

Families Created by Identifiable Egg Donation: Family Functioning in Early Childhood



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PREFACE

This thesis is the result of my own work and includes nothing which is the outcome of work done in collaboration except as declared in the Preface and specified in the text. It is not substantially the same as any that I have submitted, or, is being concurrently submitted for a degree of diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text. I further state that no substantial part of my thesis has already been submitted, or, is being concurrently submitted for any such degree, diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text. This thesis does not exceed 60,000 words.

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Abstract

Egg donation is an increasingly common form of fertility treatment offered to women who are unable to conceive using their own eggs. Identity-release egg donation is the primary treatment method available to prospective parents seeking treatment with donated eggs in the UK. In families formed through identity-release egg donation, mother and child lack a genetic link. The child is also legally entitled to access the donor's identity when they reach adulthood. Despite identity-release egg donation being available in the UK since 2005, no studies have yet examined family functioning in families formed this way when children are in early childhood. The aim of this thesis was first, to examine the effect of the absence of a genetic link between mother and child and, second, to examine mothers' perspectives on identity-release donation and the possibility of future donor-child contact.

Data were obtained from a sample of 72 families who had conceived using *in vitro* fertilisation (IVF) and egg donation and a comparison group of 50 families who had conceived through IVF using their own gametes. Eighty-nine percent of the families were heterosexual, two-parent families and the average age of the children (45% female) at the time of data collection was 5.6 years. Standardised interview, questionnaire and observational measures were used to collect data from mothers, father and children about parents' psychological wellbeing, the quality of the parent-child relationship and children's adjustment. Data regarding mothers' thoughts and feelings about identity-release egg donation and future donor-child contact were obtained via semi-structured interview.

Egg donation families were found to be functioning well in terms of parents' psychological health, the quality of the parent-child relationship and child adjustment, with few differences found between family types. However, egg donation mothers were found to report more parenting stress and less social support than IVF mothers, and egg donation fathers were found to have poorer psychological health compared to IVF fathers. Differences in fathers' psychological health were generally associated with egg donation fathers' older age or being

a parent of twins rather than family type *per se*. Egg donation mothers and fathers were found to express more negative representations of the parent-child relationship than IVF parents; however, no group differences were found between observed parent-child interaction quality, with parents and children in both groups demonstrating good relationship functioning at the behavioural level. Egg donation children were found to be rated as higher in externalising problems by their parents than IVF children. Most of the variance in children's externalising scores was explained by family process variables and was not explained by family type.

Egg donation mothers were found to express considerable ambivalence about their use of identity-release egg donation. Thematic analysis of egg donation mothers' interviews revealed a broad range of perspectives, from viewing the prospect of future donor-child contact as threatening to the security of their position as the child's mother, to viewing identity-release an opportunity to be embraced for the benefit of the child. Mothers' narratives revealed complex and often contradictory perspectives, and demonstrated mothers' use of multiple strategies in order to make sense of and manage their feelings about identity-release egg donation.

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Chapter 1: Introduction and literature review

Egg donation is a relatively recent form of assisted reproductive technology (ART) and is an increasingly common route to parenthood for women who are unable to conceive using their own eggs. Egg donation has therefore given rise to a relatively new family type, in which infertile women gestate and give birth to children with whom they do not share a genetic link.

Following the removal of donor anonymity in the UK in 2005, couples wishing to become parents using egg donation must use an identifiable donor. Patients most commonly use identity-release donation, meaning their child has the right to access identifying information about the donor when they reach adulthood. Despite its widespread uptake, very little is known about functioning within, and the experiences of, families using this donation type. It has been suggested that identity-release donation may represent a particular challenge to these families, as the potential to find out the donor's identity in the future may lead to a perceived increased presence of the donor in family life. Moreover, as clinics worldwide move towards a policy of openness with regards to assisted reproductive technology, egg donation parents are increasingly being advised to disclose their children's method of conception to them. It is generally recommended that parents begin the disclosure process before their child begins school, usually before the age of 5 years. Identity-release legislation may add a further layer of complexity to the already challenging disclosure process. Despite these concerns, no studies have examined family functioning in identifiable egg donation families during early childhood. This thesis explores the functioning of families with 5-year-old children born using identifiable egg donation in the UK, and constitutes a follow-up to a study of the same sample begun when the children were in infancy (Imrie, et al., 2019a; Imrie et al., 2019b; Imrie, et al., 2020).

This thesis had two aims. First, to explore egg donation mothers' thoughts and feelings about identity-release egg donation, and about the prospect of potential future contact between their child and the donor. The second aim was to establish whether egg donation families created using identifiable donors experienced greater difficulties than a comparison group of own-gamete IVF families, with respect to three aspects of family functioning: 1) parental

psychological wellbeing; 2) the quality of the parent-child relationship; and 3) child adjustment.

1.1. Families created by egg donation

Over eight million babies have been born worldwide via ARTs since 1987 (European Society of Human Reproduction and Embryology, 2018). In 2018, approximately 20,000 live births resulted from ARTs in the UK alone (Human Fertilisation & Embryology Authority, 2020). The most prevalent form of ART is *in vitro* fertilisation (IVF), a procedure that enables eggs and sperm to be retrieved and fertilised in the laboratory, after which the resulting embryo is transferred to the gestational parent's uterus. Typically, couples use their own gametes for IVF treatment; however, a minority of prospective parents use donated gametes where they are unable to use their own. Reproductive donation (the use of donated sperm, eggs, embryos, or a surrogate) has given rise to new and complex family forms that challenge the dominant narrative of the nuclear, genetically related family unit (Andersen, 1991; Fisher, 2003; Goldberg et al., 2011) in that a child may be genetically related to only one or, indeed, neither of their social parents. Questions have subsequently been raised regarding the social and ethical implications of the use of reproductive donation, and concerns expressed about the psychosocial functioning of families created using these technologies.

Donated eggs may be an alternative route to parenthood for women who are unable to use their own eggs, including, but not limited to, post-menopausal women, women who have low quality eggs or damaged ovaries, and women who have a high risk of passing on an inherited disorder (Bodri et al., 2006; Tarlatzis & Pados, 2000). In the case of heterosexual couples, donor eggs are mixed with the prospective father's sperm during the IVF process, and the resultant embryo is transferred to the prospective mother's uterus. Children born to parents following egg donation thus share a genetic link with their father, and a gestational, but not genetic, link with their mother. Egg donation is a relatively recent form of ART, with the first successful egg donation procedure achieved in 1983 (Trounson et al., 1983), almost a century after the first successful sperm donation procedure (Beck, 1976). As such, less is known about families created using this form of ART.

Recent decades have seen an increase in the number of families created using egg donation, with the number of IVF cycles using donor eggs in the UK rising from 2,263 in 2014 to 4,212 in 2018; this represents 6.1% of all IVF cycles in the UK in 2018 (HFEA, 2020). Similar trends

have been observed worldwide: data from 2018 show that 4.2% of total ART cycles in Australia and New Zealand used donated eggs (Newman et al., 2020). In the US, 8.3% of total IVF cycles used donated eggs in 2018, with the number of procedures involving donor eggs rising from 15,504 in 2010 to 22,408 in 2018 (Society for Assisted Reproductive Technology, 2020). In the UK, donor egg cycles started in 2018 resulted in 1,260 live births, 30% of which involved mothers aged 40 or older (HFEA, 2020).

When pursuing egg donation, patients seeking treatment in the UK have two main options with regards to the type of donor they can use: identity-release donation or known donation. Identity-release donors are supplied by the clinic and are anonymous to recipients, with clinics providing only a few basic details about the donor's characteristics.¹ However, any children resulting from this type of donation are entitled to request non-identifying information about the donor at the age of 16², and identifying information about the donor at the age of 18, although it must be noted that parents are under no legal obligation to tell their child about their method of conception or their right to contact their donor.³ The identity-release programme provides recipients with eggs that were donated by either egg share or altruistic donors. Egg share donors are patients seeking IVF treatment themselves who donate a quantity of their own eggs in exchange for a reduction in treatment costs.⁴ Conversely, altruistic donors are recruited directly by the clinic and are compensated up to £750 per donation cycle (HFEA, 2019b). Current HFEA guidelines for egg donors in the UK state that donors must be no older than 36 years of age, and they are vetted for any serious medical conditions, illnesses, or physical disabilities (HFEA, 2019).

¹ These details typically include information about the donor's height, weight, hair colour, eye colour, weight, build, blood group and ethnicity.

² Non-identifying information includes the donor's year and country of birth, ethnicity, marital status, medical history, details of any offspring, the donor's physical description and a goodwill message, if provided by the donor.

³ Identifying information includes the donor's name, full date of birth, and last known address.

⁴ The ethical debate surrounding the commodification of human tissue is beyond the scope of this thesis. In the UK, monetary compensation for egg donor is capped at £750 to prevent the possible exploitation of vulnerable women. However, with the average cost of one IVF cycle in excess of £5,000, it has been argued that the offer of free or reduced-cost fertility treatment in exchange for eggs may compromise the consent of potential donors. Grtin, Ahuja & Golombok (2012) and Haimes, Taylor & Turkmendag (2012) provide thoughtful overviews of the debate and insights into the egg share scheme from donors' perspectives.

The alternative to using an identity-release donor is the use of a known donor, whereby the donor is found by, and therefore known to, the intended recipient. These donors may be genetically related to the recipient, as in the case of intra-family donation (e.g., sister-to-sister or niece-to-aunt), or genetically unrelated to the recipient. In the latter case, the donor may be a friend of the recipient, or recruited through alternative means such as online matching sites, which facilitate contact between potential donors and recipients. No published data exist regarding the prevalence of known or intra-family donation in the UK, although a 2010 HFEA survey found that >40% of clinics received a request at least once a month for intra-family donation, the majority of which were for sister-to-sister donation (HFEA, 2010).

A third option for patients is to travel abroad for treatment. Individuals may choose to do so for a variety of reasons, including to find a donor of the same ethnicity (Jadva et al., 2011) or to access treatment in countries that offer cheaper treatment. Additionally, some couples choose to seek treatment in countries which typically provide more information about the donor, such as the USA (Stuart-Smith et al., 2012), or in countries that allow treatment with eggs from fully anonymous donors, where information about the donor's identity will never be available to the recipient or any resulting children.

This thesis focuses on egg donation families headed by heterosexual couples, who had conceived following treatment at UK clinics with either identity-release or known egg donation.

A note on terminology

The majority of this sample comprised families who had used identity-release egg donation to conceive (see section 2.1). However, a small proportion (12.5%) had used known donation. As both identity-release and known donors are, or will be, identifiable to the child, and to maximise the sample size, the decision was made to include both family types in the quantitative analyses. Only identity-release donation families were included in the qualitative analyses. For clarity, when the sample comprises both identity-release and known donation families, this will be referred to as "identifiable donation". When analyses are undertaken only with identity-release families, this will be referred to as "identity-release donation".

1.2 Concerns about family functioning in identifiable egg donation families

A review of the literature has identified two main concerns about family functioning in identifiable egg donation families during early childhood: firstly, that the effects of identity-release egg donation on family functioning in early childhood are unknown, including the effects of the disclosure of the use of identity-release egg donation. Secondly, that the absence of a genetic link between mother and child may negatively impact family functioning. These concerns are discussed in the following section.

1.2.1 The unknown effects of identity-release on family functioning

Legislation removing donor anonymity was introduced in the United Kingdom in 2005, reflecting a global trend towards greater openness in assisted reproductive technology. Although some research does exist on prospective parents' feelings about and decisions regarding donation type, it tends to focus on attitudes towards anonymous and known donation. Much less is known regarding couples' thoughts and feelings about identity-release egg donation. Identity-release donation has been theorised to pose unique challenges, distinct from those posed by anonymous and known donation; the effects of these challenges on families created by identity-release egg donation remain relatively unknown.

Evidence from research on anonymous and known donation can provide some insight into parents' thoughts and feelings about donation type. Some prospective parents choose anonymous donation to help establish explicit boundaries between the donor and their family, and to avoid any potential complex legislative issues (Hershberger et al., 2007; Laruelle et al., 2011). Parents opting for anonymous donation have reported being motivated to do so to more easily minimise the role of the donor in their child's conception (Baetens et al., 2000; Greenfeld & Klock, 2004), and to limit the donor's perceived intrusion into family life (Hudson, 2020). In a study of 42 egg recipient couples, Laruelle et al. (2011) found that amongst those opting for anonymous donation, a large proportion of parents were motivated by a desire to protect the mother-child relationship (41.7%), with a further minority motivated by a desire to maintain secrecy (6.2%).

Some women have opted for anonymous donation specifically to avoid the prospect of future donor-child contact (Hershberger et al., 2007; Greenfeld & Klock, 2004). Access to information about the donor has been represented by some as a burden, threatening the “emotional distance” from the donor that some mothers wished for (Rubin et al., 2015). This is echoed by findings from a qualitative UK-based study, which found that some mothers represented the prospect of a known donor as contributing to a picture of “long-term insecurity” (Stuart-Smith et al., 2012). A slightly different perspective comes from a recent study of 23 donor egg recipients receiving treatment in several countries worldwide (Hudson, 2020). A minority of the mothers opting for anonymous donation did so due, in part, to a conviction that access to too much donor information prior to treatment would constitute a form of commercialised “baby shopping”, and therefore opted for anonymous donation on moral principle (Hudson, 2020, p. 354).

Alternatively, prospective parents may choose to use a known donor over anonymous donation. Some parents have reported feelings of trepidation when considering the unknown origins of an anonymous donor, instead finding access to plentiful donor information reassuring (Baetens et al., 2000; Winter & Daniluk, 2004). Other parents have indicated that sharing an emotional tie with the donor is a reassuring and stabilising factor (Laruelle et al., 2011). Information about the donor enables some mothers to develop a narrative about the donor that allows them to feel that they have a bond or relationship with them (Hudson, 2020). Rubin et al.’s (2015) qualitative study, designed to investigate how donor oocyte recipients relate to information about potential donors, found that based on the information provided to them, mothers would look out for signs of a connection with the donor in order to build a satisfying narrative about the donor. One mother described the process of learning certain information about a donor as facilitating a “magic connection” between them, which aided her in feeling like she’d selected the “right” donor (Rubin et al., 2015). Similarly, those opting for intra-family donation have cited the genetic and social connections between the mother and donor as a comforting feature, enhancing their feeling of connectedness to the child and increasing the feelings of kinship within the wider family network (Imrie et al., 2020; Greenfeld & Klock, 2004; Jadvá et al., 2011).

Little information exists about how these considerations about known and anonymous donation may apply to those treated with identity-release donor eggs. Identity-release donation may pose specific challenges to prospective parents as it could potentially combine the drawbacks of both anonymous and known donation. Identity-release donation may therefore represent an uncertain middle ground where parents must manage both the psychological and practical challenges of having very little information about the donor at time of treatment, alongside the knowledge of potential future donor-child contact (Imrie et al., 2019b).

A qualitative study of eleven women who had either received, or were waiting to receive, treatment in the UK with identity-release donor eggs found that some women felt that identity-release donation was preferable to known donation (Stuart-Smith et al., 2012). As identity-release donors are unknown to the children throughout childhood, identity-release donation was considered to pose less threat to the security of the mother-child relationship than known donation (Stuart-Smith et al., 2012). However, whereas for some, not knowing about the donor was seen as protective, the lack of information about the donor raised concerns for others. Some mothers were reported to experience feelings of “stranger anxiety”; that is, lack of information about the donor led to them “projecting their worst fears on to the blank screen of the unknown donor” (Stuart-Smith et al., 2012). The authors concluded that in the absence of information about the donor, there was a tendency for mothers’ perceptions of the donor to polarise, with some idealising, and others demonstrating extreme wariness of, the donor.

A multinational online survey of 108 egg donation families explored parents’ perspectives on open-identity versus anonymous donation (Blyth et al., 2013). Respondents fell into three donor types: open-identity donation, anonymous donation and anonymous donation due to no other option being available. When asked about their views regarding open-identity donation, 54.1% of those who had been given no choice but to use an anonymous donor, and 50% of those who had chosen an anonymous donor, wished they had been able to use an open-identity donor (Blyth et al., 2013). However, as the survey did not ask the same question of the open-identity group, no information is available about whether any open-identity donation parents would have preferred an anonymous donor. Given this omission, along with

the fact that the survey was advertised and distributed via the Donor Sibling Registry website and its affiliates, the sample is likely to be biased towards over-representing the views of parents who are most favourably disposed towards openness with regards to donor conception. Furthermore, the term 'open-identity' donation is used to refer to all non-anonymous donation models; it is therefore impossible to distinguish between parents' attitudes towards known and identity-release donation.

At the first phase of the current study, 85 egg donation mothers' perspectives on non-genetic motherhood were qualitatively analysed when children were aged between 6-18 months (Imrie et al., 2020). The study found that some mothers selected identity-release over known donation as a way of establishing more explicit boundaries between the donor and the family, and to minimise feelings of threat to the mother-child relationship. Having less information about the donor at time of treatment helped mothers to "fully own" the identity of being the child's parent. However, no information is available specifically regarding mothers' feelings towards the potential for future donor-child contact.

Data from studies of identity-release donor insemination families can be valuable in understanding parents' perspectives regarding identity-release donation. A US-based study of 129 lesbian mothers who used either anonymous, known or identity-release sperm donation showed that those who had opted for identity-release donation were most satisfied with their choice, as identity-release provided the opportunity to avoid potential involvement from a third person, whilst preserving their child's rights to access the donor's information in the future should they wish to (Gartrell et al., 2015). These data provide evidence for the perspective that identity-release donation represents not an uncertain, but instead a happy, middle ground between anonymous and known donation, though it must be noted that the sample comprised same-sex female couples, so the extent to which these findings may be applied to members of other family structures is unclear.

A US-based survey of lesbian couple, single mother, and heterosexual couple families created using identity-release sperm donation provided similar results: the main reason given for choosing identity-release donation was that it gave children the option of acquiring more information about the donor, with the majority of mothers from all groups endorsing the view

that identity-release was the “right” choice to make for their offspring (Scheib et al., 2003). However, lesbian and single mothers were significantly more likely to endorse this view than heterosexual couple mothers, suggesting that parents’ feelings about identity-release donation may vary according to family type, and that heterosexual couple mothers may be more hesitant about the prospect of future donor-child contact, possibly due to a desire to protect the security of the father-child relationship. A study of identity-release egg and sperm recipients found that most respondents gave neutral responses towards, or could not form an opinion about, whether future contact with the donor would be harmful to the child or family (Isaksson et al., 2011). The authors proposed that one interpretation of this result is that it suggests participants’ uncertainty about what to expect from future donor-child contact, though it is important to note that the authors’ suggestion is purely speculative. Qualitative analyses of identity-release sperm donation parents’ disclosure experiences by the same research group found that several parents raised the concern that disclosure of identity-release sperm donation would lead to their child questioning whether their father was their “real daddy” (Isaksson et al., 2016).

The potential for donor identifiability may also have negative implications for family functioning as the donor may be perceived as a more salient, ongoing presence in day-to-day life (Lampic et al., 2014; Scheib et al., 2000). This perceived presence has been theorised to potentially threaten the family unit, and, especially, to put pressure on the mother-child relationship in egg donation families due the absence of a genetic link between the mother and the child (Lampic et al., 2014). To date, no research has specifically addressed this question with identity-release egg donation samples.

A recent qualitative study of 23 parents whose adult offspring had obtained information about their sperm donor investigated parents’ thoughts and feelings about their children making contact with the donor (Widbom et al., 2021). The study described the different strategies parents used to manage the presence of the donor in their lives, by either positioning the donor at a distance, or acknowledging the donor as a person, or even as part of the family. Some parents, particularly fathers, maintained a distance between themselves and the donor, often avoiding conversations about, and communication with, the donor. Some fathers demonstrated comfort in discussing topics around sperm donation more

generally, but discomfort in discussing the donor as a person; the authors suggest this may reflect the absence of a genetic link between the father and child being perceived as a threat to some fathers when confronted with the reality of their child meeting their genetic progenitor. Conversely, some parents positioned the donor as a member of the family; some sperm donation mothers ascribed biopsychosocial roles to the donor, attributing certain aspects of their child's physical appearance or personality to the donor after learning more about him. These results suggest that, for sperm donation parents at least, the identity-release process can be experienced in a diversity of ways, from challenging the fathers' role as a parent, to representing a source of identity information about their child; however, the extent to which these findings may be applicable to egg donation parents remains to be seen.

Parents undergoing treatment with identity-release egg donation in the UK receive less information about the donor than in the US and other parts of the world; it is therefore possible that information about the donor may not be perceived as such a threat by UK-based parents. However, the potential for future donor-child contact inherent in treatment with identity-release gametes may still disrupt parents' efforts to achieve the requisite level of psychological or emotional distance from the donor (Imrie et al., 2020). Although no research currently exists regarding egg donation parents' thoughts and feelings the identity-release process, this perspective may be supported with findings from research with donor sperm recipients that suggests some parents deliberately disengage from donor information as a strategy to manage the psychological load of having needed to use donor gametes (Ehrensaft, 2008; Widbom et al., 2021; Zadeh et al., 2016). It is therefore conceivable that parents of identity-release egg donation children may feel discomfort due to the perceived proximity of the donor inherent in the identity-release structure; research is needed to directly address this question.

Disclosure of use of identity-release egg donation

Although two separate issues, identity-release donation and disclosure of donor conception are naturally bound together: a parent needs first to have told their child about their right to access donor information before the child can make a decision about whether or not to do so. It has been suggested that identity-release may therefore represent a threat to parents as

it adds a layer of complexity to parents' disclosure decisions and practises, even potentially leading to greater levels of secrecy rather than openness (English et al., 2002; Freeman et al., 2016). Disclosure of identity-release egg donation could pose a particular challenge to mothers, due to the double burden of the lack of a genetic link between the mother and child, and the fact that mothers have been found to be the parent most likely to take responsibility of disclosure in donor gamete families (Blake et al., 2010; Lycett et al., 2005; Paul & Berger, 2007). Parents' feelings about disclosure of identity-release egg donation are a particularly pertinent consideration during early childhood as, in the UK, clinics and regulatory bodies have assumed a pro-disclosure stance, encouraging parents to begin telling their children about their biological origins before children start primary school, around the age of four or five (HFEA, 2019a). A review examining the ethical implications of information sharing in the context of donor conception concluded that, although there is "patchy" evidence regarding the experiences of identity-release donation families, it will usually be better for children to be told of their donor conception "at an early age" (Nuffield Council on Bioethics, 2013). Therefore, although identity-release donation doesn't necessarily mean subsequent early disclosure, parents undergoing treatment with identity-release gametes do so surrounded by pro-disclosure messaging, the anticipation of which may put additional pressure on these parents as their children approach school age.

Studies of attitudes towards disclosure within anonymous egg donation families reflect a trend towards greater openness over the last two decades (Blake et al., 2010; Readings et al., 2011; Söderström-Anttila et al., 2010). Early studies of disclosure amongst identity-release donation families are not always indicative of high disclosure rates, with one Swedish study showing that the majority of identity-release sperm donation families had not disclosed up to 12 years after the introduction of identity-release legislation (Gottlieb et al., 2000). However, more recent studies suggest that identity-release donation is indeed associated with greater rates of disclosure; in a survey of 152 donor gamete recipient families, Isaksson et al. (2011) found that 90% of recipients endorsed the view that honesty with the child is important, and that the child has a right to information about their genetic origins. A later study from the same research group found that 78% of parents planned to tell, and 16% had begun to tell, their children about how they were conceived (Isaksson et al., 2012). Most of these parents planned to tell their children about all aspects of their donor conception, including details of

their right to access the donor's identifying information in the future; however, many of these parents were also unsure about when and how to begin the disclosure process. Therefore, although intention to disclose does not necessarily result in parents' subsequent disclosure (Applegarth et al., 2016), together these findings suggest a shift in attitudes towards openness about children's genetic origins in identity-release gamete donation families.

However, there is some subtle evidence that attitudes towards disclosure may impact functioning in these families. In a study of mixed egg and sperm recipient parents, Isaksson and colleagues (2012) found that couples who did not agree about what to tell their child about how they were conceived scored significantly lower on measures of couple relationship quality. A follow-up study found that incomplete couple agreement was not associated with increased levels of parenting stress, suggesting that couples' incomplete disclosure agreement may not directly not impact the parenting environment (Gebhardt et al., 2017). However, as the children were only aged 1-4 in this study, it is possible that the association between incomplete couple agreement on disclosure and parenting stress may change as children begin to grow older and parents begin to feel more pressure to begin the disclosure process. Rubin et al. (2015)'s qualitative study found that for some mothers, information about the donor that was perceived as valuable at the point of choosing a donor later took on a threatening aspect in the context of disclosure. For example, one mother expressed the view that, "When I talk to my children about the egg donation, the donor... I don't want them to think she's the best person in the world [laughs]. I am the best person in the world [laughs]." It is therefore possible that parents' feelings about disclosure of identity-release egg donation may become more negative as children grow older and develop the cognitive ability to understand their dual connection to their parents and to their donors.

Conclusions

Despite being the only alternative to known donation in the UK for fifteen years, the use of identity-release egg donation raises a number of questions which remain unanswered. It is unknown how parents experience their use of identity-release egg donation; nor is it known whether the use of an identity-release donor is perceived as an ongoing presence within family life. If the donor is indeed perceived as a threat, this may be particularly challenging

during early childhood, as it is the time at which parents are encouraged to begin the disclosure process. It is not known whether parents' disclosure behaviour is congruent with the advice given by clinic and regulatory bodies, or whether identity-release egg donation constitutes an extra layer of difficulty in what is already a complex process. As such, family functioning within identity-release egg donation families when children are in early childhood warrants further investigation.

1.2.2 The absence of a genetic link between mother and child

Concerns regarding the lack of a genetic link between the mother and the child stem principally from Western norms regarding traditional family formation. The concept of the 'nuclear' family was popularised as a universal social institution in the 20th century (Malinowski, 1930; Murdock, 1949); prevailing Euro-American family ideology subsequently defined the family unit as comprising two heterosexual parents with biologically related children (Baden, 2016; Fisher, 2003; Griel, 1991). Similarly, the assumed typical trajectory for most heterosexually coupled partners involves expectations of fertility and parenthood (Jennings et al., 2014).

It has been argued that over the last two decades, society has undergone a process of biomedicalization that has caused common understandings of kinship to become more and more geneticised (Clarke et al., 2010; Finkler, 2000; Lippman, 1991). It has been suggested that this is, in part, due to recent advances in assisted reproductive technologies, which have emphasised genetic relatedness, and have led to a cultural understanding of genetic kinship as relationships that are inherently "given" rather than developed over time (Carsten, 2004; Howell, 2003). Genetic relatedness has increasingly been a topic of public discourse, with some arguing that changes in UK legislation regarding donor anonymity constitute a geneticisation of the family (Turkمندag, 2012). Empirical data consistently shows a strong preference amongst Euro-American heterosexual participants for genetically related family formation over non-genetic routes to parenthood (Daniluk & Koert, 2012; Goldberg et al., 2009; Jennings et al., 2014).

The emphasis on genetic parenthood is compounded by the ideological context of pronatalism, which asserts biological parenthood to be normal and desirable, and a marker of normal gender development and psychological maturity (Morison et al., 2016; Parry, 2005a). Pronatalism is considered to be particularly harmful to women as it perpetuates the idea that women's primary social role is ultimately motherhood (Jordon & Revenson, 1999; Parry, 2005b). This is evidenced by findings that many women in contemporary Euro-American societies still experience pressure to conceive and raise children (Bartholomaeus & Riggs, 2017; Bodin et al., 2021; Moore, 2018). Further, society and cultural discourse frequently frame motherhood as central to feminine identity, with childless women being subsequently labelled pathological and incomplete (Freeark et al., 2005; Morell, 1994, 2000; Parry, 2005b). Studies of women who have used egg donation to conceive have revealed an inherent 'genetic thinking', whereby cognitions about genetic relatedness play out in mothers' conceptualisations of, and behaviour within, their families (Nordqvist, 2017; Nordqvist & Smart, 2014). For example, in emphasising the importance of their gestational relationships with their children, egg donation mothers have been described as renegotiating the 'genetic hegemony' in order to seek genetic/biological equality with their male partners in the relationship with their child (Finkler, 2000; Melhuus, 2012; Nordqvist, 2017). Women who experience infertility and subsequently pursue non-genetic motherhood therefore challenge dominant social expectations of biological/genetic motherhood, and the socially constructed importance of motherhood to women's identity development. These divergences from social norms have the potential to negatively impact the psychological wellbeing of mothers pursuing non-genetic motherhood.

The absence of a genetic link between mother and child: the adoption literature

Studies of families created via adoption comprise a vast body of literature within which non-genetic parenthood has been scrutinised. The outcomes for adoptive parents and children have been compared to those of non-adopted counterparts, and conclusions drawn from the results of these studies may be applicable to families created through other forms of non-genetic parenthood. Of course, comparisons between adoptive and egg donation families must be made with caution, as there are several key differences between them. Firstly, adopted children lack a genetic relationship with both parents, whereas egg donation children

share a genetic link with their fathers and a gestational link with their mothers. Secondly, unlike adopted children, egg donation children are born into the families that go on to raise them, without having to experience separation from their birth parents. However, adoptive and egg donation families are similar in that both egg donation and adoptive parents are likely to have experienced an extended period of infertility before starting their families. Consequently, both adoptive and egg donation parents are likely to be older than their spontaneously conceiving counterparts. Similarities can also be drawn when considering adoptive families' management of discussion about, and potential contact with, the child's birth family. In families that disclose their use of identifiable egg donation to their child, there must be a similar acknowledgement of the child's connection to both the family in which they were raised and to the donor, and a similar need to manage the psychological challenge that this dual connection may represent to all members of the family system, particularly given the potential for contact between the child and the donor. Thus, the adoption literature provides a useful framework within which to explore the potential impact of non-genetic parenthood in egg donation families.

Family functioning in adoptive families during early childhood

The body of research into family functioning in adoptive families is vast. Whilst the majority of adopted children are well adjusted, there is evidence to suggest that adopted children are at greater risk of adverse psychological outcomes, compared to their non-adopted counterparts. Studies utilising community samples have found that adoptive children are at greater risk of developing psychological issues, particularly those of an externalising nature such as conduct disorder, oppositional defiant disorder, and substance abuse (Palacios & Brodzinsky, 2010; Rosnati et al., 2008; Stams et al., 2000), although other studies have found no evidence for elevated risk of psychological problems in adopted samples (Borders et al., 1998; Singer et al., 1985). Studies using clinical samples have found that adopted children are more likely to access mental health services (Brand & Brinich, 1999; Brodzinsky et al., 1998) and to experience externalising behaviour problems (Fergusson et al., 1995), with similar results being found in several meta-analyses (Juffer & van IJzendoorn, 2005, 2007).

