, disclosing and natural conception) as the between-subjects factor. No significant differences were identified between family types for any of these variables.

Age at disclosure

The positive parenting and negative parenting variables from the interview with mothers were entered into a MANOVA with age at disclosure as the between-subjects factor. Wilks' λ showed a non-significant trend, $F(4, 100) = 2.18, p = .077, \eta^2 = .08$, and one-way ANOVAs showed a significant difference between groups for both positive parenting, $F(2, 51) = 3.37, p = .042, \eta^2 = .12$, and negative parenting, $F(2, 51) = 3.14, p = .052, \eta^2 = .11$. The Helmert contrasts identified more positive parenting and less negative parenting in families where parents had disclosed before the children were 7 years old (positive parenting, $p = .012$ and negative parenting, $p = .016$) compared to families where parents had disclosed at age 7 or older. No differences were found between families where children had been told by age 3 and families where children had been told between age 4 and age 6 (see Table 3).

With respect to global family functioning, the mothers' and adolescents' IFR scores were entered into a MANOVA with age at disclosure as the between-subjects factor. Wilks' λ was significant, $F(4, 84) = 3.75, p < .007, \eta^2 = .15$. One-way ANOVAs identified a significant difference between groups for both mothers' scores, $F(2, 43) = 7.13, p < .002, \eta^2 = .25$, and adolescents' scores, $F(2, 43) = 3.53, p = .035, \eta^2 = .14$. The Helmert contrasts showed lower mothers' and adolescents' scores, reflecting more positive perceptions of family relationships, in families where parents had disclosed before age 7 (mothers, $p < .001$ and adolescents, $p = .027$) compared to families where parents had disclosed at age 7 or older. There were no differences between families where children had been told by age 3 and families where children had been told between age 4 and age 6.

The mothers' scores on the PARQ and the PCS were entered into a MANOVA with age at disclosure as the between-subjects factor. Wilks' λ was significant, $F(4, 96) = 2.56, p = .043, \eta^2 = .10$. One-way ANOVAs identified a significant difference between groups for the PARQ, $F(2, 49) = 3.17, p = .051, \eta^2 = .12$, and a nonsignificant trend for the PCS, $F(2, 49) = 2.88, p = .066, \eta^2 = .11$. The Helmert contrasts showed higher levels of acceptance ($p = .016$) and lower levels of control ($p = .043$) in the families where parents had disclosed before age 7 compared to families where parents had disclosed at age 7 or older. No differences were identified between families where children had been told about their biological origins by age 3 and between ages 4 and 6 years. The adolescents' scores on the PARQ and the PCS were also entered into a MANOVA with age at disclosure as the between-subjects factor. Wilks' λ was not significant, $F(4, 82) = 0.55, p = .699$, showing that there were no differences in adolescents' perceptions of maternal acceptance or control according to age of disclosure.

Table 2 Means, *SDs* and *F* values for comparisons between interview and questionnaire measures of maternal mother–adolescent relationships and adolescent adjustment in disclosed, nondisclosed and natural conception families

	Disclosed		Nondisclosed		Natural conception		<i>F</i>	<i>p</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>		
Quality of parenting							1.44	.220
Positive parenting	−0.02	0.78	−0.03	0.69	−0.10	0.88	0.16	
Negative parenting	0.03	0.54	0.16	0.55	−0.09	0.70	1.72	
Global family functioning							0.99	
Mother-index of family relations	12.11	9.77	12.92	9.84	11.52	7.79	0.22	.806
Measures of mother–child dyad							0.61	.653
Mother: parental Acceptance/Rejection Questionnaire	29.06	4.48	29.63	3.84	29.25	4.25	0.16	
Mother: Parental Control Scale	36.07	4.18	36.67	5.18	35.14	4.82	1.08	
Adolescent psychological adjustment								
Mother: Strengths and Difficulties Questionnaire	5.43	3.39	5.11	3.14	4.47	3.71	1.02	.364

Table 3 Means, *SDs*, *F* and *p* values for comparisons of interview and questionnaire measures of mother–adolescent relationships and adolescent adjustment and wellbeing in reproductive donation families according to age at disclosure

	By age 3		Between ages 4 and 6		Between ages 7 and 14		<i>F</i>	<i>p</i>	Contrasts			
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>			Before 7 versus 7 or older	<i>p</i>	Before 3 versus between 4 to 6	<i>p</i>
Quality of parenting							2.18	.077				
Positive parenting	0.13	0.85	0.07	0.76	−0.59	0.48	3.37	.042	.012	.784		
Negative parenting	−0.08	0.50	−0.03	0.57	0.40	0.39	3.14	.052	.016	.743		
Global family functioning							3.75	.007				
Mother-index of family relations	8.14	4.79	9.49	7.92	21.20	13.45	7.13	.002	.000	.437		
Child-index of family relations	10.68	8.13	16.03	7.87	21.87	17.53	3.5	.035	.027	.157		
Maternal measures of mother–child dyad							2.56	0.043				
Parental Acceptance/Rejection Questionnaire	27.90	2.75	28.50	4.36	32.00	6.50	3.17	.051	.016	.657		
Parental Control Scale	36.06	4.08	34.64	4.11	38.20	2.97	2.88	.066	.043	.248		
Child measures of mother–child dyad							0.55	.699				
Parental Acceptance/Rejection Questionnaire	27.11	3.41	28.22	3.47	28.78	4.24						
Parental Control Scale	34.61	7.01	34.06	6.80	32.67	3.84						
Adolescent Psychological Difficulties (SDQ)							1.23	0.304				
Mother-SDQ	5.17	3.22	4.67	2.74	3.67	3.00						
Child-SDQ	8.39	4.80	10.50	5.86	11.00	5.20						
Adolescent wellbeing (EPOCH)	3.88	0.45	3.76	0.49	3.42	0.61	2.85	.069	.027	.485		

In addition, the variables relating to the construct of mutuality from the observational assessment of mother–child interaction (mother responsiveness, child responsiveness, dyadic reciprocity and dyadic cooperation) were entered into a MANOVA with age of disclosure as the between-subjects factor. Wilks' λ was not significant, $F(8, 72) = 0.30$, $p = .963$, showing that there was no difference in mother–child interaction according to age at disclosure.

In terms of adolescent adjustment, the mothers' and adolescents' SDQ scores were entered into a MANOVA with age at disclosure as the between-subjects factor. Wilks' λ was not significant, $F(4, 82) = 1.23$, $p = .304$, showing that there was no

difference in adolescents' emotional and behavioural problems as rated by mothers or children according to the age at which children had been told about their biological origins. However, a univariate ANOVA with adolescents' EPOCH scores as the dependent variable and age at disclosure as the between-subjects factor produced a nonsignificant trend, $F(2, 42) = 2.85$, $p = .069$, $\eta^2 = .12$, with the Helmert contrasts showing higher levels of psychological wellbeing among adolescents who had been informed of their biological origins before age 7 ($p = .027$) compared to those who had been informed at age 7 or older. There was no difference between children told by age 3 and those told between the ages of 4 and 6 years.

Mediation analysis

In order to investigate whether the association between age of disclosure and adolescents' psychological wellbeing was influenced by their perceptions of the quality of family relationships, a path analysis with indirect effects was carried out. Regression paths were specified from age of disclosure to adolescents' self-reported perceptions of family relationships as assessed by the IFR and from adolescents' perceptions of family relationships to self-reported wellbeing as assessed by the EPOCH. The direct effect from age of disclosure was not significant and was removed from the model in order to gain 1 degree of freedom and enable the evaluation of model fit. The model, depicted in Figure 1, fitted the data well, with $\chi^2(1) = 2.06$, $p = .150$ and CFI = .94. The TLI and RMSEA were below acceptable thresholds (Bentler, 1992; Hu & Bentler, 1999) but were excluded from the model fit evaluation as they underperform for models with few degrees of freedom. Thus, earlier disclosure predicted more positive family relationships as perceived by the adolescents, which in turn predicted greater psychological wellbeing. The indirect effect was significant: $\beta = -.158$, $p = .039$, 95% CI = $-.309$ $-.008$.

Discussion

The findings showed that adolescents who were unaware of their biological origins did not differ from adolescents who had been told about the circumstances of their birth (at any age), or from naturally conceived adolescents, in terms of psychological wellbeing or the quality of family relationships. However, there appears to be variation within families formed through reproductive donation. When the age at which adolescents had learned of their biological origins was examined, more positive family relationships and higher levels of psychological wellbeing were found for adolescents who had been told at a younger age. Specifically, families in which parents had started the process of disclosure before age 7 showed more positive parenting in terms of maternal warmth and sensitivity, and less negative parenting in terms of conflict, as assessed by a standardised interview designed to assess quality of parenting. Moreover, families in which children had been told about their biological origins before age 7 showed higher levels of global family functioning as rated by both mothers and adolescents. Mothers in these families also showed higher levels of acceptance of their adolescent children and lower levels of

control although this was not reflected in the adolescents' perceptions of maternal acceptance or control. No differences were found according to age of disclosure for the observational measure of mother-adolescent interaction.

With respect to the adolescents themselves, there was no difference in psychological problems according to the age of disclosure of their biological origins, as assessed by the SDQ completed by mothers and adolescents. Inspection of the scores showed low levels of emotional and behavioural problems irrespective of their age at the time of disclosure. However, those told earlier showed higher levels of psychological wellbeing as assessed by the EPOCH, with adolescents who learned of their biological origins before age 7 showing higher levels of psychological wellbeing than those who had not been told until age 7 or older. When this finding was explored further, it appeared that earlier disclosure was associated with adolescents' more positive perceptions of family relationships which, in turn, was associated with higher levels of adolescent wellbeing as assessed by the EPOCH.

Thus, it appears that the earlier children born through reproductive donation are told about their biological origins, the more positive the outcomes in terms of the quality of family relationships and psychological wellbeing at adolescence. The differences based on disclosure relate particularly to mothers' perceptions of family relationships, suggesting that disclosure may have a greater effect on mothers than on adolescents. The findings are in line with research on adoptive families which has similarly shown that telling children about their adoption at an early age is associated with more positive outcomes for parents and adolescents (Brodzinsky, 2011; Grotevant & Von Korff, 2011; Passmore, Foulstone, & Feeney, 2007; Rueter & Koerner, 2008). The findings are also consistent with research on children's developing understanding of inheritance (Gregg et al., 1996; Richards, 2000; Williams & Smith, 2010). It seems that children born through reproductive donation may be more accepting of information about their biological origins when told by age 7 before they acquire a more complex understanding of the meaning of the absence of a genetic and/or gestational connection to their mother. It cannot be ruled out that the more positive outcomes for early disclosing families were associated with the greater tendency of surrogacy families to disclose at an early age, that is, our findings may have resulted from more positive relationships in the surrogacy families rather than early disclosure. Mothers who

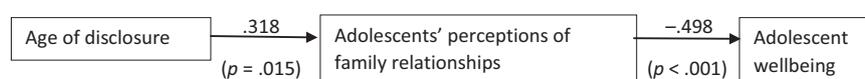


Figure 1 Path analysis for the mediation effect of adolescents' perceptions of family relationships in the association between age of disclosure and adolescent psychological wellbeing

have a good relationship with their children may find it easier to be open with them about their origins. Interestingly, no differences were identified between adolescents who had been told of their origins by age 3 and those told between 4 and 6 years old. This suggests that disclosure prior to the increased understanding of inheritance that occurs at around age 4 did not have a long-term effect on adolescent wellbeing or family relationships.

The finding that the association between age of disclosure and adolescent wellbeing was mediated by adolescents' perceptions of the quality of family relationships as assessed by the IFR also parallels findings from research on adoptive families which shows that openness about adoption is associated with more positive family relationships and more positive adolescent outcomes (Brodzinsky, 2006; Grotevant et al., 2005; Grotevant & Von Korff, 2011). The IFR assesses perceptions of the family as a whole with questions that are particularly pertinent to adolescents who lack a biological connection to their parents such as, 'I wish I was not part of this family' and 'I feel like a stranger in my family'. Thus, it appears that adolescents born through reproductive donation, like adopted adolescents, benefit from early disclosure of their biological origins by feeling more connected to their family.

From a broader perspective, recent theories of children's sociocognitive and emotional development focus on executive function which refers to cognitive processes such as working memory, inhibitory control and attentional flexibility (Best & Miller, 2010; Garon, Bryson, & Smith, 2008), theory of mind which involves the ability to understand how thoughts and feelings govern human behaviour (Hughes, 2011; Wellman, 2014), and emotional regulation which refers to the processes children use to manage emotions (Holodynski & Friedlmeier, 2006). These theories have shifted away from the earlier Piagetian stage approach to cognitive development towards a more gradual perspective. However, there is evidence that specific transitions in cognitive development do occur. In relation to executive function, for example, it appears that basic skills emerge by age 3, whereas it is not until after age 3 that these skills become coordinated (Garon et al., 2008), and further developmental changes take place at around age 6–7 when children enter school (Best & Miller, 2010). Although the predicted differences between children who first became aware of their biological origins before and after age 3 were not found, the differences identified between children who learned of their origins before and after age 7 may reflect the differences in sociocognitive development that occur at that age. Moreover, once children enter school they may be faced with the challenge of explaining their origins to their peers. This has been shown to present difficulties for children in other new family forms such as children with same-sex parents (Guasp, Statham, &

Jennings, 2010). In relation to adoption, Brodzinsky (2011) highlighted the implications of the changes in cognitive and socioemotional development that take place when children reach school age. In particular, it was argued that children's increased capacity for problem-solving, logical thought and taking the perspective of others, sensitises them to the reality of adoption-related loss. Thus, the findings of less positive perceptions of family relationships and lower levels of wellbeing among adolescents who learned of their birth through reproductive donation after age 7 are consistent with changes in children's social understanding at that age.

A limitation of the study was the small sample size. Nevertheless, consistent and meaningful differences relating to the age of disclosure of children's origins were identified from data obtained from both mothers and adolescents, with medium to large effect sizes for all of the significant differences. It should also be noted that the scores for the reproductive donation families compared favourably to normative data for the questionnaire measures. For example, the means for mothers and adolescents for the Index of Family Relations were well below the cut-off score of 30 for clinical problems, and for the SDQ were well below the clinical cut-off scores of 17 and 20 for the mothers' and adolescents' versions respectively.

A further limitation related to the comparison between the disclosing, nondisclosing and natural conception families. Although no differences were identified between adolescents who had been told about their biological origins and those who had not, data for these comparisons were obtained from mothers only as it was not possible, for ethical reasons, to interview adolescents who were unaware of their biological origins. Moreover, not all of the interview and observational variables showed inter-rater agreement of 80% or above. The coding of the interview variables that did not reach this threshold involved the use of nonverbal cues such as facial expression and gestures that were not available to the second rater. Thus, the interrater reliabilities of these interview variables may be underestimates. The observational variables showed a restriction in the range of scores rather than poor interrater agreement and have been shown to be reliable in studies of more diverse samples by our own research group (Ensor & Hughes, 2009). Similarly, ceiling effects appeared to account for the moderate alpha values for some of the questionnaires. As the only comparative longitudinal investigation of families formed through reproductive donation, the study provided a unique opportunity to examine the psychological consequences of the age at which children were told about the nature of their conception. An advantage of the study is the use of a multiinformant (mothers, adolescents and teachers) and multi-method (interview, questionnaire and observational assessment) approach. A further strength is that the

study has extended findings from the adoption literature to families formed through reproductive donation.

From a theoretical perspective, the findings contribute towards the understanding of the role of openness in families where children lack a biological connection to their parents. Although research on adoptive families has shown that children benefit from communication about their biological origins, adopted children differ from children born through reproductive donation in that they have been relinquished by, or removed from, their birth parents. The situation is somewhat different in families created by reproductive donation where children usually have a genetic and/or gestational connection to one parent and have been raised by their parents from birth. The present study suggests that even under these more favourable circumstances, children benefit from communication about their biological origins from an early age.

From a practical perspective, the findings suggest that parents' concerns about telling their young children about the circumstances of their birth are

unfounded. Indeed, it appears that the earlier that disclosure takes place, the more positive the outcomes for children and their parents. Thus, just as adoptive parents are encouraged to be open with their children about their adoption from the start, it seems that parents of children born through reproductive donation should similarly be advised to begin to talk to their children about their origins in their pre-school years.

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Key points

- Whether parents should tell children born through gamete donation or surrogacy about their biological origins is the most contentious issue in the practice of reproductive donation.
- This longitudinal study obtained data from infancy to adolescence on whether and when parents told children born through reproductive donation about their biological origins as well as data on the quality of family relationships and children's psychological adjustment.
- It was found that children told about their origins before age 7 experienced more positive family relationships and higher levels of psychological wellbeing at age 14.
- This suggests that parents should be encouraged to begin to tell their children about their birth through reproductive donation at an early age.

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Gay father surrogacy families: relationships with surrogates and egg donors and parental disclosure of children's origins

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Objective: To study the nature and quality of relationships between gay father families and their surrogates and egg donors and parental disclosure of children's origins.

Design: Cross-sectional study.

Setting: Family homes.

Patient(s): Parents in 40 gay father families with 3–9-year-old children born through surrogacy.

Intervention(s): Administration of a semistructured interview.

Main Outcome Measure(s): Relationships between parents, children, surrogates, and egg donors and parental disclosure of children's origins were examined using a semistructured interview.

Result(s): The majority of fathers were content with the level of contact they had with the surrogate, with those who were discontent wanting more contact. Fathers were more likely to maintain relationships with surrogates than egg donors, and almost all families had started the process of talking to their children about their origins, with the level of detail and children's understanding increasing with the age of the child.

Conclusion(s): In gay father surrogacy families with young children, relationships between parents, children, surrogates, and egg donors are generally positive. (Fertil Steril® 2016;106:1503–9. Copyright ©2016 The Authors. Published by Elsevier Inc. on behalf of the American Society for Reproductive Medicine. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>.)

Key Words: Children, disclosure, egg donor, gay father, surrogacy

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In the United States it has been estimated that between 2 and 3.7 million children have a lesbian, gay, bisexual, or transgender parent, with approximately 200,000 being raised by same-sex couples (1). Given

recent changes in marriage equality in the United States (2) and physicians' ethical obligation to treat all persons equally regardless of sexual orientation (3), the number of gay fathers creating families through assisted

reproductive technologies is likely to rise.

Gay men may choose to become parents via surrogacy, a process in which a woman bears a child for the intended parent(s). This can be a relatively low-technology procedure in which conception occurs using the sperm of one of the intended fathers and the egg of the surrogate who carries the child to term (referred to as genetic surrogacy). However, the most common type of surrogacy in the United States is gestational surrogacy (4), a high-technology procedure in which an embryo is created using the sperm of one of the intended fathers and the

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egg of a donor and transferred to the surrogate. The surrogate who carries the pregnancy to term and gives birth has no genetic connection to the child.

Concerns have been expressed regarding the relationship between families created through surrogacy and the surrogate over time (5). Although contact with the surrogate may be beneficial in helping children understand their origins, there have been fears that ongoing contact with the surrogate may undermine the relationship between the parents and the child. These concerns have typically been raised in relation to heterosexual parents, specifically mothers, as opposed to fathers in gay father families.

Studies of surrogacy families conducted in the United Kingdom, where commercial surrogacy is illegal, have found that heterosexual parents can and do form positive relationships with surrogates during pregnancy, which typically continue as the child grows up (6, 7). However, the amount of contact between children and their surrogate has been found to lessen over time, particularly in the case of previously unknown genetic surrogates (6).

A small body of research has examined the relationship between gay fathers and their surrogates in Spain, Italy, and the United States (8–10) both during and immediately after the birth of the child. Relationships between fathers and surrogates have generally been found to be positive, with contact being maintained through occasional emails and/or the exchange of postcards and photographs at birthdays and holidays. When contact between gay fathers and surrogates has been found to cease entirely, this has occurred in the Indian context (11), in which socioeconomic and language barriers, as well as agency policies, do not encourage or facilitate contact between parties (12).

In gestational surrogacy arrangements, parents may select an egg donor with whom they can have contact in the future (an open-identity donor) or a donor with whom they will have no contact (an anonymous donor), although the possibility of achieving anonymity is increasingly in doubt (13). A relationship between the child and the egg donor may be viewed by intended parents as threatening, given that genetic relatedness is often given primacy in family relationships (14). Even where there is no relationship between the child and the donor or surrogate, it has been argued that these “birth others” (15) may have a place in the child’s family tree (16). Despite the fact that 18,400 infants were born in the United States through gestational surrogacy between 1999 and 2013 (4), the nature of the relationship between children in these families and their egg donor is unknown.

Gay fathers who started their families using surrogacy need to explain their path to parenthood to their children. In surrogacy families headed by heterosexual couples, almost all parents are open with their children about their use of a surrogate (6, 17). This openness is unsurprising, given that the parents have to explain the arrival of the baby to family and friends in the absence of a pregnancy. A high level of openness is likewise to be expected in gay father families given the absence of a partner of the opposite-sex with whom to procreate. However, the specific aspects of the surrogacy process that gay fathers choose to

disclose to their children, and at what age they choose to do, have not been studied. When children in the United Kingdom longitudinal study of surrogacy families headed by heterosexual couples were 10 years old (6), 58% of parents with a genetic surrogate had told their children about the surrogate but had not mentioned the fact that the surrogate’s egg had been used in their conception. This partial disclosure suggests that the use of a surrogate in the gestation and birth of a child may be easier to disclose to young children than is the use of donor eggs. In addition to explaining the role of the surrogate and the egg donor, gay couples may or may not tell their children which father has a genetic connection to the child.

Relationships between fathers and surrogates have been found to be positive both during and immediately after the birth of the child. However, little is known about how relationships with both surrogates and egg donors change over time as children develop an increasingly sophisticated understanding of their birth, or how and when fathers talk about surrogacy with their children. Therefore the present study examined three questions in a sample of gay father families with 3–9-year-old children born through surrogacy: [1] Do gay fathers and their children have contact with their surrogates and egg donors? [2] What kind of relationships do gay fathers and their children have with their surrogates and egg donors? [3] What have parents explained to their children about their surrogacy origins?

MATERIALS AND METHODS

Sample

Forty gay father families created through surrogacy participated in the study, all of whom resided in the United States. The inclusion criteria for participation were that the target child was aged between 3 and 9 years and the parents had been a couple since the time of the child’s birth.

Families were recruited through the use of multiple strategies. First, surrogacy agencies that specialized in working with gay men sent information about the study to the fathers in their mailing list ($n = 18$, 45%); second, participants passed on information about the study to their friends, colleagues, or acquaintances who fit the study criteria and/or disseminated information about the study through social media ($n = 7$, 17.5%); and third, families were recruited at events at which gay fathers were in attendance ($n = 15$, 37.5%).

There were 24 boys (60%) and 16 girls (40%) in the sample, with an average age of 5 years 8 months (SD 2.2 years). The mean age of the fathers was 47.29 years (SD 6.20 years). The mean annual family income was \$370,000 (SD \$168,264). Most fathers were white ($n = 67$, 84%), with the remaining fathers identifying as Latino/Hispanic ($n = 7$, 9%), Asian ($n = 1$, 1%), or “other” ($n = 5$, 6%). Ninety-eight percent of fathers had a bachelor’s or higher degree. Most families lived in the Northeast (67.5%; New York City = 24, Massachusetts = 3), with the remaining families living in the South (7.5%; Florida = 1, Virginia = 1, Texas = 1), the West (22.5%; California = 7, Oregon = 1, Washington = 1), and the Midwest (2.5%; Minnesota = 1).

Procedure

Ethical approval was granted by the New York State Psychiatric Institute Institutional Review Board and the University of Cambridge Psychology Research Ethics Committee. Fathers were given an information sheet and an opportunity to ask any questions before signing a consent form and beginning participation. The majority of families were visited in their homes by a research psychologist trained in the study techniques ($n = 26$, 65%). Because of geographic distance from the researcher, data were collected from the remaining families over Skype ($n = 14$, 35%), which has been recognized as both commonplace in social science research and a viable methodologic approach (18).

Measures

The primary aim of the study was to investigate parent-child relationships and child adjustment in gay father families formed through surrogacy. Both fathers were interviewed separately (19), and interviews were digitally recorded. A section of the interview focused on fathers' experiences of surrogacy, using questions adapted from the United Kingdom longitudinal study of heterosexual families formed through surrogacy (7). Fathers were asked about the relationship they and their children had with the surrogate and the egg donor (including the frequency and method of contact and the general quality of the relationship). Fathers were also asked about the process of telling their children about their origins, focusing on the frequency and content of discussions they had had with their children about the surrogacy process, the use of an egg donor (if applicable), and whose sperm was used in the child's conception. Interview data have been presented from the father who identified as being the most involved with the child/children on a day-to-day basis (labeled for this analysis as parent A). This distinction was straightforward in most families ($n = 27$, 67.5%), and in the remaining families where time with children was fairly even between fathers ($n = 13$, 32.5%) the label of parent A was assigned randomly.

Analytic Approach

The section of the interview on fathers' experiences of surrogacy was transcribed and analyzed by two of the authors (L.B. and N.C.) using a content analysis approach (20). The analysis was guided by the principles of qualitative description, which aims to report participants' motivations and experiences in as close a way as possible to their own interpretation (21, 22). Because the interviews were semistructured, the data of interest were dispersed throughout the transcript. Therefore, data were organized into excel sheets (e.g., all quotes throughout the interview pertaining to "quality of relationship with surrogate" were copied into one cell). A coding manual was created that described the information in each cell succinctly. The interviews were then rated in accordance with the coding manual, and frequency counts were calculated. Where appropriate, comparisons between

the nature of fathers' relationships with surrogates and egg donors were conducted using χ^2 tests, and the strength of the association between variables was assessed through correlation.

One-third of the transcripts were recoded by a second researcher to calculate interrater reliability. Percentage agreement was 90% or above for each variable, categorized as follows: [1] Path to parenthood: Location (United States, India); surrogacy arrangement (genetic, gestational); relationship to surrogate (unknown, sister, friend); relationship to egg donor (unknown, sister, friend), meetings with unknown egg donor (yes, no, telephone); egg donor status (open identity, anonymous). [2] Contact with surrogate and egg donor: Met since child born (yes, no); met in past year (yes, no); number of meetings in past year (1–2, 3 or more); methods of contact: phone, email, Skype, text message, Facebook, cards/gifts/flowers (yes, no); met with fathers' family (yes, no). [3] Quality of relationship with surrogate and egg donor: Happy with level of contact (content, neutral, discontent, no contact); quality of relationship with surrogate/egg donor (positive, neutral, negative, no relationship); quality of child's relationship with surrogate/egg donor (close, neutral, distant, nonexistent). [4] The disclosure process: Started the process of disclosure (yes, no); stages of disclosure: two dads need help to have a baby (yes, no), babies carried in women's tummies (yes, no), specific reference to surrogate (yes, no), disclosure of donated egg (yes, no), disclosure of whose sperm was used (yes, no); use of children's books (yes, no); photos of the surrogate (yes, no); homemade books/photo albums/videos (yes, no); children's understanding (none, some understanding, understands all, don't know).

RESULTS

Path to Parenthood

The majority of surrogacy arrangements were carried out in the United States ($n = 38$, 95%), with two (5%) conducted in India. Most surrogacy arrangements were gestational ($n = 36$, 90%), with four couples (10%) conceiving via genetic surrogacy.

In families formed through gestational surrogacy, most surrogates were previously unknown to the couple ($n = 35$, 97%), and one surrogate (3%) was a friend. In genetic surrogacy families, three surrogates (75%) were previously unknown to the couple, and one was a sister of the nongenetic father (25%).

In gestational arrangements, most parents had used an unknown egg donor ($n = 34$, 94%), with one couple using a friend (3%) and one using a sister (3%). Only four fathers described donors whom they had never met with, seen, or spoken with, and with whom they had very little chance of making contact or meeting in the future (12%). All other donors were categorized as open-identity ($n = 30$, 88%). Of the 30 fathers who conceived using an open-identity egg donor, 18 fathers (60%) had met the donor, and 2 fathers (7%) had spoken to her on the phone. Of the four fathers who conceived

TABLE 1

Contact and quality of relationship with surrogate and egg donor.

Variable	Surrogate (n = 40), n (%)	Egg donor (n = 36), n (%)	χ^2	Illustrative quotes (SU = surrogate, ED = egg donor)
Met since child born			25.34, $P < .01$	
Yes	33 (83)	9 (25)		"We went to visit once with [child] shortly after he was born and then again after [other child] was born. We wanted her parents, her mom, to meet the boys as well." (ED)
No	7 (17)	27 (75)		
Met in past year			19.79, $P < .01$	"She visited us maybe 6 wk ago for 2 or 3 d and her daughter has spent a couple of weeks with us in the summer twice, and her and her husband have come another time." (SU)
Yes	21 (53)	2 (6)		
1–2 times	15 (71)	0		
3+	6 (29)	2 (100)		
No	19 (47)	34 (94)		
Contact maintenance			23.25, $P < .01$	"We have only minimal contact with the egg donor, so I send them an e-mail maybe once or twice a year with some pictures, just to stay in contact..." (ED)
Contact ^a	34 (85)	11 (31)		
Facebook	21 (62)	6 (55)		
Email	14 (41)	3 (27)		
Cards/gifts/flowers	11 (32)	2 (18)		
Text message	10 (29)	1 (9)		
Phone	9 (26)	0		
Skype	3 (9)	0		
No contact	6 (15)	25 (69)		
Met family			19.93, $P < .01$	"...we had a ceremony for a Jewish tradition, a Rabbi blesses the baby and gives [the baby] a Hebrew name and we paid and flew her and her sons to come up for that." (SU)
Yes	27 (68)	6 (17)		
Siblings, parents, etc.	18 (66)	6 (100)		
Weddings	4 (15)			
Baby showers	5 (19)			
No	13 (32)	30 (83)		
Happy with level of contact			4.17, $P < .05$	"I would be fine if it was more but I'm not bothered that it is what it is. I would not want there to be less. As I say it's just so marvelous when we do get together, it's just terrific, she's just wonderful and her husband is great. We're big fans." (SU)
No contact	6 (15)	25 (69)		
Contact	34 (85)	11 (31)		
Content	11 (32)	3 (27)		
Neutral	21 (62)	4 (36)		
Discontent	2 (6)	4 (36)		
Quality of relationship with parent A			.03, $P = .57$	"We have a great relationship, she is like a relative to us. ...We're very close to her husband. It was a real bonding experience for us, I think they're probably some of the closest people to us really." (positive relationship SU)
No relationship	6 (15)	25 (69)		
Relationship	34 (85)	11 (31)		
Positive	18 (53)	6 (55)		
Neutral	15 (44)	5 (45)		
Negative	1 (3)	0		
Quality of relationship with child			.04, $P = .85$	"Like when anyone comes over to the house, who's someone special, [child] gets along with all of them, like a special visitor. She and her husband are our special visitors, he doesn't react to her any differently than he does with other special visitors that we have." (neutral, SU)
Not seen child after birth	7 (17)	27 (75)		
Met child	33 (83)	9 (25)		
Nonexistent	7 (21)	5 (56)		
Close	7 (21)	2 (22)		
Neutral	10 (31)	0		
Distant	8 (24)	1 (11)		
Missing	1 (3)	1 (11)		

^a Some fathers engaged in multiple methods of contact maintenance, thus percentages do not equal 100.

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using an anonymous egg donor, none had met or spoken to her, but one father thought that he had seen her at the clinic by chance.

Contact with Surrogate and Egg Donor

As shown in Table 1, after the birth of the child a greater percentage of fathers had met with the surrogate ($n = 33$, 83%) than had met with the egg donor ($n = 9$, 25%) ($\chi^2 = 25.34$, $P < .01$). Similarly, fathers were more likely to have met with the surrogate in the past year ($n = 21$, 53%) compared with the egg donor ($n = 2$, 6%) ($\chi^2 = 19.79$, $P < .01$). In the two families in which fathers had met with the egg donor in the past year, the egg donor was previously known to the couple (one sister, one friend).

At the time of the interview, fathers were more likely to maintain a relationship with the surrogate ($n = 34$, 85%) than with the egg donor ($n = 11$, 31%) ($\chi^2 = 23.25$, $P < .01$). Of the 11 parents who maintained contact with egg donors, 9 were open-identity egg donors, and 2 were known (one friend, one sister). The most popular methods for maintaining contact were Facebook and e-mail, and the least common methods were phone calls and Skype.

Surrogates were more likely to have met the fathers' extended family ($n = 27$, 68%) than were egg donors ($n = 6$, 17%) ($\chi^2 = 19.93$, $P < .01$). Surrogates had met the fathers' brothers or sisters ($n = 18$, 66%) and attended weddings ($n = 4$, 15%) and/or baby showers ($n = 5$, 19%). Of the six egg donors who had met with the fathers' parents and siblings, four

were open-identity egg donors, and two were known (one friend, one sister).

Quality of Relationship with Surrogate and Egg Donor

Of the 34 fathers (85%) who were in contact with the surrogate, the majority (n = 32, 78%) were content or neutral about their level of contact, with those fathers who were discontent (n = 2, 6%) wanting more contact with her (Table 1). Of those who maintained contact with the egg donor (n = 11, 31%), most were content or neutral about their level of contact (n = 7, 63%), and four fathers (36%) were discontent and wished to have more contact with her. Fathers were more likely to be discontent with the level of contact they had with the egg donor compared with the surrogate ($\chi^2 = 4.17, P < .05$).

For those fathers who had an ongoing relationship with the surrogate (n = 34, 85%), most had a positive (n = 18, 53%) or neutral (n = 15, 44%) relationship with her. Likewise, of those fathers who had an ongoing relationship with the egg donor (n = 11, 31%), all were positive (n = 6, 55%) or neutral (n = 5, 45%). There was no difference between the quality of fathers' relationships with surrogates and egg donors (positive/neutral vs. negative).

Most of the children had met with the surrogate (n = 33, 83%). In these families, the relationship between the child and the surrogate was mostly categorized as nonexistent (n = 7, 21%), distant (n = 8, 24%), or neutral (n = 10, 31%). In a minority of families, the relationship between the child and the surrogate was close (n = 7, 23%). The quality of the relationship between the child and the surrogate was significantly correlated with the frequency with which the surrogate had visited the family in the past year ($r = 0.71, P < .01$), showing that greater contact with the surrogate was associated with a closer relationship with the child.

Of the nine families (25%) in which fathers had met with the egg donor since the birth of the child, the relationship between the egg donor and the child was most often categorized as nonexistent (n = 5, 56%) or distant (n = 1, 11%). In two families (22%), the child had a close relationship with the egg donor, one of whom was a relative and the other a family friend. There was no difference between the quality of the child's relationship with the surrogate and the egg donor (close vs. not close).

The Disclosure Process

The majority of fathers (n = 33, 83%) had started to talk to their children about their origins (Table 2). Of those who

TABLE 2

The disclosure process.		
Process	n (%)	Illustrative quotes
Started the process of disclosure	33 (83)	"We've always talked about [surrogate] and who she was. So there was never a start time. It just was always been part of ongoing conversation."
Stages of disclosure		
Two dads need help to have a baby	25 (76)	"We explained how you know, there's a nice lady. Daddy and Papa can't have kids and there's a nice lady who helped them- helped us do it. And, actually two nice ladies."
Babies carried in women's bellies/tummies	25 (76)	"He knows that two men can't have a baby without help, only a lady can have a baby and he grew up in [surrogate]'s tummy and he was born to her but he was our baby and we loved him always."
Specific reference to the surrogate	23 (70)	"What we said is like that they were in [surrogate]. The last time she was pregnant and I made that a point. I told all of them that they had been in there as well. That's how babies are created."
Disclosure of the donated egg (n = 36)	12 (36)	"We haven't gone into the genetics of there being an egg donor separate from [surrogate]. He hasn't asked about it and I feel like at this stage the whole idea of genetics seems complicated, but I don't feel we're keeping it a secret, I feel we're waiting until he's older."
Disclosure of whose sperm was used	7 (21)	"It hasn't come up that genetically, biologically they're both mine. We haven't talked about that at all yet and I think I want to make that story clear and at some point I'm going to start getting some questions and we'll kind of round the gaps from there."
Materials		
Children's books about families/reproduction	14 (42)	"We have books about India. They are Indian. I feel like I need to celebrate their heritage, which we know nothing about."
Photos of the surrogate	9 (27)	"We've always spoken of the surrogate as being a very important person, in the role, we've had a picture of her, we moved here about a year ago and in our old apartment we used to have like dozens of pictures up and one of them would be of the surrogate."
Homemade books/photo albums/videos	5 (15)	"We show them the birth book, you know, of the day they were born, and there are pictures of [surrogate] and her family in it."
Children's understanding		
None	3 (8)	"She understands the surrogate part, but not the egg donor bit. She knows that she came out of [surrogate] and she knows [surrogate] has other children and that's probably about it (some understanding)."
Some understanding	20 (50)	
Understands all	8 (20)	
Don't know	7 (17)	
Missing	2 (5)	

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had begun to disclose, three-quarters ($n = 25$, 76%) had discussed the fact that two men need help in creating a family because babies are carried by women, and more than two-thirds had made specific reference to the surrogate who helped them ($n = 23$, 70%). In contrast, only one-third of fathers who had used gestational surrogacy ($n = 12$, 33%) had mentioned the use of a donated egg. Few fathers ($n = 7$, 21%) had begun to disclose which partner's sperm had been used in the child's conception. The older the child, the higher the stage of disclosure that parents had reached ($r = 0.63$, $P < .01$).

Half of the fathers felt that their children understood some of what had been explained to them ($n = 20$; 50%), and one-fifth ($n = 8$; 20%) thought that their children had a good understanding of their origins. Parents' reports of their children's understanding of their origins were significantly correlated with the age of the child ($r = 0.42$; $P < .05$), with greater understanding associated with the older age of the child.

DISCUSSION

Three main findings emerged from this study regarding the relationship between gay father families, surrogates, and egg donors when the children were in early and middle childhood. First, most fathers were content with the level of contact they had with their surrogate, with those who were discontent wishing to have greater contact. Second, fathers were more likely to actively maintain a relationship with the surrogate than the egg donor. Third, most fathers had started the process of explaining their path to parenthood to their children, with the level of details and children's understanding increasing with the age of the child.

The quality of the relationship between gay fathers and their surrogate was generally found to be positive, with most surrogates having met the child and other members of the fathers' families during occasions such as baby showers and weddings. These findings are similar to those from surrogacy families headed by heterosexual couples (6, 7, 23, 24).

The classification of the egg donor as anonymous or open-identity was problematic, with some fathers having exchanged contact information with, and met, their "anonymous" egg donor. Studies of egg donation families headed by heterosexual couples likewise have found that parents know the name of their "anonymous" donor, in addition to having a description of her physical characteristics and medical history (25). In the present study a donor was labeled as anonymous only when there was little chance of the fathers being able to contact her in the future. Regardless of whether donors are categorized as anonymous, open-identity, or known, the reality of the situation over time may be different from the one that parents had imagined at the start of the process.

In line with previous research on gay father surrogacy families, fathers were more likely to maintain a relationship with the surrogate than with the egg donor (8, 9, 26). This discrepancy may be explained by inherent differences in the procedures: intended parents and surrogates have the opportunity to develop a relationship over many months, whereas egg retrieval is brief. Fathers may also choose a

surrogate with characteristics that will increase the chance of a successful pregnancy as well as contact in the future, and an egg donor whose fertility is optimal (8, 9, 26–28). Although the egg donor is, for the most part, invisible in gay father surrogacy families when children are in their preschool or early school years, some fathers had deliberately chosen an egg donor with whom there would be the possibility of contact, so that their child's questions might be answered in the future. It is possible, therefore, that contact with the egg donor may occur or become more frequent when the child has a better understanding of, and curiosity about, their origins.

This study is the first to examine the nature of the relationship between the children in gay father families and the surrogate and egg donor who participated in their conception. For most children, it seemed that the relationship with their surrogate was neutral or distant. Relationships between children and egg donors were less common, but in a similar vein, neutral in nature. Concerns that these "birth others" may be a threat to the strength and unity of the family therefore seem to be unfounded, although future research is required to explore how these relationships evolve over time.

As for the process of disclosure, most fathers had started this process (83%), although few had disclosed the use of an egg donor or the identity of the genetic father. These findings echo those of surrogacy families with heterosexual parents, in which "partial disclosure" (disclosure of surrogacy with no reference to the egg donor) was common (6). The older the age of the child, the more layers of the disclosure story they had been told, but the precise age at which fathers will disclose the use of an egg donor and/or the identity of the genetic father remains to be seen.

A limitation of the study was the use of a volunteer sample, because it is possible that those fathers who have had a particularly positive experience may be more likely to participate in research. A variety of recruitment procedures were used to access as diverse a sample as possible, although gay father surrogacy families will most likely be unique in terms of income, given the high cost of pursuing surrogacy as a path to parenthood in the United States (5). As the number of gay father surrogacy families grows over time, future researchers can optimize recruitment strategies to increase the likelihood of obtaining a representative sample. It is also important that future research explores the quality of relationships with surrogates and egg donors from the perspective of the child, whose voices in these families have not yet been heard.

In conclusion, the findings of this study suggest that the concerns raised regarding surrogates and egg donors interfering in family life are unfounded. Although surrogacy arrangements have been expected to be more positive when entered into on altruistic grounds (29), the findings of the present study suggest that the commercial basis of the US system may also be conducive to positive and successful surrogacy arrangements. The convenience nature of this sample must be taken into account, because fathers who have had a particularly positive experience may be more likely to participate in research. However, the findings are consistent with the

literature on heterosexual parent families created by surrogacy (5–7, 23, 24), showing positive relationships between parents, children, and surrogates.

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A Longitudinal Study of Families Formed Through Reproductive Donation: Parent-Adolescent Relationships and Adolescent Adjustment at Age 14

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The aim of the 6th phase of this longitudinal study was to establish whether children born through assisted reproduction involving reproductive donation were at risk for psychological problems following the transition to adolescence at age 14 and, if so, to examine the nature of these problems and the mechanisms involved. Eighty-seven families formed through reproductive donation, including 32 donor insemination families, 27 egg donation families, and 28 surrogacy families, were compared with 54 natural conception families. Standardized interviews, questionnaires, and observational assessments of the quality of parent-adolescent relationships and adolescent adjustment were administered to mothers, adolescents, and teachers. The mothers in surrogacy families showed less negative parenting and reported greater acceptance of their adolescent children and fewer problems in family relationships as a whole compared with gamete donation mothers. In addition, less positive relationships were found between mothers and adolescents in egg donation families than in donor insemination families as rated by both mothers and adolescents. There were no differences between family types for the adolescents themselves in terms of adjustment problems, psychological well-being, and self-esteem. Longitudinal analyses showed no differences between family types in negative parenting from age 7 to age 14, and a weaker association between negative parenting and adjustment difficulties for gamete donation than natural conception and surrogacy families. The findings suggest that the absence of a genetic link between mothers and their children is associated with less positive mother-adolescent relationships whereas the absence of a gestational link does not have an adverse effect.

Keywords: assisted reproduction, surrogacy, gamete donation, adolescence, parent-child relationships

Since the birth of the first baby through in vitro fertilization in 1978 (Steptoe & Edwards, 1978), more than 5 million children have been born through assisted reproductive technologies (Adamson, 2012), an increasing number of whom are born by reproductive donation, that is, by the donation of gametes (eggs or sperm) or the hosting of a pregnancy for another woman (surrogacy; Richards, Pennings, & Appleby, 2012). Children born through egg donation lack a genetic link with their mother whereas children born through sperm donation (donor insemination) lack a genetic link with their father. In the case of surrogacy, children

lack a gestational link with their mother. Surrogacy children additionally lack a genetic link with their mother if the surrogate's egg was used in their conception. The current study constitutes the sixth phase of the first longitudinal investigation of parenting and child development in families created through reproductive donation, and focuses on the children's transition to adolescence when issues relating to identity and autonomy become salient and difficulties in parent-child relationships are most likely to arise (Smetana, Campione-Barr, & Metzger, 2006; Steinberg & Silk, 2002).

It has often been suggested that the creation of families through reproductive donation, whereby children lack a genetic and/or gestational relationship with their parents, may be detrimental to positive family functioning (Baran & Pannor, 1993; Daniels & Taylor, 1993; Velleman, 2005). This idea arose, in part, from studies of adoptive families, in which children similarly lack a biological connection to their parents. There is a large body of research demonstrating that adopted children show higher rates of emotional and behavioral problems than do nonadopted children (Palacios & Brodzinsky, 2010). However, recent meta-analyses have found these differences to be small, with the large majority of adopted children functioning within the normal range (Juffer & van IJzendoorn, 2005, 2007). In addition, the psychological problems shown by adopted children appear to be largely related to factors associated with the adoption, such as children's experiences of abusive or neglectful parenting and multiple caretakers in the years before the adoption took place, rather than the absence of

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a biological link to their adoptive parents (Palacios & Brodzinsky, 2010).

However, the transition to adolescence presents specific challenges for adopted children. It has been shown that adopted adolescents need to integrate their experiences of being adopted into a meaningful narrative in order to develop a secure sense of identity (Grotevant & Von Korff, 2011). Moreover, adopted children show an increase in adjustment problems at adolescence (Fergusson, Lynskey, & Horwood, 1995; Sharma, McGue, & Benson, 1996; van der Voort et al., 2014; van der Voort, Linting, Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2013). Although children conceived by gamete donation and surrogacy differ from adopted children in that they have a genetic link to one parent (their father in egg donation and surrogacy families and their mother in donor insemination families), and are raised by their mother and father from birth, the absence of a genetic and/or gestational connection to a parent is considered to create important similarities between children born through reproductive donation and adopted children which may have implications for their identity development, psychological adjustment, and relationships with their parents (Cahn, 2009).

Adoptive parents also face specific challenges when their children reach adolescence. Greater conflict has been found between adoptive parents and adopted adolescents than between nonadoptive parents and nonadopted adolescents (Rueter, Keyes, Iacono, & McGue, 2009). Moreover, poor communication about adoption has been associated with more negative relationships between adoptive parents and their adopted adolescents (Brodzinsky & Pinderhughes, 2002; Rueter & Koerner, 2008). Adoptive parents are therefore encouraged to acknowledge the difference between adoptive and biological families and create a family environment that supports open communication about adoption (Brodzinsky, 2011).

Research on stepfamilies, in which one parent is genetically unrelated to the child, has also given rise to the idea that the absence of a genetic link between parents and children may have an adverse effect on family relationships and children's psychological adjustment. Stepfamilies, like adoptive families, are associated with raised levels of psychological problems for children (Dunn, Davies, O'Connor, & Sturgess, 2000; Dunn et al., 1998; Hetherington & Stanley-Hagan, 2002). This finding appears to be more marked in stepmother than in stepfather families (Dunn et al., 2000; Hetherington & Stanley-Hagan, 2002; O'Connor, Dunn, Jenkins, Pickering, & Rasbash, 2001). Once again, these difficulties appear to result from associated factors, such as disruption of the relationship with an existing parent and the acquisition of new family members, rather than the absence of a biological link between the stepparent and the child. Nevertheless, Dunn et al. (2000) reported that parents in families comprising both step and biological children were less affectionate toward, and less supportive of, their step than their biological children.

The earlier phases of the present longitudinal study were conducted when the children were at age 1 (Golombok, Lycett, et al., 2004a; Golombok, Murray, Jadva, MacCallum, & Lycett, 2004b), age 2 (Golombok, Jadva, Lycett, Murray, & MacCallum, 2005; Golombok, MacCallum, Murray, Lycett, & Jadva, 2006), age 3 (Golombok, Murray, Jadva, et al., 2006), age 7 (Golombok, Readings, Blake, Casey, Marks, et al., 2011; Golombok, Readings, Blake, Casey, Mellish, et al., 2011), and

age 10 (Golombok, Blake, Casey, Roman, & Jadva, 2013). Contrary to the concerns that had been expressed regarding the potentially negative psychological consequences of reproductive donation, the differences identified between family types in the preschool years indicated more positive parent-child relationships in these families, irrespective of the type of reproductive donation used, than in the comparison group of natural conception families. The children themselves showed high levels of psychological adjustment but did not differ from the naturally conceived children in spite of their experience of highly involved parenting. In the middle school years, by which time children show an awareness of biological inheritance (Solomon, Johnson, Zaitchik, & Carey, 1996; Williams & Smith, 2010) and of the meaning and implications of the absence of a biological connection to parents (Brodzinsky, 2011), positive parent-child relationships prevailed, although the reproductive donation families no longer showed more positive parent-child relationships than did the natural conception families. With respect to the children, those born through surrogacy exhibited higher levels of adjustment difficulties than the naturally conceived children at age 7 but were below the cutoff for clinical children by age 10. This pattern is similar to that shown by transnationally adopted children (Stams, Juffer, Rispen, & Hoksbergen, 2000) and has been attributed to these children's need to confront identity-related issues at a young age (Juffer & van IJzendoorn, 2005). Likewise, children born through surrogacy may be concerned with issues relating to identity at an early age (Golombok et al., 2013).

In spite of the generally positive outcomes shown by families formed through egg donation, donor insemination, and surrogacy up to the middle school years, the challenges of adolescence may be more pronounced in families created by reproductive donation than in natural conception families. Thus the aim of the present phase of the study was to establish whether families formed through assisted reproductive technologies involving reproductive donation are at risk for psychological problems following the children's transition to adolescence and, if so, to examine the nature of these problems and the mechanisms involved. The study is founded upon a relational developmental systems approach as an underlying conceptual framework (Aldwin, 2014; Overton, 2015), whereby bidirectional relations between individuals, the family, and the wider social world are viewed as influential in development. More specifically, the study was guided by the theoretical and research literature on parenting showing that the quality of children's relationships with their parents is associated with children's psychological adjustment, such that positive aspects of parenting including warmth, sensitivity and acceptance are associated with positive child adjustment whereas conflict, hostility, and rejection are associated with more negative outcomes for children (Bornstein, 2002; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Lamb, 2012).

In line with this framework and the research literature on adoption and stepparenting, it was hypothesized that families formed through reproductive donation would show higher levels of difficulties in mother-adolescent relationships and adolescent adjustment problems than natural conception families, arising from the absence of a genetic and/or gestational connection between the adolescents and their parents. Differences were also hypothesized

according to the specific type of reproductive donation used. Surrogacy families were predicted to show higher levels of problems in mother-adolescent relationships and adolescent adjustment than gamete donation families due to the absence of a gestational link with the mother, as adolescents conceived using donated gametes were born to the parents who raised them, whereas adolescents in families created by surrogacy were born to another woman who conceived them with the specific intention of relinquishing them to the intended parents. In addition, egg donation families were predicted to show higher levels of problems in mother-adolescent relationships and adolescent adjustment than donor insemination families due to the absence of a genetic link with the mother as opposed to the father. As mothers are more involved with their children on a day-to-day basis than are fathers (Lamb, 2010, 2012), the absence of a genetic link to the mother may be more detrimental to family functioning than the absence of a genetic link to the father. It may also be relevant, as mentioned above, that children are more likely to experience psychological difficulties when raised by stepmothers than by stepfathers.

Two further hypotheses were tested longitudinally using data from Phase 4 when the children were aged 7 years and Phase 5 when the children were aged 10 years. The first was that parenting difficulties would become more marked at adolescence in reproductive donation than in natural conception families as the absence of a biological connection is expected to produce greater challenges at adolescence than in middle childhood. For the reasons outlined above, it was also hypothesized that parenting difficulties would become more marked in surrogacy than in gamete donation families, and in egg donation than in donor insemination families. The second focused on the impact of parenting in middle childhood on adolescent adjustment. Based on a cross-sectional study of assisted reproduction families showing a weaker association between maternal hostility and child depression in genetically unrelated than in genetically related mother-child dyads (Harold et al., 2011), it was predicted that the long-term association between negative parenting and adolescent adjustment would differ according to biological relatedness such that there would be a weaker association between preadolescent parenting problems and adolescent adjustment problems in reproductive donation families than in natural conception families.

Method

Participants

At Phase 5 of the study, parents were asked for permission to contact them again for follow up (see Golombok, Lycett, et al., 2004 and Golombok, Murray, et al., 2004 for details of the initial recruitment of families to the study). Those who agreed were approached by telephone, letter, or email as close as possible to the child's 14th birthday. The present phase of the study involved 87 families with a child born through reproductive donation including 32 families with a child born through donor insemination, 27 families with a child born through egg donation, and 28 families with a child born through surrogacy, and a comparison group of 54 families with a naturally conceived child, representing 91%, 84%, 90%, and 100%, respectively, of the number of donor insemination, egg donation, surrogacy, and naturally conceived families seen at Phase 5, and 89%, 84%, 86%, and 100%, respectively, of

the number of donor insemination, egg donation, surrogacy, and naturally conceived families seen at Phase 4. These percentages include six families who participated at age 10 who had not taken part at age 7, and seven families who participated at age 14 who had not taken part at age 10. Of the 16 families who were lost to follow up between the present phase and the previous phase at age 10, six (37.5%) could not be traced, four (25%) actively withdrew, and the remaining six families (37.5%) were unable to participate due to other commitments but did not withdraw from the study. For ethical reasons, it was not possible to administer questionnaires or the observational assessment to adolescents who had not been informed of the method of their conception. Thus, 50 adolescents who were aware of the method of their conception (24 surrogacy adolescents, 16 egg donation adolescents, and 10 donor insemination adolescents) participated in the study, as well as 52 natural conception adolescents, representing 98% of eligible adolescents.

As shown in Table 1, there were no differences between family types in the age or gender of the children. A one-way analysis of variance (ANOVA) showed that the age of the mother differed significantly between family types, $F(3, 137) = 12.42, p < .001$, reflecting the older age of the egg donation ($M = 53.66$ years) and surrogacy ($M = 51.60$ years) mothers than the donor insemination ($M = 48.93$ years) and natural conception ($M = 48.27$ years) mothers. There was also a significant difference between family types for number of siblings in the family, $\chi^2(6) = 20.40, p < .01$, with a greater number of siblings in the natural conception than in the reproductive donation families. Of the surrogacy families, 10 (35.7%) mothers were genetically related to their children as they used their own eggs to create the pregnancy.

Excluding the two families where the father had died, 83.5% of parents were still married or cohabiting at the time of the study. There was no significant difference between family types in the proportion of mothers who had separated or divorced from the child's father, although there was a nonsignificant trend toward higher relationship breakdown among the surrogacy and donor insemination families alongside a particularly low rate among the egg donation families, $\chi^2(3) = 6.42, p = .09$. There was a significant difference between family types in mothers' educational level, $\chi^2(3) = 15.16, p = .002$. The natural conception mothers had the highest rate of university degrees and the lowest rate was found among the surrogacy mothers. There was no difference in mothers' ethnic group between family types. Ninety-two percent of mothers were White, with the remaining 8% identifying as Black or Asian.

Procedure

A psychologist trained in the study techniques visited the families at home. Written informed consent to participate in the investigation was obtained from the mother. Mothers and adolescents also gave written informed consent for the adolescents to participate. Ethical approval for the study was granted by the University of Cambridge Psychology, Research Ethics Committee. The mothers were administered a standardized interview that was digitally recorded. In addition, the mothers and adolescents completed standardized questionnaires and participated together in a video-recorded observational task that lasted 5–10 min. The adolescents' teachers completed a questionnaire to give an indepen-

Table 1
Sociodemographic Information by Family Type

Variable	Natural conception		Surrogacy		Egg donation		Donor insemination		F	p
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Age of mother (years)	48.27	2.73	51.60	4.85	53.66	5.91	48.93	3.45	12.42	.000
Age of children (months)	169.16	4.23	167.17	5.84	168.29	5.73	167.37	5.04	1.32	ns
	N (%)		N (%)		N (%)		N (%)		χ^2	p
Child's gender									1.69	ns
Boy	25 (46.3)		12 (42.9)		15 (55.6)		18 (56.3)			
Girl	29 (53.7)		16 (57.1)		12 (44.4)		14 (43.8)			
Number of siblings									20.40	.002
0	4 (7.4)		12 (42.9)		13 (48.1)		11 (34.4)			
1	41 (75.9)		13 (46.4)		11 (40.7)		17 (53.1)			
2+	9 (16.7)		3 (10.7)		3 (11.1)		4 (12.5)			
Marital Status									6.42	.09
Married	48 (88.9)		21 (75)		25 (92.6)		22 (73.3)			
Separated/divorced	6 (11.1)		7 (25.0)		2 (7.4)		8 (26.7)			
Ethnic group:									2.90	ns
White	47 (97.9)		25 (100)		23 (92.0)		26 (96.3)			
Non-white	1 (2.1)		0 (0)		2 (8)		1 (3.7)			
Mothers' educational level									15.16	.002
No university degree	19 (35.2)		22 (78.6)		16 (59.3)		19 (59.4)			
University degree	35 (64.8)		6 (21.4)		11 (40.7)		13 (40.6)			

dent assessment of the adolescents' adjustment. As data were obtained by interview on issues relating to the child's conception, it was not possible for interviewers to be blind to family type. However, a section of the interview on the child's psychological adjustment was rated by a child psychiatrist who was unaware of the method of the child's conception.

Measures

Mother-child relationships

Interview with mother. The mothers were interviewed using an adaptation of a semistructured interview designed to assess the quality of the mother-child relationship that has been validated against observational ratings of mother-child relationships in the home (Quinton & Rutter, 1988) and has been used successfully in previous studies of assisted reproduction families (Golombok et al., 2013; Golombok, Readings, Blake, Casey, Marks, et al., 2011, Golombok, Readings, Blake, Casey, Mellish, et al., 2011). Detailed accounts are obtained of the child's behavior and the mother's response to it, with particular reference to interactions relating to warmth and control. A flexible style of questioning is used to elicit sufficient information for each variable to be rated by the researcher using a standardized coding scheme based upon a detailed coding manual. Thus ratings are carried out by the researcher using in-depth information obtained from the mother rather than by the mother herself.

The following variables were coded at Phases 4, 5, and 6 of the study: (a) *expressed warmth* from 1 (*little*) to 5 (*high expressed warmth*) took account of the mother's tone of voice, facial expressions, and gestures in addition to what the mother said about the child; (b) *sensitive responding* from 1 (*low*) to 4 (*high*) represented the mother's ability to recognize and respond appropriately to her child's needs; (c) *quality of interaction* from 1 (*low*) to 4 (*very*

high) was based on the extent to which the mother and child wanted to be with each other and enjoyed each other's company; (d) *frequency of battles* from 0 (*never/rarely*) to 5 (*a few times daily*) assessed the frequency of mother-child conflict; (e) *level of battles* from 0 (*none*) to 3 (*major*) assessed the severity of mother-child conflict; and (f) *resolution* from 0 (*full resolution*) to 3 (*no resolution*) assessed the attempt made to resolve the conflict. To establish interrater reliability, 47 randomly selected interviews were coded by a second interviewer and the interclass correlation coefficients were as follows: expressed warmth, .70; sensitive responding, .56; quality of interaction, .79; frequency of battle, .99; level of battle, .96; and resolution, .88.

Index of Family Relationships (IFR). Mothers and adolescents completed this 25-item questionnaire designed to measure problems in family relationships (Hudson, 1989). The total score, which ranges from 0 to 100, gives an assessment of family relationship difficulties, with higher scores representing greater difficulties. Internal consistencies for the original sample ranged from 0.91 to 0.98, and for the present sample are .91 and .94 for the mother and adolescent questionnaires, respectively. The IFR has been found to show good discriminant validity and to distinguish between families with and without clinical problems.

Parental Acceptance Rejection Questionnaire (PARQ). The short 24-item version of this questionnaire was administered to both mothers and adolescents to provide total scores of maternal acceptance/rejection comprising subscales of warmth/affection, hostility aggression, indifference/neglect, and undifferentiated rejection (Rohner, 2001). Mothers completed the questionnaire regarding their feelings toward their adolescents and the adolescents completed the questionnaire regarding their perceptions of their mothers' feelings toward them. Thus data on maternal acceptance/rejection was obtained from both mothers and adolescents. Higher

scores represent greater rejection whereas lower scores represent greater acceptance, with scores above 60 representing higher levels of rejection than acceptance. The PARQ has been reported to have good internal consistency, with alpha values of 0.91 and 0.84, respectively, for the parent and adolescent versions. The alpha values for the current study were .66 and .82, respectively, for the parent and adolescent versions, with the discrepancy for the parent version resulting from high levels of maternal acceptance in the present study.

Parental Control Scale (PCS). This 13-item measure of parental control was completed by mothers and adolescents to provide total scores of behavioral control (Rohner, 2001). Mothers completed the questionnaire regarding the control they enforced on their adolescents and the adolescents completed the questionnaire regarding their perceptions of the control their mothers enforced on them. Thus data on maternal control was obtained from the perspectives of both mothers and adolescents. Higher scores reflected higher levels of behavioral control, with scores ranging from 13–26 indicating low control, 27–39 indicating moderate control, 40–45 indicating firm control, and 46–52 indicating restrictive control. The PCS has been shown to have good internal consistency with an average alpha of 0.73 from a meta-analysis of studies using this measure (Rohner & Khaleque, 2003). The alphas for the current sample were .75 and .84 for mothers and adolescents, respectively.

Mother-adolescent interaction. Mothers and adolescents participated together in a video-recorded observational assessment involving a vacation planning task in which they were given 5 min to plan a 2-week family holiday for which they had unlimited funds (Grotevant & Cooper, 1985). Mother-adolescent dyads were instructed to talk freely about whom they wished to go on the holiday, where they wished to go, and what they planned to do while there. The session was coded using the Parent-Child Interaction System (Deater-Deckard & Petrill, 2004) to assess the construct of mutuality, that is, the extent to which the mother and child engaged in positive dyadic interaction characterized by warmth, mutual responsiveness, and cooperation. The following variables were rated on a 7-point scale ranging from 1 (*no instances*) to 7 (*constant, throughout interaction*): (a) *mother's responsiveness to child* assessed the extent to which the mother responded immediately and contingently to the child's comments, questions, or behaviors; (b) *child's responsiveness to mother* assessed the extent to which the child responded immediately and contingently to the mother's comments, questions, or behaviors; (c) *dyadic reciprocity* assessed the degree to which the dyad showed shared positive affect, eye contact, and a "turn-taking" (conversationlike) quality of interaction; and (d) *dyadic cooperation* assessed the degree of agreement about whether and how to proceed with the task. To establish interrater reliability, 47 randomly selected interviews were coded by two raters who were unaware of family type. The intraclass correlations for child's responsiveness to mother, dyadic reciprocity, and dyadic cooperation were 0.61, 0.71, and 0.69, respectively. It was not possible to calculate an intraclass correlation for mother's responsiveness to child due to the restriction of range of the scores as most dyads obtained scores at the top end of the scale.

Children's psychological adjustment

Strengths and Difficulties Questionnaire (SDQ). The presence of adolescent psychological problems was assessed with the

SDQ (Goodman, 2001) administered to mothers and adolescents. The SDQ produces an overall score of adolescent adjustment with scores of 13 or below classified as within the normal range, scores of 14–16 classified as borderline and scores of 17 or above classified as abnormal, that is, indicating psychological disorder. An independent assessment of the adolescents' psychological adjustment was obtained by administering the SDQ to teachers. Following permission from the mother, the questionnaire was mailed to the adolescent's teacher with an enclosed stamped addressed envelope for return to the researcher. Teachers were informed by covering letter that their responses to the questionnaire would not be reported back to the adolescent's family or school. For teachers' questionnaires, scores of 11 or below are classified as within the normal range, scores of 12–15 are classified as borderline, and scores of 16 or above are classified as abnormal.

The SDQ has been shown to have good internal consistency, test-retest and interrater reliability, and concurrent and discriminative validity (Goodman, 2001). For example, based on an epidemiological sample of more than 10,000 children in the United Kingdom (Goodman, 2001), internal consistency (Cronbach's alpha) was found to be 0.73, test-retest reliability after 4–6 months was 0.62, and, in terms of validity, scores above the 90th percentile predicted a substantially raised probability of independently diagnosed psychiatric disorders. Internal consistencies for mothers, adolescents, and teachers, respectively, in the current study were .69, .77, and .62. In a review of the reliability and validity of the SDQ based upon 48 studies involving more than 130,000 children, Stone, Otten, Engels, Vermulst, and Janssens (2010) found the psychometric properties of the SDQ to be strong.

Rosenberg Self-Esteem Scale. The Rosenberg Self-Esteem Scale was administered to adolescents to provide a measure of overall self-worth (Rosenberg, 1979). This 10-item questionnaire ranging from 10 to 30, for which higher scores represent higher self-esteem and scores below 15 suggest low self-esteem, has been shown to have high internal consistency, with an average alpha of 0.81 across studies in different nations (Schmitt & Allik, 2005). Cronbach's alpha was .89 for the present sample. In addition, the scale has been found to be negatively correlated with anxiety and depression (Torrey, Mueser, McHugo, & Drake, 2000) thus demonstrating construct validity.

Engagement, Perseverance, Optimism, Connectedness, and Happiness Measure of Adolescent Wellbeing (EPOCH). The 20-item EPOCH was administered to adolescents to produce a total score of positive psychological functioning ranging from 20 to 100, with higher scores representing more positive functioning (Kern, Benson, Steinberg, & Steinberg, 2016). Although this is a new measure and, as such, lacks a body of data on its psychometric properties, it was administered to assess positive functioning in adolescence as opposed to the absence of psychological problems. Test-retest reliability has been shown to be satisfactory across 3 weeks, ranging from .55 for Connectedness to .61 for Happiness, and internal consistency has been found to be high, ranging from .85 to .95 in different samples. For the present sample, Cronbach's alpha was .89. EPOCH scores have been shown to be negatively correlated with measures of emotional distress and behavior problems indicating that the EPOCH is a valid measure of adolescent well-being.

Ratings of psychiatric disorder. The presence of adolescent psychiatric disorder was assessed during the interview with the

mother using a standardized procedure (Rutter, Cox, Tupling, Berger, & Yule, 1975). Detailed descriptions were obtained of any emotional or behavioral problems shown by the adolescent. These descriptions of actual behavior, which included information about where the behavior was shown, severity of the behavior, frequency, precipitants, and course of the behavior over the past year, were transcribed and rated by a child psychiatrist who was unaware of the nature of the study. A high level of reliability ($r = .85$) between ratings made by social scientists and those made "blindly" by a child psychiatrist has been demonstrated for this procedure and validity has been established through a high level of agreement between interview ratings of children's psychological problems and mothers' assessments of whether or not their children had emotional or behavioral difficulties (Rutter et al., 1975). Psychological problems, when identified, were rated according to severity on a 3-point scale ranging from 0 (*no disorder*) through 1 (*slight disorder*) to 2 (*marked disorder*) and type (emotional disorder, conduct disorder, mixed emotional and conduct disorder, developmental disorder, ADHD, psychotic disorder, or other disorder).

Analysis Plan

In the first instance, confirmatory factor analysis was conducted with the interview variables relating to parenting quality (comparative fit index [CFI] = 1.00; Tucker-Lewis index [TLI] = 1.00; root-mean-square error of approximation [RMSEA] = .03, 90% confidence interval [CI] = [.00, .11]). Two factors were obtained, each with item loadings of at least 0.43. The first factor (comprising expressed warmth, sensitive responding, and quality of interaction) was labeled positive parenting and the second factor (comprising frequency of battles, level of battles, and resolution) was labeled negative parenting. The correlation between the two factors was $r = -.37$, $p = .001$, showing a slight negative relation between them. Comparisons between the surrogacy, egg donation, donor insemination, and natural conception families at age 14 were conducted using univariate and multivariate analyses of variance. Where significant overall differences were found between family types, the following Helmert contrasts were carried out: reproductive donation families versus natural conception families (RD vs. NC) to establish whether there were differences between families where children lacked a genetic and/or gestational relationship with their parents and families with biologically related children, surrogacy families versus gamete (egg and sperm) donation families (S vs. GD) to establish whether families with children who lacked a gestational relationship with their mother differed from families where mothers had given birth to their children, and egg donation families versus donor insemination families (ED vs. DI) to establish whether families where children lacked a genetic link to their mother differed from families where children lacked a genetic link to their father. Effect sizes for the Helmert contrasts were calculated using Cohen's d . For the comparisons between the reproductive donation and natural conception families, the sample size was large enough to detect an effect size of .34 for a power of 0.80, and for the comparisons between the surrogacy and gamete donation families, and between the egg donation and donor insemination families, it was possible to detect effect sizes of .45 and .52, respectively for a power of 0.80. As the demographic variables that differed significantly between groups (mothers' age, number

of siblings in the family, and mothers' educational level) were not correlated with the dependent variables, these were not entered into the analyses as covariates.

For the longitudinal analysis of parenting difficulties over time, a mixed analysis of variance with Helmert contrasts was used to investigate differences between family types in negative parenting between age 7 and age 14. Path analysis was used to examine the relation between negative parenting and child adjustment over time. All families who had data at a minimum of one time point were included, producing an enhanced sample of 165 families. First, longitudinal confirmatory factor analysis with measurement invariance constraints was applied across the negative parenting variables obtained at child ages 7, 10, and 14 to ensure the creation of robust measures that functioned equivalently over time. The negative parenting factor achieved partial measurement equivalence and excellent fit to the data (CFI = .95; TLI = .96; RMSEA = .04, 90% CI [.00, .07]). The path analysis first focused on examining stability in negative parenting over time. The relation between negative parenting and child adjustment was then tested through the inclusion of mothers' SDQ scores at age 14 as an outcome variable in the model. The models were conducted using Mplus v.7.4. Model fit was considered excellent for CFI and TLI values $\geq .95$ and acceptable for CFI and TLI values $\geq .90$. Although the RMSEA is reported for the models (adequate fit is achieved for RMSEA $\leq .08$ and excellent fit is achieved for RMSEA $\leq .06$), it was not used for the evaluation of model fit as the RMSEA underperforms in small samples.

Results

Comparisons Between the Surrogacy, Egg Donation, Donor Insemination, and Natural Conception Families at Age 14

Mother-child relationships. As shown in Table 2, the positive parenting factor scores and the negative parenting factor scores from the interview with mothers were entered into a multivariate analysis of variance (MANOVA) with family type as the between-subjects factor. Wilks' λ was significant, $F(6, 272) = 2.90$, $p < .01$. One-way ANOVAs found a significant difference between groups for negative parenting, $F(3, 137) = 4.10$, $p < .01$, but not for positive parenting. With respect to the questionnaires, the mothers' and adolescents' IFR scores were entered into a MANOVA with family type as the between-subjects factor. Wilks' λ was significant, $F(6, 184) = 5.11$, $p < .001$. One-way ANOVAs identified a significant difference between groups for both mothers' scores, $F(3, 93) = 10.16$, $p < .001$, and adolescents' scores, $F(3, 93) = 2.92$, $p < .05$. In addition, the mothers' and adolescents' total acceptance/rejection scores on the PARQ were entered into a MANOVA with family type as the between-subjects factor. Wilks' λ was significant, $F(6, 184) = 3.06$, $p < .05$. One-way ANOVAs identified a significant difference between groups for mothers' scores, $F(3, 93) = 5.42$, $p < .01$, but not for adolescents' scores. The mothers' and adolescents' total scores on the PCS were also entered into a MANOVA with family type as the between-subjects factor. Wilks' λ was not significant, $F(6, 180) = 0.56$, $p = ns$, showing that there was no difference in maternal control

Table 2

Means, SDs, *F*, and *p* Values for Comparisons of the Interview, Questionnaire, and Observational Assessment of the Quality of Parent-Adolescent Relationships Between Family Types

Variable	Natural conception		Surrogacy		Egg donation		Donor insemination		<i>F</i>	<i>p</i>	Contrasts					
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>			NC vs RD		S vs GD		ED vs DI	
											<i>p</i>	<i>d</i>	<i>p</i>	<i>d</i>	<i>p</i>	<i>d</i>
Quality of parenting									2.90	.009						
Positive parenting ^a	-.10	.87	.03	.86	.04	.66	-.13	.71	.43	<i>ns</i>	<i>ns</i>	.09	<i>ns</i>	.11	<i>ns</i>	.26
Negative parenting ^b	-.09	.70	-.19	.58	.26	.53	.15	.40	4.10	.008	<i>ns</i>	.49	.003	.77	<i>ns</i>	.23
Index of family relationships ^b									5.11	.000						
Mother	11.61	7.93	6.37	4.99	20.86	12.11	10.80	3.91	10.16	.000	<i>ns</i>	.09	.000	.77	.002	.46
Adolescent	14.32	9.93	12.96	7.56	21.30	14.87	10.61	8.09	2.92	.038	<i>ns</i>	.05	<i>ns</i>	.36	.012	.89
Parental acceptance/Rejection questionnaire ^b									3.06	.007						
Mother	29.32	4.26	27.28	2.70	32.50	5.92	27.40	2.54	5.42	.002	<i>ns</i>	.01	.034	.61	.003	.59
Adolescent	28.78	4.95	27.61	3.42	30.18	5.69	26.10	2.72	1.92	<i>ns</i>	<i>ns</i>	.23	<i>ns</i>	.22	.031	.91
Parental control scale ^b									.56	<i>ns</i>						
Mother	35.14	4.86	35.95	3.70	36.93	5.93	34.80	3.29	.69	<i>ns</i>	<i>ns</i>	.24	<i>ns</i>	.05	<i>ns</i>	.16
Adolescent	33.42	6.94	35.50	7.23	33.66	6.59	33.10	6.85	.48	<i>ns</i>	<i>ns</i>	.14	<i>ns</i>	.30	<i>ns</i>	.08
Observational assessment ^a									1.49	<i>ns</i>						
Mother responsiveness	6.07	1.02	6.09	.92	6.57	.51	6.29	.95	1.13	<i>ns</i>	<i>ns</i>	.22	<i>ns</i>	.48	<i>ns</i>	.36
Child responsiveness	6.02	.95	5.73	1.63	6.57	.64	6.43	1.13	1.81	<i>ns</i>	<i>ns</i>	.08	<i>ns</i>	.61	<i>ns</i>	.15
Dyadic reciprocity	4.57	1.64	4.68	1.58	3.86	.94	5.43	.97	1.85	<i>ns</i>	<i>ns</i>	.04	<i>ns</i>	.21	<i>ns</i>	.15
Dyadic cooperation	5.52	1.28	5.36	1.52	5.64	.84	6.29	1.11	.94	<i>ns</i>	<i>ns</i>	.07	<i>ns</i>	.39	<i>ns</i>	.66

Note. NC = natural conception; RD = reproductive donation (surrogacy, egg donation and donor insemination combined); S = surrogacy; GD = gamete donation (egg donation and donor insemination combined); ED = egg donation; DI = donor insemination.