Together, these findings from the adoption literature suggest that non-genetic parenthood poses specific challenges to family functioning. However, it is important to note that the differences found between adopted and non-adopted groups are typically small in size (Holmgren et al., 2020; Juffer & van IJzendoorn, 2005). It is also possible that adopted children's relative over-representation amongst those accessing mental health services could be explained by adoptive parents' greater likelihood to seek support services for their children, or by adoptive parents' tendency to be more sensitive to, and actively report, changes in their children's behaviour (Hellerstedt et al., 2008; Stams et al., 2000).

Moreover, many of the studies that comprise this body of work utilise samples of children adopted at various ages. Children adopted during childhood, as opposed to infancy, may have experienced exposure to various risk factors at their birth home, or during their time in institutional care, which are known to have a negative impact on adopted children's later adjustment (Fisher, 2015; Pinderhughes, 1998). Research indicates that around three quarters of adopted children are exposed to abuse or neglect before they enter care (Anthony et al., 2019; Dance & Rushton, 2005; Selwyn, 2017). There exists a well-documented association between such aversive childhood experiences and a range of deleterious outcomes, including increased risk of chronic disease, autoimmune dysfunction, poorer mental health and poorer academic achievement (Jaffee & Christian, 2014; Metzler et al., 2017). As previously mentioned, a crucial difference between adopted and egg donation children is that the latter do not experience a period of pre-placement instability and are therefore at far less risk of being exposed to this broad complement of risk factors. In order to examine the family functioning outcomes unique to non-genetic parenthood, **l**over and above those associated with adverse childhood experiences, studies of child adjustment and functioning in families where children were adopted during infancy are, therefore, the most relevant in relation to the current sample.

Recent studies of parent psychological wellbeing during the transition to adoptive parenthood with early-adopted children demonstrate low rates of parental distress, with some suggesting that rates of psychological distress are lower amongst adoptive than biological parents (Bird et al., 2002; McKay et al., 2010; Palacios & Sánchez-Sandoval, 2006). One study found that couple relationship quality declined over the transition to adoptive

parenthood (Goldberg et al., 2010), but that this trajectory was similar to declines in couple relationship quality amongst non-adoptive couples during the early parenthood period (Cowan & Cowan, 1992). In their study of gay, lesbian, and heterosexual adoptive families, Goldberg & Garcia (2015) found low rates of relationship dissolution at five years post-adoption; moreover, couples who adopted a noninfant (≤ 3 months) were significantly more likely to have separated than those who had adopted an infant. Why infancy was defined as up to three months is unclear, as the majority of the adoption literature operationalises infant adoption as up to around eighteen months (McKay et al., 2010; Moore & Fombonne, 1999; Palacios & Sánchez-Sandoval, 2006). However, a similar result was found when child's age at adoption was analysed as a continuous variable, adding weight to the finding.

Early studies of child adjustment in early-adopted samples yield mixed results. Some studies suggest few differences exist between early-adopted and non-adopted children's functioning, findings of comparable levels of communication development, motor function and mental function in early-adopted and non-adopted infants (Plomin & DeFries, 1985; Thompson & Plomin, 1988). More recent studies have found early-adopted children's levels of externalising and internalising problems to be in line with, or lower than, population norms in toddlerhood (Farr et al., 2010; Goldberg & Smith, 2013), and well below clinical levels in middle childhood (Farr et al., 2019).

In contrast, Moore & Fombonne (1999) found that children adopted during infancy were at increased risk of externalising behaviours compared to their unassisted conception counterparts, and that child's age at adoption was not related to levels of psychopathology. In their birth cohort study of adoptive, single parent and two-parent families, Fergusson et al., (1995) found that, whilst early-adopted children did not differ from non-adopted children in levels of internalising problems, they did demonstrate significantly higher levels of externalising problems. Several studies have found that, whilst early adoptees tend to fare better than their late-adopted counterparts, they still experience elevated levels of adjustment problems relative to their nonadopted peers. Howard and colleagues (2004) found that levels of problem behaviours were highest amongst children adopted through the state welfare system (aged ≥ 6 years at adoption) and lowest amongst non-adopted children; levels of behaviour problems amongst children adopted during infancy were intermediary

between late-adopted and non-adopted children. A similar distinction has been found with early-adopted children's levels of attention problems and thought problems⁵ (Gunnar & Van Dulmen, 2007) and cognitive abilities in adulthood (Côté & Lalumière, 2020), such that levels of problems are higher amongst adopted samples than the non-adopted comparisons, but higher still amongst those who were adopted later in childhood. These findings suggest that, whilst early adoption may attenuate the association between adoption and poorer outcomes, children's adjustment in adoptive families may still be comparatively worse than in non-adopted families.

One possible explanation for these findings is that, despite their early adoption and subsequent reduced risk of being exposed to early adverse childhood experiences, 40-60% of adopted children in the UK are born to mothers who have struggled with substance misuse or abuse during pregnancy (Selwyn, 2017; Selwyn et al., 2010). This can lead to children's increased risk of internalising disorders, as well as developmental disorders such as ADHD (Selwyn, 2017; Gilbert et al., 2009). Moreover, maternal adverse experiences during pregnancy, such as domestic abuse, can result in chronic maternal stress, which has also been linked with children's increased risk of socio-emotional disorders, neurodevelopmental disorders and poorer cognitive functioning (Bowers et al., 2018; Fernald et al., 2013; Steele et al. 2015; Talge et al., 2007). It is therefore important to acknowledge that, whilst more informative than late-adopted samples, samples of early-adopted children remain an imperfect analogue for examining the effects of non-genetic parenthood via gamete donation.

Processes in adoption adjustment: Shared Fate Theory and the acknowledgement of difference

The focus in adoption research in recent years has turned to scrutinising the specific parenting cognitions and processes that might underlie individual differences in adoption adjustment (Lo & Cashen, 2020; Palacios & Brodzinsky, 2010). Much of this research has developed from Kirk (1964)'s early work on adoptive parenthood. Kirk argued that, as discussed above, there

⁵ As assessed by the Child Behaviour Check List (CBCL, Achenbach, 1991)

exist dominant cultural scripts that emphasise the centrality of biogenetic relatedness in society's understanding of what it means to be a parent. As these cultural scripts do not map onto the experiences of adoptive parents, Kirk argued that adoptive parents may experience "role handicaps", such that their inability to rely on these cultural scripts may hinder effective parenting and interfere with the development of a positive family environment (Kirk, 1964; Lo & Cashen, 2020).

Kirk subsequently posited that parents will react to these role handicaps in two ways: they will either reject the fact that their parenting experiences are different from those of biological families, or they will acknowledge these differences as a unique aspect of adoptive parenting. Parents who reject these differences might typically avoid reference to, or depersonalise, the child's birth parents, and might repress memories of the pre-adoption period. Conversely, parents' acknowledgement of these differences might entail actively engaging with their feelings about their infertility and the subsequent adoption, facilitating conversation about the adoption within the family, and displaying an empathetic attitude towards the child's birth family. Kirk conceptualised these strategies as two ends of a continuum of adoption-related behaviour and beliefs, and he argued that whereas rejecting the differences between adoptive and non-adoptive parenthood would hinder the development of a trusting and supportive family setting, embracing an acknowledgement stance would facilitate the development of a positive family environment (Kirk, 1964).

It has since been theorised that Kirk's acknowledgement/rejection of difference constitutes a specific parenting cognition that taps into parents' ability to take their child's perspective, and their capacity for attunement to their child's mental state (Lo & Cashen, 2020). Similarities have been drawn between acknowledgement of difference and other parenting cognition constructs such as mind-mindedness (Meins, 2013), parental insightfulness (Oppenheim & Koren-Karie, 2002), and parental reflective functioning (Rutherford et al., 2013), all of which refer to parents' mentalizing abilities and have been found to predict more optimal child outcomes (Koren-Karie et al., 2002; Meins et al., 2001; Slade et al., 2005).

Empirical studies testing this theory provide mixed, and sometimes surprising, results. Some studies have found parents' acknowledgement of difference to be related to poorer, rather

than more optimal, family outcomes (Kaye, 1990; Sobol, Delaney, & Earn, 1994). More recent evidence suggests a curvilinear relationship between parental acknowledgement of difference and family functioning, such that over-emphasis of adoption (known as insistence-of-difference (Brodzinsky, 1987)) is associated with poorer family functioning. Soares and colleagues (2017) found that high, but not moderate, levels of acknowledgement of difference were related to poorer parent-child adoption-related communication and poorer child emotion regulation. Conversely, one recent study found that parents' acknowledgment of differences in middle childhood positively predicted adolescents' perceptions of the parent-child attachment relationship as secure eight years later, particularly amongst adolescents who reported general discomfort in talking about adoption (Lo & Grotevant, 2020). It therefore appears that parents acknowledging, but not insisting upon, the differences between adoptive and non-adoptive parenthood (and, by extension, genetic and non-genetic parenthood) may be optimal for family functioning as children develop through childhood and into adolescence.

Processes in adoption adjustment: Adoption Communication Openness

A related, growing body of evidence in the adoption literature attests to the importance of the quality of adoption-related communication, particularly with regards to child outcomes (Brodzinsky, 2006; Brodzinsky, 2005; Kohler et al., 2002). However, the challenge of talking to their child about adoption can lead to feelings of discomfort and distress amongst adoptive parents (Barbosa-Ducharne & Soares, 2016), and can be a difficult task to begin, with many parents worrying about how and when to introduce the topic, and about the impact this may have on the parent-child relationship (Brodzinsky, 2011; Pinderhughes & Brodzinsky, 2019). To begin this process, adoptive parents must shift their efforts from integrating the child into their family (where they may be actively engaging in a rejection of difference strategy), to actively drawing attention to their child's membership to two families and thereby acknowledging the differences between adoptive and non-adoptive family making. In so doing, adoptive parents may be forced to accept that they may experience unique parenting challenges whilst also potentially confronting difficult memories from during the adoption process, including experiences of infertility and the fact that they lack a genetic connection with their child (Lo & Cashen, 2020). Thus, discussing adoption with their child constitutes a

complex and potentially difficult process, whereby adoptive parents are tasked with managing these feelings whilst simultaneously navigating the task of raising their adopted child.

The concept of Adoption Communicative Openness has been developed over the last two decades and constitutes the process of sharing adoption information with the adopted child and creating a safe, respectful environment in which adoption-related thoughts and feelings can be discussed in a developmentally appropriate manner (Pinderhughes & Brodzinsky, 2019).⁶ Communicative openness has been found to be a stronger and more consistent predictor of adopted children's adjustment than the extent of structural openness existing between children and their birth families (Brodzinsky, 2006). Further empirical support for the significance of Adoption Communication Openness in family functioning comes from a longitudinal study designed to examine the dynamics of relationships within adoptive family systems (Grotevant et al., 2013). The study found that satisfaction with, rather than existence or type of, contact with birth families predicted more optimal adjustment among adopted adolescents and young adults. Further, the study found that frequency of adoption-related communication within the adoptive family mediated associations between contact with birth mothers and positive adoptive identity during adolescence and young adulthood. This suggests that how parents and their children *make meaning of* their contact with birth families, rather than having contact *per se*, has important implications for family and child outcomes.

Adoption Communication Openness has consistently been found to be associated with the development of a secure adoptive identity and subsequent self-esteem (Hawkins et al., 2007; Le Mare & Audet, 2011; Skinner-Drawz et al., 2011). Open communication patterns have also been found to significantly relate to perceptions of secure parent-child attachment in young adults, which in turn were related to satisfaction with birth family contact (Farr et al., 2014). It has been theorised that when children are reared in a home environment in which they feel

⁶ Adoption communication openness has specifically been defined as “a willingness on the part of individuals to consider the meaning of adoption in their lives, to share that meaning with others to explore adoption related issues in the context of family life, to acknowledge and support the child's dual connection to two families, and perhaps facilitate contact between these two family systems in one form or another.” (Brodzinsky, 2005)

comfortable expressing their thoughts and feelings about their adoptive status, and when their unique adoption-related experiences are acknowledged, respected and supported by their parents, adopted children are likelier to internalise their adoption experience in a manner that reflects a positive self-concept (Pinderhughes & Brodzinsky, 2019).

There has been almost no research conducted regarding communication openness within donor conceived families. Rueter et al., (2016)'s study tested the hypothesis that the family communication context moderates the association between disclosure of IVF conception and parent-child relationship satisfaction. The study found that restricted communication patterns were directly related to poorer parent-child relationship satisfaction, and indirectly related to poorer child adjustment (Rueter et al., 2016). Although this study provides a glimpse into the role communication styles can play in family functioning, no information is provided about conception-specific communication, *per se*. The study's sample comprised children conceived using IVF, ICSI or IUI, only 17.8% of whom were donor conceived. As results are reported for the sample at large, no information can be extrapolated specifically to egg donation populations.

In a study of topic avoidance in families created using donor sperm, Paul & Berger (2007) found an inverse relationship between conception-specific topic avoidance and family functioning, such that increases in either mothers' or fathers' conception-specific topic avoidance predicted decreases in family functioning. The study further found that in families where parents took joint responsibility for disclosure, offspring reported higher levels of perceived family functioning than those from families in which disclosure was undertaken by one parent (Paul & Berger, 2007). This finding is particularly pertinent given that fathers tend to have less involvement in the disclosure process, particularly within egg donation families (Blake et al., 2010; Lycett et al., 2005).

Conclusions

There are obvious limitations in applying the findings of adoption research to egg donation samples. Egg donation families differ from adoptive families in several ways, chief amongst which is the fact that egg donation children are born into the families that will raise them and

so do not experience the process of separation from their birth families. Nevertheless, the adoption literature provides a useful framework within which to understand the complexities of parenting non-genetically related children in the context of a pronatalist society that values biogenetic relatedness. Like adoptive parents, egg donation parents may struggle to identify with the dominant cultural scripts that govern society's perception of what it means to be a parent, which may result in psychological distress and may disrupt their ability to parent. Egg donation mothers must also come to terms with their own infertility and confront their feelings about raising a non-genetically related child. Moreover, those who intend to disclose their use of an identifiable donor to their child must navigate how and when to do so, and in so doing must begin to acknowledge the ongoing presence of the donor in their family story. Developments in recent adoption research also demonstrate the mechanisms that may underlie differences in family functioning in adoptive families. Specific adoption-related parenting processes, such as the acknowledgement and rejection of difference and adoption-related communicative openness, more accurately predict family functioning outcomes than do specific structural differences. This may also be the case for egg donation families that have used an identifiable donor. These results further highlight the vital importance of examining the relationship between not only family functioning and family structure in identifiable egg donation families, but also that between family functioning and specific family processes within these families.

1.3 Processes in Family Functioning

This thesis draws upon two key theories that conceptualise the individual and the family as parts of a system: Family Systems Theory and Ecological Systems Theory. This section will outline the key principles of these theories, before providing an overview of the constructs that are considered important for optimal family functioning during early childhood.

Families as systems

As Parke (2002) notes, “models that limit examination of the effects of interaction patterns to only the father-child and mother-child dyads... are inadequate for understanding the impacts of social interaction patterns in families”. This perspective underlies the key tenet of Family Systems Theory (FST), namely that an individual can only be understood within the family context within which they were raised. The family system is conceptualised as a dynamic system which is characterised by wholeness, order, multidirectional influences and adaptive self-organisation (Bornstein & Sawyer, 2008; Vallacher & Nowak, 1994). The family system comprises interdependent subsystems, such as the marital relationship, parent-child relationships and sibling relationships, that function together as an organised whole (Golombok, 2002; Magnusson, 1998). As such, the family system has properties that cannot be reduced to its constituent parts (Cox & Paley, 2003). A Family Systems perspective emphasises the reciprocal nature of influences between different parts of the family system, such that changes in any one aspect of the system can lead to changes in others. For example, challenging child behaviour may put pressure on the marital relationship, which may lead to an increase in marital conflict. This may in turn impact parental wellbeing and lead to an increase in negative parenting styles, which may result in further challenging child behaviour, and so on. The above example highlights the circular, multidirectional nature of influences within the family system (Bell, 1968; Golombok, 2002).

Family systems also adaptively self-organise in the face of challenge or change (Cox & Paley, 2003; Bornstein & Sawyer, 2008). As each individual or subsystem within the family responds to novel situations, the family system adaptively and reciprocally self-organises, such that new structures, hierarchies, and patterns emerge (Cox & Paley, 2003; Minuchin, 1974).

Moreover, as families move from one stage of the family life-course to the next, equilibriums established during the previous stage are disturbed and subsequently must be re-established (Steinberg & Silk, 2002). This aspect of the family system emphasises the importance of examining child adjustment and family functioning at transitional points in family life, such as the transition to parenthood and children's transition to school (Bogartz, 1994; Bornstein & Sawyer, 2008).

Ecological Systems Theory (EST) overlaps with Family Systems Theory in that it places the individual within a dynamic system, but it extends the framework to examine the influences of factors beyond the immediate family system. EST is derived from Bronfenbrenner's early work on ecological systems, which encourages a perspective in which a child's development is influenced by broad factors such as society and culture (Bronfenbrenner & Morris, 1998; Crockenberg, 1988). EST places the child at the centre of four related systems that interact with each other. The first of these, the *microsystem*, refers to the individual's immediate surroundings, such as the family unit. Other microsystems could include school and child-care settings. As individuals spend time within, and therefore function within, multiple, interconnected systems, the *mesosystem* consists of the interactions between these various microsystems (Volling et al., 2019). The *exosystem* includes settings that may indirectly influence the child's environment, such as the parent's workplace, extended family networks and community support. Finally, the *macrosystem* constitutes the overarching structure and patterns of interaction between these three systems, thus reflecting the individual's specific socio-cultural context (Bronfenbrenner & Morris, 1998; Volling et al., 2019). This can include societal beliefs about family making and childrearing, legal structures, and socio-economic status (Volling et al., 2019).

Thus, Family Systems Theory and Ecological Systems Theory can be used in tandem to understand both the role of the immediate family system, and the roles of broader socio-cultural influences, in child adjustment and functioning within families created via identifiable egg donation.

Parent psychological wellbeing

From the perspective of the theoretical frameworks outlined above, parental psychological wellbeing can be considered a key factor that influences family functioning and child adjustment.

Depression

Maternal depression has consistently been found to be associated with children's increased behavioural, interpersonal and internalising problems (Connell & Goodman, 2002; Golombok, 2015; Kelley et al., 2017). The children of depressed parents are at elevated risk of being depressed themselves, as well as being more likely to suffer from other mental health issues such as panic disorders, substance abuse and phobias (Goodman et al., 2011; Weissman et al., 2006). With regards to the mother-child relationship, depressed mothers have been found to be less emotionally available and less sensitively attuned to their infant children (Easterbrooks et al., 2000; Murray et al., 1996), and also less responsive and more hostile in their interactions with them (Lovejoy et al., 2000; Zlochower & Cohn, 1996). These disruptions may impede the development of a secure emotional environment and, subsequently, a secure mother-child attachment relationship. Evidence in support of this comes from two meta-analyses exploring postnatal depression and mother-infant attachment quality, which found that postnatal depression was associated with an increased risk of insecure mother-infant attachment (Atkinson et al., 2000; Martins & Gaffan, 2000). As insecure mother-child attachment is known to be a risk factor for later child adjustment problems (Deklyen & Greenberg, 2008), this may be one mechanism by which maternal depression impacts child development.

Paternal depression has also been found to relate to several child outcomes. A recent meta-analysis found that paternal depression was associated with an increased risk of child internalising and externalising problems in childhood and through to adolescence, although the strengths of these associations were moderated by interpersonal factors such as paternal hostility, involvement and negative expressiveness (Sweeney & MacBeth, 2016). Paternal depression also has long-term implications for child adjustment, with paternal postnatal

depression having been found to relate to poorer child language development at age two years and child behaviour problems at age three (Paulson et al., 2009; Ramchandani et al., 2005).

From a developmental perspective, one mechanism proposed to explain the association between parental depression and poorer child outcomes is that depressed parents participate in less optimal parenting practises, which in turn impact child adjustment. This explanation is supported by findings from a meta-analysis showing a consistent relationship between parental depression and both observed and self-reported negative parenting behaviours in both mothers and fathers (Lovejoy et al., 2000; Wilson & Durbin, 2010). Parental depression may also influence parents' ability to effectively set boundaries for their children; in disciplining their children, depressed parents have been found to either be overly permissive or overly authoritarian and to vacillate between the two approaches (Kochanska et al., 1987), both of which are associated with less optimal child adjustment and family functioning (Simons & Conger, 2007).

Maternal and paternal depression have been found to co-occur throughout the perinatal period (Paulson & Bazemore, 2010; Thiel et al., 2020). In addition, co-occurring parental depression in the perinatal period has been found to be associated with an increased risk of internalising behaviours in children at ages two and three, after controlling for sociodemographic risk and protective factors (Letourneau et al., 2019). These findings suggest that some children may be at particular risk of later developmental and adjustment problems, and further highlight the usefulness of approaching the family as a dynamic system in understanding the role of parental mental health in family functioning.

Anxiety

Historically, research into parental psychological wellbeing has focused primarily on parental depression. However, a growing body of research has come to investigate the role of anxiety in parental psychological wellbeing and family functioning. Mothers typically report higher levels of anxiety than fathers (Möller et al., 2015); consistent with this, most parental anxiety research focuses on mothers, despite evidence that suggests anxiety may be a more common

response to the transition to fatherhood than depression (Matthey et al., 2001). Depression and anxiety are known to frequently co-occur, with comorbidity indicating greater severity of psychological distress (Andrews et al., 2000; Gorman, 1996; Schoevers et al., 2003).

Maternal anxiety has been found to have long-term implications for child development and adjustment. A systematic review of maternal postnatal anxiety found that maternal anxiety had adverse effects on child physiological and psychological outcomes (Glasheen et al., 2010). Maternal antenatal anxiety has been found to be associated with an increased risk of child emotional problems and conduct problems at age four, and decreased social competence at age five (Barnett et al., 1991; O'Connor et al., 2002). Although research tends to focus on parental anxiety during the perinatal period, there is evidence to suggest that maternal anxiety during early childhood is also related to increased child internalising and externalising symptomatology (Hentges et al., 2020). Children of anxious parents are also significantly more likely to be anxious themselves (Beidel & Turner, 1997; Burnstein & Ginsburg, 2010; Lieb et al., 2000).

Studies of paternal anxiety show similar associations with later child outcomes, including increased child anxiety symptomatology (Bögels & Phares, 2008). Fathers with elevated anxiety have been found to practise more controlling parenting behaviours (Bögels et al., 2008; Teetsel et al., 2014). Correspondingly, anxious mothers have also been found to engage in harsher discipline practises and to be more controlling and overprotective in their parenting (McLeod et al., 2007; Teetsel et al., 2014). These findings are consistent with theories explaining the intergenerational transmission of anxiety whereby anxious parents perceive higher levels of threat from the environment and subsequently communicate this to their children during the early developmental period. Together, these parenting practises may increase children's levels of anxiety later in life (de Rosnay et al., 2006; McLeod et al., 2007; Murray et al., 2007). Moreover, some evidence exists to suggest that maternal parenting behaviours mediate the association between paternal and child anxiety: in families where fathers are anxious, mother have been found to be less encouraging of their toddler's autonomy (Gibler et al., 2018). Evidence such as this demonstrates how one subsystem of the family can influence another, and resultantly alter the quality of family functioning.

Parenting stress

Parenting stress, defined as “the aversive reaction to the demands of being a parent” (Deater-Deckard, 1998), is thought to be a universal feature of parenthood, with most parents experiencing parenting stress to a lesser or greater degree (Crnic, & Greenberg, 1990). However, how parents respond to this stress has implications for family functioning; parenting stress has been found to be associated with the quality of the parent-child relationship, child adjustment and adult psychological functioning. For example, parents high in parenting stress have been found to be more critical of, and behave more harshly towards, their children, and to be more demanding and less responsive in their parenting styles and communication with their children (Abidin, 1990a; Belsky et al., 1996; Deater-Deckard & Scarr, 1996; Webster-Stratton, 1990). Parenting stress has consistently been found to contribute to child adjustment problems, particularly externalising problems (Barry et al., 2005; Dennis et al., 2018). It is important to note that, in line with a Family Systems perspective, this relationship has been found to operate in a circular manner, with problematic child behaviour leading to increased parenting stress, which in turn leads to increases in challenging child behaviours, and so on (Neece et al., 2012; Webster-Stratton, 1990).

Parenting stress can also influence family functioning via its interaction with other facets of parental mental health (Gelfand et al., 1992; Leigh & Milgrom, 2008; Misri et al., 2010; Thomason et al., 2014). For example, maternal stress at three months has been found to predict maternal depressive symptoms at fourteen months (Thomason et al., 2014); further, Leigh & Milgrom (2008) found postnatal depression to be the only predictor of later maternal parenting stress and that it also mediated other risk factors found to be associated with maternal parenting stress. These results suggest a reciprocal relationship between parenting stress and maternal depression, such that each contributes to the other. Parenting stress has also been found to mediate associations found between parental depression and harsh parenting (Choi & Becher, 2019), and between maternal mental health and child psychopathology, including internalising and externalising problems (Weijers et al., 2018).

Social support

The availability of emotional and social support is increasingly being identified as a key factor in an individual's ability to cope with parenting stress (Cohen & Wills, 1985), with parents who perceive higher levels of social support from their friends and family reporting lower levels of parenting stress (Abidin & Brunner, 1995; Deater-Deckard, 1998). Higher levels of social support have also been found to be associated with more optimal parenting behaviours in both mothers and fathers. Mothers who receive more social support have been found to offer more stimulation to their infants (Adamakos et al., 1986); correspondingly, a study of single fathers following divorce found fathers who had higher levels of perceived social support to be more involved with their children (Castillo & Sarver, 2012).

It has been suggested that both instrumental and emotional support from a partner are important; mothers' satisfaction with the division of household labour has been found to relate to marital satisfaction and parenting stress (Bianchi et al., 2000; Dew & Bradford-Wilcox, 2011), while parents who perceive less partner support and who are unhappy in their relationship with their partner have been found to report higher levels of psychological distress (Deater-Deckard & Scarr, 1996). The same study also found parents' levels of parenting stress to correlate with each other, suggesting that the buffering effect of social support may be particularly important for family functioning across the family system.

Resilience

Although there is continuing debate regarding how best to conceptualise resilience, it can be broadly understood as a dynamic process allowing individuals to 'bounce back' from adversity or change (Leys et al., 2020; Garcia-Dia et al., 2013). Although some researchers operationalise resilience as a personality trait specific to the individual (e.g. Block & Block, 2006), more contemporary accounts of the concept emphasise the context-bound nature of resilience, in that an individual's ability to cope with stressors is likely to vary depending on the timing, nature and severity of the stressors, along with the availability of support within their larger social environment (Lock et al., 2019; Lui et al., 2020).

Resilience has been found to relate to a number of psychological processes implicated in family functioning. Levels of resilience have been found to positively correlate with individuals' emotional stability (Friborg et al., 2005) and with positive affect (Lu et al., 2014), whilst negatively correlating with levels of depression and anxiety (Foisson et al., 2013). Resilience has also been found to mediate associations between levels of family cohesion and depression in certain populations (e.g. Nam et al., 2016).

Stressors that are likely to uniquely impact egg donation families include the experiences of infertility and fertility treatment, both of which have been identified as highly stressful experiences for both women and men (Greil et al, 2011; Peronace et al., 2007). In addition to this, experienced or perceived stigma around non-genetic parenthood, particularly for mothers embedded within a pronatalist cultural context, may expose some egg donation parents to minority stress, which places them at risk for mental health problems (Meyer, 2007; Williams & Mann, 2017).⁷ Whilst no research has been conducted with egg donation samples from a minority stress perspective, studies of other minority groups have found resilience to be a key protective factor in the relationship between perceived stigma and mental health outcomes (Scandurra et al., 2017; Dunn et al., 2014). Scrutinising egg donation parents' levels of resilience may therefore provide insight into how families manage the potential stressors that may be unique to egg donation parenthood.

Couple relationship quality

There is a substantial body of literature linking the quality of the couple relationship and child adjustment. In line with a Family Systems perspective, studies have found that the quality of the couple relationship and parent-child relationship quality are interdependent (Cox et al., 2001; Goldberg & Carlson, 2014; Grych, 2002). Attachment Theory, too, places the couple relationship at the centre of family functioning (Rothbaum et al., 2002). In two-parent families, positive couple functioning has been found to relate to secure parent-infant attachment, whilst high levels of couple conflict are associated with insecure attachment in

⁷ The Minority Stress model stems from sexual minority health research, and can be described as “the relationship between minority and dominant values, and the resultant conflict with the social environment experienced by minority group members” (Denato, 2012).

infancy, particularly amongst father-child dyads (Belsky & Fearon, 2008; Frosch et al., 2000; Owen & Cox, 1997).

Couple conflict is particularly implicated in the development of child adjustment problems. High levels of couple conflict have consistently been found to relate to an increased likelihood of child internalising and externalising problems, sleep problems, delinquency, problematic peer relations and poorer academic performance (Cummings & Davies, 2010; El-Sheikh & Whitson, 2006; Fincham et al., 1994; Reynolds et al., Harold, 2014). It has been shown that high levels of couple conflict have a direct effect on the child, as witnessing parental conflict is associated with increased psychological distress, particularly if the conflict becomes violent or when the child is the subject of parental arguments (Cummings et al., 2009; Grych & Fincham, 1990; Katz & Woodin, 2002). There is also evidence for an indirect effect of parental conflict on child outcomes. Harold & Conger (1997)'s longitudinal study of young adolescents found that parents who were more hostile towards each other were also more hostile towards their children, with levels of parental hostility towards the child predicting later internalising and externalising problems in early adolescence.