^a Higher scores represent fewer difficulties. ^b Higher scores represent greater difficulties.

between family types as rated by mothers or adolescents. Finally, the variables relating to the construct of mutuality from the observational assessment of mother-adolescent interaction (mother responsiveness, child responsiveness, dyadic reciprocity, and dyadic cooperation) were entered into a MANOVA with family type as the between-subjects factor. Wilks' λ was not significant, $F(12, 211) = 1.49$, $p = ns$, showing that there was no difference in mother-adolescent interaction between family types.

In order to test the first hypothesis that families in which children lacked a genetic and/or gestational relationship with their parents would show higher levels of difficulties in mother-adolescent relationships than families with biologically related children, contrasts between the reproductive donation families and the natural conception families were carried out for the variables that showed an overall difference between family types. None of these contrasts was significant showing that the reproductive donation families did not differ from the natural conception families with respect to the quality of mother-adolescent relationships.

In terms of the second hypothesis that families with children who lacked a gestational relationship with their mother would show higher levels of difficulties in mother-adolescent relationships than families in which mothers had given birth to their children, contrasts between surrogacy families and gamete donation families were carried out for the variables that differed between family types. The level of negative parenting was found to be significantly lower in the surrogacy families than in the gamete donation families (S vs. GD, $p < .01$, $d = .77$). In addition, the mothers' IFR scores were lower in the surrogacy families compared with the gamete donation families (S vs. GD, $p < .001$, $d = .77$), reflecting lower levels of family relationship difficulties in the surrogacy families. There was no difference between the sur-

rogacy families and the gamete donation families for the adolescents' scores. Similarly, the contrasts for the PARQ showed lower scores in the surrogacy families compared with the gamete donation families for mothers (S vs. GD, $p < .05$, $d = .61$), reflecting greater parental acceptance in the surrogacy families, but not for adolescents.

Regarding the third hypothesis that families in which children lacked a genetic link to their mother would show higher levels of difficulties in mother-adolescent relationships than families in which children lacked a genetic link to their father, contrasts between egg donation families and donor insemination families were carried out for the variables that differed between family types. For the IFR, higher scores were found in the egg donation families compared with the donor insemination families for both mothers and adolescents (ED vs. DI, $p < .01$, $d = .46$ for mothers; ED vs. DI, $p < .05$, $d = .89$, for adolescents), reflecting greater family relationship difficulties in the egg donation families. Similarly, for the PARQ, mothers and adolescents from egg donation families obtained higher scores than mothers and adolescents from donor insemination families (ED vs. DI, $p < .01$, $d = .59$ for mothers; ED vs. DI, $p < .05$, $d = .91$ for adolescents), reflecting lower parental acceptance in the egg donation families.

Adolescent adjustment. One-way ANOVAs with family type as the between-subjects factor were carried out for the SDQ separately for the mothers' and teachers' scores in order to maximize the number of participants in each analysis. There were no significant differences between family types for either mothers or teachers (Table 3). Although only just over half of the teachers completed the SDQ, there was no significant difference in mothers' total SDQ scores between those adolescents for whom teachers' SDQ scores were available and those for whom they were not,

Table 3

Means, SDs, *F*, and *p* Values for Comparisons of the Strengths and Difficulties Questionnaire Completed by Mothers and Teachers and the EPOCH, SDQ, and Rosenberg Self-Esteem Scale Completed by Adolescents Between Family Types

Variable	Natural conception		Surrogacy		Egg donation		Donor insemination		<i>F</i>	<i>p</i>	Contrasts					
	Mean	SD	Mean	SD	Mean	SD	Mean	SD			NC vs RD		S vs GD		ED vs DI	
											<i>p</i>	<i>d</i>	<i>p</i>	<i>d</i>	<i>p</i>	<i>d</i>
Strengths and Difficulties Questionnaire (SDQ) ^b																
Mothers' ratings	4.47	3.71	5.61	3.85	5.70	2.75	4.76	3.19	1.04	ns	ns	.31	ns	.24	ns	.31
Teachers' ratings	3.76	3.94	7.00	5.73	5.61	5.17	4.58	3.87	1.76	ns	ns	.22	ns	.44	ns	.22
Adolescent adjustment																
EPOCH ^a	3.72	.63	3.78	.54	3.64	.58	3.75	.29	.18	ns	ns	.23	ns	.02	ns	.23
SDQ ^b	9.55	4.74	9.00	5.23	10.75	5.90	8.40	3.94	.566	ns	ns	.47	ns	.02	ns	.47
Rosenberg Self-Esteem Scale ^a	22.81	5.17	24.05	4.75	22.75	6.93	22.40	6.20	.30	ns	ns	.05	ns	.01	ns	.05

Note. SDQ = Strengths and Difficulties Questionnaire; EPOCH = Engagement, Perseverance, Optimism, Connectedness and Happiness Measure of Adolescent Wellbeing; NC = natural conception; RD = reproductive donation (surrogacy, egg donation and donor insemination combined); S = surrogacy; GD = gamete donation (egg donation and donor insemination combined); ED = egg donation; DI = donor insemination.

^a Higher scores represent fewer difficulties. ^b Higher scores represent greater difficulties.

and no significant difference between family types in the proportion of teachers who did not complete this questionnaire.

The adolescents' scores on the EPOCH, the SDQ, and the Rosenberg Self-Esteem Scale were entered into a MANOVA with family type as the between-subjects factor. Wilks' λ was not significant, $F(9, 216) = 0.45$, $p = ns$, showing that there was no difference in adolescents' adjustment between family types as rated by the children themselves.

Thus, there was no evidence in support of the first hypothesis that adolescents who lacked a genetic and/or gestational relationship with their parents would show higher levels of adjustment difficulties than those who were biologically related to their parents. Neither was there evidence for the second hypothesis that adolescents who lacked a gestational relationship with their mother would show higher levels of adjustment difficulties than those whose mothers had given birth to them, or for the third hypothesis that adolescents who lacked a genetic connection to their mother would show higher levels of adjustment difficulties than those who lacked a genetic connection to their father.

The child psychiatrist identified psychiatric disorder among four (14.3%) surrogacy adolescents (2 with emotional disorder and 2 with developmental disorder), three (11.5%) egg donation adolescents (2 with emotional disorder and 1 with epilepsy), three (9.7%) donor insemination adolescents (2 with emotional disorder and 1 with mixed emotional and conduct disorder), and one (1.9%) naturally conceived adolescent (with emotional disorder). There was no difference between family types in the presence of psychiatric disorder, $\chi^2(3) = 4.88$, $p = ns$. However, there was a significant difference between family types when psychiatric disorder was subdivided into slight and marked disorder, $\chi^2(6) = 14.54$, $p < .05$, reflecting a higher proportion of adolescents in surrogacy families showing a marked disorder (10.7%) compared with 1.9% of adolescents in natural conception families and none in egg donation or donor insemination families.

Longitudinal Analysis of Negative Parenting From Age 7 to Age 14

The variable negative parenting was entered into a mixed ANOVA with Helmert contrasts, with time as the within-subjects

factor and family type as the between-subjects factor. Wilks' λ was significant with respect to time, $F(2, 160) = 993.47$, $p < .01$, reflecting an increase in negative parenting between age 7 and age 10, followed by a decrease between age 10 and age 14. For the interaction between time and family type, Wilks' λ was not significant, $F(6, 320) = 0.89$, $p = ns$, showing that change in negative parenting over time was similar for all family types.

Longitudinal Analysis of the Association Between Negative Parenting and Adolescent Adjustment at Age 14

A path analysis whereby factor scores of negative parenting at each time point were used as predictors of factor scores of negative parenting at the subsequent time point revealed high stability across all time points in individual differences in negative parenting, with a similar pattern for all four family types. To investigate the influence of negative parenting on adolescent adjustment, the path analysis was modified to include mothers' SDQ scores at age 14 which were regressed onto mothers' negative parenting scores at age 14. In addition, to investigate long-term influences, indirect paths were specified from parenting at ages 10 and 7 to mothers' SDQ scores at age 14, via parenting at age 14. As shown in Table 4, higher levels of adjustment difficulties at age 14 were explained by higher levels of negative parenting for naturally conceived adolescents and for adolescents conceived through surrogacy, but not for adolescents conceived by egg donation or donor insemination. Tests of indirect effects indicated the presence of adverse influences of negative parenting as early as 7 years beforehand, when the child was aged 7, as mothers who showed higher levels of negative parenting at the earlier time points maintained a higher level of negative parenting over time, relative to other mothers.

Discussion

Despite the concern that children born through reproductive donation would be at risk for psychological difficulties at adolescence, the findings of the present phase of this longitudinal study of families formed through egg donation, donor insemination, and surrogacy showed that these families did not differ from natural

Table 4
Path Analysis of the Influence of Negative Parenting on Mothers' Strengths and Difficulty Questionnaire Scores

Variable	Natural conception	Surrogacy	Donor insemination	Egg donation
Stability in negative parenting over time				
Age 7 → Age 10	.87*** [.79, .95]	.90*** [.82, .97]	.86*** [.77, .95]	.88*** [.76, .97]
Age 10 → Age 14	.86** [.78, .93]	.89*** [.83, .94]	.84*** [.75, .94]	.90*** [.84, .97]
Prediction of SDQ scores at age 14 from negative parenting				
Age 14	.34** [.10, .59]	.29* [.01, .57]	.02 (ns) [-.28, .31]	.06 (ns) [-.34, .46]
Age 10 → Age 14	.29** [.01, .51]	.26* [.003, .51]	.01 (ns) [-.24, .26]	.05 (ns) [-.31, .42]
Age 7 → Age 10 → Age 14	.25** [.06, .45]	.23† [-.001, .46]	.01 (ns) [-.20, .23]	.05 (ns) [-.27, .37]
	CFI	TLI	RMSEA	RMSEA 90% CI
Model fit	.98	.96	.14	[.00, .23]

Note. SDQ = Strengths and Difficulties Questionnaire; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root-mean-square error of approximation; CI = confidence interval. The numbers in square brackets represent 95% confidence intervals.

† $p = .051$. * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

conception families when the children reached age 14. The interview and observational ratings, as well as the scores on questionnaires for which norms were available, were characteristic of positive mother-adolescent relationships and well-adjusted adolescents. A possible explanation for this finding lies in the mothers' high motivation to have children. Children born through reproductive donation are, by necessity, planned and there is evidence to show that planned pregnancies are associated with more positive psychological outcomes for mothers and children (Carson et al., 2013; Nelson & O'Brien, 2012), with a longitudinal study of adolescents born as a consequence of unplanned pregnancies showing raised levels of externalizing problems at age 14 (Hayatbakhsh et al., 2011).

Where differences in the quality of mother-adolescent relationships were identified between family types, these reflected more positive relationships in the surrogacy families compared with the gamete donation families. The mothers in surrogacy families showed less negative parenting and reported greater acceptance of their adolescent children and fewer problems in family relationships as a whole. These findings are unexpected, given that surrogacy is considered to be the most controversial form of reproductive donation and has been assumed to carry the greatest psychological risks; not only are the children relinquished by the woman who gave birth to them but also negative societal attitudes toward surrogacy prevail (Anderson, 2000; Brazier, Campbell, & Golombok, 1998). However, surrogacy is a complex process that requires a trusting relationship between the intended parents and the surrogate, and the majority of couples who become parents in this way maintain contact with the surrogate as the child grows up (Jadva, Blake, Casey, & Golombok, 2012). Thus, surrogacy is not undertaken lightly and couples who have followed this route to parenthood are not only highly committed to becoming parents but also are willing to accept a third party into the process of forming a family. As surrogacy is not something that most prospective parents would contemplate even when faced with infertility, it is perhaps not surprising that their strong desire for a child translates into more positive parenting than that shown by parents of children conceived by gamete donation. It may also be relevant that 10 (35.7%) of the surrogacy mothers had used their own eggs to

create the pregnancy and thus were genetically related to their children.

Differences were also identified between the egg donation families and the donor insemination families. These differences indicated less positive relationships between mothers and adolescents in egg donation families than in donor insemination families both in terms of mothers' acceptance of their adolescents and the functioning of the family as a whole. Importantly, these differences were identified not only from the mothers' reports but also from the adolescents' reports which gives greater weight to the findings. Although it is essential to stress that the scores for both mothers and children in egg donation families are indicative of high levels of maternal acceptance and family functioning, inspection of the mean scores shows the donor insemination families to be similar to the natural conception comparison group whereas the egg donation families show less positive scores. This finding is in line with the hypothesis that the absence of a genetic link between mothers and their children would present more difficulties for mother-child relationships than would the absence of a genetic link between children and their fathers. Although there was no significant difference in the rates of divorce or separation between family types, it is notable that only 7.4% of egg donation families had separated or divorced. This is very low compared with the national divorce rate reported by the Office of National Statistics which is 28% for couples with children of this age and suggests that mothers who do not have a genetic tie to their children may be more likely to remain with their children's father.

Regarding the adolescents, there were no differences between family types in emotional or behavioral problems as assessed by the SDQ completed by mothers, teachers, and the adolescents themselves. Neither were there differences in adolescent well-being or self-esteem. For all of these measures, the adolescents obtained scores that reflected high levels of psychological adjustment. The ratings of interview transcripts by a child psychiatrist who was unaware of the child's family type were in line with these findings. The higher proportion of adolescents in surrogacy families who showed a marked disorder reflected developmental disorder in two of the three adolescents with this classification which is unlikely to be related to the quality of family relationships.

No differences were found for the observational measure of mother-adolescent interaction. Although this suggests that the groups did not differ in the quality of dynamic interactions between mothers and their adolescents, it is possible that the task of planning a family holiday was not sufficiently emotive or salient to elucidate differences in interaction patterns. The use of a conflict task was considered but was felt to be inappropriate with these particular families due to the sensitivities associated with the circumstances of the children's birth. In terms of mothers' level of control of their children, no difference was identified between family types.

Although it has been suggested that the additional challenges of adolescence may result in greater difficulties in parenting for families created by reproductive donation than for natural conception families, no differences were found between family types in negative parenting from middle childhood to adolescence. In all family types, negative parenting increased between age 7 and age 10 and then decreased between age 10 and age 14. This finding is consistent with a meta-analysis of parent-child conflict over time which concluded that conflict peaks during early adolescence (age 10–12) and then declines (Laursen, Coy, & Collins, 1998). In line with the hypothesis that there would be a weaker association between negative parenting and adjustment difficulties for genetically unrelated than genetically related mother-adolescent dyads, an association was found between negative parenting and adjustment difficulties at age 14 for naturally conceived adolescents but not for adolescents conceived by egg donation or donor insemination. This finding is consistent with the view that the association between parenting and child adjustment is, to some extent, genetically transmitted (Harold et al., 2011; Rutter, 2006). Although the surrogacy families were similar to the natural conception families in showing an association between negative parenting and adolescent adjustment difficulties at age 14, this finding may result from the presence of a genetic connection between one third of the surrogacy mothers and their children. It should be noted that differences between family types with respect to the presence of a relation between maternal negativity and child behavior problems were inferred based on the pattern of significant and nonsignificant findings.

A limitation of the study is the small sample size. As a consequence, differences between family types may not have been detected. Nevertheless, consistent differences were identified from different informants even with this small sample size, with large and medium effect sizes for the IFR and the PARQ. A further limitation was the low response rate (51%) from teachers which may have biased the findings to the extent that teachers may have been reluctant to complete questionnaires for adolescents who were showing emotional or behavioral problems. However, 40 (28.3%) of the teachers were not approached because the mothers did not give permission and thus the response rate from teachers who were asked to complete the questionnaire was 71.2%. In addition, there was no difference in the proportion of missing teachers' questionnaires between family types and no difference in mothers' SDQ scores between families with and without teachers' questionnaires. Sampling bias may also have arisen from families lost to follow up since the previous phase of the study. However, the retention rate was high and attrition did not differ according to family type. A further limitation of the small sample was that the

surrogacy families could not be divided into subsamples of families with genetically related, and genetically unrelated, children.

The study had a number of advantages. In particular, this is the only longitudinal study worldwide of parenting and child development in surrogacy families and, with the exception of a previous study by the same research team, the only longitudinal study of parenting and child development in egg donation and donor insemination families. Moreover, it is the first study to obtain data from the children themselves. In addition, the ratings of adolescent psychiatric disorder by a child psychiatrist who was "blind" to family type, as well as the teachers' questionnaires, provided independent validation of the data obtained from mothers and adolescents. A further advantage is that parenting quality was assessed using the same interview procedure at three time points from age 7 to age 14 which enabled longitudinal analyses of negative parenting and its association with adolescent adjustment to be carried out.

From a theoretical perspective, studying families where children lack a biological connection to their parents can increase understanding of the importance of biological relatedness for parent-child relationships and child adjustment. More specifically, studying families formed through reproductive donation can help establish whether the lack of a genetic and/or gestational link between parents and their children has an adverse impact on parenting or adolescent adjustment in the absence of the potentially confounding factors associated with adoption and living in a stepfamily. Overall, the findings of this longitudinal study of children born through egg donation, donor insemination, and surrogacy did not indicate raised levels of mother-adolescent relationship difficulties or adolescent adjustment problems compared with natural conception families. However, the differences identified between the egg donation and donor insemination families suggest that the absence of a genetic link between mothers and their children is associated with less positive mother-adolescent relationships than is the absence of a genetic link between the father and the child. In contrast, it appears that the absence of a gestational link between mothers and their children does not have an adverse effect on the quality of mother-child relationships at adolescence.

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Gay fathers' motivations for and feelings about surrogacy as a path to parenthood

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STUDY QUESTION: Why do gay men choose to start their families through surrogacy?

SUMMARY ANSWER: Most fathers chose surrogacy because they considered adoption to be a less desirable and/or accessible path to parenthood.

WHAT IS KNOWN ALREADY: Little is known of gay fathers' motivations to use surrogacy as a path to parenthood over and above other forms of family building, such as adoption, and no studies have examined fathers' satisfaction with the surrogacy process.

STUDY DESIGN, SIZE, DURATION: This study used a cross-sectional design as part of a larger investigation of parent–child relationships and child adjustment in 40 gay father surrogacy families. Multiple strategies (e.g. surrogacy agencies, social events and snowballing) were used to recruit as diverse a sample as possible. Data were obtained from 74 fathers (in 6 families only 1 father was available for interview).

PARTICIPANTS/MATERIALS, SETTING, METHOD: Semi-structured interviews, lasting ~1 h, were conducted in the family home (65%) or over Skype (35%) with 74 gay fathers (35 genetic fathers, 32 non-genetic fathers and 7 fathers who did not know or did not disclose who the genetic father was), when the children were 3–9 years old.

MAIN RESULTS AND THE ROLE OF CHANCE: Genetic and non-genetic fathers were just as likely to want to become parents and had similar motivations for choosing surrogacy as a path to parenthood. Most fathers ($N = 55$, 74%) were satisfied with surrogacy and were satisfied ($N = 31$, 42%) or had neutral feelings ($N = 21$, 28%) about their choice of who would be the genetic father. Most fathers received supportive reactions to their decision to use surrogacy from both families of origin (e.g. parents, siblings) ($N = 47$, 64%) and from friends ($N = 63$, 85%).

LIMITATIONS, REASONS FOR CAUTION: Although diverse recruitment strategies were used, data were obtained from a volunteer sample. Therefore, the possibility that fathers who had a positive surrogacy experience may have been more likely to participate in the study, and therefore introduce bias, cannot be ruled out. Due to the high average annual income of the fathers in the study, findings may not generalize to gay fathers with lower incomes.

WIDER IMPLICATIONS OF THE FINDINGS: It is often assumed that parents' primary motivation for using ART is to have a genetic connection to the child. This study revealed that whilst genetic fatherhood was important for some gay fathers in surrogacy families, it was not important for all. This information will be of use to surrogacy agencies and organizations supporting men who are considering the different routes to parenthood.

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Introduction

In 2014, ~37 800 male same-sex couples were raising children in the USA (US Census Bureau, 2014). Gay couples who wish to become parents may do so through surrogacy, a process in which a woman carries a pregnancy to term with the intention to relinquish the child to the intending parent(s). Intending fathers may choose to conceive using gestational surrogacy, where an embryo is created using the sperm of one partner and the egg of a donor, which is then transferred to the surrogate, or genetic surrogacy, in which conception occurs using the sperm of one partner and the egg of the surrogate.

Little is known about the motivations of gay couples who pursue surrogacy as a path to parenthood. However, several studies have explored the motivations of gay men who decide to adopt (Goldberg *et al.*, 2012; Jennings *et al.*, 2014). Most gay and lesbian adoptive parents choose adoption as their preferred route to parenthood, in contrast to heterosexual couples who typically consider adoption only after failed attempts at natural and/or assisted reproduction (Jennings *et al.*, 2014). In this UK study (Jennings *et al.*, 2014), gay adoptive fathers were uncomfortable with the moral issues and questions that can arise in surrogacy, such as the payment of the surrogate. They also wanted to avoid an imbalance in genetic relatedness to the child, as one father in surrogacy families is genetically related to the child and the other is not. A study of gay pre-adoptive couples in the USA also found that men were concerned that surrogacy would be challenging due to the logistical and emotional challenges it can entail and considered this path to parenthood inaccessible due to its high cost (Goldberg *et al.*, 2012).

For lesbian women and heterosexual couples who created their families using ART, a key motivation for doing so was the ability to have a genetic relationship with the child (Ragoné, 1994; Teman, 2010; Goldberg and Scheib, 2015). Lesbian mothers who started their families through donor insemination wanted to experience pregnancy and the birth of the child (Chabot and Ames, 2004; Lingardi *et al.*, 2016). The lesbian mothers in Goldberg and Scheib's (2015) study also had concerns about the cost and the complexity of adoption, the potential problematic background children may come from and the possibility of encountering discrimination and stigma during the adoption process.

Once intending gay couples have decided on surrogacy as a path to parenthood, they face a decision as to which father will have a genetic connection with the child. For those couples who have an equal desire for genetic parenthood, they can choose to mix their sperm together, or the eggs of a donor can be fertilized with sperm of both partners and multiple embryos can then be transferred to the surrogate (referred to as 'intentional unknowing') (Murphy, 2013). Other couples may choose to take genetic fatherhood in turns, with one partner providing sperm for the first child and their partner providing sperm for the following attempts. In making decisions about genetic fatherhood, intending fathers may also need to consider factors such as paternal age and the presence and heritability of health conditions (Greenfeld and Seli, 2011). How fathers think about these choices in retrospect is unknown.

Gay couples choosing surrogacy as a path to parenthood also have to consider whether to conceive a child through genetic or gestational surrogacy arrangements, both of which are currently practised in the USA. Little is known about men's motivations for the choices that they make. Although legislation differs across states, medical practitioners

and agencies typically recommend gestational surrogacy as this arrangement gives intending fathers certainty over legal parentage (American Society for Reproductive Medicine, 2012). Some argue that there is a greater risk that surrogates who are genetically related to the child will change their minds about delivering the baby to the intending parents, although there is no empirical evidence to support this view (Imrie and Jadva, 2014).

Of all the ART available to intending parents, surrogacy is arguably the most controversial (Jadva, 2016). Only 19 states in the USA currently allow commercial gestational surrogacy to married same-sex couples and in 15 states it is practiced because no statute or published case law prohibits it (Creative Family Connection, 2016). Given its controversial nature and the fact that intending gay couples may live in a different state to the surrogate, support by families of origin (e.g. parents and siblings) and friends is important through the process and after the birth of the child (Hammarberg *et al.*, 2015). A study of gay fathers of children born by surrogacy reported that the families of origin were supportive and excited to become grandparents, with the frequency of contact and visits increasing following the birth of children (Bergman *et al.*, 2010). In donor insemination families headed by heterosexual couples and lesbian mothers, grandparents with a genetic connection to the child have been found to be more involved in the children's lives than grandparents who lack this connection (Fulcher *et al.*, 2002). Whether families of origin react similarly to genetic fathers (whose parents and siblings will have a genetic connection to the child) versus non-genetic fathers (whose parents and siblings will not) is yet to be explored.

The present study explored gay fathers' motivations for having a child through surrogacy and the various decisions involved in following this path to parenthood. Fathers' feelings about these decisions were also examined. In addition, the study investigated how families of origin and friends responded to men becoming fathers in this way. Comparisons between genetic and non-genetic fathers were conducted in order to explore the relevance, or irrelevance, of genetic relatedness to fathers' motivations for, and feelings about, surrogacy.

Materials and Methods

Participants

Data were collected as part of a larger investigation of parent-child relationships and child adjustment in gay father families formed through surrogacy (Golombok *et al.*, 2016). A total of 40 families participated in the study, all of whom resided in the USA. The inclusion criteria for participation in the study were that the target child was aged 3–9 years old and that the parents had been a couple since the time of the child's birth. In this analysis, data were analysed from 74 fathers (in 6 families only 1 father was available for interview).

A variety of strategies were used to recruit as diverse a sample as possible. Firstly, surrogacy agencies that specialized in working with gay men sent information about the study to the fathers in their mailing list ($N = 18$, 45%); secondly, families were recruited at events at which gay fathers were in attendance ($N = 15$, 37.5%); thirdly, participants passed on information about the study to their friends, colleagues or acquaintances who fitted the study criteria and/or disseminated information about the study through social media ($N = 7$, 17.5%).

The mean age of the fathers was 47.29 years ($SD = 6.20$ years). The mean annual family income was \$370 000 ($SD = \168.264), which is

unsurprising given the significant cost of commercial surrogacy arrangements in the USA. Most fathers were White ($N = 67$, 84%), with the remaining fathers identifying as Latino/Hispanic ($N = 7$, 9%), Asian ($N = 1$, 1%) or 'other' ($N = 5$, 6%). Ninety-eight percent of fathers had a Bachelor's or higher degree. Most families lived in the Northeast (67.5%; New York City, NY = 24, MA = 3), with the remaining families living in the South (7.5%; FL = 1, VA = 1, TX = 1), the West (22.5%; CA = 7, OR = 1, WA = 1) and the Midwest (2.5%; MN = 1).

Twenty-four (60%) of the target children were boys and 16 (40%) were girls, with an average age of 5.8 years ($SD = 2.2$ years). In most families ($N = 28$, 70%), the target child's siblings had been conceived through surrogacy, with one family (2.5%) having a child conceived in a previous heterosexual relationship and one family (2.5%) having an adopted child; in the remaining 10 families (25%), the target child had no siblings.

The majority of surrogacy arrangements ($N = 38$, 95%) were carried out in the USA with 2 (5%) conducted in India. Most surrogacy arrangements ($N = 36$, 90%) were gestational, with four couples (10%) conceiving through genetic surrogacy. In gestational surrogacy families, most surrogates ($N = 35$, 97%) were previously unknown to the couple and one surrogate (3%) was a friend. In families formed via genetic surrogacy, three surrogates (75%) were previously unknown to the couple and one was a sister of the non-genetic father (25%). In gestational arrangements, most parents ($N = 34$, 94%) had used a previously unknown egg donor, with one couple (3%) using a friend and one (3%) using the sister of the non-genetic father.

Procedure

The majority of families ($N = 26$, 65%) were visited at home by a research psychologist trained in the study techniques. Due to geographical distance from the researchers, data were collected from the remaining families over Skype ($N = 14$, 35%). The fathers were presented with an information sheet and were given an opportunity to ask questions about the study before signing consent forms and participating in the study. Ethical approval was obtained from the University of Cambridge Psychology Research Ethics Committee and the New York State Psychiatric Institute Institutional Review Board.

Measures

Of the 40 families who participated in the study, interviews were conducted with 74 fathers (in 6 families only 1 father was available for interview). Interviews lasting ~1 h were conducted with each father separately and a section of the interview focused on fathers' experiences of surrogacy, using questions adapted from the UK longitudinal study of heterosexual families formed through surrogacy (MacCallum et al., 2003). This section of the interview was digitally recorded and transcribed verbatim.

Fathers were asked whether they and their partner had an equal desire to become parents; whether they had always preferred surrogacy or considered other paths to parenthood; why they had chosen surrogacy; the process of deciding whose sperm to use in the child's conception and why they had chosen to conceive a child through a gestational or genetic surrogacy arrangement. During this section of the interview, almost all of the fathers disclosed who the genetic father of the child was (if this information was known), with the exception of two fathers in one family. Fathers were also asked how they felt about having conceived a child through surrogacy, how they felt about their decision regarding genetic fatherhood and how their family and friends felt about their decision to become parents through surrogacy.

Data analysis

Interviews were analysed using a text-driven, qualitative content analysis approach (Krippendorf, 2013), which aims to report participants' motivations and experiences in as close a way as possible to their own interpretation

(Sandelowski, 2000, 2010). This analytic approach was selected so that frequency counts could be calculated and group comparisons could be conducted.

The data were analysed by two coders, in a process comprising three stages: first, as the interviews were semi-structured, data of interest were dispersed throughout the transcript, therefore coder one organized the data into excel sheets (e.g. all quotations pertaining to 'motivations for surrogacy' were copied into one cell); second, coder one condensed the quotations in each excel cell into simple and succinct categories (e.g. 'adoption less desirable path than surrogacy'), which comprised the first draft of the coding manual. Any questions or complexities that arose were discussed and agreed on between the first and second coder until a consensus was reached; third, using the coding manual, coder one analysed all of the data and one-third of the data were rated by coder two to calculate inter-rater reliability. Percentage agreement was equal or above 92% for each variable, rated as described below.

Choosing surrogacy as a path to parenthood

Desire for parenthood: genetic father more strongly; equal desire, non-genetic father more strongly; Preferred path to parenthood: always preferred surrogacy; considered adoption; attempted adoption; Motivations for surrogacy: adoption a less desirable path to parenthood than surrogacy (yes, no); desire for genetic relatedness with child as an individual or as a couple (yes, no); surrogacy was a financially viable option (yes, no); partner's choice (yes, no); desire for involvement in pregnancy and birth (yes, no); Decision about genetic parenthood: both donated sperm; one donated sperm—more important to one than the other; one donated sperm—turn taking; one donated sperm—medical reason; one donated sperm—sister as egg donor; Motivations for gestational surrogacy: prefer to separate genetic and gestational links to the child (yes, no); agency policies (yes, no), gestational surrogacy enabled a specific family set-up (yes, no).

Reflections on and reactions to surrogacy as a path to parenthood

Feelings about surrogacy: mostly satisfied, neutral, mostly dissatisfied; Feelings about whose sperm was used: mostly satisfied, neutral, mostly dissatisfied; Reactions of family of origin: mostly supportive, mixed, mostly negative; Reactions of friends: mostly supportive, mixed, mostly negative.

Data were obtained from 35 genetic fathers, 32 non-genetic fathers, 5 fathers who did not know the status of genetic parenthood in their family and 2 fathers who did know this information but chose not to disclose it during the interview. Chi-square tests were used to conduct comparisons between fathers' parental status (genetic versus non-genetic) and quotations that illustrate the study findings are reported. Data were analysed using SPSS (IBM Corp., Armonk, NY, USA). A $P < 0.05$ was considered statistically significant.

Results

Choosing surrogacy as a path to parenthood

As shown in Table I, genetic and non-genetic fathers did not differ in their desire to become a parent ($\chi^2 = 0.84$ (2), $P = 0.66$). Likewise, there was no difference between genetic and non-genetic fathers in their preferred path to parenthood ($\chi^2 = 3.43$ (2), $P = 0.18$), with most fathers having considered adoption ($N = 48$, 65%), but only three fathers (4%) having attempted adoption as a path to parenthood.

The most common reason given for pursuing surrogacy, given by approximately two-thirds of fathers ($N = 50$, 68%), was that adoption was a less desirable and/or achievable path to parenthood than surrogacy. As shown in the quotations in Table II, fathers felt that they would have had less control over the process of both becoming a parent and raising the child if they were to adopt.

Table 1 Choosing surrogacy as a path to parenthood: gay fathers' motivations and decisions.

	Genetic father (N = 35)	Non-genetic father (N = 32)	χ^2	Do not know or disclose (N = 7)	Total (N = 74)
	N (%)	N (%)		N (%)	N (%)
<i>Desire for parenthood</i>			0.84 (2), P = 0.66		(N = 67)
Genetic parent more strongly	10 (28.5%)	6 (19%)		NA	16 (24%)
Equal desire	14 (40%)	13 (41%)		NA	27 (40%)
Non-genetic parent more strongly	10 (28.5%)	11 (34%)		NA	21 (31%)
Missing	1 (3%)	2 (6%)		NA	3 (5%)
<i>Preferred path to parenthood</i>			3.43 (2), P = 0.18		
Always preferred surrogacy	13 (37%)	8 (25%)		2 (29%)	23 (31%)
Considered adoption	20 (57%)	24 (75%)		4 (57%)	48 (65%)
Attempted adoption	2 (6%)			1 (14%)	3 (4%)
<i>Motivations for surrogacy*</i>					
Adoption a less desirable path to parenthood than surrogacy	23 (66%)	21 (66%)	0.14 (1), P = 0.71	6 (86%)	50 (68%)
Desire for genetic relatedness as an individual or couple	21 (60%)	13 (41%)	1.79 (1), P = 0.18	4 (57%)	38 (51%)
Surrogacy was a financially viable option	6 (17%)	4 (12.5%)	0.18 (1), P = 0.67	2 (29%)	12 (16%)
Partner's choice	3 (9%)	7 (22%)	2.70 (1), P = 0.10	0	10 (13%)
Desire for involvement in pregnancy and birth	1 (3%)	1 (3%)	0.01 (1), P = 0.93	0	2 (3%)
<i>Decision about genetic parenthood</i>			1.17 (4), P = 0.88		
Both donated sperm	16 (46%)	15 (47%)		6 (86%)	37 (50%)
One donated sperm-more important to one than the other	8 (23%)	8 (25%)		0	16 (22%)
One donated sperm-turn taking	6 (17%)	3 (9%)		0	9 (12%)
One donated sperm-medical reasons	2 (6%)	1 (3%)		0	3 (4%)
One donated sperm-family structure (e.g. sister as egg donor)	2 (6%)	2 (6%)		0	4 (5%)
Missing	1 (3%)	3 (9%)		1 (14%)	5 (7%)
<i>Motivations for gestational surrogacy*</i>	N = 31	N = 28			(N = 66)
Prefer to separate genetic and gestational links to the child	17 (55%)	13 (46%)	0.70 (1), P = 0.40	3	33 (50%)
Agency policies	17 (55%)	13 (46%)	0.70 (1), P = 0.40	1	31 (47%)
Gestational surrogacy enabled a specific family set-up	1 (3%)	1 (4%)	0.01 (1), P = 0.95	1	3 (5%)
Missing	7 (23%)	6 (21%)		0	13 (20%)
<i>Not applicable (genetic surrogacy chosen)</i>	4	4			8

*Some fathers described more than one motivation, thus percentages do not equal 100.

The second most common response as to why fathers chose surrogacy was that they wanted to have a genetic connection with their child as this was important to them either as an individual, or as a couple (N = 38, 51%). Some fathers (N = 12, 16%) chose surrogacy because it was a financially viable option for them. Other fathers described becoming a parent through surrogacy because it was their partner's preference (N = 10, 13%). Lastly, two fathers (3%) pursued surrogacy because they wanted to be involved in the pregnancy and birth of the child. Differences between genetic and non-genetic fathers' motivations for surrogacy were not statistically significant.

After deciding to pursue surrogacy as a path to parenthood, couples were faced with the decision as to which intending father would have a

genetic link to the child. Half of the fathers in the study (N = 37, 50%) decided that they and their partner would both donate sperm, therefore leaving genetic parenthood to chance. In the remaining families, only one intending father donated sperm. In some cases, genetic parenthood was more important to one intending father than the other (N = 16, 22%); in others, the fathers had agreed to take genetic fatherhood in turns (N = 9, 12%); for three fathers (4%) medical reasons determined who should donate, and for four fathers, only one father donated because they had decided to use a sister as an egg donor (N = 4, 5%).

Another decision couples had to make was whether to choose a gestational or a genetic surrogacy arrangement, although the overwhelming majority opted for the former (36 out of 40 families). Of the 66 fathers

Table II Choosing surrogacy as a path to parenthood: illustrative quotations.

<i>Motivations for surrogacy</i>	
Adoption a less desirable path to parenthood than surrogacy	'We liked surrogacy really because what we had read about adoption it seemed like quite a random process, and you weren't in control. Even after the child was born, there were all sorts of stipulations and criteria by which you, for no reason of your own, lose your child. And we just thought let's keep it simple, it's complicated enough being a parent.' (Genetic father)
Desire for genetic relatedness with child	'I guess we felt that we really wanted to have our own biological children as much as possible so we could possibly understand them more. In retrospect that's kind of a naive, ridiculous notion because I see how it is being a parent and having an adopted child is completely one hundred percent as satisfying as having a child through surrogacy, I now believe. At the time I didn't.' (Genetic father)
Surrogacy was a financially viable option	'And we had, the most important thing is that, at the time, we had enough money to do it. We don't anymore. But it is expensive, you know. You have to have \$100,000 sitting around that you have no use for.' (Non-genetic father)
Partner's choice	'The primary reason is that [partner] wanted to have a child through surrogacy, and so it became quickly apparent to me that essential a condition, one of the non-flexible conditions of being in relationship with him, was that if we were going to have children it was going to be through surrogacy.' (Genetic father)
Desire for involvement in pregnancy and birth	'And I think we both felt like, number one, we really wanted to be part of the whole birth process.' (non-genetic father)
<i>Decision about genetic parenthood</i>	
Both donated sperm	'They're hard questions, it took a while. So we came up with this plan which we were going to use, some embryos would be from me, some embryos would be from him, so we had this great, neat plan. Then we got twins.' (Genetic father)
One donated sperm-more important to one than the other	'It just seemed inherently so much more important to [husband] and children were from his perspective, an important thing that he wanted and I loved him and wanted him to be happy. So it just seemed more logical that we would do that and I think that there was also that his parents were into the surrogacy and the genetic link was super important too and it wasn't that important to me.' (Non-genetic father)
One donated sperm-turn taking	'When we decided we were going to do surrogacy I wanted him to be the biological father of the girls. And then when we decided that we were going to have a third child it just, it just seemed natural to alternate, so I did; I was the biological father.' (Genetic father)
One donated sperm-medical reasons	'I have an aunt who was mentally disabled, and also like I'm older. There is talk about older fathers, autism being more prevalent.' (Non-genetic father)
<i>Motivations for gestational surrogacy</i>	
Prefer to separate genetic and gestational links to the child	'We thought just legally and emotionally it would be the best so that if you know we thought that it would be healthier for our relationship with the surrogate and healthier for the kids relationship with her because you know we were always very careful to say this is your surrogate you know, this is not your mother, we explained that to friends, because it's not her genetic egg it really isn't their mother and so we wanted that sense of separation.' (Father didn't disclose genetic parenthood status)
Agency policies	'Our surrogacy agency and our fertility clinic would only work with gestational carriers which is a separate egg donor and a separate gestational carrier so you have an agreement with both and both of them disavow their parental rights so it's just cleaner legally.' (Genetic father)

who had conceived a child through gestational surrogacy, half chose to do so because they felt that there was a greater risk of an unsuccessful surrogacy arrangement if the surrogate had both a gestational and genetic link to the child ($N = 33$, 50%). The second most popular motivation for choosing gestational arrangements, once again endorsed by approximately half of the fathers, was because this was recommended to them by their surrogacy agency ($N = 31$, 47%).

Reflections on and reactions to surrogacy as a path to parenthood

As shown in Table III, genetic and non-genetic fathers did not differ in how they felt about having conceived a child through surrogacy ($\chi^2 = 0.43$ (2), $P = 0.81$). Most fathers ($N = 55$, 74%) were satisfied with the surrogacy journey. Five fathers (7%) had neutral feelings about surrogacy. Five fathers (7%) were mostly dissatisfied. Fathers who were dissatisfied described the surrogacy process as a huge undertaking, which could produce feelings of anxiety and concern. Illustrative quotations of father's comments are shown in Table IV.

When asked how they felt about their decision on whose sperm would be used to conceive their child, the responses of genetic and non-genetic fathers did not differ ($\chi^2 = 1.10$ (2), $P = 0.58$). Most fathers felt either satisfied ($N = 31$, 42%) or neutral ($N = 21$, 28%), with just three fathers (4%) feeling mostly dissatisfied with their decision.

The fathers were asked how their families of origin reacted to them becoming parents. Family members' reactions were no different for genetic compared to non-genetic fathers ($\chi^2 = 0.38$ (1), $P = 0.54$). Most fathers ($N = 47$, 64%) described their family's reactions as supportive. Approximately one-third ($N = 23$, 31%) of fathers reported that their family's reaction was mixed. Fathers described their parents and/or siblings as having questions or feeling confused, but then embracing the child when he or she finally arrived.

As for the reactions of friends, once again there was no difference in the reports of genetic and non-genetic fathers ($\chi^2 = 0.03$ (1), $P = 0.87$). The majority of the fathers reported that this was positive ($N = 63$, 85%), although some did note that the quality and nature of some friendships changed once they became a parent. A minority of

Table III Reflections on and reactions to surrogacy as a path to parenthood.

	Genetic father (n = 35)	Non-genetic father (n = 32)	χ^2	Do not know or disclose (n = 7)	Total (n = 74)
<i>Feelings about surrogacy</i>					
	N (%)	N (%)	0.43 (2), P = 0.81	N (%)	N (%)
Mostly satisfied	26 (74%)	23 (72%)		6 (86%)	55 (74%)
Neutral	2 (6%)	3 (9%)		0	5 (7%)
Mostly dissatisfied	3 (9%)	2 (6%)		0	5 (7%)
Missing	4 (11%)	4 (13%)		1 (14%)	9 (12%)
<i>Feelings about whose sperm was used</i>					
			1.10 (2), P = 0.58		
Satisfied	16 (45%)	12 (38%)		2 (29%)	30 (41%)
Neutral	8 (23%)	11 (34%)		2 (29%)	21 (28%)
Unsatisfied	1 (3%)	2 (6%)		0	3 (4%)
Not applicable (sister was egg donor)	2 (6%)	2 (6%)		0	4 (5%)
Missing	8 (23%)	5 (16%)		3 (42%)	16 (22%)
<i>Reaction of family of origin</i>					
			0.38 (1), P = 0.54		
Supportive	24 (68.5%)	19 (60%)		4 (57%)	47 (64%)
Mixed	10 (28.5%)	11 (34%)		2 (29%)	23 (31%)
Negative	0	0		0	0
Missing	1 (3%)	2 (6%)		1 (14%)	4 (5%)
<i>Reaction of friends</i>					
			0.03 (1), P = 0.87		
Supportive	31 (89%)	27 (84%)		5 (72%)	63 (85%)
Mixed	3 (8%)	3 (10%)		1 (14%)	7 (10%)
Negative	0	0		0	0
Missing	1 (3%)	2 (6%)		1 (14%)	4 (5%)

fathers ($N = 7$, 10%) reported that their friends' reactions were mixed, with some fathers describing less support from gay than heterosexual friends, or friends and colleagues having questions about the ethical aspects of surrogacy.

Discussion

The findings of this study indicate that a number of factors influence men's decisions to choose surrogacy as a path to parenthood. The most popular reason given by the fathers in the study was that they felt that adoption was a less desirable and/or accessible path to parenthood. Some fathers explained that at the time that they were thinking of becoming a parent, adoption was prohibited to same-sex couples, or that open-adoption was the only option permitted to them. Other fathers felt that a child adopted by same-sex parents may be subjected to greater levels of stigma. Until the June 2015 Supreme Court decision regarding marriage equality (*Obergefell versus Hodges*), same-sex couples and single lesbian and gay people could not legally adopt children in some states in the USA (*American Psychological Association, 2015*). Even though legislation has changed, legal ambiguities remain about second-parent adoptions by lesbian and gay partners and the rights of unmarried same-sex couples to access domestic adoption (*Smalling, 2016*) and experiences of discrimination from child welfare agencies are not unusual (*Downing et al., 2009; Goldberg et al., 2012*). It is therefore unsurprising that these factors affect men's decisions as they consider their options on how to start their families.

Whilst the ability to have a genetic connection to their child was of great value to some gay fathers, it was not important to all. Approximately half of the fathers ($N = 38$, 51%) described having chosen surrogacy as a path to parenthood so that they themselves could have a genetic connection to the child, or because surrogacy allowed them as a couple to have a genetic tie to the child. For one-fifth of families in the study ($N = 16$, 22%), only one father donated sperm to create embryos. The fathers in these families described genetic fatherhood as only important to one parent, rather than to both of them. The findings of the present study are in contrast to a Spanish study of 10 gay father surrogacy families, in which fathers did not state a strong belief in the importance of genetic ties (*Smietana et al., 2014*). The culture and socio-legal constraints in the countries in which gay men raise their families may be an important factor in shaping intending fathers' beliefs about the significance of genetic relatedness for family relationships. Whereas surrogacy is one of the most regulated paths to parenthood through ART in the USA (*Perkins et al., 2016*), it is prohibited in Spain and its use is controversial (*Smietana et al., 2014*).

The findings of the study help to shed light on surrogacy practices in the USA. Fathers chose gestational surrogacy arrangements because they did not want the surrogate to have both a genetic and gestational connection to the child. This is consistent with the finding that for some (but not all) gay fathers, the genetic link between that father and the child was considered to be significant. Whereas this connection was desirable for themselves as fathers, the men in the study wanted to avoid the risk that there would be a bond between the surrogate

Table IV Reflections on and reactions to surrogacy as a path to parenthood: illustrative quotations.

<i>Feelings about surrogacy</i>	
Mostly satisfied	'For us it was, we just lucked out, it was such a wonderful process for us, and I'm sure it's not for other people, and I'm sure it's hard for other people to go through the process and not get pregnant and all that... It would be hard to have anything negative to say about the process at all. For us, other than the fact that it cost a lot of money, it was all wonderful...' (Non-genetic father)
Neutral	'I don't really think about it more anymore, it's just sort of like, I don't know, I just never even think, like I never even think about the fact that we're in a same-sex couple, I don't even think about the fact that we had them in an unconventional way. I think we lived in a region where people were constantly asking us about it, maybe, you know, I don't really think about it.' (Non-genetic father)
Mostly dissatisfied	'I thought it was painful, arduous for us personally, I think it could be a lot less if things that happened to us hadn't happened to us. So I think it's person dependant, I think it's experience dependant.' (Genetic father)
<i>Feelings about whose sperm was used</i>	
Mostly satisfied	'I love it. I couldn't imagine being closer to [child's name] if he was biologically my son.' (Non-genetic father, satisfied)
Neutral	'It's not something we give a whole lot of thought to.' (Non-genetic father, neutral)
Mostly unsatisfied	'It's very painful for me as somebody that didn't even want to have children, let alone bio children, this makes no sense at all but it hurts my spirit that neither one are mine. I can't help that.' (Non-genetic father, unsatisfied)
<i>Reaction of family of origin</i>	
Mostly supportive	'Well, I mean my father was unconditionally supportive, he was thrilled that we were going to have children, he felt as though it was the thing he had hoped for me and now it was happening, he paid for the cost of doing it very generously, offered to do that and then did that, so he was terrific.' (Genetic father)
Mixed	'They just had a lot, my family, my parents, had a lot of questions. They didn't understand at all. And it was, it was a little annoying actually I remember because I thought they were just going to be you know unbelievably excited, and instead of unbelievable excitement it was... I would probably characterise the reaction as confused, and a bit tentative, like we were doing some sort of crazy science experiment, and did we really understand what we were doing and was this a good idea... Yeah they were concerned and confused at first, and the unbelievable excitement eventually set in for them.' (Genetic father)
<i>Reaction of friends</i>	
Mostly supportive	They were all very supportive, and happy for us, and loving (non-genetic father)
Mixed	'They were very excited and supportive I would say, with the one possible exception of our gay friends. We didn't, and we don't, have a lot of gay friends, but the ones who we were friends with at the time, these were the same people who when [partner] and I decided to get married they were, they seemed to be the least excited, as though we were somehow changing our lives to conform to society's norms in a way that they didn't think was you know necessary... So ironically it was our gay friends who I would say, it wasn't that they weren't, but they certainly seemed the least excited about what we were doing.' (Genetic father)

and the child. A similar proportion of fathers reported being influenced by the agencies with whom they worked, who typically favoured gestational over genetic surrogacy arrangements. Therefore, decisions about the surrogacy process appear to be shaped not only by men's beliefs about the significance of genetic relatedness but also by agency policies, which are arguably driven and no doubt formed to some degree by state legislation.

The majority of fathers were satisfied with having chosen to have a child through surrogacy, and with their choice about who would be the genetic father. However, owing to the use of a volunteer sample in this study, the possibility that those fathers who had a particularly positive experience were more likely to participate in the research cannot be ruled out. Future research would benefit from a longitudinal approach, which would avoid the biases inherent in retrospective recall. Another challenge is to acknowledge and appreciate the sensitivity of exploring personal issues such as the significance of genetic relatedness for family relationships. The interviewers were trained to be aware of the potential sensitivity of questions pertaining to genetic fatherhood, and in some interviews, these questions were not asked, at the interviewer's discretion. Questions were also omitted if a child or family member interrupted the interview, or due to time constraints.

Consistent with previous studies of gay fathers in surrogacy families (Bergman et al., 2010), the majority of the families received support from their families and friends when they became parents through surrogacy. However, for one-third of the gay fathers ($N = 23$, 31%), family members were initially confused or perplexed about the surrogacy process, but then supportive once the child arrived. As the mean age of the fathers was 47 years and surrogacy has only recently become a viable route to parenthood (Perkins et al., 2016), especially for gay men, these reactions from family members and friends are perhaps unsurprising.

Genetic and non-genetic fathers did not differ in their reports of their family's reactions to them becoming parents through surrogacy. The quality of relationships between gay fathers and their children in surrogacy families and their grandparents, aunts and uncles has not been examined. As gay fathers in surrogacy families can and do take turns in being the genetic father, their families of origin may have a genetic link to at least one child in the family. Fathers may also have chosen not to disclose the identity of the genetic father to their children, extended family, friends or acquaintances (Dempsey, 2013; Murphy, 2013; Carone et al., 2016) and therefore the status of genetic relatedness may be unknown.

This study contributes to the small yet growing literature that explores the significance, or insignificance, of genetic relatedness for gay father surrogacy families. Understanding the motivations or gay men and their experiences of both genetic and non-genetic fatherhood may be helpful for clinicians, practitioners and counsellors working with this population. The more that is known about this growing family type, the better informed policy and practice can be.

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Authors' roles

As principal investigator, S.G. was responsible for the design of the study in collaboration with A.E. Data were collected by L.B., E.R. and J.S. and the management of the study was overseen by L.B. L.B. and N.C. conducted data analysis, interpreted results and drafted this manuscript. All authors contributed to its revision and have approved the final version for publication.

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Conflict of interest

None declared.

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Parenting and the Adjustment of Children Born to Gay Fathers Through Surrogacy

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Findings are presented on a study of 40 gay father families created through surrogacy and a comparison group of 55 lesbian mother families created through donor insemination with a child aged 3–9 years. Standardized interview, observational and questionnaire measures of stigmatization, quality of parent–child relationships, and children’s adjustment were administered to parents, children, and teachers. Children in both family types showed high levels of adjustment with lower levels of children’s internalizing problems reported by gay fathers. Irrespective of family type, children whose parents perceived greater stigmatization and children who experienced higher levels of negative parenting showed higher levels of parent-reported externalizing problems. The findings contribute to theoretical understanding of the role of family structure and family processes in child adjustment.

Research on children with same-sex parents was initiated in the 1970s to inform custody cases involving a lesbian mother. Since that time, longitudinal studies have followed up children of lesbian mothers to adulthood, investigations have been conducted on children raised in lesbian mother families from birth, data have been obtained from general population samples of lesbian mother families, and meta-analyses of these studies have been carried out (for reviews, see Fedewa, Black, & Ahn, 2014; Goldberg, 2010; Patterson, 2006, 2009). This substantial body of research has consistently shown that children in lesbian mother families do not differ from children in comparable groups of heterosexual parent families in terms of psychological adjustment. Instead, difficulties experienced by these children appear to be associated with stigmatization by the outside world (Bos & Gartrell, 2010; Bos & van Balen, 2008).

The circumstances of children with gay fathers are somewhat different from those of children with lesbian mothers in that it is unusual for fathers, whether heterosexual or gay, to be primary caregivers. Although research on fathering has shown that the constructs of fathering and mothering involving positive engagement, warmth, and responsiveness are largely the same and that the processes through which heterosexual fathers influence their children are similar to that of mothers (for a review, see Fagan, Day, Lamb, & Cabrera, 2014), it is widely assumed that fathers are less suited to parenting than are mothers (Biblarz & Stacey, 2010). Moreover, children with gay fathers may be exposed to greater stigmatization than children with lesbian mothers because gay father families possess the additional nontraditional feature of being headed solely by men (Golombok & Tasker, 2010). Similarly, gay fathers may themselves be exposed to greater stigmatization regarding their sexual identity than are lesbian mothers (Goldberg & Smith, 2011).

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Controlled, in-depth studies of children of gay fathers were initiated following the millennium and largely focused on gay father families formed through adoption. In a study of the psychological adjustment of 2-year-olds (Goldberg & Smith, 2013), no differences were found between children with gay, lesbian, and heterosexual adoptive parents. However, parental depression, relationship conflict, and lack of preparation for the adoption were associated with children's emotional and behavioral problems. Farr, Forssell, and Patterson (2010a, 2010b) found preschool children adopted in infancy by gay fathers to be as well adjusted as those adopted by lesbian or heterosexual parents. In an observational assessment of family play, the gay couples were rated not only as less supportive of each other but also as less undermining than were the heterosexual couples (Farr & Patterson, 2013). A comparison of adoptive gay father families, adoptive lesbian mother families, and adoptive heterosexual parent families with 3- to 9-year-old children was conducted in the United Kingdom (Golombok et al., 2014). Where differences were identified between family types, these indicated more positive parental well-being and parent-child relationships and lower levels of children's externalizing problems in gay father families compared to heterosexual parent families.

Although limited, research on adoptive gay father families indicates that children can flourish in this family environment. However, gay father families with children born through surrogacy differ not only from the traditional family with respect to the sexual orientation and gender of the parents but also from adoptive gay father families in that the children have both a genetic and nongenetic father as well as a genetic mother (the egg donor) and a gestational mother (the surrogate). A longitudinal study of children in heterosexual families created through surrogacy found high levels of psychological adjustment in surrogacy children in the preschool years (Golombok, MacCallum, Murray, Lycett, & Jadva, 2006a; Golombok et al., 2006b; Golombok, Murray, Jadva, MacCallum, & Lycett, 2004) but raised levels of emotional and behavioral problems at age 7 (Golombok et al., 2011), the age at which children acquire an understanding of biological inheritance and the biological concept of family (Gregg, Solomon, Johnson, Zaitchik, & Carey, 1996; Williams & Smith, 2010) and of the meaning and implications of the absence of a biological connection to parents (Brodzinsky, 2011). Raised levels of emotional and behavioral problems among the surrogacy children were no longer apparent at age 10 (Golombok, Blake, Casey,

Roman, & Jadva, 2013) or age 14 (Golombok, Ilioi, Blake, Roman, & Jadva, 2016).

Although there has been a dramatic rise in the number of gay men having children through surrogacy (Berkowitz, 2013), the creation of gay father families through assisted reproductive technologies is such a recent phenomenon that there is little research on children born in this way. In an uncontrolled, questionnaire-based study of 68 gay father families with 3- to 10-year-old children born through gestational surrogacy, the children of gay fathers were reported to show significantly lower levels of adjustment problems compared to data obtained from general population norms, with the daughters of gay fathers appearing to exhibit particularly low levels of internalizing problems (Green, Rubio, Bergman, & Katuzny, 2015). In a questionnaire-based study in Italy, gay father families formed through surrogacy did not differ from lesbian mother families formed through donor insemination or heterosexual parent families with naturally conceived children with respect to parent-reported family functioning or the emotional regulation or adjustment of children aged around 4 years (Baiocco et al., 2015).

The aim of the present investigation was to conduct a controlled, in-depth study of gay father families created through surrogacy with children who were old enough to understand that their family structure differed from that of other children. The study focused on families with children aged at least 3 years, as it is not until age 3 that adopted children acquire a rudimentary understanding of having been born into a different family (Brodzinsky, 2011), and children in single-parent families become aware that their family differs from the traditional family with a mother and a father (Zadeh, Freeman, & Golombok, 2016). The upper age limit of age 9 was chosen to optimize the sample size of this emerging family form while ensuring the appropriateness of the measures across the age range.

From a theoretical perspective, the study was grounded in a developmental contextual systems approach (Overton, 2015), whereby bidirectional relations between the children, the family, and the wider social world are viewed as influential in development. The study tested the hypothesis that gay father families created through surrogacy would experience greater difficulties in terms of stigmatization, parenting, and child adjustment than a comparison group of lesbian mother families created through donor insemination due to the additional challenges faced by gay father families formed in this way. Although adoptive gay father families have not been found to show elevated

levels of problems compared to adoptive lesbian mother families or adoptive heterosexual parent families, greater difficulties were predicted for gay father families formed through surrogacy as raised levels of psychological problems have previously been found among early school-age children born to heterosexual parents through surrogacy (Golombok et al., 2011). Moreover, gay father families formed through surrogacy may face greater stigmatization than adoptive gay father families resulting from their use of a surrogate and an egg donor to create a family. Lesbian mother families formed through donor insemination were chosen as the comparison group to control for both the non-heterosexual orientation of the parents and the use of third-party assisted reproduction, and because of the large body of research showing that children with lesbian mothers do not differ in psychological adjustment from children with heterosexual parents. It was also hypothesized, based on the growing body of research showing that parental sexual orientation is less predictive of child adjustment than is the quality of family relationships (e.g., Bos & Gartrell, 2010; Chan, Raboy, & Patterson, 1998; Farr et al., 2010a, 2010b; Golombok et al., 2014), that stigmatization of the family and quality of parenting would be more strongly associated with children's adjustment than would family type.

Method

Participants

Forty gay father families created through surrogacy and a comparison group of 55 lesbian mother families created through donor insemination participated in the study in the United States. As this is the first in-depth study of children born to gay fathers through surrogacy, it was necessary to rely on a volunteer sample of this small and hard-to-reach population. Thus, the gay father families were recruited through surrogacy agencies that specialized in working with gay men, gay father social groups, and snowballing. The lesbian mother families were similarly recruited through the Donor Sibling Registry, lesbian mother social groups, and snowballing. The inclusion criteria for both the gay father families and lesbian mother families were that the couple had a child aged between 3 and 9 years, and had lived together since the child's birth.

There was no significant difference between family types in the age of the target child, $F(1, 93) = 0.04$, $p = .82$, with the average age being 5.3 years, or with respect to the child's gender,

$\chi^2(1) = 0.77$, $p = .25$. The age of the parents differed significantly between family types, $F(1, 93) = 47.43$, $p < .001$, reflecting the older age of the gay fathers (average age 47 years) than the lesbian mothers (average age 40 years). There was no difference between family types in the marital status of the parents, $\chi^2(1) = 1.49$, $p = .19$, or in the number of siblings in the family, $\chi^2(2) = .51$, $p = .77$. There was a significant difference between family types in household income, $\chi^2(3) = 49.71$, $p < .001$, reflecting a higher income in gay father families. In families with more than one child in the required age range, the oldest was selected.

Procedure

The majority of families were assessed at home. However, 35% of gay father families and 42% of lesbian mother families were assessed by Skype because of the geographical distance from the researchers. Written informed consent to participate in the investigation was obtained from each parent. Ethical approval was granted by the University of Cambridge Psychology Research Ethics Committee and the New York State Psychiatric Institutional Review Board. Each parent was administered an audio-recorded standardized interview that lasted approximately 1.5 hr, a video-recorded observational assessment of parent-child interaction, and standardized questionnaires. Teachers were administered a questionnaire. Data were collected between September 2013 and December 2015.

Measures

Quality of Parenting

Each parent was interviewed using an adaptation of a semistructured interview designed to assess quality of parenting that has been validated against observational ratings of mother-child relationships in the home (Quinton & Rutter, 1988) and has been used successfully in previous studies of same-sex parent families with children of the same age (Golombok et al., 2014). Detailed accounts are obtained of the child's behavior and the parent's response to it, with particular reference to interactions relating to warmth and control. A flexible style of questioning is used to elicit sufficient information for each variable to be rated by trained researchers using a standardized coding scheme based on a detailed coding manual. Thus, ratings are carried out by the researchers using in-depth information obtained from the parents.

The following variables were coded: (a) *expressed warmth* from 0 (*none*) to 5 (*high*) took account of the parent's tone of voice, facial expressions, and gestures in addition to what the parent said about the child; (b) *sensitive responding* from 1 (*low*) to 4 (*high*) represented the parent's ability to recognize and respond appropriately to the child's needs; (c) *quality of interaction* from 1 (*poor*) to 4 (*very good*) was based on the extent to which the parent and child wanted to be with each other and enjoyed each other's company; (d) *frequency of battles* from 1 (*never/rarely*) to 6 (*few times daily*) assessed the frequency of parent-child conflict; (e) *level of battles* from 0 (*none*) to 3 (*major*) assessed the severity of parent-child conflict; and (f) *disciplinary aggression* from 0 (*none*) to 2 (*moderate*) assessed the level of anger shown by the parent toward the child. To establish interrater reliability, 30 randomly selected interviews were coded by a second rater. The intraclass correlations for expressed warmth, sensitive responding, frequency of battles, and disciplinary aggression were 0.77, 0.73, 1.0, and 0.8, respectively. It was not appropriate to calculate intraclass correlations for quality of interaction and level of battles as they operated almost as binary variables. However, the percentage agreement between raters for these variables was 94% and 100%, respectively. Total scores of positive parenting (expressed warmth, sensitive responding, and quality of interaction) and negative parenting (frequency of battles, severity of battles, and disciplinary aggression) were computed for each parent using principal component analysis according to the procedure outlined in Golombok et al. (2013). Higher scores reflected more positive parenting (e.g., enthusiasm about the child, recognition of the child's worries, and enjoyment of the child's company) and more negative parenting (e.g., a high frequency and severity of conflict, loss of temper, and physical aggression), respectively. The factors explained over 46% of variance in the items and all of the factor loadings were above .55. The correlation between the positive parenting factor and the negative parenting factor was $-.317$.

Parent-Child Interaction

Within each family, each parent-child dyad participated in an observational assessment of parent-child interaction. In order to avoid practice effects, the Etch-A-Sketch task (Stevenson-Hinde & Shuldice, 1995) was used with the parent who spent most time with the child, and the Co-Construction task (Steele et al., 2007) was used with the other

parent. In the one third of families where both parents shared parenting equally, the tasks were randomly assigned. The Etch-A-Sketch is a drawing tool with two dials that allow one person to draw vertically and the other to draw horizontally. The parent and child were asked to copy a picture of a house, each using one dial only, with clear instructions not to use the other dial. With the Co-Construction task, the parent and child were given a set of wooden building blocks and instructed to build something together using as many blocks as possible. The Etch-A-Sketch and Co-Construction sessions were video recorded and coded using the Parent-Child Interaction System (PARCHISY; Deater-Deckard & Petrill, 2004) to assess the construct of mutuality, that is, the extent to which the parent and child engaged in positive dyadic interaction characterized by warmth, mutual responsiveness, and cooperation. The following variables were rated on a 7-point scale ranging from 1 (*no instances*) to 7 (*constant, throughout interaction*): (a) *child's responsiveness to parent* assessed the extent to which the child responded immediately and contingently to the parent's comments, questions, or behaviors; (b) *parent's responsiveness to child* assessed the extent to which the parent responded immediately and contingently to the child's comments, questions, or behaviors; (c) *dyadic reciprocity* assessed the degree to which the dyad showed shared positive affect, eye contact, and a "turn-taking" quality of interaction; and (d) *dyadic cooperation* assessed the degree of agreement about whether and how to proceed with the task. To establish interrater reliability, 50 randomly selected video recordings were coded by a second rater. The intraclass correlations for parent's responsiveness to child, child's responsiveness to parent, dyadic reciprocity, and dyadic cooperation were .92, .83, .75, and .85, respectively.

Perceived Stigma

Perceived stigma was measured using the personalized stigma subscale of a measure originally developed by Berger, Ferrans, and Lashley (2001) to assess HIV-related stigma and later modified for the assessment of stigma associated with being gay (Frost, Parsons, & Nanin, 2007). The personalized stigma subscale comprises 10 items relating to negative social consequences associated with being gay. A total score is produced, with higher scores representing more negative experiences. The scale has been shown to have high internal consistency

(Cronbach's $\alpha = .90$) as well as construct validity (Frost et al., 2007). Cronbach's α for the present sample was .91.

Children's Adjustment

The presence of children's emotional and behavioral difficulties was assessed with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1994, 1997) administered to each parent to produce total scores of internalizing problems and externalizing problems (Goodman, Lamping, & Ploubidis, 2010), with higher scores indicating greater problems. The cutoff points for clinical problems are 9 for internalizing problems and 11 for externalizing problems. An independent assessment of the children's psychological adjustment was obtained by administering the SDQ to teachers. The cutoff point for both internalizing problems and externalizing problems is 11 for the teachers' SDQ. Following permission from the parents, the questionnaire was mailed to the child's teacher with an enclosed stamped addressed envelope for return to the researcher. Teachers were informed that their responses to the questionnaire would not be reported back to the child's family or school. Questionnaires were received by 48 (50.5%) of the teachers. The SDQ has been shown to have good internal consistency, test-retest and interrater reliability, and concurrent and discriminative validity (Goodman, 1994, 1997). In a review of the reliability and validity of the SDQ based on 48 studies involving more than 130,000 children, Stone, Otten, Engels, Vermulst, and Janssens (2010) found the psychometric properties of the SDQ to be strong. Cronbach's α for the present sample was .71.

The children's externalizing and internalizing problems were also assessed during the interview with the parent who spent most time with the child or a parent selected at random in the families in which parenting was shared equally using a standardized procedure (Rutter, Cox, Tupling, Berger, & Yule, 1975). Detailed descriptions were obtained of any emotional or behavioral problems shown by the child. These descriptions of actual behavior, which included information about where the behavior was shown, severity of the behavior, frequency, precipitants, and course of the behavior over the past year, were transcribed and rated by a child psychiatrist who was unaware of the nature of the study. A high level of reliability ($r = .85$) between ratings made by social scientists and those made "blindly" by a child psychiatrist has been demonstrated for this procedure, and validity has been

established through a high level of agreement with parents' assessments of whether or not their children had emotional or behavioral difficulties (Rutter et al., 1975). Externalizing and internalizing problems were rated according to severity on a 3-point scale ranging from 0 (*no disorder*) through 1 (*dubious or trivial disorder*) to 2 (*definite disorder*). Descriptive statistics are presented in Table 1.

Analysis Plan

The two research questions relating to family structure differences and factors associated with child adjustment were tested using multilevel modeling. This procedure is particularly useful when researching dyads that can be considered indistinguishable, as is the case for same-sex parents (Smith, Sayer, & Goldberg, 2013). The variance of each variable is partitioned into variance occurring *within* families (i.e., the extent to which variation is due to differences between the two parents within a dyad; Level 1) and variance occurring *between* families (i.e., the extent to which variation is due to differences between families; Level 2). The variables that were measured separately for each parent, which were measured at Level 1, were modeled as random intercepts at Level 2, and represented average levels for each family. These random intercepts were used as outcome or predictor variables in regression models specified at Level 2, as the focus of the analyses was to identify differences between family types.

The hypothesis that gay father families would experience greater difficulties than lesbian mother families in terms of stigmatization, parent-child relationships, and child adjustment was tested using simple linear regression at Level 2, where models were specified separately for each outcome variable. The outcome variables were perceived stigma, positive and negative parenting, parent-child interaction (parent responsiveness, child responsiveness, dyadic reciprocity, and dyadic cooperation), and children's externalizing and internalizing problems as assessed by the parent-rated SDQ and the teacher-rated SDQ. Although the gay fathers were significantly older and economically better off than the lesbian mothers, parental age and family income were not related to the outcome variables (except for a significant relationship between income and both parent-reported and teacher-reported internalizing problems) and were therefore not included as control variables. The predictor in each model was family type, with lesbian mother families used as the reference group.

Table 1
 Descriptive Statistics for the Study Measures, Presented as Average Scores Across Both Parents

	Full sample	Lesbian mother families	Gay father families
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Child's gender			
Boys	52 (54.7)	28 (50.9)	24 (60.0)
Girls	43 (45.3)	27 (49.1)	16 (40.0)
Number of siblings			
0	28 (29.5)	17 (30.9)	11 (27.5)
1	51 (53.7)	30 (54.5)	21 (52.5)
2 or more	16 (16.8)	8 (14.5)	8 (20.0)
Household income			
Less than \$60K	13 (13.7)	13 (13.7)	0 (0)
Between \$60K and 150K	35 (36.8)	31 (32.6)	4 (4.2)
Between \$151K and 499K	29 (30.5)	10 (10.5)	19 (20.0)
More than \$500K	18 (18.9)	1 (1.1)	17 (17.9)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Child's age in months	68.31 (24.64)	67.84 (23.76)	68.95 (26.09)
Parent's age	43.10 (6.18)	40.05 (4.80)	47.29 (5.39)
Parent's educational level	4.68 (1.02)	4.45 (0.98)	5.01 (1.00)
Perceived stigma	15.53 (4.20)	15.89 (4.49)	14.94 (3.65)
Quality of parenting			
Positive parenting	-0.017 (0.87)	0.11 (0.85)	-0.21 (0.87)
Negative parenting	-0.001 (0.80)	-0.02 (0.76)	0.02 (0.85)
Observational assessment			
Parent responsiveness	4.78 (0.90)	4.98 (0.81)	4.50 (0.95)
Child responsiveness	4.59 (0.98)	4.77 (0.92)	4.33 (1.04)
Dyadic reciprocity	1.90 (0.78)	2.01 (0.78)	1.75 (0.79)
Dyadic cooperation	3.06 (1.18)	3.24 (1.15)	2.80 (1.20)
Parent-rated SDQ			
Externalizing problems	4.02 (2.43)	3.94 (2.42)	4.14 (2.49)
Internalizing problems	2.75 (2.35)	3.30 (2.47)	1.86 (1.86)
Teacher-rated SDQ			
Externalizing problems	3.88 (3.97)	3.45 (4.02)	4.53 (3.91)
Internalizing problems	2.00 (2.48)	2.38 (2.62)	1.42 (2.16)

Note. SDQ = Strengths and Difficulties Questionnaire.