Another mechanism proposed to explain the impact of couple conflict on child outcomes is the Emotional Security hypothesis (Cummings & Davies, 1994, 2010), whereby destructive couple conflict threatens the child's sense that they can feel emotionally safe within the family unit, which may jeopardise the security of the child's attachment to their parents (Cummings & Davies, 2010). Correspondingly, high levels of couple conflict may limit a parent's ability to be emotionally and physically available to the child, which may leave the child without a source of support and stress relief (Bornstein & Sawyer, 2008). This is particularly pertinent during the transition to school, as school-aged children rely on their parents to guide and manage their social functioning (Barth & Parke, 1993; Parke et al., 1988).

It is worth noting that, as conflictual parental relationships are associated with child maladjustment, so too is harmonious couple functioning related to more optimal child outcomes. Parents with higher levels of relationship satisfaction demonstrate more parental engagement with their children (Carlson et al., 2011; Ratcliffe et al., 2016). In addition, parents' greater support of, and communication with, each other has been found to relate to

lower levels of child behavioural problems (Goldberg & Carlson, 2014; Schoppe-Sullivan et al., 2009). It has been suggested that more optimal couple functioning is related to greater parental psychological wellbeing; parents resultingly participate in more positive and engaged parenting practises, which has positive implications for children (Lamb, 2012).

The quality of the parent-child relationship

The quality of the parent-child relationship is a fundamental aspect of family functioning, and has principally been studied within the framework of Attachment Theory (Bowlby, 1969). Attachment relationships describe the proximity-seeking behaviours of infants to their caregivers when feeling distressed, afraid, or in need of emotional support (Bowlby, 1969). The infant will seek to use the caregiver as a secure base from which to explore the world around them, and as a safe haven to return to in times of fear of distress (Ainsworth, 1967; Bowlby, 1969, 1982). An infant's early interactions lead them to form a set of expectations about how the caregiver is likely to respond to them; these experience-based mental representations, termed by Bowlby as "internal working models", guide the developing child's expectations of how the specific caregiver may be expected to behave, whilst also providing a framework for what to expect from relationships more broadly (Bowlby, 1969, 1982; Main et al., 1985)

Attachment relationships can be classified as either secure or insecure, with each classification representing the infant's perception of the caregiver's emotional and physical availability when support is needed (Ainsworth, 1972; Ainsworth et al., 1978; Bowlby, 1973). A securely attached child can rely on the caregiver to be available and promptly responsive and can subsequently explore the world around them with confidence. Conversely, an insecurely attached child has not had a history of care in which they have experienced a consistent, comforting and responsive caregiver; they are therefore less able to confidently navigate their environment, and have developed internal working models of their caregiver as unavailable or ineffective in times of distress. A final attachment classification, disorganised attachment, was proposed by Main & Solomon (1990), and refers to situations in which the infant is unable to develop a consistent attachment strategy with regards to the caregiver. In two-parent families, infants form attachment relationships with both parents

(Bretherton, 2010; Fox et al., 1991; Lamb & Lewis, 2010); meta-analyses show that infant attachment security can vary from parent to parent and is therefore relationship-specific rather than infant-specific (Sroufe, 1985; van IJzendoorn & De Wolff, 1997).

Secure attachment has consistently been found to be associated with more optimal child outcomes, including more positive peer relations (Groh et al., 2017; Schneider et al., 2001; Youngblade & Belsky, 1992), better emotion regulation (Kochanska, 2001) and a lower risk of externalising problems (Belsky & Cassidy, 1994; Fearon et al., 2010; Suess et al., 1992). In contrast, insecure and disorganised attachment have been identified as risk factors for later externalising (Fearon et al., 2010) and internalising (Brumariu & Kerns, 2010; Groh et al., 2014) problems. Children's internal working models are also believed to govern their self-representations; securely attached children are more likely to view themselves as worthy of love and care, whilst insecurely attached children are more likely to have a negative self-concept and to view the world as insensitive and unpredictable (Bowlby, 1969; 1982). A study of school-aged children found that children assessed as securely attached at age four had a more positive self-concept at age five, and they were more consistent in their self-perceptions over time (Goodvin et al., 2008).

Attachment research has increasingly examined the specific parenting constructs that underlie attachment security. Maternal sensitivity has been identified as highly important for the development of secure mother-infant attachment relationships (Ainsworth et al., 1974; van IJzendoorn & De Wolff, 1997; Verhage et al., 2016). Parental sensitivity refers to the caregiver's ability to perceive and accurately interpret the communications and signals implicit in the infant's behaviour (Ainsworth et al., 1974). Significant associations have been found between maternal sensitivity and secure infant attachment, with meta-analyses suggesting an important causal role for maternal sensitivity in attachment security (Atkinson et al., 2005; Bakermans-Kranenburg et al., 2003; Verhage et al., 2016). This association has been found to hold over a range of cultural contexts (Belsky & Fearon, 2008). Maternal sensitivity has been found to relate to several positive child outcomes, including the absence of anxious behaviour in toddlerhood (Crockenberg & Leerkes, 2006), infants' more optimal adaptive emotion regulation (Haley & Stansbury, 2003), and more secure attachment representations in early adulthood (Schoenmaker et al., 2015).

Evidence for the role of paternal sensitivity in attachment security is less consistent, with studies showing a weaker effect for paternal than maternal sensitivity (Lucassen et al., 2011; van IJzendoorn & De Wolff, 1997). Research suggests that factors such as fathers' positive parenting behaviours (Brown et al., 2007), paternal joy in parenting (Brown & Cox, 2019), and paternal engagement in stimulating play (Olsavsky et al., 2019) may be more important for the development of secure father-infant attachment relationships.

Attachment research has also increasingly examined the role maternal representations of the mother-infant relationship may play in the development of secure attachment relationships. It has been theorised that all behavioural systems are guided by specific cognitions and that, just as infants develop internal working models of their caregivers, new parents also develop representations of their infant, themselves and of the caregiving relationship (Bowlby, 1969, 1982). These representations constitute a specific set of expectations about how the child will interact with the parent, and how they as the parent will interact with their child (Slade et al., 1999). Maternal representations of the mother-child relationship have been found to be influenced by several factors, including their own attachment relationships with their caregivers, mothers' psychological health, and experiences of traumatic life events (Slade et al., 1999; Huth-Bocks et al., 2004; Pajulo et al., 2004; Madigan et al., 2007). Thus, parents' own internal working models of their child and the caregiving relationship may influence how they will behave within the attachment relationship, which may influence the extent to which a secure attachment relationship may be formed (George & Solomon, 1996; Steele & Steele, 2013).

Empirical work testing this theory attests to the centrality of maternal representations of the mother-child relationship to attachment security and optimal child adjustment. Maternal representations of the mother-child relationship have been found to relate to attachment security in non-clinical (Solomon & George, 1999; Zeanah et al., 1994) and clinical (Cox et al., 2000) samples. Mothers' balanced representations of the mother-child relationship have been found to be associated with more positive mother-child interactions (Korja et al., 2010; Sokolowski et al., 2007), whilst maternal representations that are high in anger have been found to be associated with mothers' less sensitive responding (Slade et al., 1999). There is

also evidence for the influence of maternal representations on infant behavioural outcomes, with infants of mothers with balanced representations demonstrating significantly more positive emotion regulation than infants of mothers with disengaged or distorted representations of the child, during the Still Face procedure (Rosenblum et al., 2002). These findings emphasise the importance of not only observing parental behaviours, but also assessing parental cognitions, when exploring the quality of the parent-child relationship from an Attachment Theory perspective.

Parental warmth is another aspect of the parent-child relationship that has received much attention from researchers. Parental warmth refers to expressions of affection within the parent-child dyad, and is typically measured by the verbalisations and behaviours adopted by parents (e.g. kissing, hugging, verbal statements of love and acceptance) in order to signify feelings of warmth (Rohner et al., 2012). Children raised in households high in warmth and acceptance have consistently been found to show more optimal adjustment, across a variety of cultures and family structures (Chen et al., 2000; Davidov & Grusec, 2006; Fine et al., 1993; Khaleque & Rohner, 2002). Findings regarding parental warmth fit into broader parenting frameworks, wherein the combination of high warmth and the setting of clear, consistent boundaries is related to the most optimal child outcomes and positive family functioning (Baumrind, 1971; Maccoby & Martin, 1982; Steinberg et al., 2006; Steinberg et al., 1991). Conversely, parenting styles characterised by low warmth and high levels of behavioural control have been associated with children's higher levels of internalising problems, lower levels of self-esteem and poorer social skills (Fletcher et al., 2008; Martinez & Garcia, 2007; O'Reilly & Peterson, 2014; Rudy & Grusec, 2006).

In line with Family Systems Theory, research into parent-child relationship quality has increasingly emphasised the bidirectional nature of the parent-child relationship, and that the communicative characteristics of each half of the dyad will influence the other (Kochanska & Aksan, 2004; Kochanska & Kim, 2014). Interactions that are mutually warm, synchronous, coherent, and co-operative are demonstrative of what has been termed "dyadic mutuality" (Deater-Deckard & Petrill, 2004). Dyadic mutuality has been proposed to consist of four observable components, namely the parent's and the child's responsiveness to each other, co-operative behaviours between the parent and child, and reciprocity (i.e. joint mutual

positive affect such as instances of eye contact and smiling between the dyad) (Deater-Deckard & Petrill, 2004). This operationalisation of dyadic mutuality allows for the examination of parent-child relationship quality through behavioural assessments on each of the above dimensions; parent-child relationships that are high in dyadic mutuality have been found to be associated with more optimal parenting behaviours (Kochanska, 1997) and a range of positive outcomes amongst school aged children, including lower levels of externalising problems (Deater-Deckard & Petrill, 2004; Harrist et al., 1994; Harrist & Waugh, 2002).

Relevance for egg donation families

Egg donation parents may be particularly vulnerable to psychological difficulties when children are in early childhood for several reasons. Concerns and anxieties about use of an identifiable egg donor may be particularly salient for parents when children are aged five, as this is the age by which families are advised to have begun disclosing their use of gamete donation to their child. Those who are undecided, or plan not to tell, may experience heightened anxiety (Karpel, 1980). Studies have found that topic avoidance can have negative implications for family functioning (Paul & Berger 2007), and that maintaining secrecy in social situations requires constant vigilance which may prove to be a significant drain on psychological resources (Smart & Wegner, 2000).

Conversely, for those that have decided to disclose, there may be concerns about how and when to do so, and whether it will have an impact on the parent-child relationship. This may be particularly pronounced for egg donation mothers, who bear the dual burden of lacking a genetic link with their child and being likely to be the parent taking primary responsibility for disclosure (Blake et al., 2010). Disclosure of egg donation requires a shift towards acknowledging the donor's presence and their role in the family's story. This process may reawaken egg donation parents' memories of infertility and the fertility treatment process, and remind egg donation mothers that they lack a genetic link with their child. This is particularly pertinent for those who have used identifiable egg donation; disclosure of egg donation in the context of potential future donor-child contact may invoke the donor and make the donor feel like a salient, ongoing presence in family life. These factors, in

combination, may negatively influence maternal representations of themselves, the child, and the mother-child relationship, and, consequently, the affective quality of their relationship with their child.

1.4 Family functioning and child adjustment in egg donation families

The study of family functioning and child adjustment in egg donation families is still relatively underrepresented in the assisted reproduction literature, with data coming principally from two longitudinal studies. The European Study of Assisted Reproduction Families examined family functioning in families created through egg donation, sperm donation, IVF, and adoption when children were aged 3-8 years (Golombok et al., 1999), and again at 12 years (Murray et al., 2006). Children in this study were born during the 1980s. The UK Longitudinal Study of Reproductive Donation Families began at the millennium, and explored functioning within families created using egg donation, sperm donation, surrogacy, and unassisted conception when the children were aged one, two, three, seven, ten and fourteen years (Golombok et al., 2004; 2005; 2006; 2011; 2013; Blake et al., 2014a, 2014b; Golombok et al., 2017). Both studies focused on families created through anonymous gamete donation⁸.

Evidence from anonymous and known donation samples

Parental psychological health

The European Study of Assisted Reproduction Families found egg donation parents to be psychologically well adjusted with regards to depression, anxiety, parenting stress and relationship quality at both phases (Golombok et al., 1999; Murray et al., 2006). At phase one, egg donation mothers reported significantly higher levels of satisfaction with their relationship with their partner than IVF and sperm donation mothers, and egg donation parents reported significantly lower levels of parenting stress than sperm donation and IVF parents (Golombok et al., 1999). At phase two, egg donation mothers rated their partners as significantly less reliable in their parenting support than IVF mothers, and reported their partners as taking significantly less of the parenting load than did sperm donation or IVF mothers, although no group differences were found on overall relationship satisfaction (Murray et al., 2006).

⁸ Eighty-six percent of families in the European Study of Assisted Reproduction Families (Golombok et al., 1999) and 71% of families in the UK Longitudinal Study of Reproductive Donation Families (Golombok et al., 2004) had used anonymous donors. The remainder of families had used known egg donors.

Similarly, the UK Longitudinal Study of Reproductive Donation Families found egg donation parents to be psychologically well adjusted. No differences in maternal psychological wellbeing were found at any phase of the study (Golombok et al., 2004, 2005, 2006, 2011, 2013; Blake et al., 2014; Golombok et al., 2017). When children were aged seven, egg donation fathers reported higher levels of parenting stress than sperm donor fathers, though this was at a similar level to unassisted conception fathers (Casey et al., 2013). No group differences were found in paternal depression, anxiety, or couple relationship quality.

Quality of parent-child relationships

Egg donation families were found to demonstrate high-quality parent-child relationship functioning at both phases of the European Study of Assisted Reproduction Families. Egg donation mothers were found to express significantly more warmth than sperm donation and adoptive mothers when the children were aged six, with no group differences in levels of parental emotional over-involvement, the quality of mother-child interaction or the quality of father-child interaction (Golombok et al., 1999). However, egg donation mothers were found to respond less sensitively to their children than sperm donation mothers at age 12, though did so at similar levels to IVF mothers (Murray et al., 2006).

Findings from the first three phases of the UK Longitudinal Study of Reproductive Donation Families demonstrated good parent-child relationship quality in egg donation families relative to sperm donation and unassisted conception families, with egg donation mothers showing high levels of warmth, joy in parenting, and interaction quality with their child during infancy and toddlerhood⁹ (Golombok et al., 2004; Golombok et al., 2005; Golombok et al., 2006). Egg donation fathers were also found to show high levels of emotional involvement with their children during infancy (Golombok et al. 2004). However, at age seven, when egg donation and sperm donation families were analysed together in one 'gamete donation' group, gamete donation mothers demonstrated lower levels of positivity and poorer observed interaction

⁹ Constructs assessed using a standardised interview at phases one and three (Quinton & Rutter, 1988). Constructs assessed using the Parent Development Interview at phase two (Aber et al., 1985; Slade et al., 1999)

quality than unassisted conception mothers¹⁰ (Golombok et al., 2011). When gamete donation families were compared to unassisted conception families according to whether or not they had disclosed the method of conception to their child, the differences in maternal positivity and interaction quality appeared to be largely explained by less optimal scores amongst the non-disclosing group. The authors suggested that secrecy around the child's method of conception may have negatively influenced mother-child interaction quality in families that had not informed their children of the way they were conceived (Golombok et al. 2011).

Children's perspectives of the parent-child relationship were examined at ages seven and ten (Blake et al., 2014b). Interview assessments of parent-child relationship quality found no differences in egg donation parents' warmth, availability or shared interests and activities, compared with families created by sperm donation and unassisted conception. However, whereas children in unassisted conception families reported a significant decline in shared interests and activities with their mother between the ages of seven and ten, children in egg donation families reported a consistently high level of shared activities with their mother over time.

At age fourteen, egg donation mothers and adolescents independently reported less positive mother-child relationship quality than sperm donation mothers and adolescents¹¹, and egg donation mothers reported lower levels of acceptance of their children than did sperm donation mothers (Golombok et al., 2017). It must be noted that scores in the egg donation group indicated high levels of family functioning; nonetheless, egg donation families' scores were significantly lower than those of both sperm donation and unassisted conception families (Golombok et al., 2017). No data regarding the father-adolescent relationship were available at this phase.

Child adjustment

¹⁰ Assessed using standardised interview (Quinton & Rutter, 1988) and the Parent-Child Interaction System (PARCHISY, Deater-Deckard & O'Connor, 2000; Deater-Deckard & Petrill, 2004)

¹¹ Assessed using the Index of Family Relationships (Hudson, 1989)

A UK survey of 769 families examined five- to nine-year-old children's psychological wellbeing in families that had used own-gamete IVF, sperm donation, egg donation, embryo donation or gestational surrogacy to conceive (Shelton et al., 2009). The survey found that egg donation fathers reported significantly higher levels of conduct problems in their children than did own-gamete IVF and sperm donation fathers. Mothers' reports of conduct problems did not differ between groups and there were no group differences found on mothers' or fathers' reports of their children's levels of depression, anxiety, peer problems, or prosocial behaviour. It must be noted that although higher levels of conduct problems were reported in the egg donation group, these were no higher than British norms (Shelton et al., 2009). Moreover, as this study relied solely on survey data from parents, and as the authors report a low internal consistency ($\alpha = 0.54$) for the conduct problem subscale, these results should be interpreted with caution.

The European Study of Assisted Reproduction Families found egg donation children to be well-adjusted regarding behavioural, emotional, social, and cognitive development at both phases of the study (Golombok et al., 1999; Murray et al., 2006). The UK Longitudinal Study of Reproductive Donation Families also found egg donation children to be well adjusted at all phases. No differences were found between family types in children's temperament or psychological adjustment at ages 2, 3, 7, 10 or 14 years (Golombok et al., 2005, 2006, 2011, 2013, 2017).

Conclusions

Evidence from studies of anonymous egg donation families suggest good overall family functioning, particularly with regards to parental psychological wellbeing and child adjustment. The quality of the parent-child relationships in these families also appears to be good, although the UK Longitudinal Study of Reproductive Donation Families provides some evidence to suggest a decline in mother-child relationship quality in egg donation families over time. However, as egg donation and sperm donation families were analysed together when children were in middle childhood, it is not known to what extent these findings apply specifically to the egg donation families amongst the sample. Moreover, as the majority of participants in these studies had used anonymous donation, the extent to which the

challenges specific to the use of an identifiable donor may impact family functioning is also unknown. The adjustment of members of families created this way therefore warrants further empirical study.

Evidence from identity-release egg donation samples

Data on family functioning in identity-release egg donation families is available from just three studies: one Swedish (Sydsjö et al., 2014), one Finnish (Sälevaara et al., 2018), and the first phase of the current study (Imrie et al., 2019a, 2019b, 2020). Sydsjö et al.'s. (2014) study of 104 donor egg recipient couples assessed the parental relationship quality at time of treatment and 2-5 years after treatment was concluded. Assessments were made via standardised questionnaire. At both phases, egg donation mothers' levels of satisfaction with couple communication, conflict resolution, financial management, leisure activities and parenting were significantly higher than those of a comparison group of IVF mothers. Egg donation fathers also reported significantly higher levels of satisfaction with couple communication than IVF fathers.

These results suggest that conceiving a child via identity-release egg donation does not have a negative effect on couples' perceptions of their relationship with their partner when their children are in early childhood. It has been theorised that the experience of fertility treatment may have the effect of strengthening the bond between couples; early studies of donor gamete families report the experience of undergoing fertility treatment bringing couples closer together and improving their relationship satisfaction (Applegarth et al., 1995; Leeton & Blackwell, 1982). Similar effects have been observed in families using identity-release sperm donation and own-gamete IVF, with the experience of fertility treatment reportedly strengthening subsequent psychological resilience and positively impacting open husband-wife communication (Pasch et al., 2002; Repokari et al., 2007; Sydsjö et al., 2014b).

A recent Finnish study compared mental health outcomes in identity-release egg donation, own-gamete IVF, and unassisted conception parents (Salevaara et al., 2018). Questionnaire measures of depression, anxiety, social dysfunction and sleeping difficulties were obtained at three points during the perinatal period. Egg donation mothers reported significantly lower

levels of anxiety than unassisted conception mothers at two months post-partum. No differences were found between groups on reported levels of depression, although significantly more unassisted conception mothers reported clinically significant mental health problems than egg donation mothers. No group differences were found between fathers at any time point. This study benefits from utilising a matched sample design, whereby mothers in each group were matched on age, birth parity and birth plurality, thus reducing background error variability and increasing the validity of the findings. The use of an own-gamete IVF alongside a natural conception comparison group is also a strength, as this controls for the possible impact of fertility treatment on parental psychological wellbeing. The authors concluded that the extended period of waiting for treatment may allow egg donation parents time for “proper preparation for parenthood” and that the birth of their child represented the “fulfilment of an almost unreal dream” (Salevaara et al., 2018), both of which may explain egg donation mothers’ lower levels of mental health problems.

The only in-depth investigation of family functioning a UK sample comes from the first phase of the current study, which was conducted with 85 families created using identity-release egg donation when the children were in infancy (Imrie et al., 2019a; Imrie et al., 2019b). A comparison group of 65 own-gamete IVF families was recruited, thus controlling for the potentially confounding effects of infertility and fertility treatment. Standardised interview, questionnaire and observational measures were used to assess parental psychological adjustment and the quality of parent-infant relationships. Few differences were found in parental psychological wellbeing according to family type, with parents in both groups functioning within the normal range (Imrie et al., 2019a, 2019b). Egg donation mothers perceived significantly lower levels of social support than IVF mothers, although this appeared to be accounted for by the egg donation mothers’ older age. The study also found that egg donation fathers reported significantly higher levels of depression than their IVF counterparts but, like mothers, the effect was no longer significant when paternal age was included as a covariate (Imrie et al., 2019a). Additionally, when analyses were rerun excluding data from families including twins, no significant differences were found between egg donation and IVF fathers’ psychological wellbeing, although egg donation mothers’ perceived social support remained significantly lower than IVF mothers’. As mothers (Fisher & Stocky, 2003; Glazebrook et al., 2004), and fathers (Vilksa et al., 2009; Wenze et al., 2015) of twins have

been found to experience poorer psychological health than parents of singletons, it was concluded that these parents' older age combined with twin parenthood contributed to their poorer psychological wellbeing.

No group differences were found between fathers with regards to the quality of the father-child relationship or the quality of father-child interactions. (Imrie et al., 2019b.) However, egg donation mothers were rated as significantly less confident as parents than IVF mothers, although this effect appeared to be associated with the older age of the egg donation mothers. Observational data of mother-child interactions revealed egg donation mothers to be less sensitive and structuring than IVF mothers, and egg donation infants to be less responsive and involving of their mothers than IVF infants. When twin data were omitted from the analyses, these group differences became non-significant, although there remained a trend towards less optimal interactions in egg donation mother-infant dyads. Qualitative analyses from the first phase of the present study also revealed that, whilst most mothers felt that they had developed a strong bond with their baby, a minority of egg donation mothers were worried about developing a bond, and attributed difficulties bonding with their child specifically to their use of egg donation (Imrie et al., 2020).

Conclusions

The limited evidence on family functioning in identity-release egg donation families is mixed, with some surveys indicating good parental psychological adjustment when children were in infancy. However, the only in-depth, UK-based study found relatively poorer functioning in identity-release egg donation families with regards to mothers' perceived social support, fathers' depression and mother-child relationship quality. It is important to investigate whether these group differences persist into childhood and, if so, to attempt to establish the extent to which they are related to the use of an identifiable donor, over and above demographic factors such as older parental age and twin parenthood.

1.5 Aims and rationale for the present study

The aims of this thesis were to examine egg donation mothers' perspectives on the prospect of future donor-child contact, and to explore parental psychological wellbeing, parent-child relationship quality, and child adjustment in families created using identifiable egg donors. Studying families created using identifiable egg donation, in comparison to families using own-gamete IVF, allows for the investigation of the impact of identifiable egg donation on family functioning whilst controlling for experiences of infertility and fertility treatment.

Very few studies have investigated family functioning in identity-release egg donation families, with most utilising self-report questionnaire measures of family functioning. There are no studies of child adjustment in identifiable egg donation families, or that examine the quality of the parent-child relationship when the children are in early childhood. The little evidence that exists provides mixed results, with some suggesting poorer mother-child relationship quality in identifiable egg donation families relative to their own-gamete IVF counterparts. Investigating family functioning in identifiable egg donation families is important due to the unique challenges posed by identifiable egg donation. Identifiable egg donation may offer mothers less security than anonymous donation, as it may prove more difficult to establish clear practical and psychological boundaries between the donor and the family. Egg donation mothers may perceive the donor's ongoing presence within the family unit, due to their knowledge of the possibility of future donor-child contact. Such perceptions may impact egg donation mothers' thoughts and feelings about their own identity as a parent which, in turn, may affect the quality of the mother-child relationship, the effects of which may spill over into other parts of the family system.

Identifiable egg donation parents may also be concerned about whether, how and when to inform their children of their method of conception, and about how their children may feel about being conceived via this type of donation and the prospect of learning the donor's identity. Studying family functioning in identifiable egg donation families when children are aged five may be particularly informative, as this is the age by which clinics and regulatory bodies advise parents to have begun the disclosure process. Moreover, children's transition to school at age five coincides with developments in their social understanding (Hughes,

2011), and in their understanding of genetic relatedness and heritability, which is thought to develop between the ages of five and seven (Brodzinsky, 2011; Solomon et al., 1996; Williams & Smith, 2010). Early childhood may therefore represent a period of increased stress for identity-release egg donation parents, as they may begin to feel increasing pressure to begin the disclosure process; this may, in turn, catalyse thoughts about the donor and the possibility of their child one day having contact with the donor, which may have the effect of invoking the donor's presence in family life yet more strongly.

Few studies of egg donation families have examined family functioning using interview and observational measures of parent-child relationship quality. Whilst anonymous egg donation families have been found to be functioning well during very early childhood in previous studies, observational measures of parent-child relationship quality administered in middle childhood have produced results that have diverged from those previously provided by global codes derived from interview measures, to suggest poorer functioning in egg donation families. Moreover, no studies of identifiable egg donation families have ever used child-reported measures of parent-child relationship quality; combining parents' representations, children's representations and observations of parent-child relationship quality should provide a unique and robust insight into functioning at this stage of family life.

Finally, no studies have been designed in order to directly address the question of how mothers feel about identity-release egg donation, and whether mothers that have used this kind of donation perceive the donor as an ongoing presence, or even a threat, due to their child's potential to find out the donor's identity in the future.

This thesis therefore had the following aims:

- 1) To investigate egg donation mothers' level of understanding about, and attitudes towards, identity-release egg donation and the prospect of potential future contact between their child and the donor.
- 2) To establish whether egg donation families created using an identifiable donor experience greater difficulties in terms of parental psychological health, child

adjustment and the quality of parent-child relationships than a comparison group of own-gamete IVF families.

The following research questions and hypotheses were proposed:

1. Egg donation mothers' thoughts and feelings about identity-release egg donation

Egg donation mothers challenge dominant cultural narratives regarding the primacy of genetic motherhood, and must overcome such role handicaps during their transition to non-genetic motherhood. As discussed, it has been suggested that identity-release egg donation may represent an uncertain middle ground between anonymous and known donation, and that mothers of school-aged children may struggle with the dual burden of a lack of genetic relationship and managing the disclosure of information that may one day lead to their children seeking out their genetic progenitor. It is not known how these women feel about the prospect of future donor-child contact, despite identity-release egg donation being the only choice for women pursuing egg donation motherhood in the UK. It is therefore important to understand how these mothers perceive identity-release donation, and how they assimilate the prospect of donor-child contact into their lived experiences as non-genetic mothers. The current sample allows for questions such as these to be explored in an in-depth and systematic manner.

2. Family functioning in Egg Donation and IVF Families

2a) Parental psychological health

Based on the literature regarding the psychological wellbeing of identity-release egg donation parents of infants, and on the adoption literature which demonstrates that the transition from a rejection-of-difference to acknowledgement-of-difference stance in early childhood may be challenging for some parents, it was hypothesised that mothers and fathers in identifiable egg donation families would experience greater psychological health problems than IVF parents, and lower levels of social support when their children were five years old.

2b) Parent-child relationship quality

Based on the literature on identity-release donation, which suggests that parents may perceive the donor as a more salient, ongoing presence within the family than parents of children born using an anonymous donor, it was hypothesised that egg donation parents would demonstrate poorer functioning in the parent-child relationship than IVF parents. Specifically, concerns about egg donation parents' security in their parenting role, particularly at a time when they are expected to begin the disclosure process, and thus to acknowledge the donor's presence in the family's story, may result in egg donation parents' less positive representations of themselves as parents, and of their children. From a family systems perspective, mothers' insecurity in the parental role due to the absence of a genetic link between mother and child may also be expected to impact other parts of the family system such as the father-child relationship.

2c) Parent-child interaction quality

Due to the previous identity-release literature demonstrating poorer mother-child interaction quality during infancy, it was hypothesised that egg donation parents with identifiable donors would demonstrate poorer parent-child interaction quality when the children reached the age of aged five.

2d) Child adjustment

To the extent that parents of children born using identifiable donors are expected to show higher levels of psychological problems, and lower levels of parent-child relationship and interaction quality, than own-gamete IVF parents, raised levels of adjustment difficulties are expected amongst egg donation children at age five.

Chapter 2: Methodology

This chapter provides details of the methodology used in this study. Section 2.1 outlines the recruitment of the study participants. Section 2.2. outlines the data collection procedure. Section 2.3 describes the sample characteristics, and section 2.4 provides details of the interview, questionnaire and observational measures used to collect data for the qualitative and quantitative analyses. Finally, section 2.5 provides a discussion of the ethical considerations of this study.

2.1 Recruitment

The present study constitutes a follow-up to a study begun when the children were in infancy¹² (Imrie et al., 2019a; Imrie et al., 2019b; Imrie et al., 2020). The 85 egg donation and 65 IVF families that participated at phase one were asked to participate again at phase two. At phase one, families were recruited through ten fertility clinics in the United Kingdom. To maintain confidentiality, all families were initially contacted by the clinics. At phase one, all families provided written consent to be contacted again at phase two. Families were contacted when their child approached the target age of five years, between March 2018 and November 2019, and were asked to participate in the follow-up study. Most families were contacted via telephone or email, using the details provided at phase one. Where the original contact details proved to be no longer in use, a minority of participants were contacted using social media (i.e. Facebook). Upon making contact, families were informed that participation would comprise an audio-recorded interview with each parent, a video-recorded interactive task with the child and each parent separately, a video-recorded puppet-based interview with the child, and a booklet of questionnaires for each parent. Where a home visit was not possible or convenient, participants were offered a telephone/Skype interview and/or the option to complete postal questionnaires.