Results

Comparisons Between Gay Father and Lesbian Mother Families

Children in gay father families were reported by their parents to show significantly lower levels of internalizing problems than children in lesbian mother families (see Table 2). An alternative model, whereby the predictor was family income rather than family type, suggested a similar association between higher income and lower internalizing problems as reported by parents (intercept = 2.730, standardized slope = $-.279$, $p = .004$). The introduction of family type and family income as simultaneous predictors of internalizing problems lead to both effects becoming nonsignificant due to multicollinearity between the two constructs

(standardized $r = .68$, $p < .001$). To understand whether the key predictor of internalizing problems was family type or family income, a multiple-group multilevel model was specified, whereby the indicator of internalizing problems was regressed onto family income at Level 2 and the model run separately for each family type. Higher income did not predict lower internalizing problems in either lesbian mother or gay father families (standardized slope_{lesbian} = $-.108$, $p = .498$; standardized slope_{gay} = $-.187$, $p = .358$), suggesting that the key predictor of lower internalizing problems as reported by parents was family type rather than family income. However, in a further regression in which children's internalizing scores were residualized by income, family type did not explain further variance in children's internalizing problems. When

Table 2
Differences in Parenting, Stigma, and Child Adjustment By Family Type

Outcome variable	Predictor	Coefficient	<i>p</i>	Standardized coefficient	<i>p</i>
Parent age	Intercept	40.055			
	Gay	7.233	.000	.649	.000
Family income	Intercept	1.982			
	Gay	1.343	.000	.699	.000
Positive parenting factor	Intercept	0.110			
	Gay	-0.244	.179	-.168	.180
Negative parenting factor	Intercept	0.002			
	Gay	-0.005	.976	-.005	.976
Parent responsiveness	Intercept	4.996			
	Gay	-0.343	.077	-.410	.173
Child responsiveness	Intercept	4.770			
	Gay	-0.429	.057	-.378	.037
Dyadic reciprocity	Intercept	2.011			
	Gay	-0.224	.209	-.195	.209
Dyadic cooperation	Intercept	3.168			
	Gay	-0.358	.181	-.317	.184
Perceived stigma	Intercept	15.853			
	Gay	-1.277	.126	-.258	.141
Parent-rated SDQ (externalizing problems)	Intercept	3.915			
	Gay	0.483	.368	.108	.360
Parent-rated SDQ (internalizing problems)	Intercept	3.216			
	Gay	-1.179	.014	-.267	.015
Teacher-rated SDQ (externalizing problems)	Intercept	3.448			
	Gay	1.078	.344	.134	.358
Teacher-rated SDQ (internalizing problems)	Intercept	2.379			
	Gay	-0.958	.159	-.191	.148

Note. Intercept = the overall level of the outcome variable in lesbian mother families; Gay = how much the score differed between gay father families and lesbian mother families; Coefficient = unstandardized coefficients; SDQ = Strengths and Difficulties Questionnaire.

the analysis was conducted using teachers' scores, children's internalizing problems did not differ between family types.

There were no differences between gay father families and lesbian mother families in terms of perceived stigma, quality of parenting, parent-child interaction, or children's externalizing problems as reported by parents and teachers, with scores on the individual variables reflecting low levels of perceived stigma, high levels of positive parenting, low levels of negative parenting, average levels of parent-child interaction, and low levels of externalizing problems.

With respect to the ratings by the child psychiatrist, only 2 (5%) children in gay father families showed a definite disorder (1 with internalizing problems and 1 with externalizing problems) and only 2 (3.6%) children in lesbian mother families showed a definite disorder (1 with internalizing problems and 1 with externalizing problems). There was no difference between gay father and lesbian mother families in the proportion of children with a

psychiatric disorder as rated by a child psychiatrist, $\chi^2(1) = 0.11, p = .74$.

Stigma, Parenting, and Child Adjustment

To examine factors associated with children's adjustment, the variables of perceived stigma, positive parenting, negative parenting, and the four observational measures of parent-child interaction (parent responsiveness, child responsiveness, dyadic reciprocity, and dyadic cooperation) were entered into a Level 2 regression as predictors of children's externalizing and internalizing problems as reported by parents (one model per outcome).

With respect to externalizing problems, positive parenting and the four observational measures of parent-child interaction showed no significant effects and were therefore excluded from the model. The two remaining predictors were significant. Parents who perceived higher levels of stigma reported that their children showed higher levels of externalizing problems (estimate = 0.767, *SE* = 0.289,

standardized $z = 2.638$, $p = .008$), and children exposed to higher levels of negative parenting were reported by their parents to show higher levels of externalizing problems (estimate = 5.285, $SE = 1.335$, standardized $z = 4.277$, $p < .001$). These effects could not have arisen due to multicollinearity, as the two predictors were not significantly related to each other. Regarding internalizing problems, none of the predictors was significant ($p > .528$).

The analyses were repeated using teacher-reported externalizing and internalizing problems. None of the paths was significant.

Discussion

Contrary to the hypothesis that children with gay fathers would show higher levels of adjustment difficulties than children with lesbian mothers, the children in both family types were reported by parents and teachers to show low levels of behavioral and emotional problems, and significantly lower levels of parent-reported internalizing problems were found for the children of gay fathers than for the children of lesbian mothers. It is important to emphasize that children's internalizing problems were very low in both family types in relation to the cutoff point for clinical problems. The significant difference between family types reflected a difference between low levels of internalizing problems reported by lesbian mothers and even lower levels of internalizing problems reported by gay fathers.

There were no differences between the children of gay fathers and lesbian mothers in terms of externalizing problems as reported by parents or teachers. Again, levels of externalizing problems were very low in both family types in relation to the cutoff score for clinical problems. Neither were there differences between gay father and lesbian mother families for perceived stigma, quality of parenting, or parent-child interaction, reflecting low levels of perceived stigma, high levels of positive parenting low levels of negative parenting, and typical levels of parent-child interaction.

The ratings of internalizing and externalizing problems by the child psychiatrist, who was unaware of the child's family type, corroborated these findings. The 5% of children of gay fathers and 3.6% of children of lesbian mothers who showed a disorder are lower than the population norm for this measure (Meltzer, Gatward, Goodman, & Ford, 2000). Interestingly, the other studies of children

born to gay fathers through surrogacy similarly found low levels of parent-reported adjustment problems among the children (Baiocco et al., 2015; Green et al., 2015), especially in terms of internalizing problems (Green et al., 2015).

Although further examination of factors associated with variation in children's adjustment irrespective of family type showed neither parenting quality nor parents' experience of stigmatization to be associated with children's internalizing problems as reported by parents and teachers, both of these factors predicted children's externalizing problems as reported by parents. Thus, as hypothesized, parents who perceived higher levels of stigma reported their children to show higher levels of externalizing problems. In addition, children who experienced higher levels of negative parenting were reported by their parents to show higher levels of externalizing problems. Both of these processes appeared to operate independently of each other as there was no association between negative parenting and perceived stigmatization. These findings are consistent with the large body of research showing negative parenting to be associated with children's externalizing problems in heterosexual parent families (Bornstein, 2002; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). There is also a growing research literature showing that the stigmatization of gay and lesbian families is associated with externalizing problems in children (Bos & Gartrell, 2010; Bos & van Balen, 2008). No associations were identified between either parents' experience of stigmatization or negative parenting and children's externalizing problems when reported independently by teachers. It is not known whether this reflected a difference in the perceptions of teachers or was due to the smaller sample of teachers.

A limitation of the study was the moderate sample size, which may have resulted in differences between the gay father and lesbian mother families not being detected. Although not all of the interview variables showed interrater agreement of .80, the coding of those that did not reach this threshold involved the use of nonverbal cues such as facial expression and gestures that were not available to the second rater. Thus, the interrater reliabilities of these interview variables may be underestimates. Although some of the assessments were carried out by Skype, there were no differences in any of the measures between families assessed in person and by Skype.

A further limitation was the use of volunteer samples. Although it was not possible to obtain a

representative sample of gay father families, a variety of recruitment procedures were used to access as diverse a sample as possible. It should be emphasized that this is the first controlled, in-depth study worldwide of parenting and child adjustment in the small but growing number of gay father families created through surrogacy and, as such, provides much needed data on the well-being of children in this emerging family form. As the present study did not include a heterosexual comparison group, firm conclusions cannot be drawn regarding the absence of differences between gay father families formed through surrogacy and heterosexual parent families.

An advantage of the study was that data were obtained using a multimethod and multi-informant approach. Although only 50% of the children's teachers completed the SDQ, significant correlations were obtained between parents' and teachers' SDQ scores for both externalizing ($r = .55, p < .001$) and internalizing problems ($r = .40, p < .01$), providing validation of the parents' reports of their children's psychological adjustment. In addition, there were no differences in parent-rated externalizing or internalizing SDQ scores between children whose teachers had and had not completed the SDQ. As some parents did not give consent for their children's teachers to be sent the questionnaire, the teachers' actual response rate was 70%.

It cannot be ruled out that the lower levels of internalizing problems reported for the children of gay fathers resulted from the gay fathers being less aware of their children's internalizing problems than were the lesbian mothers. Externalizing problems may have been just as apparent to gay fathers as to lesbian mothers, as these tend to be more overt. Studies of heterosexual parent families show lower levels of parental sensitivity to children by fathers than mothers (Kwon, Jeon, Lewsader, & Elicker, 2012; Schoppe-Sullivan et al., 2006) and may reflect differences in the ways in which men and women are socialized to parent (Fagan et al., 2014). Furthermore, the lower levels of parent-reported internalizing problems among the children of gay fathers may have resulted from the higher incomes of gay fathers. Although there was no significant association between family income and children's internalizing problems when the relationship between the two was examined separately for gay father and lesbian mother families, when children's internalizing problems were residualized by income, there was no difference in children's internalizing problems between family types. Due to the high correlation between income

and family type, it was not possible to fully disentangle the influence of family income from the influence of family type on children's internalizing problems. To the extent that there is a genetic component to children's development of internalizing problems (Gregory & Eley, 2007), it may be relevant that egg donors are screened for emotional disorders.

Overall, the study found the children of both gay fathers and lesbian mothers to show high levels of psychological adjustment and to have positive relationships with their parents. Stigmatization of the family and negative parenting were associated with higher levels of children's behavioral problems in both family types. These findings are consistent with the theoretical framework of the study (Overton, 2015) that emphasizes the bidirectional nature of relations between the social environment, parenting, and child adjustment. Research on gay father families formed through surrogacy is of interest in its own right as it is important to understand the psychological consequences for children of being conceived using the egg of a donor, born to a surrogate mother, and raised by two fathers, one of whom lacks a genetic connection to the child. However, this research is also of broader theoretical interest. By controlling for the presence of two parents in the family and the use of assisted reproduction, the study enabled the influence of parental gender on child development to be examined. The findings are consistent with those from studies of adoptive gay fathers (Farr et al., 2010a, 2010b; Farr & Patterson, 2013; Goldberg & Smith, 2013; Golombok et al., 2014) showing that men can be just as competent at parenting as women and that the absence of a female parent does not necessarily have adverse consequences for children's psychological adjustment. In addition, the finding that stigmatization and negative parenting were associated with higher levels of parent-reported externalizing problems in children, irrespective of family type, contributes to the growing body of evidence that social and family processes are more influential in child adjustment than are structural variables, such as the gender and sexual orientation of parents.

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The psychological well-being and prenatal bonding of gestational surrogates

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STUDY QUESTION: How does the psychological well-being and prenatal bonding of Indian surrogates differ from a comparison group of mothers?

SUMMARY ANSWER: Surrogates had higher levels of depression during pregnancy and post-birth, displayed lower emotional connection with the unborn baby, and greater care towards the healthy growth of the foetus, than the comparison group of mothers.

WHAT IS ALREADY KNOWN: Studies in the West have found that surrogates do not suffer long-term psychological harm. One study has shown that surrogates bond less with the foetus than expectant mothers.

STUDY, DESIGN, SIZE, DURATION: This study uses a prospective, longitudinal and cross-sectional design. Surrogates and a matched group of expectant mothers were seen twice, during 4–9 months of pregnancy and 4–6 months after the birth.

PARTICIPANTS/MATERIALS, SETTING, METHODS: Semi-structured interviews and standardized questionnaires were administered to 50 surrogates and 69 expectant mothers during pregnancy and 45 surrogates and 49 expectant mothers post-birth. All gestational surrogates were hosting pregnancies for international intended parents.

MAIN RESULTS AND THE ROLE OF CHANCE: Surrogates had higher levels of depression compared to the comparison group of mothers, during pregnancy and post-birth ($P < 0.02$). Low social support during pregnancy, hiding surrogacy and criticism from others were found to be predictive of higher depression in surrogates post-birth ($P < 0.05$). Regarding prenatal bonding, surrogates interacted less with and thought less about the foetus but adopted better eating habits and were more likely to avoid unhealthy practices during pregnancy, than expectant mothers ($P < 0.05$). No associations were found between greater prenatal bonding and greater psychological distress during pregnancy or after relinquishment.

LIMITATIONS, REASONS FOR CAUTION: All surrogates were recruited from one clinic in Mumbai, and thus the representativeness of this sample is not known. Also, the possibility of socially desirable responding from surrogates cannot be ruled out.

WIDER IMPLICATIONS OF THE FINDINGS: As this is the first study of the psychological well-being of surrogates in low-income countries, the findings have important policy implications. Providing support and counselling to surrogates, especially during pregnancy, may alleviate some of the psychological problems faced by surrogates.

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Key words: cross-border / surrogacy / India / depression / prenatal bonding / quantitative research / health policy

Introduction

Commercial surrogacy in India became a global phenomenon in 2002 (Pande, 2011). Factors such as allowing the intended parents' names to be on the birth certificate, cutting-edge technology and cheaper medical costs attracted intended parents from around the world towards commercial gestational surrogacy in India (Smerdon, 2008; Karandikar *et al.*, 2014). In gestational surrogacy, a surrogate lacks a genetic link to the child. It is estimated that 25 000 children were born through surrogacy in India up until 2015 (Söderström-Anttila *et al.*, 2016) and terms such as 'womb farm' (Moorti, 2011), 'baby factory' (Roberts, 2012) and 'market pregnancy' (Rudrappa, 2015) were frequently used to represent this burgeoning 'business'. This unregulated surrogacy market is believed to be worth \$2.3 billion (Deonandan *et al.*, 2012). However, media stories about stateless and parentless surrogacy children, and concerns regarding the poor treatment of surrogates, resulted in the government of India drafting a new Surrogacy (Regulation) Bill in 2016 to ban commercial surrogacy, deeming it exploitative. The Bill permits only altruistic surrogacy for infertile Indian couples (Sibal, 2016).

It has been argued that cross-border surrogacy with its legal, political, ethical, religious and procedural challenges puts the well-being of the surrogates, intended parents and unborn children at serious risk (Pennings *et al.*, 2008; Crockin, 2013; Söderström-Anttila *et al.*, 2016). In particular, it has been suggested that large income gaps and extreme power differentials between intended parents and surrogates (Dasgupta and DasGupta, 2014), the commodification of women's bodies in poverty-stricken populations (Baumhofer, 2012) and a lack of alternative choices for surrogates (Pande, 2009a) made surrogates in India vulnerable to exploitation. Moreover, since women from lower-income populations in developing nations suffer from high levels of emotional problems, primarily prenatal and postnatal depression, compared to women from higher-income nations, surrogacy candidates in India may already be at risk for psychological problems (WHO, 2017). These concerns have led to considerable unease regarding surrogates' psychological well-being; however, the potential psychological distress experienced by surrogates has not been studied in the Global South (Crockin, 2013; Söderström-Anttila *et al.*, 2016).

Specific factors that may cause psychological harm to surrogates, also remain largely unexplored. Critics of surrogacy argue that women form a deep bond with the unborn baby and that it is emotionally distressing for a woman to give up a child that has been nurtured in her womb (Warnock Report, 1985; British Medical Association, 1996). In non-surrogacy pregnancies, lower maternal–foetal bonding has been found to be associated with decreased positive health practices during pregnancy (Lindgren, 2001). For surrogates, it has been suggested that detaching from the foetus could lead to surrogates putting the unborn child's health at risk by engaging in risky behaviours such as smoking or not eating well (British Medical Association, 1996; Jadva, 2016).

Only three studies have examined maternal–foetal bonding or attitudes towards the foetus in the context of surrogacy (Fischer and Gillman, 1991; van den Akker, 2007; Lorenceau *et al.*, 2015), all of which were conducted in the USA or Europe. Fischer and Gillman (1991) administered the Maternal Fetal Attachment Scale (Cranley, 1981) to 21 surrogates and 21 expectant mothers in the USA and found that surrogates were significantly less attached to the unborn child than were the non-surrogates. In contrast, in France, Lorenceau

et al. (2015), found surrogates to show levels of attachment to the foetus that fell within the normal range for non-surrogate pregnant women. However, only 11 surrogates participated in the study and there was no comparison group. van den Akker (2007) found that surrogates were significantly less concerned about the health and well-being of the foetus and less positive about the foetus than were intended mothers.

In terms of relinquishment, research in the USA and the UK has repeatedly shown that most surrogates are able to hand over the baby they carry (Ragoné, 1994; Jadva *et al.*, 2003, 2012; van den Akker, 2003; Imrie and Jadva, 2014). It has been suggested that they make a conscious effort to think of surrogacy as a job and do not see the baby as their own (Snowdon, 1994; Baslington, 2002). Payment in commercial surrogacy is also thought to be a contributing factor in creating an emotional distance between the surrogate and the developing foetus (Baslington, 2002).

However, studies conducted in the West cannot be generalized to the Global South, mainly due to the large cultural differences in the way in which surrogacy is practiced and legislated (Pande, 2009a; Crockin, 2013; Söderström-Anttila *et al.*, 2016). Sociologists and anthropologists, through their in-depth fieldwork, have studied the lived experiences of Indian surrogates (Pande, 2009a, 2010a, 2011; Vora, 2014; Rudrappa, 2015). In India, surrogates are generally recruited by agents via word of mouth. Pande described surrogates as 'docile, selfless and nurturing' women who were trained to be perfect 'worker-mothers' (Pande, 2010a). She found that Indian surrogates viewed their connection to the foetus as arising through blood ties (shared substance) and sweat (the labour of gestation) rather than the genetic connection that is emphasized in Western countries. It is not known if these feelings of connection to the foetus are similar to the concept of prenatal bonding and if so, whether developing such a bond has consequences for surrogates' psychological well-being during pregnancy and following the birth.

Surrogates in India often live in a surrogate house, which is group accommodation located near fertility clinics, during their pregnancy. While living in the surrogate house enabled them to be under 'constant surveillance' by clinic staff it has also been reported to provide surrogates with a feeling of sisterhood (Pande, 2011; Vora, 2014).

Indian surrogates often receive relatively large sums of money, amounting to ~10 years' worth of income (Pande, 2009a). Unlike the USA or the UK, surrogates in India are unlikely to meet the intended parents after the birth of the child (Pande, 2011). The clinic, as the mediator between the intended parents and the surrogate, tends to depersonalize the role of the surrogate (Vora, 2014), although the surrogates themselves often hope for a lasting bond and act of reciprocity and generosity from the intended parents (Pande, 2011). Other complications such as language barriers and distance may make direct relationships between the surrogates and intended parents difficult.

Surrogacy in India, unlike the West, is frequently kept a secret by the surrogate and her family as it is considered immoral (Pande, 2009b). Surrogates face social humiliation and criticism from family members and the wider community, and may be shunned by persons in these networks (Karandikar *et al.*, 2014). In particular, it is common for uneducated or misinformed family or friends to consider pregnancy outside the realm of marriage as sex-work or adultery, thus leading to 'sexualized stigmatization' (Deonandan *et al.*, 2012; Pande, 2009b). These experiences may negatively affect surrogates' psychological

well-being. There is a large body of research showing that social stigma is likely to generate feelings of depression and anxiety (Markowitz, 1998; Schmitt et al., 2014). For those who decide to hide their surrogacy, the visible baby bump makes it impossible for them to meet family and friends during the pregnancy, resulting in social isolation and a lack of social support. Moreover, unlike western countries, not only is the detailed screening for psychopathology in surrogates typically omitted, psychological counselling and support are also not readily available to surrogates in India, potentially making them more vulnerable to psychological problems (Palattiyil et al., 2010; Karandikar et al., 2014).

The aim of the present study was to examine the psychological well-being of Indian surrogates and the nature of their prenatal bond to the baby. A further aim was to assess the association between surrogates' experiences and their psychological well-being.

Materials and Methods

Design and participants

Fifty Indian surrogates were compared with a demographically matched group of 69 expectant mothers. The women were assessed at two time points: (i) Phase 1: during the fourth–ninth month of pregnancy and (ii) Phase 2: 4–6 months after the birth of the baby.

In line with the guidelines from the Indian Council of Medical Research (ICMR), all surrogates were gestational surrogates, had at least one child of their own from a current or previous marriage, and were screened for their physical and mental health. Surrogates were recruited by an agency working with Corion Fertility Clinic, Mumbai, over a two-year period. Surrogates who were in the second or third trimester of pregnancy were invited to take part by the clinic administrator. All agreed to participate, yielding a response rate of 100%. Approximately 4–6 months after the birth of the baby, the clinic administrator contacted the surrogates again for the follow up interview. Overall, 45 surrogates agreed to take part, representing a response rate of 90%. All surrogates were hosting pregnancies for international intended parents.

The comparison group of expectant mothers was recruited from four public hospitals in Mumbai and Delhi. Expectant mothers were recruited by the interviewer (N.L.) from hospital waiting rooms. The interviews were conducted at the hospitals. The expectant mothers were matched as closely as possible to the surrogates according to age, educational level, socio-economic background and month of pregnancy. In addition, they had to have at least one child. Of the 78 expectant mothers who fulfilled the inclusion criteria, 88% agreed to take part in the study. For Phase 2, these mothers were contacted directly by the researcher. Of the 69 mothers who took part in Phase 1, 49 mothers took part in Phase 2, representing a participation rate of 71%.

The interviews were conducted in a private room in Hindi by N.L., a native Hindi speaker. Written or verbal (recorded) consent was obtained before starting the interview. Each participant received ₹1000 (£12) for taking part in each interview. N.L. translated and transcribed the interviews from Hindi to English for analysis. Ethical approval for the study was obtained from the University of Cambridge Psychology Research Ethics Committee and the Corion Fertility Clinic's Ethics Committee.

Measures

Standardized questionnaires and face-to-face interviews were administered to all participants. The questionnaires were read out by the interviewer as the majority of the participants could not read or write.

Psychological well-being

Participants were administered the Anxiety, Depression and Stress Scale (ADSS) (Bhatnagar, 2011) at Phase 1 and Phase 2 of the study. The ADSS was developed in India and the standardization included participants from illiterate and marginalized groups. The 48-item scale comprises three subscales: anxiety (19 items), depression (15 items) and stress (14 items), with higher scores indicating greater psychological problems. The percentile cut-off for 'severe' anxiety, depression and stress was P_{76} – P_{100} . Participants responded 'yes' or 'no' to questions such as 'I feel more nervous and anxious than usual' and 'Often I want to be alone'. The internal consistency of the original scale was 0.81. Cronbach alphas for the current sample for each subscale in both phases of the study were >0.85 .

Prenatal bonding

An adaptation of the Maternal Fetal Attachment Scale (MFAS) (Cranley, 1981) was administered to assess the extent to which pregnant women had bonded with the unborn baby. The original scale comprised 24-item rated on a 5-point Likert scale. The current study used a modified version of the MFAS with yes/no response options to aid understanding by the participants. Higher scores represented greater bonding. Sample items included: 'I talk to the unborn baby' and 'I do things to try to stay healthy that I would not do if I were not pregnant'.

A principal component analysis using varimax rotation was conducted on the modified MFAS. Items with eigen values below 0.4 (5 items) and items with negative loadings (1 item) were excluded. A modified scale was produced which assessed feelings, thoughts and actions towards the foetus during pregnancy. Two factors were identified: (i) Emotional Prenatal Bonding and (ii) Instrumental Prenatal Bonding, with 10 and 5 items, respectively (Table 1). The Emotional Prenatal Bonding scale measured the level of interaction women had with the foetus and whether they had attributed characteristics to the foetus. The Instrumental Prenatal Bonding scale assessed the extent to which women were attentive and caring towards the foetus. Cronbach α were 0.74 and 0.59 for Emotional Prenatal Bonding and Instrumental Prenatal Bonding, respectively. The factor scores for the two subscales were used in further analyses.

Experiences of surrogacy

Semi-structured interviews were conducted with the surrogates to obtain detailed information on their experiences of surrogacy. A flexible style of questioning was used to collect information and the responses were coded according to a standardized coding scheme. At Phase 1 the following variables were coded: (i) *Hiding surrogacy*: 'from everyone', 'from most people' or 'did not hide surrogacy'; (ii) *Criticism for being a surrogate*: 'much criticism' or 'little or no criticism'; (iii) *Feelings about living in the surrogate house*: 'positive', 'neutral' or 'negative'; (iv) *Perceived support during pregnancy*: 'sufficient support', or 'no support'; and (v) *Satisfaction with payment*: 'satisfied', 'somewhat satisfied' or 'not satisfied'. At Phase 2, data were obtained on: (vi) *Meeting the newborn*: 'yes' or 'no' and (vii) *Meeting intended parents*: 'yes' or 'no'.

Statistical analyses

A series of 2×2 mixed ANOVAs, with group (surrogates versus expectant mothers) and time (during pregnancy versus after the birth) as factors, were conducted to examine differences between groups over time, separately for anxiety, depression and stress. A MANOVA was conducted to examine differences between the surrogates and non-surrogates during pregnancy for the two subscales of the revised MFAS. Correlations and multiple regression analyses were used to examine factors associated with surrogates' psychological well-being during pregnancy and following the birth, and with the prenatal bonding subscales. Where a significant correlation was found between a demographic variable and a dependent

Table I Factorial structure of maternal–foetal attachment subscales.

Item	Factor loadings	
	Factor 1	Factor 2
I can hardly wait to hold the baby.	0.625	
I can almost guess what the baby's personality will be from the way he/she moved around.	0.615	
It seems the baby kicks and moves to tell me it's eating time.	0.604	
I wonder if the baby thinks and feels 'things' inside of me.	0.578	
I poke the baby to get him/her to poke back.	0.535	
I talk to the unborn baby.	0.506	
I wonder if the baby can hear inside of me.	0.500	
I imagine myself taking care of the baby.	0.477	
I decided on a name for a baby boy	0.436	
I refer to the baby by a nickname	0.408	
I give up doing certain things because I want to help the baby.		0.702
I eat meat and vegetables to be sure the baby gets a good diet.		0.701
I do things to try to stay healthy that I would not do if I were not pregnant.		0.502
I stroke my tummy to quiet the baby when there is too much kicking.		0.497
I try to picture what the baby will look like.		0.482

Note: Rotated component matrix for the attachment scale; extraction method was principal component analysis, and rotation method was Varimax; only factor loadings over 0.40 are shown. Hindi version utilized in the study amended the items from 'my baby' to 'the baby' for all items.

variable, the analysis was conducted with the demographic variable included as a covariate.

Results

Characteristics

The characteristics of the sample are shown in Table II. There was no difference between groups in the age of the mothers, $F(1, 118) = 3.35$, $P = 0.07$, income level, $F(1, 110) = 0.49$, $P = 0.48$, or religious affiliation, $\chi^2(1) = 1.01$, $P = 0.31$. However, surrogates had more children, $\chi^2(1) = 21.73$, $P < 0.01$, were more likely to be single (widowed, abandoned or divorced), $\chi^2(1) = 23.92$, $P < 0.01$, were less educated $\chi^2(2) = 13.72$, $P < 0.01$, and were interviewed earlier in their pregnancy $F(1, 118) = 86.46$, $P < 0.01$, compared to expectant mothers. In total, 82% of surrogates had been employed before becoming a surrogate. The majority had worked as domestic helpers (61%) or as semi-skilled labourers in shops, factories or at home (24%).

Psychological well-being

For depression, a 2x2 mixed ANOVA found a significant main effect for group, $F(1, 85) = 6.50$, $P = 0.01$, indicating higher levels of

depression among surrogates than the comparison group of mothers. There was no significant effect for time and no significant interaction between group and time, showing that the surrogates had higher levels of depression than expectant mothers during pregnancy and after the birth of the baby. During pregnancy, 36% of surrogates obtained scores above the cut-off point for severe depression compared with 13.8% of expectant mothers ($\chi^2(1) = 12.9$, $P < 0.001$). Following the birth, the percentages of surrogates and expectant mothers who scored above the cut-off point for severe depression were 27.3 and 13.3%, respectively, ($\chi^2(1) = 6.12$, $P = 0.01$).

For anxiety and stress, separate 2x2 mixed ANOVAs found no significant main effects or interaction effects, showing that there were no significant differences between surrogates and expectant mothers in either anxiety or stress during pregnancy or after the birth of the baby (Table III).

Maternal–foetal bonding

The two subscales were entered into a MANOVA. Wilks's λ was significant, $F(2, 116) = 4.40$, $P = 0.01$. One-way ANOVAs showed a significant difference between surrogates and expectant mothers in Emotional Prenatal Bonding, $F(1, 116) = 4.19$, $P = 0.04$, with surrogates showing lower emotional connection with the foetus than expectant mothers. There was also a significant difference between surrogates and expectant mothers for Instrumental Prenatal Bonding, $F(1, 116) = 4.27$, $P = 0.04$, reflecting greater care and attention towards the foetus by surrogates than the expectant mothers (Table IV).

Experiences of surrogacy

Phase 1: During pregnancy

All of the surrogates were hiding their involvement in surrogacy to some extent. Overall, 32% of surrogates ($n = 16$) were hiding surrogacy from everyone and 68% of surrogates ($n = 34$) were hiding surrogacy from most people. With respect to criticism for being a surrogate, 26% ($n = 13$) of surrogates reported experiencing criticism. In total, 74% of the surrogates ($n = 37$) reported feeling positive about living in the surrogate house, with the remaining 26% ($n = 13$) reporting neutral rather than negative feelings. Regarding support, 66% ($n = 33$) of surrogates felt that they had received sufficient support during pregnancy. And 34% ($n = 17$) of the surrogates felt unsupported. In terms of payment, the majority of the surrogates (74%, $n = 37$) reported being satisfied with the amount of payment they were receiving, 18% ($n = 9$) were somewhat satisfied, and 8% ($n = 4$) said they were not satisfied with the amount.

Phase 2: After the birth

All surrogates reported a desire to meet the intended parents and the baby. Two-thirds of the surrogates (64%, $n = 32$) did not see the baby and just over half of the surrogates (54%, $n = 24$) did not meet the intended parents following the birth. These surrogates expressed uncertainty about whether or not they would ever be allowed to meet the intended parents and the baby. When surrogates had met the intended parents following the birth, the meetings were usually brief, ranging from 5 to 20 min, and were supervised by a member of staff from the clinic who translated their conversations.

Table II Sample characteristics.

	Surrogates		Expectant mothers		F	P
	Mean	SD	Mean	SD		
Age (years)	27.6	2.51	26.6	3.46	3.35	0.07
Month of pregnancy	6.2	1.18	8.3	1.14	86.46	0.00
Monthly income (INR.)	8042	4005	7593	2718	0.49	0.48
	n(%)		n(%)		χ^2	P
Number of children					21.73	0.00
1	18 (36)		55 (80)			
2 or more	32 (64)		14 (20)			
Religion					1.01	0.31
Hindu	24 (48)		43 (62)			
Muslim	23 (46)		27 (38)			
Other	3 (6)		0 (0)			
Educational status					13.72	0.00
No schooling	23 (44)		10 (15)			
First–seventh grade	10 (20)		18 (26)			
7th–12th grade	17 (34)		41 (59)			
Marital status					23.92	0.00
Husband	33 (66)		68 (99)			
No husband	17 (34)		1 (1)			

Note: For 'religion', codes were collapsed to 'Hindu and Muslim' for Chi square analyses.

Table III 2 × 2 Mixed ANOVA for psychological well-being scores.

Variables	Surrogates		Expectant mothers		Surrogates versus expectant mothers		Pre versus post pregnancy		Interaction between group×time	
	Mean	SD	Mean	SD	F	P	F	P	F	P
Anxiety during pregnancy	9.6	5.50	7.7	4.79	0.95	0.33	1.14	0.28	1.22	0.27
Anxiety post-birth	8.2	5.39	7.7	5.26						
Depression during pregnancy	8.4	4.88	6.1	4.06	6.50	0.01	2.31	0.13	0.02	0.86
Depression post-birth	7.6	4.88	5.4	4.47						
Stress during pregnancy	7.8	4.69	6.8	4.07	1.2	0.27	0.06	0.80	0.00	0.98
Stress post-birth	7.7	4.70	6.7	4.22						

Factors associated with surrogates' psychological well-being

Based on the previous literature, the following variables relating to surrogates' characteristics and experiences were correlated with their prenatal and postnatal depression scores: demographic factors (socio-economic status, educational status and marital status), pregnancy (support during pregnancy), bonding with the foetus (Emotional Prenatal Bonding and Instrumental Prenatal Bonding), surrogacy arrangement (satisfaction with payment and feelings towards surrogate house) and stigmatization (hiding surrogacy and facing criticism). Factors that were unique to the second phase of the study (meeting the newborn and

meeting the intended parents after delivery) were correlated with depression scores at Phase 2. None of the variables was significantly correlated with depression during pregnancy. However, support during pregnancy ($r = -0.41$, $P = 0.00$), hiding surrogacy ($r = 0.30$, $P = 0.04$) and criticism ($r = 0.33$, $P = 0.02$), were significantly correlated with postnatal depression scores. The combined effect of these variables was examined using a multiple linear regression. It was found that lower perceived support during pregnancy, hiding surrogacy and facing criticism for being a surrogate significantly predicted higher depression in surrogates after the birth of the baby, $F(3, 43) = 8.36$, $P < 0.001$, adjusted $R^2 = 0.38$, accounting for 38% of the variance in depression after the birth. All three values added significantly to the prediction, $P < 0.05$ (Table V).

Factors associated with surrogates' bonding to the unborn baby

The variables relating to surrogates' characteristics and experiences and their psychological well-being (i.e. anxiety, depression, and stress scores during pregnancy and following the birth) were correlated with the MFAS subscales. Although there were no significant correlations with Instrumental Prenatal Bonding, Emotional Prenatal Bonding was found to be correlated with educational status ($r = -0.31$, $P = 0.03$) and feelings towards the surrogate house ($r = 0.35$, $P = 0.01$), with surrogates of lower educational status and who had a positive experience at the surrogate house being more likely to emotionally bond with the foetus. In order to examine the combined effects of educational status and feelings towards the surrogate house, both variables were entered into a hierarchical multiple regression. It was found that after controlling for educational status, surrogates' feelings towards the surrogate house still significantly predicted their emotional connection with the foetus, $F(2, 45) = 4.82$, $P = 0.01$, $R^2 = 0.14$, accounting for 14% of the variance in their emotional prenatal bonding (Table VI). There were no significant correlations between surrogates' prenatal bonding and psychological well-being scores.

Discussion

The findings of the study showed that Indian surrogates experienced higher levels of depression across pregnancy and several months following the birth, than the comparison group of mothers who were

having their own babies. However, there was no difference in levels of depression from the time of pregnancy to after the birth for either group, indicating that giving up the newborn did not add to surrogates' levels of depression. Instead, it appears that the surrogates were more depressed from pregnancy onwards and may have been more depressed before they initiated the surrogacy arrangement. There were no differences between the surrogates and the expectant mothers for anxiety and stress.

An examination of factors associated with depression in surrogates following relinquishment of the baby found that lack of support during pregnancy, hiding surrogacy from family and friends, and being criticized by family or neighbours for becoming a surrogate were each found to be risk factors for depression. These factors reflect the stigmatization associated with surrogacy in India. Most of the surrogates had kept their involvement in surrogacy secret from their family and community due to anticipated stigma. As secrecy and experiencing stigma can have a negative impact on psychological well-being (Kelly, 2002; Schmitt *et al.*, 2014), this may have played a part in the raised levels of depression shown by surrogates. The majority of the surrogates reported feeling positive about living in the surrogate house. Staying there may have made them feel more supported and less burdened by the pressures of maintaining a secret from those around them and free of stress of everyday life. Additionally, surrogates' satisfaction with the payment they received for surrogacy did not facilitate their psychological well-being.

In terms of bonding with the unborn baby, surrogates bonded emotionally with the foetus less than expectant mothers; they were less

Table IV Group differences in maternal–foetal bonding subscales scores.

Variables	Surrogates		Expectant mothers		F	P
	Mean	SD	Mean	SD		
Factor 1: Emotional Prenatal Bonding	-0.21	1.23	0.16	0.75	4.23	0.04
Factor 2: Instrumental Prenatal Bonding	0.21	0.68	-0.16	1.16	4.19	0.04

Table V Factors predicting higher depression in surrogates.

Variables	Predictors	β	t	P	Adjusted R^2
Depression (post-birth)					0.32
	Perceived support during pregnancy	-0.38	-3.02	0.00	
	Hiding surrogacy	0.37	2.94	0.00	
	Facing criticism	0.31	2.44	0.02	

Table VI Factors predicting surrogates' emotional prenatal bonding.

Variables	Predictors	β	t	P	Adjusted R^2
Emotional Prenatal Bonding					0.14
	Educational status	-0.23	-1.65	0.10	
	Feeling towards the surrogate house	0.29	2.05	0.04	

likely to think about and interact with the foetus. This finding is in line with the only comparable study in the field, which found that surrogates bonded less with the unborn child than did expectant mothers (Fischer and Gillman, 1991). It has been suggested that viewing surrogacy as paid employment may help surrogates keep an emotional distance from the foetus (Snowdon, 1994; Baslington, 2002). The intention of not being a parent and the anticipated separation after the birth may also facilitate the emotional distance from the unborn baby (Braverman et al., et al., 2012; Jadva, 2016).

However, surrogates exhibited higher levels of instrumental bonding with the unborn baby than the expectant mothers. This may be reflective of how pragmatically surrogates abided by their contract and commitment to deliver a healthy baby to the intended parents. Whilst it is not surprising that surrogates allotted time and effort to nurture and protect the foetus, it was unexpected that they did so more than women carrying their own babies. This may also result from structural and cultural aspects of Indian surrogacy where the daily life of an Indian surrogate living in a surrogacy house entails one purpose, that is, to care for the foetus and deliver it at full term. All of her activities are structured around being a responsible surrogate. These findings are in accordance with Pande's (2010a) concept of 'worker-mother' duality, whereby surrogates limit their role as a 'mother' by not connecting emotionally with the foetus but responsibly follow their role as a 'worker' by being vigilant towards the needs of the foetus.

In examining factors associated with prenatal bonding, it was found that surrogates who had a more positive experience at the surrogate house were more likely to be emotionally involved with the foetus. Surrogates who were happy at the surrogate house may have felt more immersed in their role as a surrogate. It was further observed that surrogates with no education displayed higher emotional involvement with the unborn baby, than did those with at least some education. This finding suggests that lack of education may interfere with surrogates' ability to regulate their feelings towards the unborn child. This could be concerning as surrogates are generally expected to keep an emotional distance from the foetus (Baslington, 2002).

Contrary to expectations, greater bonding with the unborn baby was not found to be associated with raised levels of depression in the surrogates during pregnancy and post-birth. This challenges the widely held assumption that surrogates who develop strong bonds to the unborn baby would show higher levels of psychological problems.

Similar to findings in the West (Ragoné, 1994; Jadva et al., 2003; van den Akker, 2003; Imrie and Jadva, 2014), Indian surrogates in the present study were able to relinquish the newborn. It is noteworthy, however, that the majority of surrogates did not meet the baby to whom they had given birth nor did they meet the intended parents. This contrasts sharply with the practice of surrogacy in the West where some surrogates remain in contact with the family they have helped create as the child grows up (Jadva et al., 2015; Blake et al., 2016). Also, not being able to see, hold and meet the newborn, which is viewed as an important aspect of a successful surrogacy arrangement (Hohman and Hagan, 2001), may have led to dissatisfaction about the surrogacy. A qualitative analysis of surrogates' feelings about not seeing the baby or the intended parents is described elsewhere (Lamba and Jadva, 2018). Living in uncertainty about whether or not they would meet with the baby and the intended parents, even a few months after the birth, appeared to be psychologically stressful for the surrogates.

A limitation of the study was that all of the surrogates were recruited from one clinic in Mumbai, and thus the findings may not be

representative of surrogates' experiences at different clinics in India. Conducting interviews at the clinic may have led to socially desirable responding, as surrogates may have been afraid of the negative consequences of expressing any disagreements with clinic staff over accommodation, payment or medical assistance. However, given that most had not disclosed their decision of becoming a surrogate to most of their family members, it would have been unethical to contact them and interview them in their home environments. Surrogates were informed at the beginning of the study that no information would be shared with the clinic. Another disadvantage is that, unlike surrogates, expectant mothers may have had an unplanned pregnancy. Controlling for a planned pregnancy may have resulted in even greater differences in depression between the two groups as unplanned pregnancy is associated with raised levels of depression. A further limitation relates to the low internal reliability of the instrumental bonding subscale utilized in the present study. Additionally, there was a lower response rate (71%) for the expectant mothers than for the surrogates during the second phase of the study, which may have introduced a bias in terms of maternal depression. However, a lower response rate was not surprising as they had a newborn to attend to at home. Finally, this study lacks information on the history of participants' mental health prior to pregnancy.

An advantage of the study is that it is the only investigation to have followed up surrogates hosting pregnancies for international intended parents in India from the time of pregnancy until several months after relinquishment of the baby. It is also the only study to have examined the psychological health and feelings towards the foetus of surrogates in the Global South. Importantly, the study examined risk factors for psychological problems, which makes the findings more meaningful in terms of understanding which aspects of surrogacy may impact surrogates' mental health.

While the present study was conducted prior to the new Surrogacy Bill in India, most of the countries in the Global South are going through a transient phase regarding their laws on surrogacy, therefore, the findings have important policy implications. Since the present Indian Bill stipulates that the surrogate should be a close family relative, there is a fear that this change in the law may result in surrogacy arrangements becoming secret family affairs. This may perpetuate stigma against surrogacy in Indian society and increase the risk of psychological harm to surrogates. Informing practitioners and clinics about the importance of support during pregnancy and offering counselling to surrogates to help tackle the burden of social stigma and social disapproval, may alleviate some of the psychological issues faced by surrogates. More detailed psychological screening of surrogates prior to entering into surrogacy is also highly recommended.

While the new policy proposed by the Indian government may ensure that surrogates receive support from family members and meet the baby after the birth, it has its limitations. For instance, within a family, issues concerning failed pregnancies, multiple abortions, and miscarriages may lead to more blame and guilt. Also, whilst the surrogates in the present study lived in uncertainty regarding their meeting with the newborn and intended parents, the new Bill suggests that the surrogate—being a close family relative—may feel forced to maintain a relationship with these parties (perhaps in close proximity) for the long-term. Thus, the surrogate still may not get to choose the level of involvement she has with the intended parents and the child.

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Authors' role

K.K. assisted with the recruitment of participants to this study and all other authors were involved in the analysis and interpretation of data. N.L. drafted this article and it has been approved by all authors.

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Conflict of interest

K.K. is the Medical Director of Corion Fertility Clinic. All other authors have no conflict of interest to declare.

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The perspectives of adolescents conceived using surrogacy, egg or sperm donation

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STUDY QUESTION: What are the perspectives of adolescents conceived using surrogacy, egg or sperm donation regarding their conception and the third party involved?

SUMMARY ANSWER: The majority of adolescents described feeling indifferent about their conception, and yet simultaneously reported an interest in the third party involved, or were in contact with them.

WHAT IS KNOWN ALREADY: There is an assumption that children conceived through reproductive donation will feel negatively about their origins in adolescence. However, little is known about the views of adolescents who have been conceived through different types of reproductive donation.

STUDY DESIGN, SIZE, DURATION: Forty-four adolescents, all of whom had been told about their conception in childhood, participated in a semi-structured interview as part of the sixth phase of a longitudinal, multi-method, multi-informant study of assisted reproduction families in the UK.

PARTICIPANTS/MATERIALS, SETTING, METHODS: All adolescents were aged 14 years, had been conceived using surrogacy ($n = 22$), egg donation ($n = 13$) or sperm donation ($n = 9$) to heterosexual couples, and varied in terms of their information about, and contact with, the third party involved in their conception. Semi-structured interviews were conducted in participants' homes. Interviews were analysed qualitatively to determine adolescents' perceptions of their conception, and their thoughts and feelings about the surrogate or donor involved.

MAIN RESULTS AND THE ROLE OF CHANCE: Adolescents were found to feel positive ($n = 7$), indifferent ($n = 32$) or ambivalent ($n = 5$) about their conception. Amongst adolescents not in contact with the surrogate or donor, most were interested ($n = 16$) in the surrogate or donor, and others were ambivalent ($n = 4$), or not interested ($n = 6$) in them. Adolescents in contact with the surrogate or donor expressed positive ($n = 14$), ambivalent ($n = 1$) or negative ($n = 1$) feelings about them.

LIMITATIONS, REASONS FOR CAUTION: Of 56 adolescents invited to take part in the study, 47 consented to take part, giving a response rate of 84%. It was not possible to obtain information from adolescents who do not know about their conception.

WIDER IMPLICATIONS OF THE FINDINGS: The findings contradict the assumption that children conceived through reproductive donation will feel negatively about their origins in adolescence and suggest that it may be helpful to draw a distinction between adolescents' feelings about their conception in general, and their feelings about the surrogate or donor in particular.

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Key words: adolescence / donor conception / surrogacy / egg donation / sperm donation

Introduction

Reproductive donation is a form of assisted reproduction in which a third party assists in the conception of a child, either through donated gametes (sperm or egg) or by hosting the pregnancy, either using their own egg (traditional surrogacy) or the commissioning mother's (gestational surrogacy) (Richards et al., 2012). The different genetic and gestational connections that children born through reproductive donation have with their parents have formed the basis of much psychological research into parent and child wellbeing and parent-child relationships, showing that families formed through reproductive donation generally do not differ from their non-assisted counterparts in terms of parents' psychological wellbeing, children's psychological wellbeing, and the quality of parent-child relationships. Yet, it is still assumed that children conceived using reproductive donation, and in particular, surrogacy, will feel negatively about their origins as they grow older (Golombok, 2015).

The body of empirical evidence on donor-conceived offspring's perspectives is growing, but it is often limited to non-representative samples of adults conceived by sperm donation (Turner and Coyle, 2000; Hewitt, 2002; Cushing, 2010; Mahlstedt et al., 2010; Blyth, 2012; Harrigan et al., 2015). Studies of the views of donor-conceived children have tended to focus on children raised by single women (Zadeh et al., 2017a, 2017b) or lesbian couples (Vanfraussen et al., 2001, 2002, 2003; Tasker and Granville, 2011; Malmquist et al., 2014; Van Parys et al., 2016; Raes et al., 2015). The only study to have sought the perspectives of donor-conceived and surrogacy children raised in heterosexual two-parent families is the UK Longitudinal Study of Assisted Reproduction Families (Blake et al., 2010, 2014; Jadva et al., 2012). Blake et al. (2010, 2014) found that at age 7, children understand little, but by age 10, most demonstrate at least a rudimentary understanding of their donor conception, and express either neutral or positive feelings about it. Similarly, children born through surrogacy generally feel positive about being born in this way at ages 7 and 10, and those in contact with the surrogate feel positive about these relationships (Jadva et al., 2012). This article reports findings from the same longitudinal study when the children reached adolescence.

The transition from childhood to adolescence has been described as a crucial time for identity formation and the development of personal autonomy (Erikson, 1968; Steinberg and Morris, 2001; Smetana et al., 2006; Tsai et al., 2013). Given that this is also a time of increased understanding of biology and genetic relatedness (Richards, 2000; Williams and Smith, 2010), adolescence represents a unique developmental stage that may present particular challenges for those conceived through reproductive donation. A systematic review of the psychological adjustment of adolescents conceived through assisted reproduction found no differences between adolescents conceived through egg or sperm donation and those conceived naturally (Ilioi and Golombok, 2015). However, in most of the studies included in this review, fewer than 10% of children of heterosexual couples knew about their donor conception.

Recent research has shown that the rate of parental disclosure is increasing both amongst parents who have used donors who may be identified by offspring, and those who have used anonymous donors (Isaksson et al., 2012; Salevaara et al., 2013; Freeman et al., 2016). However, heterosexual couples generally tell their children about their donor conception at a later stage than do single women and lesbian

couples (Jadva et al., 2009). Such later and/or accidental disclosure has been shown to relate to negative feelings about donor conception (Turner and Coyle, 2000; Hewitt, 2002; Jadva et al., 2009; Blyth, 2012). The present longitudinal study found that families in which parents disclosed donor conception to their children before the age of 7 showed more positive mother-child relationships and higher levels of wellbeing at age 14, as rated independently by mothers and adolescents (Ilioi et al., 2017).

Adolescents' views of their donor conception have largely been obtained through research using questionnaire methods. These surveys have recruited adolescents via an online forum for those interested in making connections with the donor or those conceived using the same donor (Jadva et al., 2009; Beeson et al., 2011; Hertz et al., 2013), or have focused on adolescents whose donors are willing to be known (Scheib et al., 2005), or adolescents raised by two mothers (Bos and Gartrell, 2011) or single mothers (Slutsky et al., 2016). Scheib et al.'s (2005) survey included a sample of six adolescents with identifiable donors in heterosexual two-parent families, finding that these adolescents were mostly comfortable with their conception, but were less likely to expect their parents to be positive about their request for the donor's identity than adolescents raised by single women or lesbian couples. In Beeson et al.'s (2011) study of 759 donor-conceived offspring, 52.6% of whom were <18 years old, the 168 sperm donor-conceived offspring raised by heterosexual couples who answered the question about their current feelings about their conception reported feeling 'indifferent' (35.7%), 'different' (26.2%), 'special' (25.6%) or 'confused' (11.3%). However, the proportion of adolescent respondents was not reported.

This study is the first to have asked adolescents conceived through different types of reproductive donation (surrogacy, egg or sperm donation) directly for their views. It reports the thoughts and feelings of a systematic sample of adolescents who have been raised in heterosexual two-parent families that were initially recruited to the study when the adolescents were infants through fertility clinics, the UK Office for National Statistics, and Childlessness Overcome Through Surrogacy (COTS), the only UK surrogacy organization at the time. The study sought to ascertain whether or not children feel distressed about the circumstances of their conception or birth when they reach adolescence, and what they think and feel about the surrogate or donor involved.

Materials and Methods

Sample characteristics

The data analysed in this article are from the sixth phase of the UK Longitudinal Study of Assisted Reproduction Families that has examined the impact of reproductive donation on children's psychological wellbeing and parent-child relationships from infancy to adolescence (Golombok et al., 2017; Ilioi et al., 2017). Mothers were the primary point of contact and had been asked for permission to be contacted for follow-up at the previous phases of the study. The mothers were telephoned when their child reached 14 years of age (see, Golombok et al., 2004a, 2004b, for details of initial recruitment procedures).

Of the 56 adolescents who had been told about their conception by reproductive donation, 47 consented to take part, giving a response rate of 84%. Of those who took part, 44 adolescents were willing to discuss their conception (22 conceived through surrogacy (15 through traditional

surrogacy, 7 through gestational surrogacy), 13 through egg donation, and 9 through sperm donation). The remaining three adolescents, who responded to the initial question of 'Can you tell me more about how you were made?' with 'don't know', or otherwise diverted the interview to another topic, were asked no further questions, and their interviews were subsequently excluded from the analyses.

All participants came from different families, and all had been told about their conception in childhood. In total, 28 (64%) were females and 16 (36%) were males. All participants were born in the year 2000, before the removal of donor anonymity in the UK in 2005. Overall, 14 (64%) of the adolescents conceived through surrogacy had contact with their surrogate, and 2 (15%) of the adolescents conceived through egg donation had contact with their egg donor (see Table 1 for details about type of surrogate/donor and frequency of contact). None of the adolescents conceived by sperm donation knew their sperm donor.

Interview

All participants were administered a semi-structured interview on their own at home by a researcher trained in the study techniques. Participants were asked about their level of understanding, thoughts and feelings about their conception, their knowledge of, and feelings towards, their surrogate or donor, their questions for their surrogate or donor, their level of contact with their surrogate or donor, their discussions with their parents and other people about their conception and their surrogate or donor, and their thoughts and feelings about these discussions. Interviewers were trained to exercise caution in probing participants, to avoid distress. In the two cases in which it was deemed inappropriate to ask specific questions, data were recorded as missing. All interviews were audio-recorded and later transcribed without identifying information.

Written informed consent to participate was provided by all adolescents and their mothers. Participants were reminded that their responses would remain confidential, and that they could terminate the interview at any time, without giving a reason. Ethical approval was granted by the University of Cambridge Psychology Research Ethics Committee.

Analysis

Data were analysed using a qualitative content approach (Schreier, 2014) that involved reading each transcript closely, producing data-driven categories that captured the content of the transcripts, and subsequently coding all participants' responses according to these categories. After the initial analysis was complete, a second researcher trained in the approach reviewed and confirmed all categories and their content. The main categories are presented below, along with frequency counts, and illustrative quotations.

Results

How do adolescents feel about their conception?

Adolescents' feelings were found to correspond to three distinct categories: positive ($n = 7$), indifferent ($n = 32$) and ambivalent ($n = 5$) (Table 1).

Positive

Some adolescents expressed positive feelings about their conception, describing it as 'cool', 'interesting' and a 'special' fact about themselves:

'I was really confused [when first told] but then afterwards I felt quite special.' (Gestational surrogacy)

'I felt really special [when first told] because no one else was like that... I think I still feel like that. It's different but it doesn't really make me different.' (Gestational surrogacy)

Some of these adolescents also highlighted that their peers had responded positively:

'Sometimes my friends ask me about it, they're just like "oh, it's really cool how you were made"...It's a really cool process, and I'm always like, "oh, yeah, I was lucky I was made this way".' (Egg donation)

'It's cool, I think it's cool [laughs]. I quite like talking about it because it's an interesting fact about me... My friends thought it was cool as well [laughs].' (Traditional surrogacy)

Indifferent

The vast majority of adolescents expressed feeling indifferent about their conception. Adolescents in this category had been conceived through each of the reproductive techniques:

'I don't think I really minded [when first told] to be honest...I still don't really care. It doesn't make any difference.' (Sperm donation)

'[I] don't really mind. It doesn't really affect my daily life.' (Traditional surrogacy)

'I don't really mind. Yeah, I don't really mind.' (Egg donation)

'I didn't really care to be honest. I still don't really care.' (Gestational surrogacy)

Some adolescents who described feeling indifferent also stated that their conception did not change the nature of their relationship with their parents:

'Um, it didn't really bother me. Mum is still my mum. Dad is still my dad.' (Traditional surrogacy)

'I don't think it really affects anything. I consider that my dad is still my dad, so.' (Sperm donation)

Others explained that they were indifferent at the same time as being interested in the process, or that they were comfortable discussing it with others:

'Um, [I'm] not like bothered about it but I think it's quite interesting to know how I was made.' (Egg donation)

'I don't get like emotional or anything, it's just like talking about anything else.' (Egg donation)

However, others described sometimes finding such social encounters difficult:

'My friends ask questions that I don't know the answer to or I don't really want to know the answer to. Like "Where did your Mum get like the thing?", "How much money did it cost?", "How did you get like the sperm for it and stuff?". I don't really want to answer that.' (Egg donation)

Surrogacy was described as particularly difficult to explain to peers:

'When I was little, I used to get called fostered and it sort of got to me "I'm not fostered! You don't understand because you're dumb!"...Frustrating when they say like "Oh you're adopted, you're fostered..." (Traditional surrogacy)

Ambivalent

Some adolescents were ambivalent about their conception, and described a combination of different feelings:

Table I Feelings about conception, the surrogate/donor, type of surrogate/donor and frequency of contact by method of conception.

	Sperm donation	Egg donation	Traditional surrogacy	Gestational surrogacy	Total
Feelings about conception					
Positive	0	1	4	2	7
Indifferent	7	10	11	4	32
Ambivalent	2	2	0	1	5
Total	9	13	15	7	44
Feelings about surrogate or donor for adolescents not in contact					
Interested	5	6	4	1	16
Ambivalent	1	3	0	0	4
Not interested	3	0	3	0	6
Total	9	9*	7	1	26
Feelings about surrogate or donor for adolescents in contact					
Positive		2	7	5	14
Ambivalent		0	0	1	1
Negative		0	1	0	1
Total		0	8	6	16
Type of surrogate/donor					
Unknown	9	11	7	1	28
Previously unknown ^a	0	0	4	1	5
Previously known ^b	0	2	4	5	11
Total	9	13	15	7	44
Frequency of contact amongst those in contact with surrogate/donor					
Weekly or more		0	0	3	3
Weekly to monthly		1	1	0	2
A few times a year		0	5	2	7
Less than once a year		1	2	1	4
Total		2	8	6	16

*Missing data (n = 2).

^aRemained in contact after meeting for purposes of surrogacy.

^bFamily member/friend.

'It makes you feel like you weren't a mistake...but I sort of feel like I've got that part missing.' (Sperm donation)

'Sometimes I can go, 'Is it natural? Is it normal? Is it...a normal thing to happen?' but kind of assure myself that it is fine.' (Gestational surrogacy)

How do adolescents not in contact with the surrogate or donor feel about them?

Most adolescents (n = 28) had no contact with their surrogate or donor. These adolescents were found to be interested (n = 16), ambivalent (n = 4) or not interested (n = 6) in the surrogate or donor (Table I).

Interested

The majority of adolescents expressed a desire to either know who the surrogate or donor was, or to meet them. A list of these adolescents' responses to the question about what they would like to ask the surrogate or donor is provided in Table II. Within this group, there was much variation in the level of detail adolescents provided. Some

adolescents described wanting to identify similarities between themselves and the surrogate or donor:

'A lot of the time I think I have quite a lot of things in common with my mum, and then I think, "Oh, what about the things that I have in common with my donor?'" (Egg donation)

While most adolescents said that they infrequently thought about the donor, a minority stated that they thought about their donor frequently, and increasingly since entering adolescence:

'I would like to know who he is...quite a lot...Recently a lot more than I used to.' (Sperm donation)

'It's more important to me now...Um, and I'm just always thinking about what she looks like.' (Egg donation)

Others who wished to know the identity of, or to meet the surrogate or donor described them as a 'real' parent:

'[I think about] who my real mum is...I just really want to know like, who she is and meet her maybe.' (Traditional surrogacy)

Table II Questions adolescents who are interested in the surrogate or donor would like to ask them.

Question topic	Number of children who would like to ask about this	Examples
Reasons for surrogacy/donation	11	'What made you consider donating?' (SD) 'What made you like want to donate to like a complete stranger?' (ED) 'Why did you decide to be a surrogate mother?' (TS)
Interests	7	'Do you get involved in any like, sport activities?' (SD) 'Do you have any animals?' (ED)
Experience and feelings about surrogacy/donation	4	'What was it like? How did you get approached about it? And how do you feel about it all?' (ED) 'How did it feel? Are you happy you did it?' (TS)
Surrogate/donor's family	4	'If he has any children of his own' (SD) 'Are you married?' (ED)
Circumstances at time of surrogacy/donation	3	'Maybe how old was he when he donated' (SD) 'Did you know my mum at the time?' (GS)
Knowledge or thoughts about family formed through surrogacy/donation	3	'Have you ever given any thought to the people you donated eggs to?' (ED) 'Did you ever want to meet us?' (ED)
Children conceived using same surrogate/donor	3	'I'd ask her how many times she's done it, the surrogacy' (TS) 'Have you met any other people who are your children?' (SD)
Appearance	1	'I would love to know what she looks like' (ED)
Contact	1	'Would you like to get in contact... would you like to keep in contact?' (TS)
Background	1	'Where are you from?' (SD)
No questions	1	

SD = sperm donation; ED = egg donation; TS = traditional surrogacy; GD = gestational surrogacy.

'Yeah probably like [to know] who he is, and maybe meet him because he is my dad, but I'm not too bothered.' (Sperm donation)

Yet others expressed concern that their interest in the donor might impact upon their non-genetic parent:

'I would like to know who he is...quite a lot. And I told my mum that and I don't want to tell my dad that because I don't know how he would feel about that, so...' (Sperm donation)

'I think mum might be a bit upset but she'd understand about it but...I'd only do it when I was 50 or 60...I don't feel the need to now.' (Egg donation)

One adolescent stated that they would like to meet the surrogate to express their gratitude:

'Sometimes I think about it...wanting to meet my birth mum. [To] say thanks for being my birth mum [laughs]...It sounds really funny. Yeah, I don't know, just thanks.' (Gestational surrogacy)

Ambivalent

Four adolescents explained that they were either unsure, or expressed both wanting and not wanting to know more about, and/or to meet, the surrogate or donor:

'I've gone so long without knowing about her, it's just easier...I think I'd want to meet to see if I had anything in common.' (Egg donation)

'I heard it's when you're 18 or something you can try to find out who it was, so I would possibly consider doing that, but I don't know really.' (Egg donation)

Not interested

Those adolescents identified as 'not interested' ($n = 6$) in the surrogate or donor answered questions about whether they would like to know anything about, or to meet, the surrogate or donor with simply 'no', or 'not really, no'.

How do adolescents in contact with the surrogate or donor feel about them?

Those adolescents who had contact with their surrogate or egg donor ($n = 16$) were found to feel positive, ambivalent or negative about them (Table I). Most adolescents who had contact with the surrogate or egg donor explained that geographical distance or lack of time accounted for the (in)frequency of visits. Many adolescents also mentioned being in contact with the children and grandchildren of the surrogate or egg donor.

The large majority ($n = 14$) of adolescents described their relationship with the surrogate or egg donor positively. Many participants referred to them as a family friend, an aunt or a godparent, and reported having a close relationship:

'[Our relationship is] a good one. But I don't talk to her like she's my mum and she doesn't talk to me like I'm her daughter.' (Traditional surrogacy)

'She's like family to me but we don't see her that often because she lives quite far away.' (Traditional surrogacy)

Other adolescents emphasized that they didn't really know the surrogate or donor well enough to say much about them. One adolescent

was ambivalent about the surrogate, and in another case, the relationship between the surrogate and the adolescent and their family had broken down, with negative feelings reported as a result.

Discussion

This study sheds light on how adolescents make meaning of their conception during a developmental stage that is characterized by increased cognitive capabilities and marked identity development (Erikson, 1968; Steinberg and Morris, 2001). The majority of adolescents were indifferent about their conception, and were either interested in, or enjoyed positive relations with, the surrogate or donor. Not one of the adolescents was distressed about their conception or birth. These findings, obtained first-hand from a sample of donor-conceived and surrogacy children followed up from infancy to adolescence, suggest that the concern that children born through reproductive donation would be distressed about their origins in adolescence is unfounded, and that children who are informed when young of their conception through reproductive donation are accepting of this in adolescence.

Feelings of indifference towards their conception were found amongst adolescents conceived through each of the four types of reproductive donation under study: traditional surrogacy, gestational surrogacy, egg donation and sperm donation. Interestingly, adolescents' lack of concern about their method of conception is consistent with their high levels of psychological wellbeing and the quality of relationships with their mothers at this age (Golombok et al., 2017; Ilioi et al., 2017). The finding that none of the adolescents described feeling negatively about their origins is perhaps explained by the fact that almost all of them had been told about their conception before the age of 7 (Ilioi et al., 2017). It is also worth noting that some of the adolescents described feeling ambivalent about their conception, whereas others were particularly positive.

In describing their experiences, several adolescents referred to the actual or anticipated responses of others—namely, parents and peers—to their feelings. It is noteworthy that a minority of adolescents described feeling concerned that their interest in their conception might upset the parent to whom they have no genetic connection, a finding that echoes earlier research (Scheib et al., 2005; Jadva et al., 2009; Beeson et al., 2011). With regards to their peers, as in research on donor-conceived children raised by single women and lesbian couples (Vanfraussen et al., 2002; Raes et al., 2015; Van Parys et al., 2016; Zadeh et al., 2017a), a minority of adolescents also described issues arising from peers' lack of understanding of reproductive donation, and in particular, surrogacy.

In terms of adolescents' thoughts and feelings about the surrogate or donor, as in previous research on donor-conceived samples (Vanfraussen et al., 2003; Scheib et al., 2005; Jadva et al., 2009; Rodino et al., 2011; Slutsky et al., 2016; Persaud et al., 2017), many of the adolescents who were not in contact with the surrogate or donor expressed an interest in them. In a previous study of adolescents conceived by donor insemination to single women and lesbian couples, mother-child relationship quality was found to impact upon adolescents' curiosity about the donor, such that adolescents who were securely attached to their mothers were more interested in exploring their donor conception than were those who were insecurely attached (Slutsky et al., 2016). Given that the present sample was found to show high quality mother-child relationships (Golombok et al., 2017;

Ilioi et al., 2017), the adolescents' interest in the surrogate or donor is to be expected.

Adolescents who were interested in the surrogate or donor mostly wanted to know more about why they had donated or acted as a surrogate, and some had questions about the surrogate or donor's family, or children conceived using the same surrogate or donor. Previous studies of adolescents born through reproductive donation who use the internet to try to connect with donor relations have shown that adolescents desire to learn more about the donor and other children who share their genetic material in order to better understand themselves (Jadva et al., 2009; Persaud et al., 2017). The fact that similar results are found with the present sample of adolescents, recruited systematically to the study when they were aged 1, suggests that feelings of curiosity amongst donor-conceived adolescents are not simply an artefact of sampling donor-conceived offspring who are actively searching for their donor relations. Of equal significance is that some of the adolescents reported having no interest in knowing more about, or meeting, the surrogate or donor. The feelings of these adolescents have not been captured by such previous studies.

While most of the adolescents who had contact with their surrogate or donor continued to have positive relationships with them (Jadva et al., 2012), one adolescent reported that their relationship with the surrogate was now negative. Coupled with the fact that a minority of adolescents reported an increase over time in the extent to which they were thinking about their unknown surrogate or donor, this finding attests to the importance of studying the thoughts, feelings, and experiences of donor-conceived and surrogacy children over time. Relatedly, it is worth considering that the adolescents in this study were all conceived prior to legislative changes in the UK, which have ensured that since 2005 those who are donor-conceived will be able to identify the donor once they reach the age of 18, in effect inadvertently creating potentially distinct experiences amongst donor-conceived individuals conceived prior to, and after, these changes. However, the adolescents in this study may or may not engage in searching behaviour in the future. Initial insights from a longitudinal study of children with identifiable sperm donors suggest that fewer offspring raised by heterosexual couples request their donor's identity in early adulthood than do those raised by single women and lesbian couples (Scheib et al., 2017).

The findings of this study are based on a sample of adolescents who are all aware of their conception and have been raised in heterosexual two-parent families, and therefore tell us little about the experiences of adolescents in other family circumstances, or those who remain unaware of the circumstances of their conception or birth. Indeed, many parents in the overall sample of this longitudinal study have not told their children about the circumstances of their conception (Ilioi et al., 2017). Despite these limitations, the participants in this study are among the first donor-conceived and the first surrogacy adolescents to be interviewed about their thoughts and feelings on how they were conceived, as the rates of disclosure of donor conception have until recently been very low, and 84% of those who were approached agreed to participate.

Although there has been much concern about how children conceived using reproductive donation would feel about their origins as they grow older, the adolescents in this study mainly reported being unconcerned about their conception. The fact that none of the adolescents conceived through any of the types of reproductive donation

were found to feel distressed about their conception is of considerable importance given such longstanding concerns. The findings also indicate that it is important to differentiate between adolescents' feelings about their conception, and their feelings about the surrogate or donor. How these feelings may change as the adolescents enter adulthood remains to be seen.

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Authors' roles

All authors were involved in study design, data acquisition, analysis and interpretation. This article was drafted by S.Z. and has been approved by all authors.

Conflict of interest

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Cross-border and domestic surrogacy in the UK context: an exploration of practical and legal decision-making

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ABSTRACT

This study aimed to explore UK intending parent's reasons for cross-border and domestic surrogacy, their preparations for the birth and the practical and legal challenges faced after the birth. An online survey was completed by 203 participants, of which 132 had a child born through surrogacy, 33 were in the process of surrogacy and 38 were planning a surrogacy arrangement. The most common reason for pursuing surrogacy in the UK was wanting a relationship with the surrogate (43%; $n = 17$) and for conducting surrogacy in the USA was because of a better legal framework (97%; $n = 60$). Parents returning to the UK from countries other than USA experienced greater delay and difficulties in obtaining the necessary documents for their return. This study highlights the disparities in parents' experiences of undergoing surrogacy in different countries, the frustrations some face in obtaining legal parenthood and the feelings of stress and anxiety this may cause. Whilst this is the first study comparing the experiences of people from the UK having surrogacy in different countries, the representativeness of the sample is unknown. The findings are important in identifying future directions for research, including assessing the impact of these early decisions and experiences for later parental wellbeing and children's welfare.

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Introduction

In recent years, the UK has seen a rise in the number of intending parents travelling abroad for surrogacy, in particular to the USA, India and Eastern Europe (Crawshaw, Blyth, & van den Akker, 2012; Gamble, 2016). This growth reflects the global increase in cases of cross-border surrogacy, with many intending parents now travelling abroad due to surrogacy not being permitted in their country of residence (Söderström-Anttila et al., 2016). Other reasons include limited numbers of donors or surrogates in some countries, and/or access to better standards of care in others (Palattiyil, Blyth, Sidhva, & Balakrishnan, 2010). In addition, intending parents may also not meet the legal prerequisites for surrogacy treatment in their home country: for example, because of age or marital status (Ferraretti, Pennings, Gianaroli, Natali, & Magli, 2010).

There are no available, accurate statistics on the number of surrogacy births to UK parents. One way to monitor the number of surrogacy arrangements is through the number of Parental Order applications

made. The Parental Order transfers legal rights from the surrogate to the parents and, once granted, a new birth certificate is issued with the intending parents named as the child's parents. Parental Orders can currently only be granted to couples, one of whom must be the genetic parent of the child, and one of whom must be domiciled in the UK, and the consent of the surrogate and her spouse (where applicable) is required. The UK government is currently amending the law to enable single biological parents to apply for parental orders, following the ruling of the High Court in *Re Z* (No. 2) [2016] EWHC 1191 (Fam) in which the current law was declared to be incompatible with the Human Rights Act. A remedial order amending section 54 of the Human Fertilisation and Embryology Act 2008 was sent to Parliament for a second statutory period of consideration in July 2018, and the changes to the law allowing applications from single parents are expected to come into force in early 2019.

Concerns have been raised about how accurately the number of Parental Order applications reflect the overall number of surrogacy arrangements, as parents

may not always apply for a Parental Order, particularly when overseas surrogacy is involved (Crawshaw et al., 2012; Gamble, 2012, 2016; Prosser & Gamble, 2016). Reasons for not applying remain unclear, although it is possible that amongst those parents whose names are entered onto their child's birth certificate overseas, there is a lack of awareness, or a choice to ignore, the UK legal process upon return (Gamble, 2012). The Family Court deals with legal complications which subsequently arise (for example, between separating parents), leading one High Court judge to highlight her concern about the 'ticking legal time bomb' created by parents going overseas for surrogacy and not applying for a Parental Order (The Guardian, 2015). There are no statistics recording legal complications which arise in these circumstances, but a number of cases have considered difficulties arising on separation, including *JP v LP* [2014] EWHC 595 (Fam), *Re X* (2015) 1 FLR 349, *Re C and D* (2015) EWHC 1059, *Re A* (2016) 2 FLR 446, *Y v Z & Ors* (2017) EWFC 60 and *AB v CD* (2018) EWHC 1590 (and in at least three of these cases, parental orders could not be made).

A report published in 2015 by a UK surrogacy organisation concluded that although the numbers of international surrogacy arrangements are rising, most surrogacy arrangements involving UK citizens take place in the UK (Surrogacy UK, 2015). The most recent statistics available from the website of the Children and Family Court Advisory and Support Service (CAFCASS) (the body that records the number of Parental Order applications) in fact shows that of the applications made in 2016, 179 (51%) involved UK surrogacy arrangements, and 161 (46%) involved international surrogacy arrangements (including 78 from the USA and 63 from India), with the place of birth not recorded in nine cases. In 2015, the number of overseas surrogacy cases slightly exceeded domestic ones, with the child born overseas in 162 cases (51%) and the child born in the UK in 136 cases (43%). Therefore, the parents currently applying for Parental Orders (2015–2016) appear to be divided roughly equally between UK and international surrogacy arrangements (with international surrogacy therefore having grown significantly since 2008 when the first such application was made). The fact that these statistics do not include parents who do not apply for a Parental Order following overseas surrogacy suggests that more UK parents must now be going overseas for surrogacy than staying in the UK, although the extent of the difference is unknown since it is impossible to measure the numbers of parents who go overseas and do not apply for a Parental Order. Most applications in

2016 were made by heterosexual couples (234) with 82 made by same sex couples.

The USA has seen a rapid growth in the number of intending parents from overseas travelling to the USA for gestational surrogacy (Perkins, Boulet, Jamieson, & Kissin, 2016). Intending parents from the UK may be attracted to the USA by the availability of surrogates and donors and of professional services, and may perceive themselves to have greater legal security in this context (Gamble, 2016). The report by Surrogacy UK found that amongst the 19 respondents who had used a surrogate abroad, the main reasons for going overseas were 'certainty', 'availability of surrogates', 'ease of setting up arrangement' and 'ethical reasons' (Surrogacy UK, 2015). However, the number of respondents who had used overseas surrogacy was small, possibly because the study's recruitment strategy, predominantly through UK surrogacy organisations and websites, may not have reached those using overseas arrangements.