Of those who took part at phase one, 72 egg donation and 50 IVF families consented to participate at phase two, representing an overall retention rate of 81%. Eighty-five percent of

¹² Children's mean age at phase 1= 11 months

egg donation families and 77% of IVF families took part again at phase two. The difference between non-participation in each group was non-significant, $\chi^2(1) = 1.47, p = .23$. Of the egg donation families, 63 had used identity-release donation and 9 had used known donation (6 intra-family donation, 3 non-family known donation). Of the 28 families who did not participate at phase two, six were non-contactable (1 intrafamily donation, 1 non-family known donation, 2 identity-release donation, 2 IVF) and 22 did not wish to take part (1 intra-family donation, 8 identity-release donation, 13 IVF).

2.2 Procedure

Families were visited at home by two trained researchers. Home visits lasted approximately three hours. As a section of the interview referred to parents' experiences of fertility treatment, it was impossible for researchers to be blind to family type. Section 2.4 provides detailed descriptions of all measures mentioned in the procedure.

Prior to the home visit, parents were emailed an information sheet that contained details of what to expect from the visit¹³. At the beginning of each visit, parents were asked whether they had read the information sheet and given the opportunity to read it again if necessary. They were then invited to ask any questions they may have and were informed that they could opt out of any part of the study if they so wished. After ensuring that all of the participants' questions were answered, signed consent was obtained from mothers and fathers; either parent provided signed consent on their child's behalf¹⁴. Prior to administration of the child measures, the researcher explained the play tasks to the children, ensured the child understood that they could withdraw at any point, and then obtained verbal assent from the child.

Mother and father interviews were conducted separately and were audio recorded. In the scenario where a parent ran out of time to complete the interview in person, or were not available to be interviewed in person, the interviews were finished/conducted on a recorded phone call. One interview was conducted via Skype due to the participants' relocation internationally in the period between phases one and two. To maximise efficiency in families where both parents were available, researcher A began an interview with one parent whilst researcher B conducted the child tasks, followed by the observation task with the other parent. Researcher A then conducted the observation task with the first parent and distributed the questionnaire booklets, whilst researcher B conducted the second parent interview.

¹³ See appendix 1

¹⁴ See appendix 2

The first section of the interview comprised the Parent Development Interview (Aber et al., 1985; Slade et al., 1999). This was followed by a section regarding the child's experiences at school, the child's behaviour and development, parental psychological health, parenting support, parents' experiences of fertility treatment and parental attitudes towards identity-release donation, including their disclosure decisions and practises¹⁵. Both sections of the interview were semi-structured, allowing for the researcher to probe as necessary. Children were interviewed using the Berkeley Puppet Interview (Ablow et al., 2009; Ablow et al., 1999), an age-appropriate, puppet-led interview designed to assess their levels of emotional problems, social competency and to assess the children's representations of the parent-child relationship.

Observational measures of parent-child interaction were conducted with mothers and children, and fathers and children, separately. Unlike interview and self-report measures, observational measures produce a detailed assessment of the quality of interaction between parents and their children (Gardner, 2000). Moreover, the inclusion of observational methods in a multi-method study design can help in overcoming socially desirable responding; it is more difficult to "fake good" with observational measures, particularly when such assessments are made in a naturalistic environment such as the home setting (Gardner, 2000; Kerig, 2001). Mothers and children were given ten minutes to complete a drawing task using an Etch-a-Sketch toy, followed by a jigsaw puzzle task. The jigsaw was given to ensure that at least 10 minutes of codable data were produced, as many dyads were able to complete the Etch-a-Sketch task within 10 minutes. Fathers and children were given ten minutes to complete a building block task, during which the dyad was provided with wooden building blocks and instructed to build anything of their choice. Different tasks were assigned to mothers and children and fathers and children to avoid task repetition effects. The interactions were video recorded with the parents' permission.

Mothers and fathers were also administered a questionnaire booklet which took 10-15 minutes to complete. Most parents completed their questionnaires during the home visit; occasionally, the questionnaires were left with the parents to complete in their own time. In

¹⁵ See appendix 3

these cases, parents were provided with a pre-paid self-addressed envelope, and were asked to return the questionnaires within approximately one week of the home visit. In cases where one of the parents (typically fathers) were unavailable for interview, a questionnaire booklet, consent form and self-addressed, pre-paid envelope were left at the family home to be filled out in their own time.

During the visit, parents were asked for permission to send a questionnaire to the child's teacher. Where permission was granted, the Strengths and Difficulties Questionnaire (Goodman, 1994) was sent to the child's teacher, along with a covering letter explaining that their responses would be confidential and would not be reported back to the child's parents. A copy of parental written consent to contact the teacher was provided with the questionnaire. Written informed consent was required from the teacher prior to completing the questionnaire¹⁶. To protect participants' confidentiality regarding method of conception, the covering letter stated that the child was participating in a family research project in loose terms; no information was given regarding the specific focus of the study. Teachers were given the option of responding either by returning their questionnaire by post, or by completing it online¹⁷. Including an independent measure of the child's behaviour adds more rigour to the study's methodology as it helps combat issues of potential socially desirable responding from parents.

At the end of the interview, families were given £30 as a token of thanks for their participation. Children were given a small gift of a sticker book to thank them for their participation. Following the visit, one of the researchers sent a letter to the family to thank them for their participation.

The percentage of data collected from mothers, fathers, children, and teachers for each family type is summarised in Table 2.2. Fewer fathers than mothers were available for interview due to work commitments/time constraints, or because they did not wish to take part in the study. Each family was allocated a unique ID number to ensure confidentiality and

¹⁶ See appendix 4

¹⁷ The majority of teachers (83%) responded via postal questionnaire.

anonymity. All hard copies of data were stored in a locked filing cabinet; all digital raw data and any databases containing identifying information were encrypted.

Table 2.2. Summary of data collected for each family type

	Egg donation n (%)	Own-gamete IVF n (%)
Mother's interview ¹⁸	69 (95.8%)	48 (96%)
Mother's questionnaires	66 (91.6%)	46 (92%)
Father's interview	57 (79.2%)	32 (64%)
Father's questionnaires	68 (94.4%)	37 (74%)
Child's interview	61 (84.7%)	45 (90%)
Mother-child observation task	67 (93.1%)	47 (94%)
Father-child observation task	59 (81.9%)	30 (60%)
Teacher questionnaires	56 (77.8%)	40 (80%)

¹⁸ One egg donation mother was unable to participate in the interview due to time constraints and two egg donation mothers participated via questionnaire only. Two IVF mothers participated via questionnaire only.

2.3 Sample Characteristics

Egg donation and IVF families were compared on several demographic variables which are presented in Tables 2.3.1 and 2.3.2. As data on family demographic characteristics were collected from the mothers, demographic data for fathers are included, even if they did not participate in the study.

One hundred and six (97.2%) mothers identified their ethnic group as 'White British' or 'White Irish'. One mother identified as 'any other white background', one mother identified as Indian, and one mother identified as Chinese.¹⁹ Ninety-six (92%) fathers identified as 'White British' and four (3.7%) identified as 'any other white background'. One father identified as 'Mixed white and Asian', one father identified as Indian, and one father identified as 'any other ethnic group'.²⁰

Age

The mean age in months of children was 67.38 months in the egg donation group and 67.36 months in the IVF group. There was no significant group difference in child age. However, the ages of the parents differed significantly between family types. Mothers in the egg donation group ($M= 47.10$, $SD= 4.47$) were significantly older than mothers in the IVF group ($M= 42.06$, $SD= 4.0$), $t(121)= -6.39$, $p < .001$. Fathers in the egg donation group ($M= 48.24$, $SD= 6.41$) were also significantly older than fathers in the IVF group ($M= 44.52$, $SD= 6.14$), $t(121)= -3.20$, $p= .002$.²¹

¹⁹ There were no significant differences between groups on mothers' ethnicity; 100% of egg donation mothers and 95.6% of IVF mothers identified as 'White British/Irish/Other', with the remaining 4.4% of IVF mothers identifying as 'Asian'. Data on ethnicity were unavailable for thirteen mothers (8 ED, 5 IVF).

²⁰ There were no significant differences between groups on fathers' ethnicity; 96.8% of egg donation fathers and 90.2% of IVF fathers identified as 'White British/Irish/Other'. The remaining 3.2% of egg donation fathers identified their ethnic group as 'Asian Indian'. The remaining 4.8% of IVF fathers identified as 'Mixed White/Asian' (2.4%) and 'Asian Indian' (2.4%). Data on ethnicity were unavailable for seventeen fathers (8 ED, 9 IVF).

²¹ The age ranges of the mothers in the egg donation and IVF and groups were 38-57 years and 34-51 years respectively. The age range of fathers in the egg donation and IVF groups were 37-67 years and 34-59 years respectively.

There were similar proportions of boys and girls in each group, and a similar proportion of twins in each group. A significantly higher proportion of egg donation than IVF children had no siblings at home ($\chi^2(1) = 8.59, p = .004$). A similar proportion of mothers and fathers in each group had children from a previous relationship who did not live with them.

Couple relationship

The majority (90.2%) of couples were either married or cohabiting, with a similar proportion of couples married (84.5% ED, 78% IVF) and cohabiting (11.3% ED, 10% IVF) within each group. Couples in each group had been married or cohabiting for similar lengths of time (see Table 2.3.1). However, Chi-square analysis revealed a significant difference between the proportion of mothers who had separated from their child's father since the first phase ($\chi^2(1) = 6.37, p = .01$). Fewer egg donation than IVF mothers had separated from their child's father over the intervening period.

Employment status

Socioeconomic status was assessed using information about parents' employment status and occupation. Employment status was coded as 'not currently working', 'working part time', 'working full-time', 'on parental leave' and 'retired'. The occupation of the parent was classified using the United Kingdom Registrar General's classification (OPCS and Employment Department Group, 1991) and was classified as either: 1) professional; 2) managerial/technical; 3) skilled non-manual, 4) skilled manual, 5) partly skilled, or 6) unskilled. Categories 4, 5 and 6 were collapsed to create a 'skilled manual/ non-skilled' category. No significant group differences in socioeconomic status were found, with most parents in both groups classified as working in managerial/technical roles. The large majority (81.4% ED, 77.1% IVF) of fathers in both groups worked full-time, and just over half (51.4% ED, 56.3% IVF) of mothers in both groups worked part-time.

Table 2.3.1 Family sociodemographic characteristics by family type

	Egg donation (n=72)		IVF (n= 50)		t-test		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>d</i>
Child's age (months)	67.38	4.29	67.36	3.98	-.020	.984	<.001
Mother's age (years)	47.10	4.47	42.06	4.0	-6.39	<.001	1.19
Father's age (years)	48.24	6.41	44.52	6.14	-3.20	.002	.59
Relationship length (years)	16.38	5.13	17.18	5.0	.78	.44	.16
	N (%)		N (%)		Chi-square		
					χ^2	<i>df</i>	<i>p</i>
<i>Relationship status</i>							
Married/ cohabiting	69 (95.8%)		41 (82%)		6.37	1	.012
Separated/divorced	3 (4.2%)		9 (18%)				
<i>Sex of child</i>							
Female	35 (48.6%)		21 (42%)		.52	1	.47
Male	37 (51.4%)		29 (58%)				
<i>Multiple births</i>							
Singleton	64 (88.9%)		43 (86%)		0.23	1	.63
Twin pair	8 (11.1%)		7 (14%)				
<i>No. siblings²²</i>							
0	38 (52.8%)		13 (26%)		8.59	1	.003
1 or more	32 (44.4%)		35 (70%)				
<i>Mother has a child from previous relationship</i>							
No	68 (97.1%)		46 (95.8%)		0.15	1	.70
Yes	2 (2.9%)		2 (4.2%)				
<i>Father has child from previous relationship</i>							
No	61 (87.1%)		42 (87.5%)		<0.001	1	.95
Yes	9 (12.9%)		6 (12.5%)				

²² Data on *number of siblings, mother's previous children* and *father's previous children* were unavailable for 2 IVF families and 2 egg donation families due to questionnaire-only participation.

Annual income

Mothers were asked to indicate their net annual income from a selection of ten salary brackets, ranging from (1) no paid employment to (10) more than £52,000. For ease of analysis, the ten salary bands were collapsed into five broader bands: (1) £0 - £12,200; (2) £12,201 - £24,200; (3) £24,201 - £38,200; (4) £38,201 - £52,000, and (5) More than £52,000. Mothers were also asked to indicate fathers' net annual income. There were no significant differences between groups regarding mothers' net annual income ($\chi^2(4) = 2.22$, $p = .70$) or fathers' net income ($\chi^2(4) = 3.34$, $p = .50$).

Educational level

As shown in Table 2.3.2, parents' educational levels were classified using the Regulated Qualifications Framework (RQF). Education levels ranged from (1) no qualifications, to (8) doctoral degree. For clarity and ease of analysis, education level categories were also collapsed to create two variables that indicated whether parents had a higher education qualification. Similar proportions of mothers (70.8% ED, 70% IVF) and fathers (68.7% ED, 71.43% IVF) in each group had a higher education qualification.

Table 2.3.2 Mother and father employment and educational level by family type

	Egg donation (n=72) N (%)	IVF (n= 50) N (%)	Chi-square		
			χ^2	df	p
<i>Mother working²³</i>					
Not working	12 (17.1%)	5 (10.4%)	1.05	2	.59
Part-time	36 (51.4%)	27 (56.3%)			
Full-time	22 (31.4%)	16 (33.3%)			
<i>Mother's occupation</i>					
Professional	18 (30.51%)	5 (11.63%)	732	3	.62
Managerial/technical	30 (50.85%)	25 (58.14%)			
Skilled non-manual	10 (16.95%)	9 (20.93%)			
Skilled manual/non-skilled	1 (1.7%)	4 (9.30%)			
<i>Mother's education²⁴</i>					
School education	13 (18.1%)	9 (18%)	< 0.001	1	.99
Higher education	51 (70.8%)	36 (70%)			
<i>Father working²⁵</i>					
Not working	-	1 (2.1%)	0.88	2	.64
Part-time	10 (14.3%)	4 (8.3%)			
Full-time	57 (81.4%)	37 (77.1%)			
Retired	3 (4.3%)	-			

²³ Data on *mother's working status* and *mother's occupation* were unavailable for 2 IVF mothers and 2 egg donation mothers due to questionnaire-only participation. In order to conduct chi-square analysis, categories were collapsed into not working/ part time/ full time.

²⁴ Data on *mother's education* were unavailable for 13 mothers (5 IVF, 8 ED) due to non-return of postal questionnaires.

²⁵ Data on *father's working status* were unavailable for 8 IVF fathers (2 due questionnaire-only participation, 6 due to couple separation since phase 1) and 2 ED fathers due to questionnaire-only participation. In order to carry out chi-square analysis for *fathers' employment status*, categories were collapsed into not working/ part time/ full time.

<i>Father's occupation</i> ²⁶					
Professional	20 (28.6%)	8 (16.7%)	1.88	3	.60
Managerial/technical	31 (45.7%)	21 (43.8%)			
Skilled non-manual	5 (8.6%)	3 (6.3%)			
Skilled manual/ non-skilled	10 (14.3%)	9 (18.8%)			
<i>Fathers' education</i> ²⁷					
None	1 (2.4%)		0.09	1	.77
School education	11 (26.2%)				
Higher education	30 (71.4%)				
<i>Mothers' net annual income</i> ²⁸					
£0 - £12,200	21 (29.2%)	14 (28%)	2.22	4	.70
£12,201 - £24,200	15 (20.8%)	9 (18%)			
£24,201 - £38,200	12 (16.7%)	13 (26%)			
£38,201 - £52,000	7 (9.7%)	5 (10%)			
> £52,000	9 (12.5%)	4 (8%)			
<i>Fathers' net annual income</i> ²⁹					
£0 - £12,200	3 (4.2%)	-	3.34	4	.50
£12,201 - £24,200	12 (16.7%)	7 (14%)			
£24,201 - £38,200	18 (25%)	12 (24%)			
£38,201 - £52,000	15 (20.8%)	6 (12%)			
> £52,000	15 (20.8%)	16 (32%)			

²⁶ Data on *father's occupation* were unavailable for 8 IVF fathers (2 due questionnaire-only participation, 6 due to couple separation since phase 1) 3 ED fathers (2 due to questionnaire-only participation, 1 due to couple separation since phase 1).

²⁷ Data on *father's education* were unavailable for 8 IVF fathers (5 due to non-return of postal questionnaire, 3 due to couple separation since phase 1) and 8 ED fathers, due to non-return of postal questionnaires. In order to carry out chi-square analysis for *fathers' education*, categories were collapsed into school education/ higher education

²⁸ Data on *mother's net annual income* were unavailable for 13 mothers (8 ED, 5 IVF)

²⁹ Data on *father's net annual income* were unavailable for 18 fathers (9 ED, 9 IVF)

2.4 Measures

2.4.1. Family functioning

Questionnaire, interview, and observational measures were used to assess three aspects of family functioning: 1) parental psychological wellbeing; 2) the quality of the parent-child relationship; and 3) the quality of parent-child interaction. These measures are described below.

Parent psychological health

Parents' psychological health was assessed using both questionnaire and interview measures.

Questionnaire measures

The Edinburgh Depression Scale (Cox et al., 1987; Thorpe, 1993) was administered to mothers and fathers to assess parents' levels of depression. Each of the questionnaire's ten items is scored on a four-point scale (0-3), to produce a total score ranging from zero to 30. Higher scores reflect higher levels of depression. A score of 13 has been suggested for major depressive disorder; however, a lower cut-off of 10 has been recommended for use in community screening (Cox et al., 1987) with a recommended cut-off score of 10 also having been suggested for fathers (Matthey et al., 2001). A cut-off of 10 was therefore used for all parents in the current study. The EDS was first developed to screen for symptoms of postnatal depression in women (Cox et al., 1987), and was subsequently validated for use with fathers (Matthey et al., 2001), with parents outside the postnatal period (Thorpe, 1993), and with general population samples (Matijasevich et al., 2014). The EDS possesses satisfactory validity and split-half reliability (Cox et al., 1987) and has been found to be sensitive to changes in depression over time. Cronbach's alpha for the present sample was .87 for the mothers' questionnaire and .84 for the fathers' questionnaire, indicating good internal consistency.

The Trait-Anxiety Inventory (TAI; Spielberger, 1983) was administered to both mothers and fathers to assess parents' general level of anxiety. The TAI is a 20-item questionnaire which

produces total scores ranging from 20 to 80. Higher scores reflect greater levels of anxiety. The TAI has been found to have good reliability and discriminates well between clinical and non-clinical groups (Spielberger, 1983). Spielberger (1983) reported norms on the TAI as 34.79 and 34.89 for women and men respectively; studies have subsequently considered scores of > 45 as representing the clinical cut-off (Fisher & Durham, 1999). A meta-analysis of 816 studies conducted between 1990-2000 found test-retest reliability and internal consistency coefficients to be acceptable (Barnes et al., 2002). Cronbach's alpha for the present sample was .87 for the mothers' questionnaire and .90 for the fathers' questionnaire, indicating good internal consistency.

Mothers and fathers were also administered the short form of the Parenting Stress Index (PSI-SF; Abidin, 1990b). The PSI-SF assesses stress associated with parenting and comprises 36 items, each rated from one ('strongly disagree') to five ('strongly agree'). Three subscale scores (Parental Distress, Parent-Child Dysfunctional Interaction, and Difficult Child) are summed to produce a total parenting stress score; total scores range from 36 to 180, with higher scores reflecting greater parenting stress. Concurrent and predictive validity have been demonstrated for the full-length questionnaire, and the short form has been found to correlate highly with the full-length version (Abidin, 1990b). Test-retest reliability for the total score was found to be 0.96 over a 1- to 3-month period, and .65 over one year. Cronbach's alpha for the present sample was .94 for the mother's questionnaire and .93 for the fathers' questionnaire, indicating excellent internal consistency.

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) was administered to parents to assess their perceived levels of social support. The MSPSS is a 12-item questionnaire and comprises 3 subscales of 4 items each, which are designed to measure parents' perceived levels of support from three sources: friends, family and significant others. Each item is rated on a 7-point scale. Subscales can be totalled to create an overall score for perceived social support, with higher scores indicating higher levels of perceived support. Zimet et al., (1988) suggest that mean total scores between 1-2.9 are indicative of low social support, that scores of 3-5 are indicative of moderate support, and that scores of 5.1-7 are indicative of high levels of support. The MSPSS has good validity, and the test-retest reliability of the total score was .85 over a 2-3 month interval (Dahlem et al., 1991; Zimet et al., 1990;

Zimet et al., 1988). Cronbach's alpha for the present sample was .95 for the mother's questionnaire and .92 for the fathers' questionnaire, indicating excellent internal consistency.

To assess the overall quality of the couple relationship, parents were administered the 28-item Golombok Rust Inventory of Marital State (GRIMS; Rust et al., 1990). Each item is rated on a four-point scale, with scores ranging from 0 to 84. Higher scores reflecting poorer couple relationship quality. A score of 34 or more indicates marital dissatisfaction, with scores above 42 indicating severe problems within the relationship. Split-half reliability for the GRIMS has been found to be 0.87 for women and .91 for men, and the measure has been shown to discriminate significantly between couples who are about to separate and those who are not (Rust et al., 1990). Cronbach's alpha for both the mothers' and fathers' questionnaires in this study was .93, indicating excellent internal consistency.

Mothers and fathers were administered the 6-item Brief Resilience Scale (BRS; Smith et al., 2008) to assess parents' stress-coping ability. Each item is scored on a five-point scale, which are summed to create a total score, with higher scores indicating higher levels of resilience. Smith et al. (2008) suggest that scores of 1-2.9 can be categorised as low resilience, scores of 3-4.3 as normal resilience, and scores of 4.31-5 as high resilience. The BRS has been found to have good convergent and discriminant predictive validity, with adequate test-retest reliability at .62 over a one-to-three-month period (Smith et al., 2008). Cronbach's alpha for this sample was .88 for the mothers' questionnaire and .88 for the fathers' questionnaire, indicating good internal consistency.

Interview measures

A section of the parent interview, described below, focused on the parent's psychological health. Parents were asked whether they had ever sought professional support for a mental health problem (i.e. seen a GP, received counselling or accessed inpatient care), whether they had ever received a diagnosis for a mental health problem, and whether they had ever taken, or were still taking, any medication.

Parent-child relationship quality

The quality of the mother-child and father-child relationship were assessed using (i) a standardised interview with each parent separately, (ii) a standardised interview with the child, and (iii) an observational measure of parent-child interaction with the child and each parent separately.

Interview assessment of the parent-child relationship: parents' perspectives

Parental representations of the parent-child relationship were measured using the Parent Development Interview (PDI, Aber et al., 1985). The PDI is a semi-structured interview designed to assess parents' representations of themselves as parents, their children, and the quality of the parent-child relationship (Slade, 2005). The PDI is derived from attachment theory and is based on the view that parents' understanding of their own and their child's internal experience is related to their parenting practises and behaviours. Parents are asked to describe their own and their child's experiences, and they are asked to share real-life examples of "charged interpersonal moments" (Slade, 2005, p. 276) to provide direct windows into parents' understandings of their own, and their child's, internal experiences (Slade, 2005). Mothers and fathers were interviewed separately using a modified form of the PDI, adapted by Steele and colleagues (Henderson et al., 2007).

The PDI is divided into four sections. The first assesses the parent's view of their child. Parents are asked to describe their child, and their child's least and most favourite moments. Parents are then asked to describe what they like most and least about their child, and whether they notice any similarities or differences between the child and each parent. The second section focuses on the parent's view of their relationship with their child; parents are asked to list three adjectives that describe the quality of the relationship between themselves and their child, and are then asked to provide detailed examples as to why these adjectives were chosen. Parents are requested to describe specific instances of interacting with their child during periods of harmony and disharmony, and they are also asked to reflect upon any experiences in their child's life that may have been particularly challenging for them. In addition, parents are asked to reflect upon how the quality of their relationship with their child may be impacting their child's development or personality.

The third section of the PDI explores the parent's experience of parenting. They are asked to describe themselves as a parent, and about their feelings of joy, pain, anger, worry and guilt within the context of parenting their child. Parents are then asked to reflect upon how having their child has changed them, whether and when they feel the need for emotional support as a parent, and about their level of satisfaction with the support available to them. Parents are also questioned about challenging parenting situations, such as when their child is upset, noncompliant or provocative, and how they manage such situations when they arise. Parents are asked whether they think their child ever feels rejected by them, and how readily their child will both accept and spontaneously seek out physical affection. The final section of the PDI assesses the parent and child's reaction to routine separations; parents are asked what they find difficult and easy about routine separations, and how their child responds. Many items on the PDI interview schedule include secondary probes to enable the interviewer to effectively evaluate the parent's experiences and representations of the relationship dynamics with their child.

Parental Development Interview coding

PDIs were coded according to a system developed by Henderson and colleagues (2007). PDIs were transcribed verbatim and then coded by one of three trained coders. The coding system provides codes for (i) the parent's representations of themselves as a parent (parent affective experience codes), (ii) the parent's representation of the child (child affective codes), and (iii) global codes.

The parent affective experience codes used in this study were: (a) *degree of anger*, assessing the extent to which the parent feels angry within the relationship with the child (rated from 1 'none/minimal' to 4 'high anger felt'); (b) *expression of anger*, assessing the extent to which expressions of anger are present within the relationship, and the parent's ability to control their behaviour (rated from 1 'no/minimal anger shown' to 4 'high anger shown'); (c) *support need*, which measures the parent's acknowledgment of need for support (rated from 1 'none/minimal feelings of needing support' to 4 'high feelings of needing support'); (d) *support satisfaction*, assessing parental satisfaction with the support available to them (rated

from 1 'no/minimal satisfaction' to 4 'high satisfaction'); (e) *guilt*, assessing the degree to which parental guilt is a feature of the parent-child relationship (rated from 1 'none/minimal guilt' to 4 'high guilt'); (f) *joy*, measuring the parent's ability to express feelings of joy, contentment and happiness in the relationship with the child (rated from 1 'none/minimal acknowledgement of joy or pleasure' to 4 'high acknowledgement of joy or pleasure'); (g) *competence*, which assesses how well the parent is coping in parenting the child (rated from 1 'low competence' to 4 'high competence'); (h) *confidence*, measuring the parent's view of their own competence (rated from 1 'none/minimal confidence' to 4 'high confidence'); (i) *child focus*, assessing the degree to which the parent is focused on the needs of the child, compared with their own emotional needs (rated from 1 'none/minimal level of child focus' to 4 'high level of child focus'); (j) *disappointment*, which measures the extent to which the parent expresses disappointment with the role of being a parent (rated from 1 'none/minimal disappointment/despair' to 4 'high despair'); (k) *warmth*, assessing the amount of warmth the parent feels towards their child (rated from 1 'none/minimal warmth' to 4 'high warmth'); (l) *attachment awareness and promotion*, measuring the parent's understanding of the attachment issues for their child and their ability to behave in ways which will promote the child's attachment to them (rated from 1 'none/minimal attachment awareness' to 4 'high attachment awareness'); and (m) *hostility*, assessing the level of parental hostile feelings towards the child (rated from 1 'none/minimal hostility' to 4 'high hostility').

The child affective experience codes used in this study were: (a) *child anger*, assessing the degree to which the parent represents the child as experiencing or expressing anger (rated from 1 'none/minimal child anger' to 4 'high child anger'); (b) *child happiness*, assessing the degree to which the parent represents the child as happy and contented within themselves as distinct from the parent-child relationship (rated from 1 'none/minimal child happiness' to 4 'high child happiness'); (c) *child controlling*, measuring the extent to which the child attempts to both control the parent and interactions more generally (rated from 1 'none/minimal child controlling/ manipulating' to 4 'high child controlling/ manipulating'); (d) *child affection*, measuring the extent to which the child shows and accepts physical affection in relation to their primary caregivers (rated from 1 'none/minimal child affection' to 4 'high child affection'); and (e) *child rejection*, assessing the degree to which the parent feels

emotionally or practically rejected by the child (rated from 1 'none/minimal child rejection' to 4 'high child rejection').

The global codes included (a) *reflective functioning*, assessing the extent to which the parent can reflect on the child and the relationship (rated from 1 'non/minimal reflection' to 4 'high reflection'); (b) *coherence*, measuring the overall coherency of ideation and feeling in the parent's representation of the child (rated from 1 'highly incoherent' to 4 'high coherence'); and (c) *richness of perceptions*, assessing the richness or poverty of the parent's perceptions of their child and the relationship with the child (rated from 1 'no/minimal richness of perception' to 4 'high richness of perception').

Interview assessment of the parent-child relationship: children's perspectives

Children's representations of the parent-child relationship were measured using the Berkeley Puppet Interview (BPI; Ablow et al., 1999; Ablow et al., 2009). The BPI is an interactive, puppet-based interview tool designed to assess young children's self-reports of two broad domains: *Children's Perceptions of Competence, Self, and Emotional Wellbeing* and *Children's Perceptions of their Family Environments* (Ablow et al., 2009). The BPI methodology builds on theories of child development which posit that children's self-perceptions play an important and active role in shaping their behaviour (Cicchetti, 1993; Crick & Dodge, 1994; Harter & Pike, 1984; Rutter, 1989). It also draws on Eder's (1990) work with puppets in facilitating children's self-expression to assess their psychological adjustment. Extensive work over the last two decades has demonstrated the BPI's utility as a psychometrically sound measure of young children's self-perceptions and perceptions of interpersonal relationships (Ablow, 2005; Luby et al., 2002; Measelle et al., 2005; Pike et al., 2005). Young children have been found to be valid and accurate reporters of their own and others' perceptions (Ablow et al., 2009; Sierau et al., 2017), and children's self-perceptions have been found to play an important part in shaping their behaviour (Coplan et al., 2004; Hughes & Ensor, 2011). A key replicated finding is that the agreement between young children's self-reports via the BPI and adult informants tends to be as strong, and sometimes stronger, than the level of agreement between pairs of adult informants (Ablow et al., 2009; Measelle et al., 1998; Ringoot et al., 2017).