The country in which surrogacy arrangements take place, and the related regulation and support available to intending parents, may have an impact on intending parents' experiences. The few studies that have examined intending parents' experiences of surrogacy in India have highlighted the difficulties in obtaining valid birth certificates, and in negotiating Indian and domestic laws about legal parentage (Deomampo, 2015). The ambiguous legislation in India, coupled with limited information and a lack of direct contact with the surrogate, has been found to lead to additional anxiety and stress for parents (Ruiz-Robledillo & Moya-Albiol, 2016) and may also place them at risk of fraud and financial exploitation (Fronek, 2018).

Studies of patients travelling overseas for fertility treatment more generally, including for IVF and gamete donation, have found that reasons for travelling overseas can include greater availability of donors, better success rates, shorter waiting times and cheaper costs (Blyth, 2010; Culley et al., 2011; Ferraretti et al., 2010; Pennings et al., 2008). The internet has also been found to be a major source of information for patients travelling overseas (Blyth, 2010; Hudson et al., 2011; Jackson, Millbank, Karpin, & Stuhmcke, 2017), although this can vary for patients from different countries (Hudson et al., 2011).

Jackson et al. (2017) emphasised the importance of learning from the experiences of those travelling overseas for egg donation and surrogacy for policy makers and regulators. Preliminary findings from their qualitative study on the motivations and experiences of reproductive travellers in Australia found that the legal distinction between compensated and altruistic

surrogacy is often problematic in the context of overseas surrogacy. For example, Australians seeking surrogacy were travelling to Canada to access paid brokering services even though Canada is seen by policy makers to practice altruistic surrogacy (as surrogates cannot be paid more than their expenses) (Jackson et al., 2017).

Despite the increase in the number of people accessing cross-border surrogacy, few studies have examined the experiences of parents using international surrogacy arrangements, and none has directly compared the experiences of those using surrogacy in the UK to those who travel abroad. The present study aimed to examine intending parents and parents' motivations for going abroad or remaining in the UK, and the legal and practical challenges faced as a result. Participants were recruited through NGA Law, an English family law firm which specialises in surrogacy, and Brilliant Beginnings, a non-profit UK surrogacy agency, established by the owners of NGA Law in 2013 as its sister organisation. Overall, since 2009, approximately one-third of the clients seeking advice from NGA Law about surrogacy had sought advice in relation to UK surrogacy arrangements and two-thirds about international surrogacy arrangements. Brilliant Beginnings only advises parents who are domiciled in the UK and, of the UK's three surrogacy organisations, is the only one which advises and assists intending parents with both UK and overseas surrogacy options. Thus, recruiting through these organisations provided access to people who were conducting or had completed surrogacy in the UK as well as overseas. The current paper reports data from a larger survey examining the experiences of surrogacy for people who were either thinking about pursuing surrogacy, had started a surrogacy arrangement or who had completed a surrogacy arrangement in the UK or abroad.

Materials and methods

Recruitment

Invitation emails to participate in the study were sent to a total of 1212 individual email addresses representing 776 family units. The survey was available for two months from February to March 2017, during which time two further reminder emails were sent. Ethical approval for the study was granted by University of Cambridge Psychology Research Ethics Committee (reference number: PRE.2016.050).

Measures

The front page of the survey contained information about the study and consent procedures. To avoid data from the same surrogacy arrangement being reported twice, participants were asked to complete only one survey per couple and could choose to either complete the survey by themselves or as a couple.

The survey consisted of both open-ended and multiple-choice questions about the entire surrogacy process from initial motivations for using surrogacy, reasons for choosing the country in which to undertake surrogacy, experiences of surrogacy in that country, details about the surrogate, experiences after childbirth, and current experiences. Participants only saw relevant sections and questions for their particular stage of surrogacy. The present paper focuses on participants' decisions on where to undertake surrogacy, and for those who had a child born following surrogacy, their preparations for the birth and experiences of returning to the UK. For those with a child following surrogacy, the data relates to the participants' first successful surrogacy arrangement (i.e. their eldest child(ren) born following surrogacy) in order to reflect their experiences of their initial surrogacy arrangement. Questions were informed by previous studies on surrogacy (e.g. Jadva, Blake, Casey, & Golombok, 2012) and through engagement with staff at NGA Law and Brilliant Beginnings. The questionnaire was piloted by potential participants to ensure that questions were meaningful and contained no ambiguities, and to also check survey length and functionality. Following piloting, the survey was amended, mainly by rephrasing some questions and shortening the survey. Data were obtained on the following three sections:

(i) Choosing where to conduct surrogacy

Questions included: Where was your surrogacy arrangement carried out? (Drop-down list of countries); Did you consider surrogacy in any country other than the country you finally chose? (Yes/No) If yes, which countries did you consider? (Open-ended); Did you consider surrogacy in any country other than the country you finally chose (Yes/No) If yes, which countries did you consider? (Open-ended); Why did you decide against having treatment in these countries? (Open-ended); Why did you decide to have surrogacy in the country that you chose? (Multiple choice response which included options such as 'Better legal framework, Better success rates at clinic, Cheaper cost'); Did you explore surrogacy in the United Kingdom? (Yes/No); Why did you decide not to pursue surrogacy in the UK (Multiple choice responses which

Table 1. Participant characteristics.

	Stage of surrogacy		
	Completed	In progress	Considering
	Median (IQR)	Median (IQR)	Median (IQR)
Age	44 (9)	38 (8.5)	42 (9.25)
	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)
Sex			
Male	68 (52)	14 (42)	19 (50)
Female	64 (48)	19 (68)	19 (50)
Transgender			
No	130 (99)	33 (100)	0 (0)
Yes	2 (1)	0 (0)	37 (97)
Missing	0 (0)	0 (0)	1 (3)
Sexual orientation			
Heterosexual	85 (64)	24 (73)	24 (63)
Gay	46 (35)	9 (27)	13 (34)
Bisexual	1 (1)	0 (0)	0 (0)
Missing	1 (1)	0 (0)	1 (3)
Currently residing			
England	90 (68)	29 (88)	33 (87)
Scotland	2 (2)	0 (0)	2 (5)
Wales	1 (1)	0 (0)	0 (0)
Other	39 (29)	4 (12)	3 (8)
Nationality			
British	111 (84)	27 (82)	30 (79)
Australian	5 (4)	2 (6)	0 (0)
Irish	4 (3)	1 (3)	2 (5)
Canadian	2 (2)	1 (3)	0 (0)
German	2 (2)	1 (3)	0 (0)
Portuguese	0 (0)	0 (0)	2 (5)
Other <1 in each country	7 (5)	1 (3)	4 (11)
Ethnicity			
White	117 (88)	31 (94)	31 (82)
Black	1 (1)	0 (0)	1 (3)
Asian	9 (7)	2 (6)	4 (11)
Mixed	3 (2)	0 (0)	2 (5)
Other	2 (2)	0 (0)	0 (0)
Current relationship status			
Married	89 (67)	26 (79)	29 (76)
Civil partnership	23 (17)	0 (0)	3 (8)
Cohabiting	10 (8)	0 (0)	2 (5)
Single	7 (5)	3 (9)	0 (0)
Non-cohabiting partner	1 (1)	1 (3)	1 (3)
Separated	1 (1)	0 (0)	2 (5)
Other (engaged)	1 (1)	0 (0)	0 (0)
Relationship status during surrogacy			
Married	83 (63)	– (–)	– (–)
Civil partnership	25 (19)	– (–)	– (–)
Cohabiting	15 (11)	– (–)	– (–)
Single	7 (5)	– (–)	– (–)
Non-cohabiting partner	2 (2)	– (–)	– (–)
Highest educational attainment			
Less than high school	0 (0)	0 (0)	1 (3)
High school	9 (7)	2 (6)	1 (3)
College	4 (3)	2 (6)	7 (18)
Trade qualification	3 (2)	1 (3)	0 (0)
University degree	59 (45)	13 (39)	13 (34)
Higher university degree	57 (43)	15 (45)	16 (42)
Total household income			
Less than £10,000	1 (1)	0 (0)	2 (5)
£10,000–£49,999	11 (9)	2 (6)	5 (13)
£50,000–£99,999	19 (14)	11 (33)	5 (13)
£100,000–£199,999	48 (37)	8 (24)	21 (56)
£200,000–£299,999	19 (15)	3 (9)	2 (6)
£300,000 or more	28 (22)	9 (27)	1 (3)
Missing	6 (5)	0 (0)	2 (5)

*(continued)***Table 1.** Continued.

	Stage of surrogacy		
	Completed	In progress	Considering
No. of children born through surrogacy			
0	– (–)	33 (100)	38 (100)
1	81 (61)	– (–)	– (–)
2	43 (33)	– (–)	– (–)
3	7 (5)	– (–)	– (–)
4	1 (1)	– (–)	– (–)
Survey completed			
Alone	84 (64)	23 (70)	18 (47)
With partner	48 (36)	10 (30)	20 (53)

included options such as 'lack of legal framework', 'shortage of surrogates', 'lack of professional services'; and Please tell us about your experiences of surrogacy in the UK (Open-ended).

(ii) Preparations for surrogacy

Questions included: Did you do any of the below before pursuing surrogacy in the country you finally chose? (Multiple choice option which included responses such as 'Sought legal advice', 'Contacted a clinic in the UK for more information'); How did you prepare for the birth? (Multiple choice options which included responses such as 'bought baby clothes', 'sought legal advice', 'sought counselling'); Did you plan to be at the birth? (Yes/No); and Were you at the birth? (Yes/No).

(iii) Experiences after the birth

Questions included: What documents did you obtain to bring your child home? ('UK passport', 'US/Canadian passport', 'Other EU passport', 'Other, please specify'); How long did you stay abroad with your baby before you returned to the UK? ('Less than 1 month', '1–2 months', '3–5 months', '6 months to less than 1 year', 'more than 1 year'); Did you experience any particular challenges in bringing your baby to the UK? (Yes/No), If yes, please tell us about the challenges you experienced in bringing your child home (Open-ended); Did you apply for a parental order? (Yes/No/Currently in process/Planning to in future/Do not plan to apply); Please tell us why you did not/or do not plan to apply for a parental order (Open-ended); Did you face any difficulties with obtaining a parental order? (Yes/No), If yes, please explain these below (Open-ended); Approximately, how much did you spend on surrogacy overall? (Open-ended); Approximately, how much did the surrogate receive for expenses or compensation? (Open-ended); How did you arrive at the figure that was paid to the surrogate? (Open-ended); What were the advantages of carrying out surrogacy in the way that you did? (Open-ended); What were the

Table 2. Country where surrogacy was carried out.

Country	Stage of surrogacy		
	completed N (%)	In progress N (%)	Considering* N (%)
UK	39 (30)	13 (39)	24 (63)
USA	62 (47)	16 (48)	18 (47)
India	15 (12)	0 (0)	2 (5)
Thailand	7 (5)	0 (0)	2 (5)
Ukraine	3 (4)	0 (0)	2 (5)
Georgia	3 (4)	3 (9)	5 (13)
Mexico	2 (2)	0 (0)	1 (3)
Russia	0 (0)	0 (0)	1 (3)
Nepal	0 (0)	0 (0)	1 (3)
Greece	0 (0)	0 (0)	2 (5)
Canada	0 (0)	1 (3)	4 (11)
Cyprus	1 (1)	0 (0)	2 (5)
Czech Republic	0 (0)	0 (0)	1 (3)
South Africa	0 (0)	0 (0)	1 (3)
Laos	0 (0)	0 (0)	1 (3)
Bhutan	0 (0)	0 (0)	1 (3)

*Countries being considered.

disadvantages in carrying out surrogacy in the way that you did? (Open-ended).

Data analysis

Responses to the multiple-choice questions are reported as percentages and number of cases. Qualitative responses to open-ended questions were systematically coded into categories using the qualitative data analysis software Atlas.ti and the most common responses are reported as frequencies. Qualitative responses are also used to illustrate and explain the quantitative data. The findings are presented in three sections: (i) choosing where to conduct surrogacy, (ii) preparation for surrogacy and (iii) experiences after birth. The first section reports data from all three groups of participants (i.e. those considering surrogacy, those who were in the process of surrogacy, and those who had completed their surrogacy arrangement). The second section reports data from the latter two groups and the third section includes data from parents who had completed their surrogacy arrangement.

Results

A total of 203 surveys were completed, resulting in a response rate of 26% of the number of family units invited. Demographic information for participants is shown in Table 1. Most participants (65%; $n = 132$) had at least one child born through surrogacy, 16% ($n = 33$) were in the process of a surrogacy arrangement (i.e. their surrogate was trying to conceive or was pregnant), and 19% ($n = 38$) were thinking about or planning a surrogacy arrangement. For those

Table 3. Other countries considered for surrogacy according to final country chosen.

Countries considered	Country surrogacy conducted					
	UK ($n = 27$) N (%)	USA ($n = 20$) N (%)	India ($n = 9$) N (%)	Thailand ($n = 6$) N (%)	Other ($n = 7$) N (%)	Total ($n = 69$) N (%)
UK	– (–)	6 (30)	0 (0)	0 (0)	0 (0)	6 (7)
USA	19 (70)	– (–)	4 (44)	4 (67)	3 (43)	30 (43)
India	13 (48)	7 (35)	– (–)	4 (67)	4 (57)	28 (41)
Ukraine	2 (7)	0 (0)	4 (44)	0 (0)	1 (14)	7 (10)
Thailand	1 (4)	2 (10)	0 (0)	0 (0)	0 (0)	3 (4)
Poland	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Georgia	1 (4)	0 (0)	1 (11)	0 (0)	1 (14)	3 (4)
Mexico	1 (4)	1 (5)	0 (0)	0 (0)	0 (0)	2 (3)
Russia	1 (4)	1 (5)	1 (11)	0 (0)	0 (0)	3 (4)
Guatemala	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Nepal	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	1 (1)
Greece	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	1 (1)
Spain	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	1 (1)
Israel	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	1 (1)
Canada	0 (0)	1 (5)	0 (0)	0 (0)	0 (0)	1 (1)
Cyprus	0 (0)	0 (0)	1 (11)	0 (0)	1 (14)	2 (3)

intended parents who had completed a surrogacy arrangement, the majority (63%; $n = 83$) were in a heterosexual couple relationship at the time of the surrogacy arrangement and 32% ($n = 42$) were in a gay couple relationship. Of the seven (5%) participants who were single, four were male, all of whom identified as gay, and three were female, of whom two identified as heterosexual and one as bisexual. The age of the eldest child born using surrogacy ranged from 0 to 11 years (Mean = 2.84; Median = 2). Seventy-three per cent of the children were aged 0–3 years with 41% aged under two years.

Choosing where to conduct surrogacy

Table 2 shows where intending parents had completed or were currently undergoing their surrogacy arrangement. The UK and USA were the most commonly selected countries for all three groups of respondents.

Fifty-two per cent ($n = 69$) of those who had completed their surrogacy arrangement and 48% ($n = 16$) of those in the process of surrogacy had considered surrogacy in a different country to that which they finally chose. Table 3 shows which other countries were considered by parents who had completed their surrogacy journey, according to their final country. The most common countries to be additionally considered were the USA and India. Open-ended responses revealed that the main reason for not going ahead with surrogacy in the USA was financial ($n = 21$). Other reasons included wanting more involvement with the pregnancy and/or the surrogate ($n = 5$) and concern about geographical distance from the surrogate ($n = 4$). Six respondents reported that they had found

Table 4. Reasons for final country and preparations for surrogacy.

	Country					
	UK N (%)	USA N (%)	India N (%)	Thailand N (%)	Other N (%)	Total N (%)
Why did you decide to have surrogacy in the country that you chose?						
Better legal framework	16 (31)	76 (97)	7 (47)	1 (14)	8 (62)	108 (65)
Easier to find surrogate	8 (15)	51 (65)	11 (73)	4 (57)	11 (85)	85 (52)
Better success rates at clinic	3 (6)	48 (62)	5 (33)	1 (14)	3 (23)	60 (36)
Wanted agency to manage surrogacy process	3 (6)	50 (64)	5 (33)	3 (43)	6 (46)	67 (41)
Wanted a relationship with the surrogate	22 (42)	32 (41)	0 (0)	1 (14)	1 (8)	56 (34)
Cheaper cost	15 (29)	1 (1)	8 (53)	5 (71)	11 (85)	40 (24)
Did not want relationship with the surrogate	0 (0)	2 (3)	3 (20)	1 (14)	2 (15)	8 (5)
Other	21 (40)	16 (21)	6 (40)	5 (71)	4 (31)	52 (32)
Did you do any of the below before pursuing surrogacy in the country you finally chose?						
Sought legal advice	– (–)	61 (78)	11 (73)	6 (86)	8 (62)	86 (52)
Contacted a clinic in the UK for more information	– (–)	19 (24)	4 (27)	0 (0)	3 (23)	26 (16)
Obtained information from surrogacy support group in UK	– (–)	18 (23)	6 (40)	1 (14)	4 (31)	29 (18)
Obtained information from website	– (–)	17 (22)	7 (47)	1 (14)	4 (31)	29 (18)
Obtained information from HFEA	– (–)	7 (9)	6 (40)	0 (0)	1 (8)	14 (8)
Talked to others who had been to same country	– (–)	36 (46)	11 (73)	2 (29)	3 (23)	52 (32)
How did you prepare for the birth?						
I did not prepare	2 (4)	0 (0)	1 (7)	1 (14)	0 (0)	4 (2)
Bought baby clothes/food	40 (77)	55 (71)	14 (93)	6 (86)	9 (69)	124 (75)
Bought baby equipment	40 (77)	54 (69)	13 (87)	6 (86)	9 (69)	122 (74)
Decorated nursery	32 (62)	41 (53)	1 (7)	3 (43)	4 (31)	81 (49)
Talked to other parents	35 (67)	40 (51)	7 (47)	3 (43)	6 (46)	91 (55)
Sought legal advice	30 (58)	60 (77)	9 (60)	4 (57)	6 (46)	109 (66)
Sought counselling	19 (37)	8 (10)	0 (0)	0 (0)	1 (8)	28 (17)
Attended prenatal classes	16 (31)	18 (23)	3 (20)	0 (0)	1 (8)	38 (23)
Arranged a nanny	4 (8)	23 (29)	3 (20)	3 (43)	2 (15)	35 (21)
Arranged a doula	1 (2)	6 (8)	0 (0)	0 (0)	0 (0)	7 (4)
Did you plan to be at the birth?						
Yes	43 (83)	64 (82)	10 (67)	6 (86)	9 (69)	132 (80)
No	1 (2)	4 (5)	5 (33)	1 (14)	1 (8)	12 (7)
Were you at the birth?*						
Yes	36 (92)	41 (66)	5 (33)	3 (43)	4 (44)	89 (67)
No	3 (8)	21 (34)	10 (67)	4 (57)	5 (56)	43 (33)

*Percentages are of those who planned to be at the birth.

a surrogate in the UK. The reasons for not pursuing surrogacy in India were because the intending parent(s) did not meet the criteria for accessing surrogacy ($n=9$), perceived the arrangement to be characterised by legal uncertainty ($n=9$) and had ethical concerns ($n=7$). Four respondents reported that they went on to find a surrogate in the UK, and three said that they wanted a relationship with the surrogate.

Participants who had completed their surrogacy arrangement were asked to select their reasons for choosing their final country from a list of possible reasons (Table 4). In terms of the other reasons given, the most common, given by nine (17%) parents who undertook surrogacy in the UK, was having found a surrogate (family member or friend) in the UK. The other most common reason for having surrogacy in the USA, mentioned by seven (9%) parents, was its perception as more advanced or ethical. The most frequently mentioned other reason for parents who had been to India, stated by three (20%) respondents, was being of Indian heritage.

Of the 92 parents who had completed their surrogacy arrangement abroad, approximately half

(49%; $n=45$) had explored surrogacy in the UK. Their reasons for not pursuing UK surrogacy obtained from a list of possible reasons found the most common was 'lack of a legal framework' (67%; $n=30$). Forty-four per cent ($n=20$) selected 'shortage of surrogates', 36% ($n=16$) 'lack of professional services', and 33% ($n=15$) 'informal matching methods'. Twenty-two participants gave other reasons, of which the most common reason was not living in the UK ($n=5$), followed by being single ($n=3$). Open-ended responses illustrated their experiences, for example 'Without the legal framework, we felt it was an absolute no-go. Something as important as the right to raise your own child should not be subject to even the tiniest risk'.

Another example included: 'Very difficult to find matches. Lack of agencies so worries about vetting surrogates. We were older couple, impression that surrogates only interested in younger couples'. Another participant wrote 'After a brief investigation it became clear there was no support network or expertise in the UK and seeking a surrogate here would have been a case of "pot luck"'.

Table 5. Returning to UK by country.

	USA N (%)	India N (%)	Thailand N (%)	Other N (%)	Total N (%)
Documents obtained for return travel*					
UK passport	11 (18)	14 (93)	4 (57)	5 (56)	34 (37)
US passport	51 (84)	0 (0)	0 (0)	0 (0)	51 (55)
Other EU passport	0 (0)	0 (0)	1 (14)	0 (0)	1 (1)
Other	4 (7)	3 (20)	2 (29)	3 (33)	12 (13)
Length of stay abroad					
Less than 1 month	24 (39)	1 (7)	0 (0)	0 (0)	25 (27)
1–2 months	23 (37)	2 (13)	2 (29)	4 (44)	31 (34)
3–5 months	7 (11)	7 (47)	2 (29)	6 (67)	22 (24)
6 months to less than a year	1 (2)	2 (13)	2 (29)	2 (22)	7 (8)
More than 1 year	3 (5)	2 (13)	1 (14)	1 (11)	7 (8)
Missing	4 (7)	1 (7)	0 (0)	1 (11)	6 (7)
Challenges faced in bringing baby to UK					
Yes	23 (37)	11 (73)	5 (71)	5 (56)	44 (48)
No	37 (60)	3 (20)	2 (29)	3 (33)	45 (49)
Missing	2 (3)	1 (7)	0 (0)	1 (11)	4 (4)
Overall experience of surrogacy in chosen country					
Very positive	53 (87)	6 (40)	1 (14)	4 (44)	64 (67)
Positive	8 (13)	7 (47)	2 (29)	5 (56)	22 (24)
Neither negative nor positive	0 (0)	1 (7)	1 (14)	0 (0)	2 (2)
Negative	0 (0)	1 (7)	2 (29)	0 (0)	3 (3)
Very Negative	0 (0)	0 (0)	1 (14)	0 (0)	1 (1)
Missing	1 (2)	0 (0)	0 (0)	0 (0)	1 (1)

*Respondents could select more than one response.

Preparations for surrogacy

Table 4 shows how participants had prepared for surrogacy and for the birth of the child. Only one-third of parents whose surrogacy arrangements were carried out in India were at the birth, even though approximately two-thirds had planned to be there (Table 4). The open-ended responses indicated that this was usually because the child(ren) had arrived early, and parents were unable to amend their travel plans in time for the birth.

Experiences after birth

Intending parents obtained different documents according to which country they were returning from (Table 5). One-third (33%; $n = 44$) of parents reported having faced challenges in bringing their baby back to the UK with those returning from India most likely to report facing challenges. Open-ended responses highlighted that for parents returning from India, the main difficulty was the length of time it took to obtain the child's passport. Parents expressed feelings of disappointment with both UK and Indian agencies. For example:

Our daughter was granted British citizenship within 8 days, but it took 6 months to get a passport. The passport office did not communicate with us and gave us false information. It was a very very difficult process and in the end we got home with the help of a legal team. (Heterosexual couple returning from India)

Table 6. Parental order and cost of surrogacy.

	Country					
	UK N (%)	USA N (%)	India N (%)	Thailand N (%)	Other N (%)	Total N (%)
Did you apply for a parental order?						
Yes	34 (87)	45 (73)	11 (73)	6 (86)	7 (78)	103 (78)
No	0 (0)	7 (11)	2 (13)	0 (0)	1 (11)	10 (8)
Currently in process	4 (10)	6 (10)	1 (7)	0 (0)	1 (11)	12 (9)
Planning to in future	1 (3)	4 (6)	1 (7)	1 (14)	0 (0)	8 (6)
Did you face any difficulties in obtaining a parental order?						
Yes	6 (15)	10 (16)	1 (7)	1 (14)	4 (44)	22 (17)
No	32 (82)	40 (65)	11 (73)	5 (71)	4 (44)	92 (70)
Missing	1 (3)	12 (20)	3 (20)	1 (14)	1 (11)	18 (14)
How did you arrive at the figure that was paid to the surrogate?						
Set by agency/clinic	6 (15)	54 (87)	8 (53)	4 (57)	6 (66)	78 (59)
Expenses only	11 (28)	1 (2)	0 (0)	0 (0)	0 (0)	12 (9)
Took advice from agency/lawyers or internet	11 (28)	0 (0)	0 (0)	0 (0)	1 (11)	12 (9)
Amount fixed prior to surrogacy	4 (10)	0 (0)	0 (0)	0 (0)	1 (11)	5 (4)
Other	5 (13)	0 (0)	0 (0)	0 (0)	0 (0)	5 (4)
Missing/don't know	3 (8)	7 (11)	7 (47)	3 (43)	1 (11)	21 (16)

Similar problems were faced by those returning from Thailand, Mexico and Georgia.

Even amongst those returning from the USA, some reported feelings of anxiety about passing through UK immigration, and of experiencing delays once there. For example:

This whole thing is really not for the amateur. You need to be very switched on and have very good advice. Even though I knew we had done everything right, I was still terrified at Heathrow. (Heterosexual couple returning from USA)

As shown in Table 6, all parents who had used surrogacy in the UK had either applied for a Parental Order or were planning to apply for one in the future. The most frequently mentioned reason for not applying was because parents were not currently living in the UK ($n = 4$). Two respondents stated that a Parental Order was not needed, the first respondent explaining that they already are the legal parent of their child, and the second, reporting that their children had passports of other nationalities. Some respondents were unaware of the need to apply for a Parental Order until later on in the process, with one parent stating that they only understood this to be necessary upon reading a news article 6 months after the baby was born. This respondent had decided against applying because it seemed 'too late, too risky and certainly too costly'.

The majority (70%; $n = 92$) of parents did not face any difficulties in acquiring a Parental Order. For those who did experience difficulties, the open-ended responses revealed that parents who had surrogacy in the UK, had faced problems such as the surrogate

separating from her husband, which made it hard to obtain his signature for the necessary paperwork. One surrogate withdrew her consent, which led to the parents having to apply to adopt their child. Another respondent had difficulties due to undeclared expenses. Amongst those who had undergone surrogacy in the USA, difficulties experienced included exceeding the 6-month limit for applying for a Parental Order ($n=3$), obtaining court dates ($n=2$), being resident outside of England ($n=2$), and the extra cost involved ($n=2$).

Parents who had undergone surrogacy in the USA had spent more money on surrogacy (Median = £120,000; IQR = £60,000) compared to those having surrogacy in Thailand (Median = £55,000; IQR, £28,750) and India (Median = £50,000; IQR = 45,000) with those who had surrogacy in the UK spending the least amount of money (Median = £25,000; IQR = £22,000). The amount surrogates received varied by country with surrogates in the USA receiving the most (Median = £25,500; IQR = £15,000), followed by Thailand (Median = £14,000; IQR = £23,500), the UK (Median = £13,000; IQR = 6,500) and India (Median = £5,500; IQR = 3,500).

Over 40% of those who underwent surrogacy in India or Thailand either did not say how much the surrogate received, or reported that they did not know, explaining in their open-ended responses that this was managed by the agency or clinic.

In terms of how the amount of money received by the surrogate was decided upon, the open-ended responses were categorised into the most frequent responses. For overseas surrogacy, most agencies or clinics had a set fee for the amount of money the surrogate should receive, whereas for surrogacy arrangements in the UK, the amount received by surrogates was fixed in different ways as shown in [Table 6](#).

In terms of the advantages and disadvantages of carrying out surrogacy in the way that they did. For those who had used surrogacy in the UK, the advantages included having a long-term relationship with the surrogate ($n=16$) and logistical simplicity because they stayed close to home ($n=7$) and were close to the surrogate which enabled them to attend scans and appointments ($n=8$). Other reasons for staying in the UK were that it was perceived to be legally easier ($n=9$) (although less certain than in the USA), and it was affordable ($n=8$), and a friend or family member was able to act as the surrogate ($n=5$). Disadvantages included anxieties over the surrogate wanting to keep the child after the birth, a concern compounded by the UK legal system which was perceived to be ill-

adapted to surrogacy cases ($n=7$). Others mentioned the difficult emotional investment required during the pregnancy ($n=5$) and the lack of support or understanding from hospital staff ($n=4$). Some said there were no disadvantages to domestic surrogacy arrangements ($n=7$).

For those who had surrogacy in the USA, the advantage that was by far the most cited was the legal framework ($n=39$) which offered certainty and peace of mind to parents who could then focus on other aspects of the surrogacy process that they deemed to be more important, such as their experience, and, in some cases, developing a close relationship with the surrogate. Many parents felt that the legal framework in the USA also offered protection for the surrogate and donors and thus made them confident that it was ethical ($n=10$). Other aspects mentioned included working with professionals who were familiar with the process ($n=10$), receiving excellent support ($n=10$), having choice and control over the process (e.g. type of relationship with surrogate, etc) ($n=5$) and having no stigma attached to surrogacy ($n=3$). The main disadvantages of carrying out surrogacy in the USA were cost ($n=35$) and geographical distance ($n=17$). The latter impacted parents' experience where they missed having friends and family by their side as they went through the surrogacy process. Some parents mentioned legal issues, which referred only to difficulties and delays on the UK side ($n=7$).

For those who went to India, the advantages included affordability ($n=2$), the advanced speed of the process, including ease of finding a surrogate ($n=2$), the legal process, perceived to be simpler than in other countries ($n=2$) and not having to have a long-term relationship with the surrogate ($n=2$). The most frequently reported disadvantage was having to stay in India after the birth of the child in order to obtain the paperwork for returning home ($n=7$).

The advantages of having surrogacy in Thailand or other countries such as Georgia, Ukraine or Mexico included it being fast ($n=3$), straightforward ($n=3$), including fewer restrictions upon, or scrutiny of, intending parents ($n=2$), and the process fostering a feeling of connectedness to the country in which it was conducted (in this case, Thailand) ($n=1$). The most reported disadvantage of having surrogacy in Thailand concerned the legal problems faced ($n=7$) and the unforeseen costs (legal or otherwise) these problems generated ($n=3$). Drawn out legal issues also meant families were on their own without the support from friends and family when they first welcomed their new-born child ($n=5$).

Discussion

The findings of this study show that intending parents are travelling abroad for surrogacy despite surrogacy being available in the UK. Approximately, half of those looking to use surrogacy did not consider more than one country, suggesting that many intending parents, and especially those having surrogacy in the USA, had a clear idea about where they wished to undergo their surrogacy journey. The main reason for not pursuing surrogacy in the UK for those who considered it was because of the perceived lack of a legal framework. However, other reasons, such as it being easier to find a surrogate, and wanting a professional agency to manage the surrogacy were reasons for considering and indeed pursuing cross-border surrogacy.

In the present study, for those carrying out their surrogacy arrangement in the UK, the most common reason for doing so was because they wanted a relationship with the surrogate, a reason also given by a similar proportion of those using surrogacy in the USA. Studies examining the relationship between intending parents using domestic surrogacy in the UK and USA have found that in some cases contact may be maintained with the surrogate as the child grows up (Blake et al., 2016; Jadva et al, 2012), although the amount of contact between intending parents and the surrogate has been found to decline over time in domestic UK surrogacy arrangements (Jadva et al., 2012). A recent study of adolescents found that although all felt positive or indifferent about their birth through surrogacy, around half of the adolescents who had no contact with their surrogate were interested in her (Zadeh, Ilioi, Jadva, & Golombok, 2018). Thus, it is important that parents recognise that although they may not view a relationship with the surrogate as important, their child may feel differently, and may be curious about their surrogate in the future.

Findings also illustrate that most intending parents had sought legal advice prior to going abroad. This is perhaps unsurprising given that the participants in this study were recruited through a law firm. Those intending parents who had accessed surrogacy in India had also obtained information from relevant websites such as the Human Fertilisation and Embryology Authority website, and over two-thirds had spoken to others about their experiences in India, suggesting that they had gathered information from multiple sources prior to embarking on their own surrogacy arrangement. Unlike intending parents who use professional agencies in the USA, this finding may reflect the greater need for intending parents visiting

India to actively seek out advice and guidance for themselves. Whilst all intending parents who had surrogacy in the UK had applied for or were intending to apply for a Parental Order, a small number of those who had surrogacy abroad did not apply, some of whom were not aware of the need to apply or felt they already had legal parentage of their child. As Parental Orders are the means by which parents become the legal parents of their children under UK law, there are potentially significant consequences if a parental order is not obtained, including inheritance disputes, nationality issues, problems if the parents separate, and issues over who can exercise parental responsibility to make medical or educational decisions for the child.

The findings of this study highlight how parents returning from countries other than the USA are most likely to report difficulties in obtaining the necessary paperwork, leading to feelings of frustration with government departments in the UK and abroad, and resulting, for some respondents, in costly legal counsel. These findings concur with those reported by Deomampo (2015), whose research found similar experiences amongst parents of different nationalities undergoing surrogacy in India. In the present study, many of those who had used surrogacy in the USA returned to the UK with a US passport for their child, documentation that was described as easier and faster to obtain than a UK passport, and which may have resulted in fewer challenges. However, some parents who had returned from the USA still reported feelings of anxiety and stress about going through UK immigration. Furthermore, parents who pursued surrogacy in countries other than the USA had often spent months abroad before returning to the UK, meaning that they also had to face the challenge of being a new parent in a foreign country. It is important for future research to address the impact that the experience of overseas surrogacy may have on those involved, and, in particular, to examine the impact of increased stress and anxiety where experienced by parents on the parent-child relationship and the well-being of the child. Indeed, it has been suggested that prior to embarking on surrogacy abroad, intending parents should be provided with official information about the possible legal and health risks involved (Jackson, 2016) which may lessen the stress and anxiety experienced.

The present study highlighted the huge variation in the cost of overseas surrogacy in different countries. The USA was the most expensive; parents who had surrogacy in the USA tended to have higher incomes

than those going elsewhere. Indeed, some parents who had considered the USA but accessed surrogacy elsewhere had said that cost had prevented them from pursuing surrogacy in the USA. States in the USA which offer surrogacy, operate under a compensated and professionally arranged model, where agencies, lawyers, fertility clinics, surrogates and egg donors receive compensation for their services which explains the greater costs involved (Braverman, Casey, & Jadva, 2012). In the UK, advertising or brokering a surrogacy arrangement is not permitted and surrogacy organisations work on a not-for-profit basis, although fertility treatment for surrogacy is provided on a privately paid basis. An application for a parental order following a UK surrogacy arrangement is typically also less costly, with most parents self-representing and little documentary evidence required in the magistrates court (which is the primary court of allocation where the child is born in the UK), compared with international surrogacy cases which are routinely heard by High Court judges and require the filing of detailed written evidence and legal argument and typically involve two court hearings. Furthermore, within the UK traditional surrogacy, where the surrogate uses her egg to achieve the pregnancy, is commonly practiced (whereas overseas surrogacy services exclusively involve gestational surrogacy) and is considerably cheaper than IVF treatment required for gestational surrogacy.

Parents who travelled to the USA were the least likely to have faced challenges returning home, a finding that is perhaps related to the additional support provided by surrogacy agencies in the USA, and the legal framework, which enables a USA passport to be issued to the baby. These findings therefore suggest that the decision to carry out surrogacy in a particular country may be a choice borne from financial circumstance. Simply put, surrogacy in countries perceived as providing a better legal framework and easier access to surrogates, such as the USA, is neither affordable nor feasible for all those who intend to have a child through surrogacy.

Although the study's findings are exploratory in nature, they highlight the need for greater support and advice for people seeking and pursuing surrogacy overseas. It is important that all professional services supporting intending parents are aware that even though parents may wish to pursue surrogacy in the UK, they may end up travelling overseas. The Human Fertilisation and Embryology Authority on their website stress the importance of applying for a parental order following overseas surrogacy and

includes a link to the webpage of the Foreign Commonwealth Office providing guidance for those considering treatment abroad. However, not all respondents to our survey were accessing the HFEA webpage. Providing guidance and support is further complicated by the fact that international surrogacy laws are always evolving, and countries which may be accessible at one point in time can quickly and abruptly change their policies, as has happened with India and Thailand which were popular destinations for parents in the present study, but which no longer permit surrogacy to foreigners. Thus, the onus must also be placed on parents themselves to take greater responsibility for making informed choices about where to have surrogacy as these decisions can lead to additional risks and challenges for them and more importantly for their child in the future (Fronek, 2018).