The BPI uses an interactive approach, whereby two identical hand puppets volunteer opposing statements about themselves before asking the child about their view on the issue. The interview begins with warm-up items to demonstrate for the child how the task works³⁰, before moving on to the formal BPI items. For example, one puppet would say, “My mum is nice to me”, whereas the second puppet would say, “My mum is not nice to me ... how about you?” The aim of this technique is to promote a peer-like exchange between the child and the puppets. Presenting each item as a dichotomous option maximises children’s comprehension, whilst simultaneously decreasing the chances of socially desirable responding (Measelle et al., 1998). Items were counterbalanced so that children heard the negative half of an item first as often as they heard the positive half of an item first. Positive and negative item halves were distributed equally between each puppet to avoid children overidentifying with either puppet (Measelle et al., 1998). This method blends structured and clinical interviewing techniques in that each child’s own mode of communication shapes the exchange between the child and the puppets. For example, whilst most children respond verbally to the BPI, some children may use limited verbal responses, such as naming whichever puppet they identify with. Other children may use entirely non-verbal responses, i.e. by pointing at or even petting the puppet whose statement they most closely identify with. By enabling children to respond in their own individual fashion, the BPI aims to promote a fluid and unselfconscious dialogue between the child and the puppets (Measelle et al., 1998).

Over 40 subscales have been developed for use in the BPI over the last two decades (Ablow & Measelle, 1993; Ablow et al., 2009). For this study, five subscales were selected to provide information about the family environment and child adjustment from the child’s perspective without making the interview schedule too long and taxing for the child participants. With respect to children’s perspectives of the quality of the parent-child relationship, the subscales of *Positive Parental Affect (Warmth and Enjoyment)* and *Negative Parental Affect (Anger and*

³⁰ These typically included items such as: “I like playing in the park/ I don’t like playing in the park”, “I like chocolate/ I don’t like chocolate”, and “I have one brother and one sister/ I have two sisters”. In the rare circumstance that the child did not demonstrate mastery of the interview format after three warm-up items, more items were delivered until the interviewer was satisfied with the child’s level of comprehension.

Hostility) were used. Items on the *Positive Parental Affect* subscale include statements such as: “My mum likes to cuddle with me/ My mum doesn’t like to cuddle with me”, “My dad doesn’t hug and kiss me/ My dad hugs and kisses me”, and “My mum and I have fun together/ My mum and I don’t have fun together”. Examples of items on the *Negative Parental Affect* subscale include: “Sometimes, my mum tells me that I’m a bad girl/ My mum doesn’t tell me that I’m a bad girl”, “My dad is mean to me/ My dad is not mean to me”, and “When my mum is angry, she smacks me/ When my mum is angry, she doesn’t smack me”.

Berkeley Puppet Interview coding

All interviews were scored by two coders from video recordings according to a coding scheme developed by Ablow & Measelle (1993). Both coders had received formal training from one of the authors and underwent a thorough practise coding period to establish reliability. Children’s responses are coded on a 7-point scale (1-7). Positive responses are coded on the 5-7 range of the scale, whereas negative responses are coded on the 1-3 range of the scale. Exact codes are established based on the degree to which children’s responses endorse one of the puppet’s statements. The codes 2 and 6 represent responses that are equivalent to one of the statements made by either puppet (i.e. a child’s responses of “My mum is nice to me too” would be coded as a 6; “My mum isn’t nice to me either” would be coded as a 2). Codes 1 and 7 represent an amplified response; for example, “My mum is *very* nice to me” would be coded as a 7 whereas “My mum is *never* nice to me” would be scored as a 1. A less emphatic endorsement of either puppet’s statement would be coded as a 3 or a 5 (i.e. “My mum is kind of nice to me”/ “Most of the time, my mum isn’t nice to me”). Where a child genuinely endorses both of the puppets’ statements equally, a score of 4 is given. Two additional codes, 8 and 9, are available to indicate responses that are not codable in terms of a positive or negative endorsement. A score of 8 is used to code a response where a child clearly understands the question, yet indicates that neither response pertains to them, and instead offers an appropriate, alternative response. For example, in response to the item, “When my daddy gets home from work, he plays with me”/ “When my daddy gets home from work, he doesn’t play with me”, a child might legitimately respond “My daddy doesn’t go to work.” A score of 9 is used when a response cannot be used, for example, in the situation where a child’s response is inaudible or not forthcoming.

Parent-child interaction quality

A 10-minute Etch-a-Sketch (Stevenson-Hinde & Shouldice, 1995) and jigsaw puzzle task were used to obtain observational assessments of mother-child interaction quality. To obtain observational assessments of father-child interaction quality, a 10-minute building block task was used. These measures were chosen because they were age-appropriate, could be transported easily to home visits, and could be rated blind to family type. Different tasks were used with each parent to avoid repetition effects. Mothers and children were instructed to work together to complete a drawing using the Etch-a-Sketch, a children's toy used to create line drawings. The Etch-a-Sketch is operated by two dials; one which moves the line horizontally and one which moves the line vertically. One dial was assigned to the child and the other was assigned to the mother; mother and child were instructed to work together to copy a picture of a house without touching one another's dials. The dyads were given as much time as they needed to practise drawing a square before being given the picture of the house to copy³¹. Upon completion of this task, mothers and children were given an age-appropriate jigsaw puzzle and were instructed to complete it together, with the aid of a picture of the puzzle.

Fathers and children were instructed to work together to build something together from a set of wooden building blocks supplied by the researcher. Father child dyads were instructed that they could build whatever they liked, but that they had to do so together. Parents were asked for permission for the task to be videotaped.

Video recordings were coded using the 4th edition of the Emotional Availability (EA) Scales (Biringen, 2008). Emotional availability is a concept derived from attachment theory, and it refers to a dyad's capacity to share an emotionally healthy relationship. An emotional availability approach expands on parental sensitivity to include 'emotional' and 'dyadic' features of the relationship, by not only measuring parental attitudes and behaviours towards the child, but also codes which capture the child's contributions to the relational interaction (Biringen et al., 2014; Bretherton, 2000). The EA scales are also influenced by systems theory,

³¹ See appendix 5

which posits a holistic view of relationships, where each partner contributes to, and is affected by, the other partner's influence (Guttman, 1991) and by a transactional model of relationships, where parent and child mutually influence one another (Biringen et al., 2014; Sameroff, 2010).

Much of the early research using the EA scales focused on children in the early years, aged between 9 months and 3 years old (Biringen et al., 2014). However, the EA scales have been validated for use with children up to the age of 14 years, and a number of studies have utilised the EA scales with preschool aged children, demonstrating its psychometric utility with this aged group (Biringen et al., 2005; Howes & Hong, 2008; Stack et al., 2012). The EA scales have been found to be reliable across contexts, and to be equally appropriate for use with children of different genders (Bornstein et al., 2008, 2010). The EA scales have been found to be consistently predictive of attachment categories (Altenhofen et al., 2013; Aviezer et al., 1999; Easterbrooks et al., 2000; Ziv et al., 2000) and to be meaningfully related to developmental outcomes in early childhood, including stress regulation (Kertes et al., 2009), internalising and externalising disorders (Kang, 2005) and school readiness (Biringen et al., 2005).

The EA coding scheme (4th edition, Biringen, 2008) provides four scales measuring the behaviour and affect of the parent, and two scales measuring the behaviour and affect of the child. The parent EA dimensions are the following: *sensitivity*, *structuring*, *non-intrusiveness*, and *non-hostility*. The child EA dimensions comprise *child responsiveness* to the parent and *child involvement* of the parent.

Sensitivity focuses on dyadic expressions of emotion and measures the emotional and behavioural sensitivity of the parent towards the child. This dimension measures the emotional signals and behaviours the parent uses to encourage and maintain a positive, healthy connection with the child. The parent is also scored on their ability to clearly perceive the child's emotional expressions and to flexibly respond in a timely manner. This scale also focuses on the parent's acceptance of the child, and resolution of conflicts that may arise during the interaction.

Structuring measures the degree to which the parent appropriately structures and guides the child's play by taking care to follow the child's lead and to set suitable limits on the child's behaviour, whilst encouraging an appropriate degree of autonomy. The success of the parent's attempts at structuring are taken into account, as is the parent's ability to meet the child at their level of understanding. This dimension also measures the nature and amount of both verbal and non-verbal strategies used to guide the child throughout an interaction.

Non-Intrusiveness refers to the parent's ability to follow the child's lead during an interaction without over-directing, over-stimulating or over-protecting. An optimally non-intrusive adult allows the child to set the pace and direction of play, does not verbally interfere or physically intrude, limits the number of commands made and allows the child an age-appropriate level of independence.

Non-hostility assesses the extent to which the parent can manage their own negative emotions and avoid expressing overt or covert hostility to the child. Forms of overt hostility include threats of separation, negative or ridiculing statements made to the child, and physical aggression. More subtle forms of covert hostility include showing signs of boredom, impatience, or frustration, including using silence to punish the child.

Child responsiveness refers to the extent of the child's emotional and behavioural responsiveness to the parent. This is the dimension considered to most closely align with the attachment concept of a secure/insecure child (Biringen et al., 2014). In assessing the child's responsiveness, the coder observes two aspects of the child's behaviour: (i) their affect and emotion regulation, and (ii) their emotional responsiveness, i.e. the child's eagerness or willingness to engage with the adult following a bid for exchange. An optimally responsive child would appear happy and emotionally receptive, whilst being able to regulate their own emotions well.

Child involvement of the parent assesses the degree to which the child attends to and engages the adult in play. This dimension considers the child's attempts to both verbally and non-verbally initiate and elaborate upon interactions with the adult whilst also considering any avoidance of the adult indicated by the child's gaze, body language or lack of engagement.

Each EA dimension includes 7 subscales; the first two subscales in each dimension are scored on a 7-point scale (from 1 'non-optimal' to 7 'optimal'), and the remaining five subscales are scored on a 3-point scale (from 1 'non-optimal' to 3 'optimal')³². Scores for all subscales on each dimension are summed to provide a total dimension score out of 29. Participants are also assigned a Direct Score for each dimension, which is intended to provide a global rating of each dimension. Direct Scores are derived from information used to form the Total Scores, and are rated on a 7-point scale, with scores of $\geq .5$ considered as adaptive and scores of \leq considered impaired.

Child adjustment

Questionnaire measures

Children's emotional and behavioural adjustment was measured by the Strengths and Difficulties Questionnaire (SDQ, Goodman, 1997). The SDQ was administered to both parents and a teacher to provide a multi-informant assessment of child adjustment. The SDQ is a 25-item questionnaire which provides a rating of the presence of emotional or behavioural problems and is suitable for use with children aged between 4 and 16 years old. Each item is scored on a three-point scale (from 1 'not true' to 3 'certainly true'). The questionnaire comprises five subscales: Conduct Problems, Hyperactivity, Emotional Difficulties, Peer Problems, and Prosocial Behaviour. A total Difficulties score is calculated by summing the scores of the first four subscales, with higher scores indicating greater levels of problems. Cut-offs for psychiatric disorder are ≥ 17 for the parent-rated SDQ and ≥ 16 for the teacher-rated SDQ. In addition, the scores for Conduct Problems and Hyperactivity can be summed to produce a subscale score for Externalising Problems; the scores for Emotional Difficulties and Peer Problems can be summed to produce a subscale score for Internalising Problems. An advantage of utilising the two broader subscales of Externalising and Internalising Problems is that as they each comprise a greater number of items compared to the original five

³² See appendix 11

subscales, the risk of measurement error may be reduced, which is a particularly pertinent consideration for studies with smaller samples (Goodman et al., 2010).

The SDQ has high inter-rater reliability, test-retest reliability, internal consistency, and concurrent and discriminative validity (Goodman, 1994, 1997; Husky et al., 2020; Stone et al., 2010), with SDQ scores found to correlate with existing questionnaires of child emotional and behavioural difficulties such as the Rutter questionnaire (Goodman, 2001). Teachers have been found to be effective reporters of children's SDQ socioemotional adjustment, particularly with regards to detecting internalising disorders (Goodman, 2001). Questionnaires completed by mothers, fathers and teachers for this sample had good internal consistency, with Cronbach's alphas at .75, .81 and .85 respectively.

Interview measures

A section of the mother's interview assessed the child's psychological adjustment. Detailed descriptions of any child behavioural or emotional problems were obtained; these descriptions included details about the severity and frequency of relevant behaviours, where the behaviours were shown, triggers, and the course of the behaviours over time. These data were coded using a standardised procedure that has proven reliability and validity, with a good level of agreement being found between interview ratings of children's psychological problems and mothers' rating of their child's behavioural and emotional difficulties (Graham & Rutter, 1968; Rutter et al., 1975). This section of the interview was transcribed verbatim and then coded by a trained child psychiatrist who was blind to family type. The child psychiatrist rated any problem identified according to both the type and severity of the problem. Psychiatric problems could be classified as either *emotional*, *conduct*, *development*, *hyperkinetic*, *psychosis* or *other*. Where multiple psychiatric problems were identified, the classification of *mixed* was given. Severity of psychiatric problems was rated on a 4-point scale, from 0 (*no abnormality*), 1 (*dubious or trivial*) 2 (*slight but definite*) to 3 (*definite or marked*).

The Berkeley Puppet Interview (BPI, described above) was also used to assess children's self-reports of their own functioning. Three subscales were used to assess child adjustment: The

Child Depression scale, the *Child Overanxiety* scale, and the *Child Strengths and Competencies* scale. The BPI scales regarding children's depressed-anxious feelings were developed drawing on evidence in the literature for the overlap between sadness, loneliness and anxiety in young children (Achenbach et al., 1987; Kovacs, 1985), and therefore centre around children's descriptions of themselves as sad, lonely, worried and irritable (Measelle et al., 1998). BPI social competence has been defined as the ability to engage successfully in social tasks such as making friends, seeking engagement, and asserting oneself in a socially appropriate way (Measelle et al., 1998).

Items on the *Child Depression* scale included: "I'm a sad kid/ I'm not a sad kid", "I don't cry a lot/ I cry a lot", and "I like myself/ I don't like myself." Examples of items from the *Child Overanxiety* scale include: "I get tummy aches a lot/ I don't get tummy aches a lot", "I don't worry bad things are going to happen/ I worry bad things are going to happen", and "I have lots of bad dreams/ I don't have lots of bad dreams." Items from the *Child Strengths and Competencies* scale include: "It's not hard for me to learn new things/ It's hard for me to learn new things", "If another kid is alone, I won't ask them to play/ If another kid is alone, I'll ask them to play", and "Other kids don't tease or pick on me/ Other kids tease or pick on me".

Parents' disclosure intentions and practises

A section of the interview focused on parents' attitudes towards communication about, and disclosure of, their use of egg donation. Parents were asked about the extent to which they still discussed their use of egg donation as a couple, before being asked whether they had begun telling their child about their method of conception. For those who had begun the disclosure process, parents were questioned about their reasons for deciding to tell their child. For those who had not begun the disclosure process, details were obtained regarding whether and when parents planned to begin telling their child and, if not, the reasons for choosing not to tell their child about their method of conception. Parents who were unsure about whether to disclose were asked to reflect upon their reasons both for and against telling.

2.4.2. Mothers' thoughts and feelings about identity-release egg donation

Egg donation mothers' thoughts and feelings about identity-release egg donation were examined by qualitatively analysing a section of the semi-structured interview which explored parents' experiences of egg donation³³. A semi-structured interview was selected as the best method of collecting this data as it generates rich and detailed descriptions of participants' experiences, enabling them to use their own language and concepts in relation to the research question (Kvale, 2007; Rubin & Rubin, 1995).

Mothers were initially asked about what information they had been given by the clinic, and whether they had subsequently requested any further information about the donor from the clinic. Mothers were encouraged to reflect upon whether they were satisfied with the amount of information about the donor available to them at that time and, if not, what further information they wished to have. Mothers were also asked how often they tended to think about the donor, and whether they had any concerns about their use of egg donation now that their children were in early childhood.

Following these more general questions, mothers were asked specifically about their thoughts and feelings about identity-release egg donation. Mothers were asked whether they would ever like to know the donor's identity, whether they would ever like to have contact with the donor, and how they felt about the possibility of their child knowing the donor's identity in the future. Probes were used where appropriate to encourage mothers to expand upon their answers (e.g., Do you think you'd ever like to have contact with the donor in the future? Why/ why not? How does the prospect make you feel?) Certain questions from the disclosure section (described above) also pertained to mothers' thoughts and feelings about identity-release egg donation; for example, if mothers had told family members or friends about their use of egg donation, they were asked whether these people knew that their child would be able to learn the donor's identity in the future. Similarly, when discussing mothers' attitudes towards telling their child about their method of conception, they were asked

³³ This section was administered to both mothers and fathers but only mothers' responses were analysed here.

whether they had told, or planned to tell, their child that they would be able to access the donor's identifying information in the future.

Questions were generally standardised and asked in the same order; however, due to the sensitive nature of the topic being discussed, questions could be rephrased in response to changes in the interviewing environment³⁴. The order of the questions could also be amended depending on the order in which topics occurred in participants' narratives. Efforts were made to foster a non-judgemental, trusting relationship with the participant throughout the interview. Researchers worked hard to ensure participants were made to feel at ease throughout the interview; techniques used to achieve this included placing questions about egg donation towards the end of the interview to allow time establish rapport with the participant (Braun & Clarke, 2013), and engaging in "communicative validation" (Gaskell & Bauer, 2000), whereby the researcher indirectly checked they had correctly understood the participant's perspective throughout the interview.

Quality Assessment: Qualitative analyses

The quality of the qualitative analyses in this thesis was assessed using Gaskell & Bauer's two criteria of confidence and relevance (Gaskell & Bauer, 2000). Confidence markers ensure that the results of qualitative analyses reflect 'reality'; confidence markers provided by Gaskell and Bauer include transparency and procedural clarity, triangulation of methodology, and reflexivity. Relevance markers assess the importance of the research evidence for "the people involved, for the theory or concepts at stage, or for the purposes of the research project" (Gaskell & Bauer, 2000: 363). These markers include communicative validation, local surprise, and thick description. These criteria are based on the principals of public accountability and evidence-based practise, and they are considered appropriate for assessing the quality of this research due to the aims of the study and the social relevance of the topic.

³⁴ For example, the presence of any children or other family members who were unaware of the parents' use of egg donation sometimes resulted in changing the order of the questions, or occasionally in finishing the questions about egg donation via telephone at a more convenient time.

Confidence criteria were met both during data collection and analysis. With regards to transparency and procedural clarity, the purposive sampling method detailed earlier in this chapter can be considered a marker of both confidence and relevance, as participants were recruited from a group of clinics that constitute one of the main providers of egg donation treatment in the UK. Detailed descriptions of participant characteristics, interview materials, data collection and collation, and analytic approach have been provided elsewhere in this chapter. Atlas.ti, analysis software designed for use with qualitative research, was used to track codes and themes across transcripts, and to systematically document analysis decisions and stages. Furthermore, data audits were conducted to periodically assess the quality of the analysis process. This involved engaging in in-depth conversations with an experienced qualitative researcher who was not directly involved in the project. Data audits assisted in the process of refining and revising themes and the thematic network throughout the analysis period.

The further relevance criteria of thick description and local surprise were met throughout the research process. Thick description is the practise of extensively reporting verbatim quotes from the source material used for the analysis, so that readers may scrutinise the interpretation of the data. Communicative validation was conducted throughout each data collection visit, which further assured the relevance of the findings (Gaskell & Bauer, 2000; Shenton, 2004). Finally, findings that diverged from what was expected, or accounts that deviated from each other in surprising ways, were scrutinised and considered in the presentation of the results, rather than being discarded from the analysis and subsequent discussion; this process ensures the avoidance of the fallacy of selective evidence.

Reflexivity

As home visits were conducted by pairs of researchers, peer debriefing was able to occur promptly after every visit (Flick, 2014). Debriefs provided researchers with the opportunity to discuss any ethical or practical issues that may have arisen during data collection, whilst also ensuring consistency between interviewers. Debriefs also provided space for researchers to reflect on any personal biases or experiences that may have influenced data collection, thus facilitating interviewer reflexivity.

As a cisgender, White, heterosexual woman in her early thirties, the main researcher (JL) could be considered to occupy both insider and outsider positions. Similarities between researcher and participants in terms of educational status, ethnicity and, in the case of the mothers, gender, may have conferred upon the researcher an insider position that may have facilitated a more rapid and complete acceptance by the participants (Talbot, 1998; Dwyer & Buckle, 2009; Hayfield & Huxley, 2015). Conversely, as experiences of infertility are often private and are rarely immediately apparent, it was unknown to participants whether the research team had had any personal experience of parenthood or infertility. This may have caused some parents in this study to view the researchers as outsiders in this regard; indeed, several participants made a point of asking the researchers whether they had children, demonstrating that this was considered an important perspective. It is possible that these participants would have felt more able to, or comfortable with, sharing their experiences of infertility and non-genetic parenthood if members of the research team had had similar experiences. However, insider positionality also has the potential to impede the research process as it is possible that, due to participants' assumptions of shared knowledge, they may fail to explain their individual experiences in full detail (Dwyer & Buckle, 2009). It is therefore possible that the researchers' outsider positionality as non-parents enabled them to ask clarifying questions and access a greater level of detail in participants' responses. It is also plausible that the research teams' position as non-parents helped parents feel they were being interviewed by an objective, impartial individual, thereby reducing the possibility of their feeling judged by another parent.

Throughout data analysis, a reflexive journal was kept by the main researcher to monitor and reflect upon any assumptions and biases that arose during the process. In particular, the main researcher reflected upon her position as an ART researcher, such that her experience researching ART and new family forms had led to particular views about the relative importance of genetic relatedness in family functioning, and about the role of communicative openness within donor conception families. She also reflected upon her personal views about childbearing and parenthood, and personal beliefs that are opposed to dominant cultural narratives about biological motherhood and its role in the construction of female identity. The tension between these beliefs and those that were revealed in mothers' narratives were

reflected upon and discussed amongst the broader research team. As discussed, regular data audits were also conducted with a member of the senior research team who was not involved in the present study, in order to ensure the main researchers' positionality did not unduly influence the construction of the themes in the primary analysis.

Reliability: Quantitative Analyses

Parent Development Interview

PDI transcripts were coded by three researchers (Joanna Lysons, Niamh Chalmers and Poppy Hall), all of whom had undertaken training by a certified trainer. JL coded 26 mothers' and 28 fathers' PDIs; NC coded 25 mothers' and 30 fathers' PDIs; PH coded 24 mothers' and 30 fathers' PDIs. To calculate inter-rater reliabilities for the PDI, one third (39) of the mothers' interviews were double-coded. As far as possible coders were blind to family type, although this was not always possible as some parents brought up their use of egg donation during the PDI interview. Intra-class correlation coefficients ranged from .70 to .98.

Berkeley Puppet Interview

Video recordings of the child puppet interview were coded by two researchers (Kate Shaw and Jessica Grimmel). Both coders participated in a comprehensive training session on how to use the BPI coding scheme. Once good inter-rater reliability had been achieved, KS coded 53 (50%) of the video recordings and JG coded 53 (50%). To calculate inter-rater reliabilities for the BPI, 35 (33%) of the video recordings were double coded. Double coding was undertaken at regular intervals throughout the coding period, to control for rater drift. Intra-class correlation coefficients ranged from .90 to .99. As far as possible, coders were blind to family type, although this was not always feasible as both coders had been involved in data collection.

Quality of parent-infant relationship: observational measure

Video recordings of parent-child interactions were coded by three researchers (Joanna Lysons, Vasanti Jadvā and Kitty Jones). All coders participated in comprehensive training on how to use the Emotional Availability coding system and received certification after demonstrating good inter-rater reliability. JL coded 68 (59%) mother-child videos and 60 (68%) father-child videos; VJ coded 31 (27%) mother-child and 21 (24%) father-child videos, and KJ coded 16 (14%) mother-child and 8 (9%) father-child videos. To calculate inter-rater reliability, 33% (38) of the mothers-child videos were coded by a second rater. Two coders (VJ and KJ) were blind to family type; however, it was not possible for JL to be blind to family type as she had been involved in the data collection process. Intra-class correlation coefficients ranged from .72 to .94.

See Appendix 9 for a full list of ICCs for the above variables.

2.5 Ethical considerations

The principle ethical consideration when collecting data with this sample was ensuring the avoidance of accidental disclosure in families in which parents had not told their children about their method of conception. Some families had decided not to tell their children how they were conceived; others had decided, but they had not yet begun to disclose this information. Participation in the study could pose a threat to the family if family members were to find out about the child's method of conception as a result of the home visit. Great care was therefore taken during all communication with the parents to minimise this risk. When recruiting families and arranging visits, researchers only ever spoke to the parents themselves and never left messages on answering machines or with other household members. The study was referred to as the 'The Parent and Baby Follow-up Study' in all written correspondence. When scheduling home visits with parents, researchers ensured that the parent was informed of what would be discussed during the interview, including discussion of fertility treatment, and arranged for this section of the interview to be held in private if necessary³⁵.

Early in the data collection process, it became clear that not all parents knew or understood the details of identity-release donation, and, as such, were not aware that their child was entitled to find out identifying information about the donor when they reached the age of 18 (see section 3.1.1.). It was therefore considered unethical to ask questions that overtly communicated this feature of identity-release egg donation to the parent. Informing those who were unaware of their child's legal right to access identifying donor information in the future during the interview could be potentially distressing and destabilising for the parent and the family unit. Questions regarding donor identity were therefore phrased in such a way as to tap into tacit understanding in the parents who understood the full implications of identity-release egg donation, without informing, and possibly distressing, those who did not understand identity-release. Parents were asked "is there anything else you or [your child]

³⁵ Typically, this involved scheduling the visit to begin at a time when the child was still at school, so that the parent would feel free to discuss their use of fertility treatment without risking their child overhearing. Where this was not possible, researchers discussed options such as having a separate space in the house that could be used for the interview, and assuring the parent that two researchers would be present and that one researcher would be available to keep the child entertained during the fertility treatment section of the interview.

will be able to find out about the donor in the future?” This enabled the parent to respond from their perspective and provided the interviewer with an opportunity to assess whether they understood the identity-release feature of egg donation before asking more specific questions. In situations where the researcher felt unable to be sure about the parent’s level of understanding, it was assumed they did not know about identity-release egg donation and these questions were omitted from the interview.

Some parents used the interview as an opportunity to ask for advice about how to disclose their use of egg donation to their child. On such occasions, researchers provided parents with a list of organisations they could contact for further information.

Researchers scored responses on the EDS and TAI questionnaires as soon after the visit as possible. In the rare instances where participants scored over the recommended questionnaire cut-offs, but had not mentioned any diagnoses of anxiety or depressive disorder during the interview, protocol dictated that the researcher who had conducted the interview with the parent would contact the parent by phone. The participant was informed in a sensitive manner that one of their questionnaires indicated low mood or heightened anxiety, and the researcher suggested that it might be helpful to seek out further support from their GP.

Chapter 3: Qualitative Results

This chapter presents the results for the qualitative analyses of identity-release egg donation mothers' experiences of, and thoughts and feelings about, identity-release egg donation. Firstly, parents' interviews were analysed using qualitative content analysis to assess mothers' and fathers' understanding of identity-release egg donation and attitudes towards disclosure (section 3.1). Following this, mothers' interviews were analysed using thematic analysis to explore their thoughts and feelings about identity-release egg donation, and about the prospect of potential donor-child contact in the future (section 3.2). Finally, results are presented from a qualitative content analysis of mothers' interviews to examine perceived donor threat (section 3.3).

3.1 Qualitative content analysis

3.1.1 Parents' misunderstandings about identity-release egg donation

Parents' level of understanding about identity-release donation was ascertained by their answers to the questions "Is there anything else you or your child will be able to find out about the donor in the future?" and "Is there anything you plan on telling your child specifically about the donor in the future?"³⁶ Of the 61 identity-release egg donation mothers interviewed³⁷, forty-four (72.1%) mothers demonstrated at least a basic understanding of identity-release egg donation; however, seventeen (27.9%) mothers did not understand the identifiable nature of their egg donation. Of the 51 identity-release egg donation fathers interviewed, 35 (68.6%) understood the principles of identity-release donation, whilst sixteen (31.4%) did not appear to understand identity-release.

³⁶ Early versions of the interview schedule included direct questions about parents' feelings about identity-release donation. However, as soon as it became apparent that some parents were unaware, a decision was made on ethical grounds to try and ascertain parents' level of understanding about identity-release donation using indirect questions that were less likely to result in the accidental disclosure of this fact.

³⁷ One mother participated with questionnaires only, and one mother was unavailable for this section of the interview.

Qualitative content analysis was therefore conducted to examine parents' types of misunderstanding about identity-release donation. Qualitative content analysis is a method of analysis that applies the benefits of quantitative paradigms to qualitative data (Graneheim et al., 2017; Mayring, 2015). Qualitative content analysis is particularly appropriate for organising responses to a particular question or relating to a specific theme. This technique enables the exploration of participants' thoughts and experiences via the creation of categories that describe the participants' responses, whilst remaining close to the data. Counts can be made of participants in each category, ultimately allowing a comprehensive summary of participants' perspectives (Sandelowski, 2000; Schreier, 2012).

Transcripts were first read, and initial codes generated. These codes were then refined into two overarching categories, each of which contained subcategories and each of which represented a different type of misunderstanding about identity-release egg donation. Transcripts were then coded in accordance with these categories, and counts were made of each category code for both mothers and fathers. This approach was in accordance with the principles of qualitative content analysis (Krippendorff, 2004) and is in line with previous research pertaining to participants' experiences of family life in new family forms (Blake et al., 2010; Zadeh, Jones, Basi, & Golombok, 2017).

Results

Categories and illustrative quotations resulting from the qualitative content analysis are presented in Table 3.1.1. Mothers' and fathers' misunderstandings about identity-release egg donation fell into two broad categories: 1) Unclear about identity-release, and 2) Belief that the donor is anonymous.

1) Unclear about identity-release

This category corresponds with parents' uncertain responses about identity-release egg donation and subdivides into two further categories: (i) Ignorance of identity-release, and (ii) partial/incomplete understanding of identity-release.

(i) Ignorance of identity-release

Of the 33 parents that did not understand identity-release donation, most mothers (41%) and fathers (68%) responded that they didn't know whether their child could access any further information about the donor in the future. Some parents phrased this in terms of not being able to remember or needing to do some "research" by looking at their medical paperwork from the treatment stage. Others responded that they didn't know because they hadn't investigated the question, with one mother stating that as she didn't intend to tell her child about her method of conception, she hadn't investigated what information about the donor her child was entitled to.