The present study has a number of limitations, which should be considered when interpreting its findings. The main limitation concerns the representativeness of the sample, which is unknown, the recruitment method for this study relied upon a self-selecting sample, and the proportion of those who participated related to those who were contacted was relatively low. However, low response rates are a common feature of online surveys (Nulty, 2008) and should be weighed up against the advantages of this method, such as its ability to access unique and hard to reach groups (Hewson, 2014). The strength of this study was its ability to access a large sample of intending parents who had used overseas surrogacy as well as surrogacy in the UK. However, the study recruited participants through one law firm and its related surrogacy organisation and thus the findings may not be generalisable. It is important to note that the law firm involved has advised parents working through all three UK non-profit organisations (COTS, Surrogacy UK and Brilliant Beginnings) and in independent UK surrogacy arrangements, as well as cross-border surrogacy arrangements in a range of different destinations. It is, of course, possible that intending parents look to surrogacy abroad without contacting any UK organisation or seeking legal advice. The experiences of these parents, although much harder to locate, are important to understand, as this group may receive the least amount of practical and legal support, and may be the group of parents least likely to apply for a Parental Order due to not having explored the legal issues fully or chosen not to do so. Future studies that combine UK-based recruitment strategies

with recruitment via overseas agencies and clinics would enable access to a wider pool of potential participants, including those who do not receive any professional assistance in the UK.

Despite its limitations, this study provides important exploratory data highlighting how UK intending parents navigate their way through practical and regulatory challenges in different countries to obtain their goal of parenthood. The consequences of these different routes to parenthood through surrogacy, including the psychological impact of cross-border surrogacy arrangements for intending parents and for the child, should be the focus of future research.

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Disclosure statement

Natalie Gamble and Helen Prosser are the co-owners of NGA Law and Brilliant Beginnings. Vasanti Jadvā has no conflict of interest to declare.

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Parents' relationship with their surrogate in cross-border and domestic surrogacy arrangements: comparisons by sexual orientation and location

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Objective: To study heterosexual and gay couples' relationship with their surrogate and their disclosure decisions when the surrogacy arrangement was completed domestically compared with internationally.

Design: Cross-sectional study.

Setting: Not applicable.

Patient(s): Participants were 40 gay couples and 76 heterosexual couples who had domestic surrogacy in the United Kingdom (UK) (n = 38) or international surrogacy in the United States (n = 58) or Asia (20). Most (75%) of the children were aged <4 years.

Intervention(s): Online surveys containing open-ended and multiple-choice questions.

Main Outcome Measure(s): Experiences of finding a surrogate, relationship with the surrogate, and disclosure to the child were examined among UK parents who had undergone surrogacy in the UK, United States, or India/Thailand.

Result(s): Parents who had surrogacy in the UK and United States felt very involved in the pregnancy compared with those who had surrogacy in Asia. Couples whose surrogacy was completed in Asia were less likely to want contact with their surrogate after the birth and were also less likely to have any current contact with the surrogate. Parents who had surrogacy in the UK and United States described positive relationships with their surrogate. Gay couples intended to tell their child about surrogacy more than heterosexual couples.

Conclusion(s): The specific country where couples conducted their surrogacy arrangement (i.e. United States, UK, or Thailand/India) was associated with how involved they were in the pregnancy and their contact with the surrogate over time. Limitations of the study include use of survey methodology and that the representativeness of the sample is not known. (Fertil Steril® 2019;111:562–70. Copyright ©2018 The Authors. Published by Elsevier Inc. on behalf of the American Society for Reproductive Medicine. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>)).

El resumen está disponible en Español al final del artículo.

Key Words: Surrogacy, cross-border, gay couples, heterosexual couples

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A growing number of people are seeking surrogacy arrangements abroad, mainly owing to it being illegal in their country of residence (1). Despite surrogacy being

permitted in the United Kingdom (UK), it too has seen a steady rise in individuals traveling abroad for surrogacy. The most recent statistics on parental orders (applications that transfer legal

parenthood from the surrogate to the intended parents) show that, in 2016, 179 applications (51%) were made for UK surrogacy arrangements, and 161 (46%) for international surrogacy ar-

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rangements, which mainly took place in the United States (78) and India (63). Most applications were made by heterosexual couples (234), with approximately one-quarter (82) made by gay couples. These statistics only include those applying for parental orders, and thus parents who have surrogacy abroad but do not apply for a parental order are not included. Additionally, single persons using surrogacy cannot currently apply for parental orders, although this is expected to change (2). Thus it is feasible that more surrogacy arrangements may be taking place than the numbers suggest.

In domestic surrogacy cases in which the parents and surrogate live in the same country, gay couples in the United States and heterosexual couples in the UK have been reported to form close relationships with their surrogate, which may continue after the child is born (3, 4). Studies of surrogates have similarly reported how some surrogates maintain contact with the parents and child after the birth—a decision largely dependent on the strength of the relationship that develops between the surrogate and parents during the pregnancy (5).

Additional challenges might be faced during, and after, the pregnancy when the surrogate lives in a different country than the intended parents. In a study of Italian gay fathers who had used overseas surrogacy in Canada and the United States, the physical distance from the surrogate led many fathers to feel a lack of control over the pregnancy, which for some resulted in anxiety about how their surrogate was caring for the pregnancy. However, surrogates were also found to play an important role in helping fathers feel emotionally connected to the child (6). Unlike in the United States and Canada, where the intended parents are in contact with the surrogate, in countries such as India or Thailand direct contact is less common and may be complicated by language and cultural differences. In India, clinics play a key role in managing the pregnancy, and intended parents are not generally permitted to attend the birth, which can lead to feelings of dissatisfaction (7). A study of Israeli gay fathers who predominantly had surrogacy in India found they felt anxious and frustrated over the distance and inability to emotionally connect with the pregnancy and fetus (8). Indian surrogates may also feel disappointment at not being able to meet the intended parents and see the child (9). Thus the diverse ways in which surrogacy is practiced in different countries may affect parent's experiences during the pregnancy and their subsequent relationship with the surrogate.

It is feasible that experiences of the surrogacy process may differ between heterosexual and gay parents. Research with heterosexual couple families found that intended parents typically turned to surrogacy after many years of failed IVF treatments (10). Similarly, it has been suggested that the emotional challenges of infertility and treatment may deplete parents' psychological resources (11). Conversely, gay couples are more likely to come to surrogacy without a history of infertility and may be more likely to choose surrogacy as their preferred path to parenthood (3).

Surrogacy can place a number of stressors on the intended parents, who can feel anxious about whether the surrogate will hand over the baby (12). These anxieties might be greater when the surrogate is in a different country. On the other hand, work-

ing with a clinic or surrogacy agency might be more appealing than having to be directly involved with the surrogate, as is usually the case in the UK (13). To date, no studies have compared the experiences of parents who have domestic surrogacy with parents who travel overseas to destinations that may or may not allow direct contact with the surrogate. Given that contact with the surrogate can help intended parents feel involved in the pregnancy and emotionally connected to the unborn child (6, 8), and given the diverse ways in which surrogacy is practiced in different countries, it is important to understand how these different contexts affect the experiences of parents both during and after the pregnancy.

This study reports findings from a survey of UK parents who carried out surrogacy in the UK and overseas. Its objective was to examine differences and similarities in UK parents' relationships with the surrogate during the pregnancy and after the birth between gay and heterosexual couples and between couples who had surrogacy in the UK, United States and Asia.

MATERIALS AND METHODS

Procedure

Participants were recruited through NGA Law, an English family law firm specializing in surrogacy, and its sister organization, Brilliant Beginnings, a nonprofit UK surrogacy agency established in 2013 by the owners of NGA Law. Brilliant Beginnings is the only UK surrogacy organization to assist intended parents with domestic and international surrogacy arrangements.

E-mail invitations to take part in the study were sent to 1,212 individual e-mail addresses representing 776 families. Responses were collected over a 2-month period (February–March 2017) using an online survey. Seven hundred and twenty-nine (60%) of the e-mails were opened, and 203 surveys were completed, representing 26% of the families e-mailed.

Participants were asked to complete only one survey per couple, to avoid data from the same surrogacy arrangement being reported twice. For parents who had more than one child, the data relates to their first surrogacy arrangement (i.e., their eldest child born through surrogacy). Participants were either planning a surrogacy arrangement, had found a surrogate who was currently pregnant (or trying to conceive), or had completed a surrogacy arrangement. This paper focuses on data from 116 respondents who had completed their surrogacy arrangement in the United States ($n = 58$), UK ($n = 38$), India ($n = 13$), or Thailand ($n = 7$) and who were in a couple relationship at the time of the surrogacy. Because surrogacy is practiced in similar ways in Thailand and India, with the clinic or agency mediating contact between the surrogate and intended parents, data from participants for these two groups were combined. Ethical approval for the study was granted by the University of Cambridge Psychology Research Ethics Committee.

Measures

The survey included open-ended and multiple-choice questions about the relationship with the surrogate during

pregnancy and after the birth. The questions were based on previous studies of parents' relationships with their surrogates and disclosure patterns (3, 4, 14). The survey was piloted by potential participants to check survey length and functionality and to ensure the questions were meaningful. Data were obtained on [1] how participants had found their surrogate, including whether she was previously known (i.e., a family member/friend) or unknown, and if unknown, whether they had found her through an agency, clinic, website, or other means. Data were collected on whether participants had thought it was important for their surrogate to have particular traits or characteristics, and if yes, which characteristics had been important. Data were also obtained on [2] experiences during pregnancy, including who had updated the participants about the pregnancy, how involved they had felt, and whether they had been happy with their level of involvement. Data were obtained on [3] participants' contact and relationship with the surrogate, including whether they had planned to have contact with her after the birth, whether they currently had contact, and if yes, the frequency of contact, how they maintained contact, and their current relationship with the surrogate (data for these latter two variables were obtained with open-ended questions). Finally, participants were asked whether they had told or planned to tell their child about their birth using surrogacy and (where applicable) egg donation, and their reasons for disclosure (obtained with an open-ended question).

Analytical Approach

Participants' responses to all multiple-choice questions are reported as number of cases and percentages. Responses to open-ended questions were analyzed using a content analysis approach (15) whereby categories are derived directly from the text data. This approach allows frequency counts to be calculated for subsequent group comparisons. Chi-squared tests, Fisher's exact tests, *t* tests, and one-way analyses of variance were computed to compare differences by location (UK, United States, and Asia) and sexual orientation (heterosexual and gay couples).

Participants

The majority (66%, 76) of participants were in a heterosexual couple relationship at the time of the surrogacy arrangement, and 34% (40) were in a gay couple relationship. There was no difference between heterosexual and gay couples in where the surrogacy arrangement was conducted, although within Asia all of the gay couples had completed their surrogacy arrangements in Thailand.

Participant characteristics are shown in Table 1. There was a significant association between household income and surrogacy location (Fisher's exact = 0.008), with participants who had U.S. surrogacy having higher incomes. There was no difference by sexual orientation. There was a significant association between type of surrogacy and location of surrogacy (Fisher's exact = 0.000), with intended mothers more likely to have used their own egg for surrogacy arrange-

ments in the UK and all six traditional surrogacy arrangements (i.e. where the surrogate's egg was used) having taken place in the UK. There was also a significant association between type of surrogacy and sexual orientation of the couple (Fisher's exact = 0.000), reflecting the greater use of donor eggs by gay couples. The age of the eldest child born using surrogacy ranged from 0 to 11 years (mean = 2.5 years, median = 2 years). Seventy-five percent of children were aged <4 years, with 41% aged <2 years. Heterosexual couples had older children (mean = 2.86 years, SD = 2.47 years) compared with gay couples (mean = 1.88 years, SD = 1.62 years) [$t(106) = -2.54, P = .012$].

RESULTS

Choosing a Surrogate

Table 2 shows how couples had met their surrogate. Comparisons by location found a significant difference (Fisher's exact = 0.000), showing that participants who had surrogacy in the UK were more likely to have a surrogate who was previously known to them than couples who had surrogacy in other countries. Comparisons by sexual orientation found no differences between gay couples and heterosexual couples in whether their surrogate was previously known.

A significant association was found between whether parents thought it important for their surrogate to have particular characteristics and surrogacy location, with parents who had U.S. surrogacy (88%, 51) seeing this as more important than parents who had undertaken surrogacy in the UK (63%, 24) and Asia (55%, 11) [$\chi^2(2) = 11.97, P = .003$]. The difference by sexual orientation approached significance, suggesting that gay couples were more likely than heterosexual couples to think it was important for their surrogate to have particular characteristics (gay couples = 85%, 35; heterosexual couples 68%, 52) [$\chi^2(1) = 3.76, P = .07$].

Table 2 shows which particular characteristics were reported as important. Personality was seen as more important by couples who had surrogacy in the United States [$\chi^2(2) = 22.48, P < .001$], and marital status was more important for those who had completed their surrogacy in Asia [$\chi^2(2) = 10.93, P = .004$]. No other significant associations were found.

Experiences During Pregnancy

There was a significant difference between locations in who provided updates on the pregnancy. Those with surrogates in the UK and United States were more likely to be updated by the surrogate compared with those whose surrogate was in Asia (Fisher's exact = 0.000). Couples whose surrogacy had taken place in Asia were more likely to be updated by the clinic [$\chi^2(2) = 38.12, P < .001$], and those who had U.S. surrogacy were more likely to receive updates from the agency [$\chi^2(2) = 25.5, P < .001$] (Table 2).

A significant difference was found between locations in how involved couples felt in the pregnancy. Those in the UK and United States were more likely to report feeling very involved compared with those in Asia (Fisher's exact = 0.000). There were no differences by sexual orientation in how involved couples felt. Participants with United States

TABLE 1

Characteristic	UK		United States		Asia	
	Gay couple (n = 12)	Heterosexual couple (n = 26)	Gay couple (n = 23)	Heterosexual couple (n = 35)	Gay couple (n = 5)	Heterosexual couple (n = 15)
Age of participant (y)	42.2 (6.2)	42.1 (6.4)	43.5 (5.6)	45.2 (6.8)	44.4 (6.9)	44.2 (6.2)
Age of child (y)	1.4 (1.4)	3.0 (2.4)	2.0 (1.8)	2.9 (2.8)	2.2 (.44)	2.3 (1.5)
Sex						
Male	12 (100)	2 (7.7)	23 (100)	9 (25.6)	5 (100)	6 (40)
Female	0 (0)	24 (92.3)	0 (0)	26 (74.3)	0 (0)	9 (60)
Ethnicity of respondent						
White	11 (92)	24 (92)	21 (91)	33 (94)	3 (60)	10 (67)
Black	1 (8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Asian	0 (0)	2 (8)	0 (0)	1 (3)	1 (20)	4 (26)
Mixed	0 (0)	0 (0)	1 (5)	1 (3)	0 (0)	0 (0)
Other	0 (0)	0 (0)	1 (5)	0 (0)	1 (20)	1 (7)
Total household income (£)						
Less than 10,000	0 (0)	1 (4)	0 (0)	0 (0)	0 (0)	0 (0)
10,000–49,999	0 (0)	3 (12)	0 (0)	2 (6)	0 (0)	2 (13)
50,000–99,999	2 (17)	5 (19)	1 (4)	4 (11)	2 (40)	2 (13)
100,000–199,999	7 (58)	9 (35)	6 (26)	11 (31)	2 (40)	6 (40)
200,000–299,999	1 (8)	5 (19)	6 (26)	3 (9)	1 (20)	2 (13)
300,000 or more	2 (17)	1 (4)	9 (39)	14 (40)	0 (0)	1 (7)
Not provided	0 (0)	2 (8)	1 (4)	1 (3)	0 (0)	2 (13)
Type of surrogacy						
Gestational–donor egg	9 (75)	6 (23)	23 (100)	27 (77)	5 (100)	10 (67)
Gestational–intended mother's egg	–	17 (65)	–	8 (23)	–	5 (33)
Traditional	3 (25)	3 (12)	0 (0)	0 (0)	0 (0)	0 (0)

Note: Values are mean (SD) or number (percentage).

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and UK surrogacy arrangements were more likely to be very happy with their level of involvement compared with those who had surrogacy in Asia, who said they were somewhat happy (Fisher's exact = 0.000).

In terms of whether couples planned to be in contact with the surrogate after the birth, parents whose surrogacy was carried out in Asia were less likely to plan to have contact with the surrogate after the birth compared with couples who had U.S. or UK surrogacy (Fisher's exact = 0.000) and were also less likely to have any current contact (Fisher's exact = 0.000) (Table 3). Parents whose surrogate lived in Asia were in less frequent contact compared with those in the UK and United States (Fisher's exact = 0.04). For parents who had surrogacy in Asia, reasons for lack of contact included communication difficulties, for example, "our surrogate does not speak any English and we do not speak Hindi—this makes having a relationship very difficult," or that their contact was mediated via the clinic. There was no difference in frequency of contact by sexual orientation.

Comparisons Between UK and United States for Parents' Current Relationship With the Surrogate

Because parents who had surrogacy in Asia were less likely to have direct contact with their surrogate compared with those in the United States and UK, the following analyses compare participants who had undertaken surrogacy in the UK and United States only.

Table 4 shows the categories for parents' description of their current relationship with the surrogate. There was no

difference between heterosexual and gay couples in the way in which the relationship with the surrogate was described, and no difference was found between the UK and United States. When previously known surrogates (n = 14) were removed, both comparisons remained nonsignificant.

Among those who had a "very positive" relationship with their surrogate were those who viewed their surrogate as family or "like family," as "closest of friends" or "best friend," and those who described their relationship as "excellent," "very strong," or "very warm." Descriptions from families included statements such as, "she is our son's godparent, and we would consider her part of our family," or, "I feel like she is a friend with whom I have had a very emotional relationship and we therefore have a close bond," or, "she and her family became like family to us whilst we stayed in California."

Parents who had a "positive" relationship with their surrogate described it as "good," "amicable," "trusting," or simply "friendly." As one parent said, "(the relationship is) friendly—we are all just getting on with our lives."

A smaller number of families described their relationship with their surrogate as "casual," "cordial," or other terms implying a more neutral affect and relationship, for example, "we're in touch every now and then to say hi."

In four cases the relationship was categorized as "distant." In two of these families the relationship had changed since the surrogacy, and the parents described challenges in the relationship: "our surrogate avoided us for about a year after the first year. We could not quite understand it. However, she regretted the distance she had created and

TABLE 2

How couples met surrogate, important characteristics, and involvement in pregnancy by location and sexual orientation.

Parameter	UK		United States		Asia	
	Gay couple	Heterosexual couple	Gay couple	Heterosexual couple	Gay couple	Heterosexual couple
Met surrogate ^a						
Previously known						
I already knew her, she is a family member	1 (8)	2 (8)	0 (0)	1 (3)	0 (0)	0 (0)
I already knew her, she is a friend	2 (17)	8 (31)	0 (0)	0 (0)	0 (0)	0 (0)
Total	3 (25)	10 (39)	0 (0)	1 (3)	0 (0)	0 (0)
Previously unknown						
Through an agency	4 (33)	11 (43)	22 (96)	33 (94)	4 (80)	5 (33)
Through a clinic	0 (0)	0 (0)	0 (0)	1 (3)	1 (10)	10 (67)
Through a website	3 (25)	2 (8)	0 (0)	0 (0)	0 (0)	0 (0)
Other, please specify (e.g., met through a mutual friend)	2 (17)	3 (12)	1 (4)	0 (0)	0 (0)	0 (0)
Total	9 (75)	16 (63)	23 (100)	34 (97)	5 (100)	15 (100)
Important characteristics ^b						
Education	2 (17)	3 (11)	5 (22)	6 (17)	1 (20)	1 (7)
Medical history	5 (42)	12 (46)	12 (52)	23 (66)	3 (60)	7 (47)
Personality	6 (50)	10 (38)	17 (74)	21 (60)	1 (20)	0 (0)
Physical appearance	2 (17)	2 (77)	4 (17)	3 (9)	0 (0)	4 (27)
Prior experience of surrogacy	1 (8)	5 (19)	4 (17)	7 (20)	2 (40)	1 (7)
Marital status	2 (17)	5 (19)	14 (61)	14 (40)	4 (80)	7 (47)
Other	3 (25)	9 (35)	4 (17)	13 (37)	2 (40)	0 (0)
Who updated parents about the pregnancy						
Surrogate	9 (75)	26 (100)	23 (100)	32 (91)	1 (20)	0 (0)
Clinic	1 (8)	3 (12)	18 (78)	16 (46)	4 (80)	14 (93)
Agency	0 (0)	1 (4)	12 (5)	18 (51)	4 (80)	2 (13)
No one	1 (8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Other (e.g., medical professionals, attending appointment)	5 (42)	4 (15)	2 (9)	4 (11)	0 (0)	2 (13)
How involved did parents feel in the pregnancy						
Very involved	11 (92)	22 (85)	19 (93)	30 (86)	1 (20)	3 (20)
A little involved	1 (8)	4 (15)	4 (17)	5 (14)	4 (80)	10 (67)
Not involved	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (13)
Happy with level of involvement						
Yes, very happy	11 (92)	22 (85)	20 (87)	32 (91)	2 (40)	6 (40)
Yes, somewhat happy	1 (8)	1 (4)	3 (13)	3 (9)	2 (40)	8 (53)
No	0 (0)	3 (12)	0 (0)	0 (0)	1 (20)	1 (7)

Note: Values are number (percentage).

^a Categories were collapsed to previously known vs. previously unknown to run Fisher's exact tests.

^b Percentage of those who answered yes, it was important for their surrogate to have particular traits/characteristics.

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wanted to rekindle the friendship. This has not been so easy. So it is more distant than it used to be.”

In terms of how contact was maintained between parents and surrogates, there were no differences between couples who had surrogacy in the UK or United States in their likelihood of keeping in contact via social media, messaging/e-mail, calling, or sending cards, but couples who had UK surrogacy were more likely to maintain contact through visiting their surrogate than those who had had U.S. surrogacy [$\chi^2(1) = 15.18, P < .001$]. There were no differences between heterosexual and gay couples in their methods of keeping in contact with their surrogate.

Telling the Child About Surrogacy and Egg Donation

There was a significant difference between heterosexual and gay couples in telling the child about their surrogacy conception (Fisher's exact = 0.03), which reflected three heterosex-

ual couples who were undecided in whether they would tell. There was no difference in couples' decisions about whether to tell the child according to the country in which the surrogacy had taken place. Whether couples were in contact with the surrogate or type of surrogacy was also not related to parents' decision to tell their child.

For couples who had used donor eggs or the surrogates egg (as oppose to the intended mothers egg), there were no differences in couples' decisions about whether to tell the child about the use of a donor egg according to either sexual orientation of the couple or location of the surrogacy.

Table 3 shows parents' reasons for telling the child about their surrogacy conception. Only one association between country and reasons cited was significant, with couples who had surrogacy in the UK more likely than couples who had surrogacy elsewhere to say that they planned to tell the child because they were proud of their conception story (Fisher's exact = 0.02). Couples who had US surrogacy were marginally more likely to say that they planned to tell their child

TABLE 3

Frequency, type of contact, and disclosure decisions by location and sexual orientation.

Parameter	UK		United States		Asia	
	Gay couple	Heterosexual couple	Gay couple	Heterosexual couple	Gay couple	Heterosexual couple
Plan to have contact						
Yes	12 (100)	26 (100)	23 (100)	32 (91)	3 (60)	5 (33)
No	0 (0)	0 (0)	0 (0)	2 (6)	2 (40)	9 (60)
Not provided	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	1 (7)
Current contact with surrogate (including indirect contact)						
Yes	12 (100)	24 (92)	22 (96)	34 (97)	4 (80)	2 (14)
No	0 (0)	2 (8)	1 (4)	1 (3)	1 (20)	12 (86)
Frequency of current contact? ^a						
Weekly	6 (50)	9 (41)	2 (9)	7 (21)	0 (0)	0 (0)
Monthly	3 (25)	7 (29)	12 (55)	10 (29)	0 (0)	1 (50)
Once every 3 mo	1 (8)	4 (17)	5 (23)	8 (24)	2 (50)	0 (0)
Once or twice per year	2 (17)	4 (17)	3 (14)	9 (26)	2 (50)	1 (50)
Telling: surrogacy ^b						
Yes—told	1 (8)	16 (61)	8 (35)	15 (43)	1 (20)	4 (27)
Yes—plan to tell	11 (92)	9 (35)	15 (65)	19 (54)	4 (80)	10 (67)
Undecided	0 (0)	1 (4)	0 (0)	1 (3)	0 (0)	1 (6)
Not planning to tell	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Telling: egg donation ^c						
Yes—told	1 (10)	0 (0)	4 (17)	10 (37)	1 (20)	1 (10)
Yes—plan to tell	8 (80)	6 (86)	19 (83)	13 (48)	3 (60)	7 (70)
Undecided	1 (10)	0 (0)	0 (0)	1 (4)	1 (20)	2 (20)
Not planning to tell	0 (0)	1 (14)	0 (0)	3 (11)	0 (0)	0 (0)
Reasons for telling						
Child's right to know	1 (10)	5 (24)	0 (0)	6 (19)	0 (0)	3 (27)
Family structure	4 (40)	0 (0)	8 (40)	0 (0)	1 (20)	0 (0)
Importance of honesty	5 (50)	10 (48)	7 (35)	17 (53)	3 (60)	3 (27)
Ongoing relationship with surrogate	3 (30)	1 (5)	3 (15)	2 (6)	0 (0)	0 (0)
Proud of conception	2 (20)	16 (76)	3 (15)	8 (25)	0 (0)	5 (45)
Others know	0 (0)	1 (5)	0 (0)	5 (16)	0 (0)	0 (0)
Important child knows their story/identity	0 (0)	1 (5)	8 (38)	5 (16)	1 (20)	3 (27)
Advised to tell	1 (10)	1 (5)	0 (0)	4 (13)	0 (0)	0 (0)

Note: Values are number (percentage).

^a For those in contact.

^b Categories were collapsed into told/plan to tell vs. undecided/not telling to run χ^2 tests.

^c For those who used egg donation.

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because surrogacy was part of the child's story/important for the child's sense of identity (Fisher's exact = 0.06). Gay couples were more likely than heterosexual couples to cite their family structure as a reason to tell their child (Fisher's exact = 0.000), and heterosexual couples were more likely to cite

pride in their conception story as a reason for telling [$\chi^2(1) = 5.89, P=.02$].

DISCUSSION

The findings from this study highlight the similarities and differences in UK parents' relationships with their surrogates during pregnancy and after birth, depending on the country in which the surrogacy was carried out. Overall, relationships between parents and surrogates were largely similar between those who had surrogacy in the UK and United States and differed most with Asia. Thus the country to which couples traveled for surrogacy affected parents' level of involvement in the pregnancy and their subsequent relationship with the surrogate rather than travelling overseas per se.

Parents who had surrogacy in the United States were more likely to think it important that their surrogate had particular traits and characteristics. This finding reflects the marketization of U.S. surrogacy and the greater choice of available surrogates, as compared with the UK, which currently has a shortage of surrogates, and Asia, where surrogates often remain anonymous to the intended parent.

TABLE 4

Quality of relationship with surrogate for parents who had completed their surrogacy in the UK and United States.

Quality	UK		United States	
	Gay couple	Heterosexual couple	Gay couple	Heterosexual couple
Very positive	7 (58)	11 (44)	9 (39)	15 (44)
Positive	3 (25)	10 (40)	9 (39)	10 (29)
Neutral	2 (17)	2 (8)	2 (9)	7 (20)
Distant	0 (0)	0 (0)	2 (9)	2 (6)
None	0 (0)	2 (8)	1 (4)	0 (0)

Note: Values are number (percentage). Categories were collapsed to very positive/positive vs. neutral/distant/none to run χ^2 tests.

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Parents who had surrogacy in Asia were more likely to view marital status as an important characteristic that is necessary for obtaining legal parenthood via a parental order in the UK.

Parents who had surrogacy in Asia were less likely to have any direct contact with the surrogate and generally felt uninvolved in the pregnancy. They were also less likely to intend to be in contact with the surrogate after the birth and were indeed in less contact currently. This lack of contact, although preferred by some couples, was a result of the way in which surrogacy was managed, that is, with parents having a relationship with the clinic rather than the surrogate during the pregnancy. In addition, the language differences hindered any attempts for direct communication. It is no longer possible for foreigners to access surrogacy in India and Thailand; however, other countries that follow similar models of surrogacy (i.e., clinic-mediated contact) and where language differences exist are also likely to result in distant relationships with the surrogate. Indeed, data from the larger study from which this sample is drawn found that intending parents were considering surrogacy in countries such as Georgia and Ukraine, where they may also face similar communication difficulties with the surrogate (16). Lack of contact might lead to stronger relationships within the family unit because the involvement of the surrogate would not interfere in parent–child relationships (17); however, it is also possible that the child might be curious about their surrogate or want to meet her in the future (18), which would be particularly difficult in cases in which the surrogate was anonymous to the parents.

Parents who had surrogacy in the United States and UK felt involved in the pregnancy and did not differ in their descriptions of their current relationships with the surrogate, with most couples describing it as positive or very positive. Given the available technologies that now exist to maintain indirect contact between people residing in different countries (and the effect this has had on the ways in which relationships are maintained [19]), it is perhaps unsurprising that close relationships exist between couples and U.S. surrogates. It is important to note that surrogacy in the United States can be costly, and indeed couples who carried out U.S. surrogacy had higher family incomes than those who had surrogacy in Asia and UK. Given the disparities in couples' experiences of surrogacy by country, more expensive destinations such as the United States that enable greater involvement with the pregnancy and surrogate may be unaffordable to many couples planning to use surrogacy. Staying in the UK is also not an option for all couples, given the shortage of surrogates in the UK and the delay in finding a surrogate. However, it is important to note that parents who travelled to Asia for surrogacy were less likely to expect a relationship with the surrogate after the birth and thus may have chosen a destination that would facilitate lack of contact.

Most parents in this study had children under the age of 4 years. Previous studies have found that frequency of contact lessens over time (4, 20) and can differ between traditional and gestational surrogates, and previously known and previously unknown surrogates, with less frequent contact maintained with surrogates who were traditional surrogates and those who were previously unknown to the couple (4).

In the present study it was not possible to compare the experiences of traditional to gestational surrogates because only six couples had used traditional surrogacy. Parents who had UK surrogates were more likely to have known their surrogate before the surrogacy compared with parents who had traveled abroad, and thus it would be expected that they may be more likely to maintain future contact.

Because of the lack of commercial surrogacy agencies in the UK, intended parents and surrogates often have to work closely together during the pregnancy, which can lead to strong relationships forming (21). However, not all couples and surrogates agree to continue contact after the birth of the child (5), and the frequency of contact has not been found to be related to how surrogates, parents, or children feel about each other or about the surrogacy arrangement (4, 12). That is, those involved in surrogacy can still feel positive about the surrogacy regardless of whether they have contact with each other. Dissatisfaction among surrogates was found when an expectation to maintain contact after the birth was not met by couples (5).

This was the first study to compare the experiences of gay and heterosexual couples who had used surrogacy to have their child. Differences were found in whether parents planned to tell their child about their surrogacy birth, with all gay couples planning to tell, or having told, their child(ren) and three heterosexual couples being undecided. Studies have found that heterosexual couples using surrogacy are much more likely to tell their child about surrogacy compared with heterosexual couples using other forms of third-party reproduction (e.g., egg or sperm donation) (22). With regard to reasons for telling, that UK couples were more likely than couples who had traveled abroad to cite pride in their conception story as a reason may be partly explained by the surrogacy process in the UK, where surrogacy takes place in a relatively small community in which close relationships are encouraged. That gay couples were more likely to cite family structure as a reason mirrors findings in a study of U.S. gay fathers through surrogacy, in which most fathers who had started the disclosure process did so by explaining to their children that two men needed help in creating a family (3).

This study found that sexual orientation was not an important factor in determining the type of relationships couples have with their surrogate during pregnancy and after the birth. Counsellors should guard against making assumptions based on sexual orientation and should instead focus on the practical features of surrogacy (e.g., direct contact with surrogate, ease of communication) that might influence the parent–surrogate relationship. Counsellors can also highlight how the way in which surrogacy is practiced in different countries might affect how involved parents feel in the pregnancy and also discuss the implications of future contact with the surrogate.

Children aged 4–12 years born through surrogacy to Italian gay couples have been reported to feel indifferent/uninterested in their birth and to show more interest in their surrogate than their egg donor (6). Adolescents born using surrogacy have been reported to feel either positive or indifferent about their surrogacy birth at age 14 years (18). However, this latter study found that approximately half of the

adolescents who had no contact with their surrogate were interested in her, with the remainder being uninterested. Although the numbers are small, these findings suggest that some children born through surrogacy may have questions about their surrogate in the future or may express a desire to meet her. It is not known how the lack of information that some couples in the present study had about their surrogate will affect children in the future. It is possible that children in gay couple families may differ from those in heterosexual couple families in their curiosity about the surrogate or donor. In a study of adults requesting information about their sperm donor's identity, it was found that approximately one-quarter of adults from heterosexual couple families requested information about their donor, compared with approximately one-third of adults from lesbian couple families and more than half from single-mother families (23). It has also been found that children who are securely attached to their parents are more likely to be curious about their sperm donor (24), reinforcing the need for more detailed longitudinal studies of parenting and child outcome in families formed through different surrogacy practices.

The present study has a number of limitations. The representativeness of the sample is unknown, and the survey methodology did not enable in-depth exploration of couples' relationships with their surrogate. Recruitment through the law firm and surrogacy organization enabled access to couples who had carried out surrogacy in the UK and overseas. However, the sample may not be representative of all couples who have used surrogacy. Furthermore, not all couples who travel overseas for surrogacy seek professional assistance, and it is possible that couples in these arrangements have different experiences from those who seek advice from professional organizations.

In conclusion, findings from this study show that parents' surrogacy experiences during and after the pregnancy vary according to the location of the surrogacy arrangement. Gay and heterosexual couples from the UK who have surrogacy in the UK and United States maintained positive relationships with the surrogate during and after the birth of the child. Couples who had surrogacy in Asia were less likely to plan to be in contact after the birth, suggesting that destinations that do not facilitate direct contact with the surrogate might be preferred by those who do not wish to maintain a relationship. Future research should examine what these differences mean for families as the children grow up.

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Relación entre los padres y su subrogada tanto en los acuerdos de subrogación transfronteriza como nacional: comparación por orientación sexual y localización

Objetivo: Estudiar la relación de las parejas heterosexuales y homosexuales con sus subrogadas y sus preocupaciones cuando el acuerdo de subrogación fue completado nacional frente al internacional.

Diseño: Estudio transversal.

Lugar: No aplicable.

Paciente(s): Los participantes fueron 40 parejas homosexuales y 76 parejas heterosexuales que hicieron subrogación nacional en Reino Unido (UK) (n=38) o subrogación internacional en los Estados Unidos (n=58) o Asia (20). La mayoría de los niños fueron menores de 4 años.

Intervención (es): Encuestas en línea que contenían preguntas abiertas y de opción múltiple.

Principales medidas de resultado(s): Experiencias de encontrar una subrogada, relación con la subrogada y se examinó el hecho de revelárselo al niño entre los padres del Reino Unido que habían recurrido a la subrogación en el Reino Unido, Estados Unidos o India / Tailandia.

Resultado (s): Los padres que hicieron la subrogación en UK y en Estados Unidos se sintieron muy involucrados en la gestación comparados con aquellos que hicieron la subrogación en Asia. Aquellas parejas cuya subrogación fue realizada completamente en Asia eran menos propensos a querer contactar con su subrogada después del nacimiento y también eran menos propensos a tener algún contacto en la actualidad con la subrogada. Los padres que hicieron la subrogación en UK y en los Estados Unidos describieron como positivas las relaciones con sus subrogadas. Las parejas homosexuales revelaron a sus hijos la subrogación más que las parejas heterosexuales.

Conclusión (es): El país específico donde las parejas llevan a cabo el acuerdo para la subrogación (i.e. Estados Unidos, UK, o Tailandia/India) se asoció con cómo se involucraron durante la gestación y con el contacto en el tiempo con su subrogada. Las limitaciones del estudio incluyen el uso de la metodología de la encuesta y que la representatividad de la muestra es desconocida.