(ii) Partial/ incomplete understanding of identity-release

A small number of parents (18% of mothers, 13% of fathers) demonstrated vague knowledge about certain aspects of identity-release donation but stopped short of demonstrating a full understanding. For example, two parents demonstrated knowledge that the age of 18 is a threshold for children to seek out information, but were unclear as to precisely what information they would be entitled to access:

"I'm not sure what legal right she will have when she turns say eighteen to get further information, I don't know." – Father

One mother was unsure of whether information about the donor would be accessible to her child, but indicated a belief that the age of 18 was a legal deadline to disclose use of donor conception to her child:

"When she's 18 and she's...I can't remember what they said now about whether...do we tell her that she...I've forgotten all of that information... erm, because you have to by law here in this country, they have to know that...or they have to have access to information about having used donor eggs [...] I think we have to though, I think legally we have to tell her."

2) The donor is anonymous

This category corresponds to parents' responses indicating their belief that their egg donor was fully anonymous. This category contains two subcategories: (i) Belief that the donor is anonymous, and (ii) Identity-release donation was introduced after child was born.

(i) Belief that the donor is anonymous

This was the second most common type of misunderstanding about identity-release egg donation. Thirty-five percent of mothers and 13% of fathers expressed the belief that their egg donor was fully anonymous and that their child would be unable to find out any more information about the donor.

(ii) Identity-release donation was introduced after child was born

One mother and one father demonstrated clear knowledge of identity-release donation but expressed the belief that the change in UK law from anonymous to identity-release gamete donation was introduced after their child was born. These parents therefore believed that identity-release legislation did not apply to their families and that their child would not be entitled to access identifying information about their donor in the future.

Agreement between mothers and fathers

There were 33 parents in total who did not understand that they had used an identity-release donor. Data from the corresponding partner was unavailable for eight (47%) mothers, either because their partner was unable to participate, or because they had separated between phases 1 and 2 of the study. Five mothers (29%) matched with their partners, such that neither parent understood identity-release donation. A mismatch was observed for the remaining four mothers, where either the mother did not understand identity-release, but

the father did (two mothers, 11.8%), or the mother did not understand and the interviewer was unsure whether the father understood (two mothers, 11.8%).

As stated above, six fathers (37.5%) matched with their partners, such that neither parent understood identity-release donation. A mismatch was observed for nine fathers (56.2%) such that they did not understand identity-release donation, but their partners did. Data from the corresponding partner was unavailable for one (6.3%) father.

Conclusions

Most of this subset of parents demonstrated an unclear understanding of identity-release egg donation, with most parents indicating that they did not know whether their child would be able to access additional information about the donor in the future. The remaining parents in this group believed that their donor was anonymous and would not be identifiable to their child in the future. More fathers than mothers were unclear in their understanding of identity-release, whereas more mothers than fathers expressed the belief that their donor was anonymous. Whilst five couples were aligned in their misunderstanding of identity-release donation, more fathers than mothers were mismatched with their partner, such that they did not understand that they had used identity-release donation, where their partner did.

Table 3.1.1. Proportions of parents who did not understand identity-release donation, and types of misunderstanding about identity-release donation.

	Mothers (n= 61)	Fathers (n= 51)	
Understands ID-release	44 (72.1%)	35 (68.6%)	
Doesn't understand ID-release	17 (27.9%)	16 (31.4%)	
Type of misunderstanding about ID-release	Mothers (n= 17)	Fathers (n= 16)	Examples of misunderstanding
1. Unclear about ID-release			
1a) Don't know	7 (41%)	11 (68%)	<p>“Well I don't really know much about the donor to be able to tell him anything, but I don't-, I mean I think I would have to do more research before I told him anything, because I don't know whether he's entitled to find out about the donor, I don't know how that works... <i>Mother</i></p> <p>“Erm...I don't know actually, I seem terribly remiss about this and I can't remember, and I can't even remember sort of whether these things are literally kind of closed off or whether it's one of those that you can go back to the clinic and they have to keep records and, you know, you can...insist on finding out.” <i>Father</i></p>
1b) Partial/ incomplete understanding of ID-release	3 (18%)	2 (13%)	<p>“I think we can get some more information, but I haven't really looked into it, because I know when [name] became a sperm donor he had to write a statement and stuff that would get passed on if they wanted it, so I probably should look into that for when we tell her really, but it's not something I've really thought about recently.” <i>Mother</i></p> <p>“I'm not sure what legal right she will have when she turns say eighteen to get further information. I don't know.” <i>Father</i></p>

Type of misunderstanding about ID-release	Mothers (n= 17)	Fathers (n= 16)	Examples of misunderstanding
2. Belief that donor is anonymous			
1a) Donor is anonymous	6 (35%)	2 (13%)	<p>“It’s all...it’s confidential, so you can never know who she was anyway...” <i>Mother</i></p> <p>“I don’t think it’s a possibility [to find out donor’s identity], but it would be very interesting.” <i>Father</i></p>
1b) ID-release was/ will be introduced after child was born	1 (6%)	1 (6%)	<p>“I don’t know because the law changed- , when did it, it was kind of anonymous that, but now I think you can get information – I might be wrong about all this – but I think that when they’re 18 they’re allowed to find out about the donor if you want to tell them. But I can’t remember what, if that’s just recent, a recent thing, I think it was after we had him...” <i>Mother</i></p> <p>“I was reading something that they’re looking to bring in some legislation where you can actually find out, or rather if you wanted to, I guess if the child wanted to, you can find out the identity of the egg donor, but I don’t know where that is, I just saw a story about it.” <i>Father</i></p>

3.1.2 Mothers' attitudes towards disclosure of identity-release egg donation

Mothers' transcripts were analysed according to the principles of qualitative content analysis (see above) to ascertain their attitudes towards disclosure of their use of identity-release egg donation to their child³⁸. Mothers' responses were found to fall into one of five categories: (i) started telling, (ii) plans to tell, (iii) plans to tell, partial disclosure, (iv) uncertain about telling, and (v) plans not to tell.

Of the 61 identity-release egg donation mothers interviewed regarding their views on disclosure of egg donation, 49.2% had begun the disclosure process. A further 36% planned to tell their child about their method of conception, and 3.3% planned on partial disclosure to their child, such that they planned to disclose their use of IVF but not egg donation. Five (8.2%) percent of mothers were uncertain about whether to disclose, and two mothers (3.3%) intended not to tell their child about their method of conception.

Table 3.1.2. Identity-release egg donation mothers' attitudes towards disclosure of identity-release egg donation

Identity-release egg donation mothers (n= 61)	
Started telling	30 (49.2%)
Plan to tell	22 (36%)
Plans to tell- partial disclosure	2 (3.3%)
Uncertain	5 (8.2%)
Plans not to tell	2 (3.3%)

Mothers who did not understand identity-release egg donation

Of the seventeen mothers who did not understand that they had used identity-release egg donation, 23.5% had already begun the disclosure process. A further 29.4% planned to tell their child about their method of conception, whilst 11.8% planned to disclose details of their

³⁸ As more data were available from mothers than fathers, only mothers' transcripts were used for this stage of the analysis. As data from one identity-release egg donation mother were unavailable for this part of the interview and one identity-release egg donation mothers participated with questionnaires only, total *n* for this part of the analysis = 61.

use of IVF, but not of egg donation. Four (23.5%) mothers in this group were uncertain as to whether they would disclose their use of egg donation to their child, and 11.8% planned not to disclose.

Mothers who understand identity-release egg donation

Of the 43 mothers who understood that they had used identity-release egg donation, 26 (60.4%) had already begun the disclosure process by the time their child was five years old. All remaining mothers planned to tell their child about their method of conception.

Mothers in this group were also asked specifically whether they had told, or intended to tell, their child of their ability to access the donor's identity in the future. Most had told (12%), or intended to tell (79%), their child about their right to access identifying information at the age of eighteen. Four mothers (9%) were uncertain about whether to disclose this aspect of their use of egg donation to their children.

Conclusions

Most mothers had either begun, or intended, to disclose their use of egg donation to their child. All of those who were undecided, or non-disclosing, did not understand that they had used an identifiable donor. Almost all the mothers who understood the principles of identity-release donation intended to disclose this information to their child, although a few remained unsure.

Table 3.1.3. Identity-release egg donation mothers' disclosure practises by level of understanding about identity-release donation

	Mothers who do not understand identity-release donation (<i>n</i> = 17)	Mothers who understand identity-release donation (<i>n</i> = 44)
Disclosure about egg donation		
Started telling	4 (23.5%)	27 (61.4%)
Plan to tell	5 (29.4%)	17 (38.6%)
Uncertain	4 (23.5%)	-
Plan to tell- partial disclosure	2 (11.8%)	-
Plans not to tell	2 (11.8%)	-
Disclosure about identity-release		
Started telling	-	5 (11.4%)
Plan to tell	-	35 (79.5%)
Uncertain	-	4 (9.1%)

3.2. Thematic analysis: mother's thoughts and feelings about identity-release egg donation

Analytical approach

The primary aim of this analysis was to investigate mothers' thoughts and feelings about identity-release egg donation, and about the prospect of future donor-child contact. Reflexive thematic analysis (Braun & Clarke, 2019) was selected as the most appropriate form of analysis to address the research question. Broadly, thematic analysis is a method used for the identification and analysis of patterns within a dataset, enabling the researcher to construct themes that are salient within the dataset in relation to the research question (Attride-Stirling, 2001; Braun & Clarke, 2006). It has been claimed that the results of thematic analysis are generally accessible to the general public, and they may be particularly suited to informing policy and procedure (Braun & Clarke, 2006). As the present study is the first to examine parent's perspectives on identity-release donation since the introduction of this legislation in the UK over a decade ago, this analytical approach seems particularly appropriate.

Reflexive thematic analysis is a multi-stage process, during which the features of a dataset are systematically coded, sorted into themes, reviewed, refined, and named³⁹. The refining process should result in themes that are both discrete from each other, but also broad enough to represent various codes from different parts of the dataset (Attride-Sterling, 2001). This kind of analysis is inductive and data-driven, allowing the researcher to stay close to the text without necessitating a predetermined coding scheme. An important feature of reflexive thematic analysis is the researcher's role in knowledge production; the researcher's theoretical, philosophical, and subjective assumptions must be acknowledged and enacted throughout the analytical process (Braun & Clarke, 2019). Theme generation is the result of a flexible, rigorous, and recursive process, during which the researcher continually practises reflexivity and reviews adherence to the aforementioned quality criteria (see section 2.4).

Other qualitative methodologies were considered before a reflexive thematic approach was ultimately adopted. Interpretive phenomenological analysis (IPA) was considered due to its

³⁹ See appendix 6 for a summary of the stages of reflexive thematic analysis.

focus on making meaning of participants' lived experiences (Larkin et al., 2006). However, whereas IPA embraces an idiographic approach that focuses on the idiosyncrasies of each individual report, thematic analysis embraces a nomothetic perspective whereby common meaning is sought across various accounts. Qualitative content analysis was also considered as it has proved a useful method for examining perspectives on donor conception and the donor in previous studies of modern family forms (Zadeh et al., 2017; Blake et al., 2010). However, upon initial reading of the dataset, it became clear that there was considerable ambivalence amongst mothers' narratives; it was felt that attempts to represent mothers' thoughts and feelings about identity-release donation as categories would prove too narrow, whereas thematic analysis would allow themes to be constructed within this context of nuance and complexity.

Conducting the analysis

The dataset comprised 44 mothers' interview transcripts. This represented 70% of all identity-release egg donation mothers' transcripts. The decision was made to include only those transcripts where the mothers expressly understood that they had used identity-release donation. The remaining 17 transcripts were excluded from the analysis due to their inability to address the research question. Transcripts included the 'experiences of egg donation', 'telling others' and 'telling the child' sections of the interview. These sections of the parent interview were transcribed by either the researcher who had conducted the interview, or by a transcriber affiliated with the research group. Transcribers were provided with a protocol to preserve naturalistic features of participants' talk within the transcripts, such as pauses, hesitations and overt expressions of emotion⁴⁰. Pseudonyms were used to protect participants' identities, and all identifying information was removed from the transcripts.

Atlas.ti was used throughout the analyses to organise codes and themes, and to keep a record of the researcher's notes as the code/theme generation process evolved (Gaskell, 2000; Braun & Clarke, 2013). Data were analysed according to the steps outlined by Braun & Clarke (2006) and coded with a focus on mothers' thoughts and feelings about the identifiable

⁴⁰ See appendix 7 for transcription protocol

nature of their donor, and about future donor-child contact. Data were coded with both semantic-level codes (e.g. “doesn’t want to know the donor’s identity”) and latent-level codes (e.g. “genetic link confers family status”). As each transcript varied in length, the number of codes generated varied across texts. Codes and their corresponding text excerpts were subsequently reread and collapsed in order to generate initial themes. This process was iterative and was repeated until an organised thematic map was created, which demonstrated three organising themes, eleven subthemes and three basic themes.

Results

Three organising themes were produced from the analysis: (i) *identity-release as a threat*, (ii) *acceptance: it is what it is*, and (iii) *embracing identity-release*. The findings indicated that egg donation mothers utilised certain strategies to manage their feelings about identity-release in day-to-day life; each theme was associated with at least one coping strategy. In total, eleven subthemes were identified in order to describe the findings. The organising themes and subthemes are depicted in a thematic map in Figure 3.2.

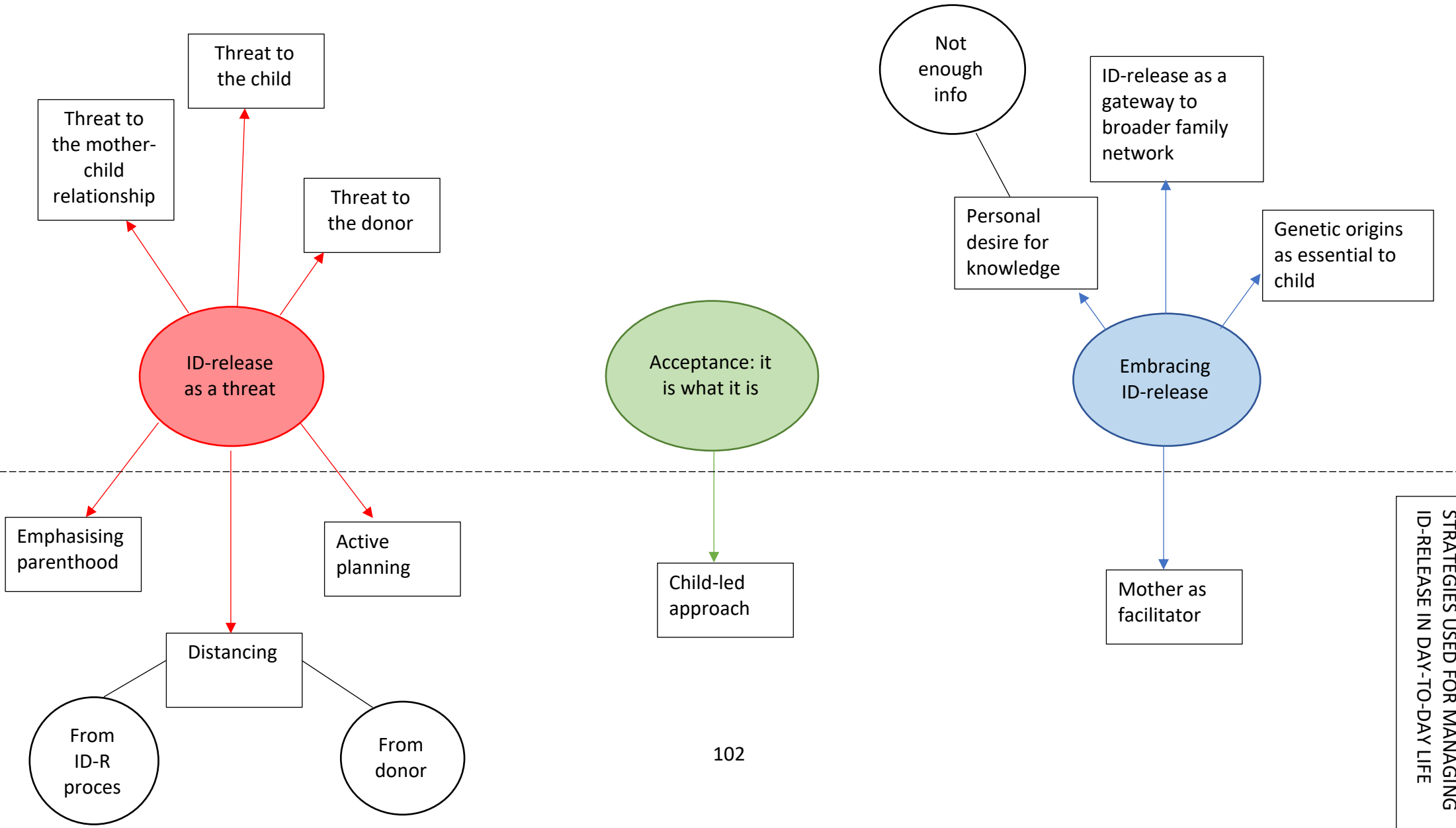
The map illustrates the relationships between the themes and subthemes. The first organising theme, *identity-release as threat*, is associated with six subthemes and two basic themes. The first three subthemes describe types of mothers’ perceived threat: *threat to the mother-child relationship*, *threat to the child*, and *threat to the donor*. The remaining three subthemes describe the strategies utilised by mothers to manage their feelings of threat: *emphasising parenthood*, *distancing*, and *active planning*. The *distancing* subtheme comprises two basic themes: *distancing from the identity-release process* and *distancing from the donor*. Approximately half of the mothers expressed at least some level of perceived threat and engaged in at least one of the three coping strategies.

Acceptance: it is what it is was identified as the second organising theme. This theme captures the attitudes of a small but distinct group of mothers who demonstrated a stoic resignation to identity-release. This theme is associated with one strategy subtheme whereby mothers adopted a *child-led approach* to manage their feelings about identity-release.

The third organising theme, *embracing identity-release*, encapsulates the thoughts and feelings of those mothers who felt that there is something essential and positive about identity-release, frequently representing it as an opportunity to be embraced. This organising theme is associated with four subthemes and one basic theme; the first three subthemes, *personal desire for knowledge*, *identity-release as a gateway to a broader family network*, and *genetic origins as essential to child*, capture mothers' various ways of embracing identity-release. The subtheme *personal desire for knowledge* is associated with one basic theme, *not enough information*. Many of these mothers viewed themselves as responsible for facilitating contact between their child and the donor; this attitude is captured in the associated strategy subtheme, *mother as facilitator*.

The organising themes identified in this analysis are not mutually exclusive; it was not uncommon for mothers to demonstrate multiple perspectives in their narratives, simultaneously perceiving the donor's identity as a threat whilst also acknowledging the ability to trace the donor as an essential opportunity for their child.

Figure 3.2. Thematic map of mothers' thoughts and feelings about identity-release egg donation



The following section presents findings from the analysis according to the three organising themes: *identity-release as threat*, *acceptance: it is what it is*, and *embracing identity-release*.

1. Identity-release as a threat

When reflecting upon how they felt about knowing the donor's identity, and potential contact between the donor and their child, many mothers viewed the prospect as threatening to some degree. This perceived threat of identity-release was represented in three key ways: as *a threat to the mother-child relationship*, *a threat to the child*, and *a threat to the donor*. The mothers were found to adopt at least one of three strategies cope with this threat: *emphasising parenthood*, *distancing* and *active planning*. Mothers adopted one or all of these strategies, although those who principally adopted an 'active planning' strategy were less likely to adopt a 'distancing' strategy, and vice versa.

Threat to the mother-child relationship

When expressing their thoughts and feelings about identity-release, the representation most commonly expressed by mothers was that their child's ability to access the donor's identifying information in the future threatened the security of the mother-child relationship. Some mothers, like Coleen, expressed a fear that a bond shared by the donor and child would cast doubt on the legitimacy of her own relationship with her child:

"I wouldn't discourage him because that's his right. Privately I'd be really concerned. I'd be worried that they'd suddenly have this unbelievable connection that, that perhaps is truer of a biological mother, and perhaps what we've got isn't a true mother-son relationship? I don't know, it worries me."

Similarly, many mothers feared being rejected by their child in favour of the donor, either at the dyad level or at a broader, family-wide level:

Interviewer: *Do you think you'd ever like to have any contact with the donor in the future?*

Clarice: *That's a tricky one because it's obviously very scary for parents who are not genetically related to their children, you do worry about...whether it would affect their relationship with you.*

Wendy expressed a similar fear of rejection: *"probably a fear of mine really, is that he might really like her and her family and, like, in future Christmases decide to spend time with her rather than us."*

Conversely, other mothers perceived threat not from rejection by their child, but instead from the donor's interest in the child. For example, one mother said that despite her curiosity about the donor, she wouldn't want to her child to initiate the identity-release process in case it piqued the donor's interest in her child:

"So I'd sort of be worried that she'd then say, 'oh yes and I'd love to get to know [Child] and I'd love...' and you sort of think well hold on a minute, no, no, no, no, no, no." (Agatha)

Some mothers expressed this perceived threat as a desire for their child to accept the status quo. Hermione explained that, *"I don't think I'd want her to [seek the donor's identity], I think I want her to be happy with this as is...your mum and dad, that we got given this opportunity and here you are, so."* Others, such as Coleen, expressed a concern that her child, as an only child, may be lured away from the family unit by the prospect of donor siblings:

"I think for me what would upset me is, or what worries me, I suppose, is if they've got siblings, or if [child]'s got siblings that she doesn't know, that's the bit that bothers me. Because then I think if we'd had more children that would have maybe been easier, but because we haven't, the chances are that she's probably got, you know, biological siblings somewhere and that I think would be interesting for her... I think that side of things is a bit of a concern."

Some mothers also expressed a concern about the identity-release process itself having a negative, potentially long-term, impact on their relationship with their child. For example, Valerie felt that the prospect of identity-release influenced her parenting style due to the fear that her child would one day use it as a weapon against her:

“That’s probably why I nurture and care for her so much more, because I want her to be, to know that I, you know, absolutely adore the ground she walks on. I don’t want her to then say ‘well you were rubbish, I’m going to go and find who’s biologically mine’ or whatever. I want to overcompensate I suppose because I don’t want her to go and find... but that will always be her choice, but I’m sure she’ll throw it in my face when she’s fifteen and I’m stopping her going out the door with a bottle of vodka in her hand or something.”

Other mothers, like Rachelle, anticipated potential rejection by the donor as something that may come between her and her child:

Interviewer: *Do you have any concerns about the way in which (child) was conceived?*

Rachelle: *Just in terms of erm...you know, the concern for him in terms of if he does want to contact them and she doesn’t, just how he processes it and what that means for us and our relationship.*

Some mothers conveyed a feeling that identity-release posed a threat to their identity as mothers and to their sense of connectedness to their child. Many mothers expressed the hope that their child wouldn’t seek contact with the donor in the future and felt that any interest their child were to show in the donor would be emotionally painful to them. Several of the mothers’ narratives suggested that their child’s interest in their donor’s identity would represent a challenge to their identity as mothers. For example, Audrey explained that her child’s interest in the donor would be an indicator that she’d failed as mother:

“I’m not sure I’d like it if I’m honest. Yeah, I don’t think I would. I don’t know. I think I might see it as, as if she wanted to find her then is it ‘cause I’ve not done my job properly?”

For some mothers, identifying information about the donor was represented as having the power to weaken or interfere with mothers’ sense of ‘ownership’ over their child: *“I don’t think I would like to know more. ‘Cause I think... because she’s obviously ours.”* (Isabella) Similarly, Valerie suggested that her child initiating the identity-release process would

constitute a challenge to the bond between them: *“I think she can find out everything when she’s eighteen. That’ll be the toughest thing for me because I don’t see her as that she’s anything other than mine, you know, she’s kind of all mine.”*

Mothers also demonstrated perceived threat from identity-release by reflecting on concerns that access to information about the donor’s identity may *“limit or influence”* (Wendy) their own perception of their child. Rachelle observed that:

“So say for example if I knew she was an artist or a musician then I might kind of think oh, that’s where he gets that from or think oh, he needs to do more...do you know what I mean, I don’t want to influence how...him being his own person.”

Several mothers suggested that knowledge of any physical resemblance between the donor and their child would intrude upon their perception of their child:

“They don’t look like me, but they do look like their dad, but they don’t look the same. If I knew who the donor was, I’d worry I’d always see the donor and I don’t want to do that.” (Melissa)

Threat to the child

Several mothers’ narratives focused on the potential threat that identity-release posed not to themselves, but to their child. Mothers expressed concerns about how the donor may behave, or what the donor would want from their child after making contact. For example, Wendy voiced a concern that the donor might *“...erm...take advantage of him in some way or hurt him.”* Others focussed on the possibility that their child may be disappointed or face rejection from their donor after attempting to make contact:

“I don’t know how important it will be for her and how involved that person, you know, would that person want to see her and if she says no...then how’s she going to feel about that, will she feel rejected?” (Sofia)

Similarly, when discussing how she felt about her child potentially making contact with the donor, Agatha explained that:

“I wouldn’t like to rule it out completely, but then obviously you couldn’t guarantee that’s what she was going to get, and she could be rebuffed and get really upset, so I don’t know.”

Some mothers also anticipated the identity-release process taking a toll on their children in the context of their lives as young adults. Many made references to the fact that the process may be difficult or “*upsetting*” for their child, and they expressed regret that their child may have to go through a difficult process. Noreen shared that she “*very much fears where [child]’s mind is going to take her about this as she gets older*”; similarly, Wendy reflected that:

“I think it’s a tricky thing is that we’re kind of...we’re aware that obviously around eighteen, you know, he might be doing exams and things like that, and how emotionally mature will he be and...so I wouldn’t want him to get...erm...to have that mess, you know, at that time, it’s about when is he emotionally ready for it.”

Several mothers wondered what contact with the donor would mean to their child, often expressing fear and resentment about not knowing how their child would react when the time came:

“I don’t know, so I’m aware that (child) has half siblings and I just don’t know how (child’s) going to react to that information and what it’s going to mean to her and how much of a relationship she’s going to want to have with them...there’s a lot of fear.” (Clarice)

For several mothers, concerns for the wellbeing of their children were compounded by the fact that, because the identity-release system is so new in the UK, very little is known about the rates and quality of donor-child contact. Mothers therefore expressed a fear of the unknown in relation to their child accessing donor information. Amelia commented that “*I don’t think even the experts know how it would go, you know.*” Lilian expressed similar concerns about the lack of official information available:

“I don’t know how many children, if any, that have reached 18 from egg donor, probably maybe none yet, so there’s no...there’s no figures, no stats are there to say how many children...want any contact...want to do whatever, but I’d like to think she wouldn’t really want to contact them or...I don’t know, it’s hard isn’t it? That’s the unknown really.”

A related concern for several mothers was that they themselves would have a personal reaction to the donor, and that these reactions may disrupt their child’s experience of contact with the donor. Mothers such as Tabitha reflected that after building their own *“ideal vision”* of the donor, they may be disappointed when they do finally make contact. Alternatively, mothers such as Agatha worried that they wouldn’t like the donor upon making contact, and wondered what impact that may have on her child:

“And then if I didn’t get on particularly well with her or if I felt she had some odd views, or... what then? I don’t know.”

Threat to the donor

A small number of mothers also expressed their concern that the identity-release process could negatively impact the donor’s life or discourage potential donors altogether. For several mothers, the potential for donor offspring to *“suddenly appear”* in the donor’s life was represented as a threat hanging over the donor’s future:

“Yeah, you never really know if people who do these things want them to come back because I think it wasn’t so many years back when you couldn’t find out and it sometimes it puts people off doesn’t it? Because they think, are they going to have these kids appear out of nowhere?”
(Marie)

Similarly, some mothers viewed not initiating the identity-release process as a way of expressing gratitude to their donor; the value of the donor’s gift was so great that despite their curiosity, mothers wanted to *“do the right thing...for her”* (Carina) and respect the donor’s boundaries. Carina went on to say that:

“She’s got her family and she helped us have ours out of the kindness of her own heart and...but obviously she signed up to know that she can be found in the future as well so...I hope that doesn’t have any effect on her, thinking oh, we’ve got these children that might come looking for us.”

Similarly, Audrey explained her uncertainty about initiating the identity-release process:

“I think she was probably a 20-year-old who wanted to help, did help, and might have her own life now and her own kids, kind of thing. I wouldn’t want to rock the boat as it were.”

Strategy subtheme: emphasising parenthood

Whilst expressing their concerns about the prospect of identity-release, mothers demonstrated various strategies that they employed in order to manage these feelings of threat. The first of these was to emphasise the role of parenthood, thereby minimising the impact that donor’s identity could possibly have on the parent-child relationship. This was expressed in several different ways; most commonly, that the biological relationship shared by mother and child counteracted or neutralised the threat of any potential bond the child and donor could share. Mothers negated the potential threat posed by an identifiable donor with the primacy of gestational parenthood. Many mothers directly contrasted identity-release egg donation with adopted children seeking out their birth families, believing that because the donor’s contribution was *“just an egg”* (Erin), their child would feel no imperative to seek a connection with them in the future:

“First of all, before the treatment I was a bit worried that he would want to go and find another family and then that would be his family. But the doctor pointed out that it’s not like adoption, they haven’t been abandoned, there’s no history there of ‘why did you give me up?’ ...Without my body, he wouldn’t even be here.” (Juanita)

Similarly, Isabella observed that:

“I carried her and gave birth to her, I think it’s a very, very different thing than...you know. I know she can find the donor in her future life, but she’s got no connection, so there’s no like...she wasn’t carried by that other lady or anything, I think it’s really, really different.”
(Isabella)

In addition to the biological connection shared with their child, some mothers referred to the experience of parenting as a protective factor. Many mothers expressed fears of their child making a strong bond with the donor, but then went on to reassure themselves by referring to experiences of carrying and parenting their child. Noreen observed that:

“I know that there will come a time where [child] legally will gain the right to gain access to the information. Part of me worries about that. And I think that I try to say to myself that this is stupid because I’m the only mum she knows. There is, I’ve done everything for her, I carried her, I’ve given birth to her, I’ve done everything for her, I’m the only mum she knows.”

Other mothers described a reduction in the levels of threat they had initially felt because they’d *“had a role to play”* (Bernie) in their child’s birth and development, and that knowing identifying information about the donor *“wouldn’t change our family life, what we do, our love for the kids... the experiences we’re giving them, the life we’re living.”* (Ursula)

This belief that the experience of parenting trumps the genetic connection shared by donor and child is further underlined by the view taken by a small number of mothers who suggested that the donor’s experiences of parenting her own children would negate any desire to build a relationship with her donor offspring. For example, Rachelle asserted that:

“I don’t believe with a family of her own that she’d want to [make contact] really.”

As well as the biological and parenting relationships being reassuring in and of themselves, some mothers believed that the quality of the mother-child relationship was a key factor in determining whether their child would wish to pursue the donor’s identity in the future. As Agatha observed:

“And I just think that I have the faith at the moment that our relationship will be so strong that she won’t feel the need to build a relationship with her. And hopefully won’t even go in search of her identity really.”

Whilst this strategy was comforting for most mothers, a few remained concerned that changes in mother-child relationship quality as children entered adolescence would result in their child’s increased interest in seeking the donor’s identity. For example, Camilla explained that:

“I would hope that the relationship that we have will warrant that she won’t need to find out anymore...What will happen when she turns sort of 15, 16, you know, you get that battle between mum and daughter, I don’t know. But we’ve got a good happy life I think at the moment so...yeah, I think hopefully that will be the foundation that she wouldn’t need to find out more information.”

Strategy subtheme: distancing

A second strategy that mothers employed in order to manage their feelings of perceived threat was to distance themselves from identity-release. This manifested in two ways: distancing from the donor as a person, and distancing from the identity-release process itself.

Distancing from the donor

Many mothers who employed this strategy believed that ignorance of the donor’s identity was protective in some way and represented safety and security for them. For example, one mother described her curiosity about the donor as *“dangerous”* (Amelia), representing identifying information about the donor and donor siblings as a potential threat to her psychological and emotional wellbeing. Other mothers expressed the view that it’s *“better that you don’t know”* (Lilian) and that it was *“important that you don’t know too much”* (Justine), to avoid knowledge of the donor intruding upon their perception of, and feeling of

connectedness to, their child. Other mothers challenged the idea that the donor would desire contact:

“I don’t know what point the donor... what she would want out of it.” (Hermione)

Mothers who used this strategy appeared to create for themselves a picture of an uninterested, indifferent donor, in order to reduce the level of perceived threat inherent in identity-release:

“I don’t think the person would want to meet up to be perfectly honest. I can’t imagine that the egg donor would actually want to meet her.” (Lilian)

Amongst those mothers who accepted the possibility of contact between donor and child, there was a tendency to distance themselves from the donor as a person, instead seeing contact with the donor in purely functional terms. In doing so, mothers rejected the prospect of having a relationship with the donor. For example, some mothers framed contact with the donor in a medicalised context:

“I haven’t thought about the person and their identity. The only thing I probably have thought about is... from a health point of view, if in the future there was any kind of illness for [child] and I couldn’t help because biologically I’m not linked to [child] that way, I’ve thought about that.” (Kim)

Similarly, Amelia made a clear distinction between the value of obtaining specific details about the donor and a desire to build a relationship with the donor; for her, the former did not imply the latter:

“In one way, I would prefer to know a little bit more... what was she good at, you know, was she sporty, was she musical...these sorts of things, and if there were or have been issues with any kids that she may have had from that cycle. Just for reference points more than anything else, not because I want to be involved in her life.”

Distancing from identity-release process

As well as distancing from the donor as a person, some narratives demonstrated a distancing from the identity-release process itself. Again, this manifested in several ways, but particularly as a tendency to situate the identity-release process in the future. Several mothers expressed the viewpoint that the identity-release process was still too distant a prospect to concern themselves with, embracing an ‘out of sight, out of mind’ attitude. Thinking about the possibility of future donor-child contact, some mothers appeared to defer judgement; for example, Amelia explained that she would “*cross that bridge when we come to it, I guess.*” Similarly, Agatha represented the donor as occupying space in both the past and the future, but ostensibly not in present, day-to-day life:

“I don’t think about her really because she’s served her purpose. She can’t do anything now until [child]’s eighteen... she’s served her purpose, she’s gone, you know... I sort of implied that that was the end of her role. I haven’t said to [child] ‘when you’re eighteen you could contact her.’”

Similarly, other mothers anticipated having more negative feelings about potential donor-child contact in the future, when their child is old enough to initiate the identity-release process:

“I’m not sure it would even bother if we ended up meeting them. But that’s how I feel at the moment. You know whether in maybe a few years’ time when we decide right, we’re going to tell [child] and that is a right that could happen now, whether that might change.” (Mina)

Some mothers appeared to distance themselves from the idea of their child wanting to initiate donor-child contact. Some mothers, such as Georgina, overtly stated their desire to be absent from the process:

“But yeah, I mean, it’s up to him really whether he wants to find out really, hopefully I’ll be dead and buried by then [laughs], by the time he’s interested.”

Others demonstrated a more subtle distancing, such that whilst they wouldn't stop their child from pursuing contact with the donor, nor would they hope for or encourage it. Many mothers expressed the hope that their child would show no interest in the donor:

"I'm kind of hoping that when [child]'s an age [that she can contact the donor], that it's not really a big deal anymore and no-one's really that bothered about it, I'm hoping." (Valerie)

Alternatively, others hoped that their child would be satisfied with a superficial level of contact with the donor:

"I'd like to think she wouldn't want to meet her... I'm hoping it doesn't come to that. What would be ideal for me-, I would like to know if the person has written a letter because I think that's the best option... because then [child] could read it, read that, and that would be it, do you know what I mean? That would fill in the gap." (Lilian)

Strategy subtheme: active planning

In contrast to a distancing strategy, some mothers took a more active approach when managing their feelings of threat. A subgroup of the mothers who perceived identity-release as a threat approached it with a certain level of resignation; typically, mothers asserted the right of their child to request the identity of their donor despite their own negative feelings about it and could subsequently see themselves actively engaging with identity-release. Mothers' feelings of reluctant acceptance ranged in strength, from feeling that *"I wouldn't particularly relish it, but I would also completely understand it"* (Valerie), to expecting to feel *"utterly broken-hearted"* (Coleen) by their child's interest in the donor. Some mothers expressed this resignation to the prospect of their child initiating the identity-release process with an emphasis on their sense of obligation to support their child:

"I suppose if (child) does want to meet them I suppose that's something we'd have to do..." (Hermione)

“If he desperately wanted to of course we would, we’d have to because it’s what your child wants...” (Amelia)

Some mothers expressed a resignation to disclosing the details of identity-release to their children, despite a strong preference not to. These attitudes were based on mothers’ beliefs that, as information about identity-release is “so accessible” (Martha) in a digital information age, the “sensible thing” would be to inform their child of identity-release, despite their own, sometimes quite marked, concerns. As Martha explained,

“At some point, I don’t know when, we’ll have to have that conversation with her and with [sibling]. But again, I don’t really want to have that. I know she’s entitled to it, and it’s splashed all over her notes so she’s going to find out, but if there was any way of her not finding out I would do that. I would do anything for her not to find that out.”

Conversely, others, whilst demonstrating that they perceived donor-child contact to represent a potential threat to their own wellbeing, showed more optimism about managing those feelings to best support their child:

“If she chooses to find out at eighteen or whatever then that’s her choice, that’s for her to choose. I’ll support her through it as best as I can. It’ll upset me, but I’m prepared for it.” (Valerie)

Several mothers suggested that, despite their negative feelings about identity-release, they would wish to be involved in the process, should their child ever make contact with the donor. Some mothers represented this as a need to be protective of the mother-child relationship, whereas others characterised their involvement as protective of the child. For example, Delphine expressed the viewpoint that:

“I think if [child] was in touch with [the donor] then I would want to at least have some sort of distal contact about that like I wouldn’t-, I would feel uncomfortable if [child] got in touch with her and then just didn’t tell me anything and that that was a secret.”

This is echoed by Sofia, who observed that if the donor “*became part of [children’s] lives, then for me it’s quite important to know more about them.*”

2. Acceptance: it is what it is

A small but distinct set of mothers expressed feelings of being resigned to potential donor-child contact and contact with the donor themselves. These narratives displayed relatively few feelings of perceived threat, but stopped short of embracing the prospect of future donor-child contact. Mothers demonstrated an acceptance of identity-release, which ranged from expressions of indifference through to becoming accepting of the realities of identity-release over time. Responding to questions about how they felt about future donor-child contact, many mothers responded with neutral responses such as “*that’s fine*” (Elaine) and “*I don’t mind*” (Zeynep). Many of these mothers expressed a level of neutrality regarding donor-child contact, describing their feelings about the prospect in terms of the absence of a problem: “*I don’t have an issue with that.*” (Christine)

Some mothers referred to their knowledge of identity-release, and how this helped them accept the details of identity-release. For example, Eloise stated that:

“I’m accepting of that. I feel when I signed the bit of paper to say ‘yes’ I was happy to have an egg donor that I understand that there, you know, was a chance that she could get in touch with her.”

Similarly, some mothers recounted scenarios where they had intentionally sought out more information about identity-release from healthcare professionals, which in turn led to a greater understanding and acceptance of identity-release:

“I went to a lecture... a while ago, it was in [place], it was research from, like, all over and ...they said that, um, the rate of children wanting to find out about their donor was very low, like the uptake was very low of anyone finding out. So I think if he wants to fine, but the chances are he might not want to. And if he does that’s fine. And if he doesn’t that’s fine too.”
(Ivy)

Several mothers, like Marie, expressed the feeling that they had come to terms with identity-release over time:

Marie: Well I don't feel like threatened by it, I would be quite happy if she wanted to so... if it comes to, if it comes to it and she wants to find out more then yeah. I don't feel, I wouldn't be, I wouldn't say 'oh no, no, you can't do that.' If she wants to then she will.

Interviewer: ***And do you think that's changed from the last time we saw you?***

Marie: Yeah, it probably has. I'm probably a bit more-, yeah. Probably a bit more chilled out about it now. Yeah.

Strategy subtheme: child-led approach

A strategy that seemed to be related to mothers' acceptance of identity-release was that of taking a child-led approach to donor-child contact. When asked about their child initiating the identity-release process, some mothers tended to respond that it was up to their child. In doing so, mothers appeared to employ a strategy whereby they deprioritised their own feelings about the prospect of donor-child contact, assuming a neutral stance and instead asserting the needs and rights of their child. For example, when asked how they felt about possible donor-child contact, several mothers answered with responses such as, "*I think it would depend on what [children] wanted*" (Gabby), "*it's not my decision really is it, it's [child]'s decision... it'll be fine, it's up to him really*" (Georgina), and "*I think it's something for her to find out if she chooses to*" (Justine).

Other mothers said that they did have specific feelings about meeting the donor, before emphasising that their child's needs superseded their own:

“Yeah, I would [like to know the donor’s identity] but it wouldn’t be my decision... it’s not an opinion I would put on [child], so it would be his decision. I wouldn’t want to make him do something for whatever reason if he didn’t want to.” (Juanita)

Part of this strategy for some mothers was to emphasise the importance of providing support to their child, whatever they chose to do. For example, Bonnie explained that:

“I’m just going to take it from [child]’s lead and respect whatever he wants to do, because it’s, you know... it’s his call, it’s his call and I just... all I need to do is support him to do whatever he wants to do.”

3. Embracing identity-release

When responding to questions about knowing the donor’s identity, and potential donor-child contact, roughly half of mothers represented identity-release primarily as an opportunity to be embraced. Mothers who viewed identity-release as an opportunity reported feeling positive about potential donor-child contact. This manifested in three main ways: representing *knowledge of genetic origins as essential to the child*, expressing a *personal desire for information about the donor*, and viewing *identity-release as a gateway to a broader family network*. This embracing attitude was associated with a strategy whereby mothers saw themselves as *potential facilitators of donor-child contact*.

Genetic origins as essential to child

Several mothers’ narratives represented identity-release as a benefit by conferring significance on their child’s genetic origins. Mothers represented their child’s genetic origins as essential information and considered it important for several different reasons. Many mothers emphasised their children’s right to access their donor’s identifying information, stating that *“it would be wrong to keep it from”* their children and that their children had a right to know *“where they came from”*. Some mothers, like Gabby, represented the donor’s identity as information that fundamentally belonged to their child:

“Although they’ll have me as their mum, genetically there’ll always be, you know, some things, questions they might ask or just information that they want about themselves, and I think it’s important that, you know, they have access to that information.”

Alternatively, some mothers stressed that knowledge of their genetic origins was essential for proper identity development in their child, suggesting that without it, their child would *“feel that there’s something missing”* and that, as such, identity-release represented an opportunity for their child to seek information *“for their own identity.”* As Bernie noted:

“I regret the fact that they will not know the person as a matter of course, that donated the egg, and I worry about that in terms of [child]’s identity and will they, when they get to teenage years, you know... I wish I’d put more thought into it. But at the time that’s why I chose not to go to [place] and have a donor that would be totally confidential, because I thought at some point they might want to know, and I think they’ve got a right to know, you know, who they’re part of really.”

Similarly, Henrietta reflected on the importance of her own experiences with her family for her own identity development, drawing comparisons between her own and her children’s situation:

“This is something they need to know, it’s for their future when they grow. I come from quite a mixed family... and part of, for me, growing up was getting to know my half family. So I kind of think of it in those terms, that actually it probably is going to be, for them, making sense of themselves and where they came from.”

Finally, a perception that occurred in several mothers’ narratives was that interest in one’s genetic origins is a fundamental aspect of being human, with mothers representing it as natural and even inevitable. Several mothers expressed the belief that their children were *“bound to be interested”* (Poppy) in the donor’s identity, and that *“it’s a natural thing to be curious”* (Carina).

A personal desire for knowledge

The majority of mothers who viewed identity-release as something to embrace expressed a desire to know more about the donor. This ranged from generalised curiosity, to wanting to know specific pieces of information about the donor, to a desire to meet the donor. Mothers reported being “*intrigued*” and anticipated that their “*curiosity would get the better of*” them. Some mothers revealed their own curiosity when attempting to take their child’s perspective on initiating the identity-release process; for example, Natalia observed that:

“I’m intrigued myself so I can kind of understand why he would be. You could, and would, feel pressed to do it.”

Similarly, Carina empathised:

“If it was me, I’d want to know and I’d want to find out.”

Several mothers expressed a desire to not only learn the donor’s identity, but to meet the donor. For example, Jemima explained that she wanted “*probably more than just to know who she is, but to actually meet her*”. These mothers expressed clear enthusiasm towards the possibility of meeting the donor, describing it variously as a “*nice*” and “*exciting*” prospect. The desire to meet the donor was sometimes intense; one mother recounted her experience of trying to resist the temptation of attempting to trace the donor using various online databases and social media platforms, before ultimately accepting that it was up to her children to decide. This was echoed by other mothers who, whilst acknowledging that contacting the donor was their child’s decision, nevertheless hoped their child would do so, so that they could meet the donor. As noted by Hannah,

“I’m expecting her to want to contact them because I would. This is really weird, but we’d be disappointed if she doesn’t, because I can’t make that decision, but I would like to meet the person.”

Similarly, several mothers acknowledged that the donor may not agree to contact but hoped that they would, so that they could fulfil their wish of meeting the donor.

As well as expressing general curiosity, mothers gave distinct reasons why they were interested in contact with the donor. In some cases, they wished to get to know the donor to discover if there were similarities between their child and the donor, along with any donor siblings there may be. This was often at both the physical level:

“I just want to see where, you know where that-, I’m intrigued when I see people with their children and you can see that the older one looks exactly like the mum, the younger one looks exactly like the dad or... that does fascinate me a bit.” (Natalia)

And also the personal level:

“I think I maybe would [like to meet the donor], because it would be intriguing to know what they’re like and what personality traits she might have the same as them or not.” (Rosa)

Other mothers expressed a wish to meet the donor so that they could ask about their medical history. These mothers viewed meeting the donor as an opportunity to access information about their child that otherwise they would never know. For example, Orla explained that her motivation for wanting to contact the donor was *“mostly for, sort of, information regarding health and development, that sort of thing.”* Alternatively, some mothers viewed meeting the donor more as an opportunity to access a peer support network, with their child and potential donor siblings represented as common ground between the mother and the donor. For example, Henrietta explained that:

“I’d just be really interested to [meet], and also just to go, to have a chat with them about their parenting and, and see if their children are similar, how similar they are, that kind of thing, yeah.”

Finally, most mothers who expressed a wish to contact the donor were motivated by a desire to express gratitude to the donor. This ranged from somewhat cursory references to thanking the donor:

"I think I probably would [want to meet the donor], just to say thanks and what have you."

(Bonnie)

Through to a heartfelt desire to acknowledge the importance of the donor's contribution. For example, mothers like Christine expressed a desire to *"know who it is so I could give her a big hug and say thank you [crying]"*. Similarly, Noreen reflected that:

"Does this person know and understand the magnitude of what she's done? The, you know, she, she gave us something that we may well not have had without her. You know, and [child]'s got her DNA and I sometimes think it would be nice to know who it is just to thank that person for their role in you know [child]'s being really, I suppose."

For some mothers, this desire to acknowledge the donor's contribution manifested in the wish to show the child to the donor. For example, Hannah commented that *"if I could meet her and say thank you and if I could show her what she'd produced, that almost sounds like a lovely thing to be able to do."* This was echoed by Susanne, who commented that *"I probably would because it would be, you know, I'd want them to see [child] really to see what, you know, what they've given us."*

Identity-release: not enough information

As part of the process of reflecting on their thoughts and feelings about identity-release, several mothers shared feelings of dissatisfaction with the way in which identity-release is practiced. Some of these mothers would have preferred to have more information about the donor at the treatment stage. Others emphasised the scarcity of medical information available to them, viewing it as a lack of vital information about their child. For example, Poppy explained that:

"I think a bit more on the medical background would be appreciated, you know when you go to the doctors and they ask the questions... we've no idea, so something about medical history would probably be helpful. Or whether it's something the doctors could access that we don't know, but it would be nice to, sort of, have that available."

Some mothers expressed a desire for more personal information about the donor, such as details of *“her career and educational background”* (Noreen) or *“her likes and dislikes, what she was good at, you know”* (Amelia). Others conveyed their frustration with the perceived paucity of information available, anticipating that it may cause difficulty when their child begins to ask questions that mothers will be unable to answer:

“I suppose there’s that degree that you’re not ever going to be able to answer very many questions so when she gets older, I think that’ll change as to how...you know, whether that’s relevant to her or not I don’t know, but I’ll probably feel a little bit like oh, I don’t know, I can’t tell you...you know, and that will be a bit frustrating possibly.” (Sofia)

To illustrate the point, Orla contrasted identity-release donor conception with adoption, noting that:

“Adopted children are given an entire folder. Um, and so it kind of seems like it’s lagged behind. I’m not saying... all of that will be easy anyway but um, but yeah, it’s not much.”

Another common perspective was that there exists a tension between their early disclosure of identity-release donor conception to their child, and their child’s inability to access the donor’s identifying information until the age of eighteen. These mothers implied that this waiting period may cause their child emotional or psychological distress. For example, Bonnie observed that *“I think the only...the issue that might be there is that, you know, he has to wait till he’s a certain age”*, whilst Ursula explained that the long waiting period would influence how she would approach telling her children about their origins:

“I won’t tell them they can access anything until they get to eighteen...so they haven’t got twelve years of wondering and they can’t do anything about it or wondering and getting angry... knowing now wouldn’t change anything. It’d just be torture waiting another twelve years until we can find out, so I can’t see the point... If I told them now, they still can’t access that information and I can only see that being harmful to them.”

Some mothers expressed regret that there wasn't earlier contact available between their child and the donor, and concern that their child's inability to contact the donor may come between mother and child in the child's teenage years. Earlier contact between the child and the donor was considered by some mothers to be a missed opportunity to normalise donor conception for the child:

"I don't know, [child] might resent the fact that he doesn't know, you know, who's-, where he's come from, and I just worry really about that and I'd like, so I would have liked to have just been able to, you know even if it was just like once or twice a year just to you know, meet up for a cup of coffee or something or at a park or something, oh this is the lady you know... I sort of think, to introduce them gradually would be better than not knowing... it might be easier for them, it might not be such a shock and such a big thing of 'oh I'm going to meet the person that could have been my mother'." (Bernie)

Identity-release as the gateway to a broader family network

An important feature of identity-release donation for many mothers was the potential for accessing a wider family network. For some mothers, the value of identity-release was not only in enabling their child to contact the donor, but also to trace donor siblings. Some mothers spoke of their own interest in finding out about donor siblings, often representing it as an intriguing prospect. This sometimes manifested as a fascination despite mothers' hesitancy, and had the effect of making them feel less negative about the identity-release process. For example, when asked how she felt about potential donor-child contact in the future, Isabella responded:

"Not great! Not great but then...I'm also slightly fascinated by the fact that she might have half siblings."

Conversely, other mothers saw the potential for meeting donor siblings as enhancing an already enticing prospect:

“I think it’s always been quite exciting actually, yeah, I think it just is, it’s just such a lovely thing to do for someone and, you know, there’s the potential of siblings as well, half siblings, so it’s...all that’s quite exciting.” (Bonnie)

Other mothers focussed on the importance of tracing donor siblings for their child’s benefit, representing the opportunity to do so as *“a very important thing”* (Carina) for their child. Henrietta described how the ability to trace donor siblings was a key factor in deciding to have her treatment in the UK; whilst reflecting on talking to her children about donor conception, she explained that:

“it’s the first time I sort of said, ‘oh you’ve got half-sisters or half-brothers out there that you might meet when you’re older,’ because it is that kind of, that you know, that and I kind of did, when I did the donation thing, I did want to choose a UK treatment because I wanted them to have that choice.”

This is echoed by Erica, who explained that:

“The very fact that there is this other set of half-siblings somewhere, albeit only biologically, if they ever felt the need to find out more about that then at least they’ve got that option as well, due to the fact that it was a UK donor and they can find things out.”

A minority of mothers represented the donor and donor siblings in terms of a potential support network in the event of their own death, often after reflecting on their own older age as parents. For example, Wendy noted that:

“I’m aware I’m an older mum and that he hasn’t got brothers and sisters, and so I like the idea that if the natural order of things happens that there would be a younger relative and potentially kids a little bit older than him who could be perhaps, kind of, not siblings, but genetically related to him, that he would...if [partner] and I, you know, died or when we do, that he wouldn’t be alone. I kind of like that idea.”

Similarly, Tabitha observed that it would be “*tragic*” if she and her husband were to die without their child having made contact with the donor, as she anticipated that “[*child*] would need contact then...and there might be somebody there who’s got a little space for her.” One mother went as far as to say that the donor could represent an alternative mother figure to her child in the case of her death:

*“It will depend what our family looks like when [*child*]’s fifteen, because obviously that’s ten years away. I’ll be sixty, you don’t know, I mean she could be worried that I’m ill and I won’t live that much longer and maybe it would be her answer to having some kind of parent figure in the future.”*

Strategy subtheme: mother as facilitator

Embracing the prospect of identity-release was associated with one distinct strategy for managing these feelings in day-to-day life. Mothers viewed themselves as uniquely placed to facilitate donor-child contact and saw it as a responsibility of egg donation parenthood to help their child have as positive an experience as possible. This view was expressed in different ways. For some mothers, the very choice to undergo treatment in the UK was a conscious and active one that was based on the perceived benefits of the identity-release system. These mothers often compared UK treatment favourably to the policies governing egg donation in other countries where donors are completely anonymous; giving their child the opportunity to trace the donor was represented as taking proper care of their child. For example, Gabby explained that:

*“I always think about, you know, a lot of women went to [*country*] and were getting egg donations in [*country*] and were going there specifically because [*country*]’s law keeps the details of donor’s anonymous and then I’m just thinking you couldn’t do that to a child, you know, that’s part of them, but they’re never ever to know or never ever to find out must be really difficult you know? So I think, you know, I think it’s important that they do know that it’s you know, just looking after them as well.”*

Mothers also expressed their desire to facilitate the identity-release process by pursuing additional information about the donor. One mother, when explaining why she chased her clinic for a letter the donor had written, observed that she was motivated by the desire to have information to give her children in case they were to ask for it in the future:

“Well I wanted to, if they choose to-, well, I think they’ll want to know about their identity and it’s just a nice thing for them to understand this is a little bit about the person... but yeah, no, I think one day they might, they will be asking more questions about it and I think for their own identity, it will help.” (Bernie)

This desire to provide their child with as much information as possible was shared by several other mothers, including Roberta, who represented being able to help her child with the identity-release process as an important part of her role as parent:

“Just whatever details he wants, I’ll provide them. And the information that once he’s eighteen, if he wants to contact the donor, then I’ll be able to facilitate that. I’ll guide him in the right direction.”

Additionally, some mothers expressed their intention not only to inform their child of their right to access identifying information about the donor, but to encourage them to do so, due to the belief that it would benefit their child:

“I would probably encourage her to do that so that she’s... I think it’s something that’s potentially very important for her.” (Sofia)

As well as providing their children with information, some mothers viewed it as their responsibility to equip their child with the personal and emotional skills necessary to cope with the identity-release process in the future. When reflecting about future donor-child contact, Tabitha observed that:

“You hope that you could say, ‘I’ll give you the skills now to go your own way and make your own decisions.’ So I think when the time comes then, you know, my job and [partner]’s job is to lay the groundwork so that when the opportunity arises for some contact... that that can

be a wholesome, balanced thing, you know? So [she] can explore her relationships in an unconfusing way."

This attitude was echoed by mothers who saw it as part of their role to help manage their child's expectations in preparation for donor-child contact, *"making sure that... if he has any contact, that it's a good thing"* (Wendy). As Bernie mentioned,

"I said you know, you might be able to, she might not want you to meet her but I said, because she might be doing other things, but I said, you know, you might want to and that's up to you, and if you want to, I'll help with that."

3.3. Quantifying mothers' perceived identity-release donor threat

Qualitative content analysis was conducted to capture the extent to which egg donation mothers viewed identity-release egg donation as a threat. This variable was derived from qualitative analysis of mothers' thoughts and feelings about identity-release egg donation (see section 3.2). Specifically, this variable was created to assess egg donation mothers' perceived threat from identity-release egg donation, and the potential for future donor-child contact. Interview material coded for this variable was specific to mothers' thoughts and feelings about the prospect of donor-child contact, and included statements about fear of rejection from the child specifically in favour of the donor, fear of the donor claiming the child as their own, and fear of the donor-child bond being more legitimate than the mother-child bond. Mothers were rated as perceiving (1) no threat, (2) little threat, (3) moderate threat, or (4) high threat. A code book was produced, providing detailed instructions for coding including examples of content for each level of the variable⁴¹. To establish inter-rater reliability, two-thirds (29) of mothers' transcripts were coded by a second rater. The intra-class coefficient was .84, indicating good reliability.

Table 3.3.1 summarises the findings of the qualitative content analysis and provides examples of coded interview excerpts.

1. No threat

The majority (45%) of mothers perceived no threat from identity-release egg donation. Mothers who were coded as lowest in perceived identity-release threat demonstrated an ability to conceptually co-exist with the donor without any difficulty or residual fear. They appeared comfortable with future donor-child contact and demonstrated either neutrality or warmth when talking about the prospect.

⁴¹ See appendix 8

Table 3.3.1. Mothers' perceived level of threat from identity-release egg donation

	<i>N</i> (%)	Examples of threat level
1. No threat	20 (45%)	I'm expecting [child] to want to contact the donor because I would. This is really weird, but we'd be disappointed if she doesn't, because I can't make that decision, but I would like to meet the person!
2. Little threat	14 (32%)	You know, I think it in an ideal world maybe you wouldn't ever want to tell them because you wouldn't want anything to come between you or what have you. But then I always think about, you know, a lot of women were getting egg donation in [country] and were going there specifically because [country's] law keeps the details of donors anonymous and then I'm just thinking you couldn't do that to a child, you know, that's part of them, but they're never ever to know or never ever to find out must be really difficult you know? So I think you know I think it's important that they do know, that it's you know, just looking after them as well.
3. Moderate threat	6 (14%)	I think I wouldn't want her to [access the donor's information] because I think I'd want her to just think that's how it was and that's it... but I think as an adult I know, because we've been gifted with that opportunity, then if she wants to do that that would have to be her choice, as much as I don't think I... probably... realistically, I probably don't think I want her to but I won't stop her from doing it.
4. High threat	4 (9%)	I think she can find out everything when she's eighteen. That'll be the toughest thing for me because I don't see her as that she's anything other than mine, you know she's kind of all mine... I don't want her to then say well you were rubbish, I'm going to go and find whose biologically mine or whatever, I want to overcompensate I suppose because I don't want her to go and find [the donor].

2. Little threat

This was the next most common rating, with 32% of mothers demonstrating little perceived threat from identity-release egg donation. Mothers coded at this level were generally positive about identity-release egg donation, as above, but expressed a small amount of uncertainty or hesitation about the prospect of future donor-child contact.

3. Moderate threat

A minority (14%) of mothers were coded as perceiving a moderate amount of threat from identity-release egg donation. At this level, mothers displayed marked ambivalence about identity-release donation, and repeated one or more of the above fears repeatedly throughout the interview. Mothers demonstrated these fears throughout their narratives, but still made attempts to rationalise or reconcile their feelings with the child's right to access identifying information about the donor.

4. High threat

A small proportion of mothers (9%) were coded as perceiving a high level of threat from identity-release egg donation. Mothers' statements evidenced pervasive fear about the prospect of future donor-child contact, and repeatedly referenced multiple different concerns about identity-release donation. Typically, mothers did not wish to disclose their use of identity-release egg donation because of these fears, or worried about their decision to disclose because of their fears about identity-release. In one case, a mother's decision not to disclose was specifically due to fear that her children would reject her in favour of the donor when they were old enough to access identifying information.

Conclusions

Whilst most mothers perceived no, or low levels of, threat from the prospect of donor-child contact, a significant minority of mothers perceived moderate to high levels of threat, with almost a quarter of mothers in this subsample expressing marked discomfort with the possibility of future contact between the donor and their child.

Chapter 4: Quantitative Results

This chapter reports on quantitative analyses of family functioning and child adjustment in identifiable egg donation and IVF families using data from mothers, fathers, and children. The analytic strategies undertaken in the quantitative analyses are first outlined in section 4.1. Between-group comparisons were conducted on parental psychological wellbeing (section 4.2), the quality of the parent-child relationship from the perspectives of parents and children (section 4.3), the quality of parent-child interaction (section 4.4), and child adjustment (section 4.5). Section 4.6 reports findings with twin data omitted. Hierarchical linear regressions were then conducted to examine factors associated with differences between family types (sections 4.7 and 4.8) and finally, correlational and regression analyses were conducted to explore factors associated with mothers' perceived donor threat (section 4.9).

4.1 Analytic strategy

Data were analysed using IBM SPSS Statistics version 26.

Categorical data

Chi-square analyses were used to examine categorical data.

Interval data

Checks were conducted on all dependent variables prior to statistical analyses to ascertain whether the assumptions of normality of distribution and homogeneity of variance were met. Data distribution was checked using the Shapiro-Wilk test (Shapiro & Wilk, 1965), by calculating z-scores for the skewness and kurtosis of each variable, and by visual examination of histograms. Z-scores with values ± 1.96 were considered problematic (Field, 2014). Homogeneity of variance was determined using Levene's test (Levene, 1960).

Where assumptions were satisfied, one-way analyses of variance (ANOVA) were conducted to compare mean scores of the two groups on a dependent variable. Multivariate analyses of variance (MANOVA) were used to compare group mean scores on conceptually related variables. Pillai's trace was selected as the multivariate test statistic, as it has been considered the most robust statistic when assumptions of normality of distribution and homogeneity of variance have been violated (Field, 2014).

Violations of these assumptions can lead to an inflated risk of Type I and Type II errors. Type I error increases the chances of falsely rejecting the null hypothesis, whereas increased Type II error rate can result in the incorrect retention of the null hypothesis. In cases where assumptions of normality and/or homogeneity of variance were markedly violated, Mann-Whitney *U* tests were conducted to verify the results of the one-way ANOVAs. The MANOVA test statistic has been found to be robust in the face of non-normality and has been found to outperform nonparametric alternatives in controlling for Type I error (Finch, 2005).

Conducting multiple simultaneous group comparisons can increase the family-wise error rate, which can also result in the increased likelihood of Type I error. Where multiple one-way ANOVAs were conducted during these analyses, Bonferroni corrections were applied to adjust for potential inflation of error.

Covariates

IVF and egg donation families were found to differ on several demographic variables (mother's age, father's age, couple relationship status, and number of siblings at home). The groups also differed on several treatment variables prior to conception (number of years trying to conceive child, number of IVF cycles to conceive child and total number of IVF cycles).

Standard procedure would require these variables to be included in the analysis as covariates. However, controlling for a covariate that is systematically associated with a defining characteristic of the group may lead to specification error, such that the removal of the variance related to the covariate will also remove the variance in the effect of the group, thereby potentially invalidating the results of the ANCOVA (Evans & Anastasio, 1968; Miller &

Chapman, 2001; Reichardt & Borman, 1994). Previous research has shown that egg donation parents are older than their unassisted conception and own-gamete IVF counterparts (Golombok et al., 2005), and that egg donation mothers are more likely to stay in unsatisfactory relationships (Blake, et al., 2012). In the current sample, therefore, group differences in variables relating to parents' ages, treatment history and relationship stability were considered inherent features of the sample, and were not controlled for in the analyses (Miller & Chapman, 2001).

Nevertheless, where a significant group difference was found, and there was a significant association between a covariate and the outcome variable, the analysis was repeated with the covariate included to establish whether the group difference was an effect of family type, or whether it could instead be explained by the covariate.

P-values and effect sizes

In line with current APA guidelines, exact *p*-values have been reported throughout the analyses (APA, 2010). Effect sizes have also been calculated and reported for all analyses. The effect size statistic selected for these analyses is Cohen's *d*, which constitutes a standardised measure of the difference between two means. Cohen's *d* is preferable when predictors are categorical (e.g. family type) and is relatively robust in the face of slight violations of assumptions (Cohen, 1988). Cohen classifies effect sizes as *small*, $d \leq .2$, *medium*, $d \leq .5$, and *large*, $d \leq .8$. Ninety-five percent confidence intervals have also been reported for effect sizes (APA, 2010).

Twin data

Fifteen families (7 IVF, 8 egg donation) in the current sample were twin families. As having twins is a common outcome of IVF treatment (HFEA, 2020), and is therefore a common feature of both IVF and egg donation parenting, twin data was included in the analyses. One twin was randomly selected for data analysis at phase one, and the same twin was followed up at phase two. However, as parenting twins after IVF is known to present specific challenges to parents which may impact parental psychological health and family functioning (Oliveness,

Golombok, Ramogida, & Rust, 2005; Glazebrook et al., 2004; Klock, 2004), all analyses were rerun omitting data from twin families to ascertain whether the inclusion of twin data significantly influenced the results.

Regression

Hierarchical linear regression was utilised to examine factors associated with differences between family types. Theoretically relevant variables that were significantly correlated with the outcome variable were included in the regression model. Where predictor variables were found to be highly inter-correlated, one variable was selected based on the existing literature. Models were also run using the alternative predictor variables and reported where relevant.

Prior to each regression, diagnostic statistical tests were run in order to ascertain that the assumptions of homoscedasticity, linearity, multicollinearity, absence of outliers and influential cases were not violated.

Homoscedasticity: This is the assumption that the residuals are equal for all values of the predictive dependent variable. This assumption was tested by examining scatterplots of the studentized residuals plotted against the unstandardised predicted values. The points on the scatterplot should be evenly and randomly dispersed throughout the scatterplot.

Linearity: This is the assumption that there is a linear relationship between each independent variable and the dependent variable, and a linear relationship between the dependent variable and the independent variables collectively. The linearity of the model was assessed by examination of partial regression plots and scatterplots of the residuals of each predictor variable and the outcome variable when both variables are regressed separately on the remaining predictors.

Multicollinearity: Multicollinearity refers to the existence of a very strong correlation between two predictor variables. Multicollinearity can lead to difficulty in understanding the individual contribution of each variable to the model. In order to check for multicollinearity,

the variance inflation factor (VIF) was inspected. A value greater than 10 is generally accepted as problematic.

Outliers: In regression, outliers can affect the estimates of the regression coefficients and can therefore bias the regression model (Field, 2014). Standardised residuals (i.e. the differences between the observed and predicted values of the outcome, converted to z-scores) were examined in order to check for outliers, and to ascertain that no more than 5% of cases had a standardised residual with an absolute value of > 2 .

Influential cases: Cook's distance, a measure of the overall influence of a case on the model, was calculated and used to ascertain whether any influential cases were present in the data. A value of greater than 1 is considered problematic (Cook & Weisberg, 1982).

Data reduction

Exploratory Factor Analysis (EFA) was used to identify common underlying factors in large sets of variables and therefore reduce these variables to a smaller number of composite variables.

Parent Development Interview variables

Mothers' representation of self as a parent

The thirteen parent variables from the PDI were found to be significantly inter-correlated, with inter-correlations ranging from .21 to .71. These variables were therefore entered into a principal axis factor analysis in order to examine whether the PDI Parent variables were tapping into a shared underlying construct. A three-factor solution emerged. Two items (*Guilt* and *Hostility*) were discarded due to having no cross-loadings of $\geq .3$. A further three items

(*Disappointment, Competence and Confidence*) were eliminated due to low communalities after rotation, or having a primary factor loading of less than .5.⁴²

Analysis of the remaining eight variables yielded a three-factor solution which fit the data well. The model explained 63.5% of the variance. Eigenvalues showed that the first factor, Positive Mother (*Joy, Child Focus, Warmth and Attachment Awareness*) explained 38% of the variance. The second factor, Unsupported Mother (*Support Need and Support Satisfaction*) explained a further 13.6% of the variance. The third factor, Angry Mother (*Degree of Anger and Expressed Anger*), explained 10.9% of the variance. Each item correlated significantly at $\geq .3$ with at least two other items ($p \leq .005$). The Kaiser-Meyer-Olkin (KMO) statistic, a measure of sampling adequacy ranging from 0 to 1, was .74, indicating satisfactory sampling adequacy⁴³. Bartlett's Test of Sphericity, which, when significant, indicates that satisfactory relationships exist between variables, was significant ($\chi^2(28) = 358.88, p < .001$).

All items had a factor loading of at least .65 (see Table 4.1.1). Higher factor scores indicated higher levels of Positive Mother, Unsupported Mother and Angry Mother representations.

Fathers' representation of self as a parent

As the 13 father parent PDI variables were also found to be highly inter-correlated, they were also entered into a principal axis factor analysis. A two-factor solution emerged. The first factor explained 44% of the variance and the second explained a further 10% of the variance. Three items were removed because they failed to meet the minimum criterion of having a primary factor loading of $\geq .5$ (*Support Need, Support Satisfaction and Guilt*) and a further three were removed as the extracted communalities were below .5 (*Confidence, Disappointment and Hostility*).

⁴²Communalities are the proportion of each variable's variance accounted for by the EFA. After factor extraction, communalities should be ≥ 0.5 for samples of between 100-200 participants. Factor loadings provide the Pearson correlation between a variable and a factor, and should ideally be above 0.5.

⁴³ Kaiser (1974) recommends a minimum KMO value of .5; values between .6 and .7 are considered satisfactory; values between .8 and .9 are considered good; and values above .9 are considered excellent.

Table 4.1.1. Parent Development Interview: Factor loadings based on principal axis factoring for 8 items from the Mother Interview (n= 117)

	Positive Mother factor loadings	Unsupported Mother factor loadings	Angry Mother factor loadings
Joy	.73	-	-
Child focus	.70	-	-
Warmth	.81	-	-
Attachment awareness	.83	-	-
Support need	-	.80	-
Support satisfaction	-	-.65	-
Degree of anger	-		.81
Expressed anger	-		.89

Reanalysis with the remaining seven variables yielded a two-factor solution; both factors had an Eigenvalue >1 and this solution was supported by the examination of the scree plot. The two-factor solution explained 65% of the variance. The first factor, Positive Father (*Joy, Competence, Child Focus, Warmth, and Attachment Awareness*) explained 51% of the variance. The second factor, Angry Father (*Degree of Anger and Expressed Anger*) explained a further 15% of the variance.

The sample for this factor analysis was small (n= 88). However, each item correlated at least .3 with at least two other items, and variables correlated with each other significantly within factors ($p < .005$), indicating good factorability. Furthermore, the KMO value (.78) was satisfactory, and Bartlett's test of sphericity was significant, $\chi^2(21) = 322.30, p < .001$. All communalities were above .6 and 19% of nonredundant residuals had an absolute value of greater than .05. Finally, all items had factor loadings of .51, with most items loading at .75 or above (see Table 4.1.2). Factor scores were calculated such that higher scores indicated higher levels of Positive Father and Angry Father representations.

Table 4.1.2. Parent Development Interview: factor loadings based on Principal Axis Factoring for 7 items from the Father Interview (n= 88)

	Positive Father factor loadings	Angry Father factor loadings
Joy	.76	-
Competence	.51	-
Child focus	.75	-
Warmth	.86	-
Attachment awareness	.79	-
Degree of anger	-	.83
Expressed anger	-	.88

4.2 Results: Parental psychological wellbeing

Mothers' psychological health

Mothers' scores on the Edinburgh Depression Scale (EDS), Trait Anxiety Index (TAI) and Parenting Stress Index (PSI) were entered into a MANOVA. A significant group difference was found for mothers' psychological health, $F(3,106)= 3.94, p= .01$. The univariate tests were consequently examined (see Table 4.2.1).

The univariate test for the PSI was significant, $F(1,108)= 7.59, p= .01$, with mothers in the egg donation group showing higher levels of parenting stress than IVF mothers.⁴⁴ The effect size was moderate ($d= .66$). No differences were found between egg donation and IVF mothers on the EDS, $F(1, 108)= .009, p= .93$, or the TAI, $F(1, 108)= 1.44, p= .23$.

In order to examine whether group differences in mothers' psychological wellbeing may have resulted from differences in demographic or fertility treatment variables, covariates were considered. Mothers in egg donation and IVF families differed on the following variables: mother's age, relationship status, number of children at home, number of years trying to

⁴⁴ Significant at the adjusted alpha level of .02.

conceive, and number of IVF cycles needed before conceiving child. However, none of these variables were found to correlate with mothers' PSI scores and so were not included in the analysis as covariates.

For the EDS, 24 (22%) mothers scored at or above the clinical cut-off for depression (15 egg donation, 9 IVF). For the TAI, ten (9.2%) mothers scored above the cut-off for high anxiety (8 egg donation, 2 IVF).

Mothers' psychological health: accessing professional support

Twenty-seven (23%) mothers indicated that they had accessed professional mental health services within the twelve months prior to participating in the study (14 egg donation, 13 IVF). A Fisher's Exact test found no significant differences according to family type, $p = .39$. Twenty-five mothers had visited their GP about their psychological wellbeing (13 egg donation, 12 IVF) and two had been referred for outpatient care (one egg donation, one IVF). Nineteen (16.5%) mothers had been prescribed medication for their psychological health (10 egg donation, 9 IVF). A Fisher's Exact test found no differences in prescription of medication according to family type, $p = .45$.

Mothers' relationship satisfaction

Mothers' scores on the Golombok Rust Inventory of Marital State (GRIMS) were entered into a one-way ANOVA (see Table 4.2.1). Mothers' relationship satisfaction differed significantly between groups, with egg donation mothers reporting significantly lower levels of relationship satisfaction than IVF mothers, $F(1,100) = 7.85$, $p = .01$.⁴⁵ The effect size was moderate ($d = .56$). The majority (73.5%) of mothers reported average or above relationship satisfaction (40 egg donation, 35 IVF). Twenty-seven (26.5%) mothers reported below average relationship satisfaction (21 egg donation, 6 IVF), with six (5.9%) mothers reporting severe relationship problems (5 egg donation, 1 IVF) and five (4.9%) mothers reported very severe relationship problems (3 egg donation, 2 IVF).

⁴⁵ Result verified with Mann-Whitney U -test, $U = 1691$, $p = .003$.

As mothers' age was correlated with mothers' GRIMS scores, maternal age was entered into the analysis as a covariate. The ANOVA for mothers' GRIMS scores was no longer significant, $F(1, 99) = 3.04, p = .16$, indicating that egg donation mothers' lower levels of relationship satisfaction was associated with their older age.

Mothers' perceived social support

Mothers' scores on the Multidimensional Scale of Perceived Social Support (MSPSS) were analysed using a one-way ANOVA. A significant group difference was found, such that egg donation mothers reported significantly lower levels of perceived social support than IVF mothers, $F(1, 109) = 5.9, p = .02$ (see Table 4.2.1). The effect size was small to moderate ($d = .48$).

To determine whether groups differed on specific sources of social support, the MSPSS subscales (support from *family*, from *friends*, and from *significant other*) were examined separately using one-way ANOVAs, with a Bonferroni correction to the alpha level due to the increased risk of type I errors attributable to multiple testing. The ANOVA for the *family* subscale was significant at the adjusted alpha level of .02, $F(1, 109) = 7.8, p = .01$. Egg donation mothers reported significantly less perceived support from their families than did IVF mothers; the effect size was moderate ($d = .56$). The ANOVA for the *significant other* subscale was also significant at the adjusted alpha level, $F(1, 109) = 9.05, p = .003$, such that egg donation mothers reported significantly less perceived support from their significant others than did IVF mothers. The effect size was medium ($d = .60$). There were no significant group differences on mothers' perceived levels of support from their friends, $F(1, 109) = .16, p = .69$.⁴⁶ None of the demographic or fertility variables correlated with the social support variables.

⁴⁶ Results for all subscales of the MSPSS were verified with Mann-Whitney *U*-tests: family $U = 992, p = .003$; significant other $U = 1039, p = .005$; friends $U = 1383, p = .53$.

The majority (77.5%) of mothers scored in the high support category (42 egg donation, 40 IVF). Twenty-one (18.9%) mothers scored in the moderate support category (17 egg donation, 4 IVF), and four (3.6%) mothers scored in the low support category (3 egg donation, 1 IVF).

Mothers' psychological resilience

Mothers' scores on the Brief Resilience Scale (BRS) were analysed using a one-way ANOVA (see Table 4.2.1). No group differences in maternal psychological resilience was found between family types, $F(1, 109) = 1.36, p = .25$.⁴⁷ The majority (64%) of mothers scored in the normal resilience range. Twenty-five (22.5%) mothers scored in the high resilience range (9 egg donation, 16 IVF), whilst 15 (13.5%) mothers scored in the low resilience range (10 egg donation, 5 IVF).

Fathers' psychological health

Fathers' scores on the Edinburgh Depression Scale (EDS), Trait Anxiety Index (TAI) and Parenting Stress Index (PSI) were entered into a MANOVA. A significant group difference was found for fathers' psychological health, $F(3,91) = 3.02, p = .03$. The univariate tests were consequently examined (see Table 4.2.2).

The univariate test for the EDS was significant at the adjusted alpha level of .02, $F(1, 93) = 6.61, p = .01$, with fathers in the egg donation group showing significantly higher levels of depression than IVF fathers.⁴⁸ The effect size was moderate ($d = .57$). The univariate test for the TAI was also significant, $F(1, 93) = 5.63, p = .02$, such that egg donation fathers reported higher levels of anxiety than IVF fathers. The effect size was moderate ($d = .53$). The univariate test for the PSI also revealed a significant difference, $F(1, 93) = 7.27, p = .01$.⁴⁹ Fathers in the egg donation group reported higher levels of parenting stress than IVF fathers. The effect size was moderate ($d = .60$).

⁴⁷ Result verified with Mann-Whitney *U*-test, $U = 1266, p = .19$.

⁴⁸ Result verified with Mann-Whitney *U*-test, $U = 1393.5, p = .02$

⁴⁹ Result verified with Mann-Whitney *U*-test, $U = 1383, p = .02$

Table 4.2.1. Means, *SD*, *F*, *p*, *d* and 95% CI values for mothers' psychological health, relationship satisfaction, perceived social support and resilience between family types

	Egg donation		IVF		<i>F</i>	<i>p</i>	<i>d</i>	95% CI
	(n= 66)		(n= 44)					
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
EDS	6.06	4.85	5.98	3.99	.009	.93	-	[4.79, 7.25]
TAI	35.42	8.32	33.71	6.44	1.44	.23	-	[32.46, 36.61]
PSI	71.80	22.22	61.24	15.72	7.59	.01	.66	[61.04, 71.87]
	Egg donation		IVF		<i>F</i>	<i>p</i>	<i>d</i>	95% CI
	(n= 62)		(n= 45)					
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
GRIMS ⁵⁰	28.85	11.31	22.37	11.70	7.85	.01	.56	[23.92, 28.57]
MSPSS total	5.58	1.23	6.11	.945	5.9	.02	.48	[5.58, 6.01]
MSPSS: family	5.08	1.70	5.93	1.29	7.8	.01	.56	[5.12, 5.72]
MSPSS: friends	5.83	1.28	5.93	1.28	.16	.69	-	[5.63, 6.11]
MSPSS: significant other	5.83	1.29	6.47	.78	9.05	.003	.60	[5.87, 6.30]
BRS	3.62	.74	3.8	.78	1.46	.23	-	[3.55, 3.84]

In order to examine whether group differences in fathers' psychological health may have resulted from differences in demographic or fertility treatment variables, father's age, number of children at home, number of years trying to conceive, and number of IVF cycles needed before conceiving child were correlated with the fathers' psychological health variables. The only positive correlation identified was between egg donation fathers' PSI scores and fathers' age, $r = .26, p = .042$.

⁵⁰ $n = 61$ egg donation, 41 IVF

When fathers' age was entered into the analysis as a covariate, the ANOVA for fathers' PSI scores remained significant, $F(1, 93) = 5.64, p = .02$. The effect size was moderate ($d = .60$). This result indicates that egg donation fathers' older age did not account for their higher levels of parenting stress.

For the EDS, 17 (17.5%) fathers scored at or above the clinically significant cut-off for probable depression (15 egg donation, 2 IVF). For the TAI, ten (10.5%) fathers scored above the suggested cut-off for high anxiety (10 egg donation).

Fathers' psychological health: accessing professional support

Four (4.7%) fathers indicated that they had accessed professional mental health services within the twelve months prior to participating in the study, and they did so by visiting their GP (4 egg donation). A Fisher's Exact test found no significant differences according to family type, $p = .46$. Of these, two (2.3%) fathers had been prescribed medication for their psychological health. A Fisher's Exact test found no differences in the prescription of medication according to family type, $p = .81$.

Fathers' relationship satisfaction

Fathers' scores on the Golombok Rust Inventory of Marital State (GRIMS) were entered into a one-way ANOVA (see Table 4.2.2). Fathers' relationship satisfaction did not differ significantly between groups, $F(1, 93) = .97, p = .33$. The majority (71.6%) of fathers reported above average relationship satisfaction (42 egg donation, 26 IVF). Eleven (11.6%) fathers reported average relationship satisfaction (5 egg donation, 5 IVF) and fifteen (15.8%) fathers reported below average relationship satisfaction (12 egg donation, 3 IVF). One father (IVF) reported very severe relationship problems.

Fathers' perceived social support

Fathers' scores on the Multidimensional Scale of Perceived Social Support (MSPSS) were analysed using a one-way ANOVA (see Table 4.2.2). No significant group differences were

found, $F(1, 95) = 1.19, p = .28$. The majority (65%) of fathers' scores indicated high levels of social support (37 egg donation, 26 IVF). Thirty-three fathers scored in the moderate support category (24 egg donation, 9 IVF), and one father (egg donation) scored in the low support range.

Examination of the MSPSS subscales using univariate tests confirmed that IVF and egg donation fathers did not differ in their levels of perceived support from family, friends, or significant others.⁵¹

Fathers' psychological resilience

Fathers' scores on the Brief Resilience Scale (BRS) were entered into a one-way ANOVA (see Table 4.2.2). The test was non-significant. The majority (82.5%) of fathers scored in the normal resilience range (51 egg donation, 29 IVF). Sixteen fathers (16.5%) scored in the high resilience range (10 egg donation, 6 IVF), and one fathers (egg donation) scored in the low resilience range.

⁵¹ Univariate tests were conducted with a Bonferroni correction to the alpha level.

Table 4.2.2. Means, SD, F, p, d and 95% CI values for fathers' psychological health, relationship satisfaction, and perceived social support between family types

	Egg donation (n= 61)		IVF (n= 34)		<i>F</i> (1, 93)	<i>p</i>	<i>d</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
EDS	6.59	4.71	4.21	3.51	6.61	.01	.57	[4.91, 6.70]
TAI	36.38	8.23	32.59	5.80	5.63	.02	.53	[33.45, 36.58]
PSI	67.48	17.78	58.12	12.89	7.27	.01	.60	[60.77, 67.52]
	Egg donation (n= 62)		IVF (n= 35)		<i>F</i> (1, 95)	<i>p</i>	<i>d</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
GRIMS ⁵²	22.93	10.31	20.66	11.74	.972	.33	-	[19.88, 24.31]
MSPSS total	5.60	1.08	5.83	.86	1.19	.28	-	[5.48, 5.88]
MSPSS: family	5.82	1.12	5.77	.97	.05	.82	-	[5.59, 6.02]
MSPSS: friends	5.16	1.46	5.54	1.12	1.79	.18	-	[5.03, 5.57]
MSPSS: significant other	5.98	1.22	6.29	.93	1.61	.21	-	[5.87, 6.32]
BRS	3.86	.70	4.0	.59	1.07	.30	-	[3.77, 4.04]

⁵² n= 35 IVF, 60 egg donation.

4.3 The quality of the parent-child relationship

Quality of the mother-child relationship

Mothers' representations of themselves as parents

Mothers' factor scores for the Positive Mother, Unsupported Mother and Angry Mother factors were entered into a MANOVA (see Table 4.3.1). Pillai's trace was non-significant, $F(3, 113) = 1.95, p = .13$. However, inspection of the univariate tests showed a significant difference for Angry Mother factor scores, with egg donation mothers representing themselves as angrier than IVF mothers, $F(1, 86) = 4.84, p = .03$. The effect size was moderate ($d = .41$). No significant group differences were found for the Positive Mother or Unsupported Mother factor scores. Mothers' Angry Mother factor scores did not correlate with any of the demographic or fertility variables.

Table 4.3.1. Means, SD, F, p, d and 95% CI values for comparisons of factor scores for mothers' representations of self between family types

	Egg donation (n= 69)		IVF (n= 48)		F (6, 107)	p	d	95% CI
	M	SD	M	SD				
Positive Mother factor	-.06	.90	.09	.98	.70	.40	-	[-.17, .17]
Unsupported Mother factor	-.03	.85	.04	.89	.18	.67	-	[-.16, .16]
Angry Mother factor	.16	.87	-.22	.98	4.83	.03	.41	[-.17, .17]

Mothers' representations of the child

The variables pertaining to mothers' representations of the child (Child Aggression, Child Happiness, Child Controlling, Child Affectionate and Child Rejecting) were entered into a MANOVA. Pillai's trace was non-significant, $F(5, 111) = 1.79, p = .12$. However, when the univariate tests were examined, a significant difference was found for Child Aggression, with

mothers in the egg donation group representing their children as more aggressive than mothers in the IVF group, $F(1, 115) = 6.71, p = .01$ (see Table 4.3.2). The effect size was small to moderate ($d = .49$). No other tests were significant at the adjusted alpha level of .01, although the test for Child Controlling approached significance, $F(1, 115) = 4.60, p = .03$. Egg donation mothers represented their children as more controlling than did IVF mothers, though the effect size was small ($d = .40$).

Table 4.3.2. Means, SD, F, p, d and 95% CI values for comparisons of mothers' representations of child between family types

	Egg donation (n= 69)		IVF (n= 48)		F (1, 115)	p	d	95% CI
	M	SD	M	SD				
Child Aggression	2.38	.84	2.0	.71	6.71	.01	.49	[2.08, 2.37]
Child Happiness	3.17	.47	3.32	.56	2.44	.12	-	[3.14, 3.33]
Child Controlling	1.97	.61	1.73	.60	4.60	.03	.40	[1.76, 1.98]
Child Affectionate	3.60	.55	3.69	.48	.76	.38	-	[3.54, 3.73]
Child Rejecting	1.44	.51	1.32	.46	1.68	.20	-	[1.30, 1.48]

Mothers' global codes

Mothers' PDI global codes were analysed separately using one-way ANOVAS (see Table 4.3.3). None of the tests were significant at the adjusted alpha level of .02. The test for maternal Coherence approached significance, $F(1, 115) = 5.17, p = .03$, indicating lower levels of coherence in egg donation mothers' representations than in IVF mothers'. The effect size was moderate ($d = .42$).

Mothers' global Coherence scores did not correlate with any of the demographic or fertility treatment variables.

Table 4.3.3. Means, SD, F, p, d and 95% CI values for comparisons of mothers' PDI global codes between family types

	Egg donation (n= 69)		IVF (n= 48)		F (1, 115)	p	d	95% CI
	M	SD	M	SD				
	Reflective functioning	3.23	.57	3.23				
Coherence	3.28	.53	3.50	.52	5.17	.03	.42	[3.27, 3.47]
Richness of perceptions	3.36	.62	3.36	.68	0	.99	-	[3.25, 3.48]

Children's representations of the mother-child relationship

To assess children's representations of the mother-child relationship, the Positive Parental Affect and Negative Parental Affect subscales from the Berkeley Puppet Interview were entered into a MANOVA (see Table 4.3.4). Pillai's trace was significant, $F(2, 81) = 3.37, p = .04$. Inspection of the univariate tests revealed a significant difference on the Positive Parental Affect subscale, with children in the egg donation group representing their mothers as higher in warmth and enjoyment than children in the IVF group, $F(1, 81) = p. 02$.⁵³ The effect size was small to moderate ($d = .52$). The test for Negative Parental Affect was non-significant.

Children's Positive Parental Affect scores did not correlate with any of the demographic or fertility variables.

Most children's scores on the Positive Parental Affect scale indicated positive mother-child relationship quality, with 97.6% (45 egg donation, 37 IVF) of children representing their mothers as above average in warmth and enjoyment (scores of 5-7). The remaining 2.4% (2 IVF) children obtained average scores (scores of 4).

⁵³ Significant at the adjusted alpha level of .03. As the Positive Parental Affect variable markedly violated assumption of normality of distribution, this result was checked using a Mann-Whitney *U* test. The Mann-Whitney *U* test approached significance, $U = 1047.5, p = .08$.

Table 4.3.4. Means, SD, F, p, d and 95% CI values for comparisons of children’s BPI representations of the mother between family types

	Egg donation (n= 44)		IVF (n= 39)		F (1, 83)	p	d	95% CI
	M	SD	M	SD				
	Positive Parental Affect	5.93	.06	5.74				
Negative Parental Affect	5.29	.13	5.30	.14	.01	.91	-	[5.12, 5.47]

Similarly, the majority (84.2%) of children in both groups represented their mothers as low in anger and hostility (40 egg donation, 35 IVF). Eleven children (12.4%, 4 egg donation, 7 IVF) obtained average scores, and three children (3.4%, 2 egg donation, 1 IVF) represented their mothers as expressing higher than average levels of anger and hostility.

Quality of the father--child relationship

Fathers’ representations of themselves as parents

Fathers’ factor scores for Positive Father and Angry Father were entered into a MANOVA (see table 4.3.5). Pillai’s trace was significant, $F(1, 85)= 3.26, p= .04$. Univariate tests revealed that egg donation fathers represented themselves as significantly less positive than IVF fathers, $F(1, 86)= 4.84, p= .03$. The effect size was moderate ($d= .49$). Egg donation fathers also represented themselves as significantly angrier than did IVF fathers, $F(1, 86)= 4.97, p= .03$. The effect size was moderate ($d= .51$).⁵⁴ Neither factor correlated with any of the demographic or fertility variables.

⁵⁴ Both group differences were significant at the adjusted alpha level of .03.

Table 4.3.5. Means, SD, F, p, d and 95% CI values for comparisons of factor scores for fathers' representations of self between family types

	Egg donation (n= 56)		IVF (n= 32)		F (1, 88)	p	d	95% CI
	M	SD	M	SD				
Positive Father factor	-.16	.96	.29	.87	4.84	.03	.49	[-.20, .20]
Angry Father factor	.16	.98	-.29	.76	4.97	.03	.51	[-.20, .20]

Fathers' representations of the child

The variables relating to fathers' representations of the child (Child Aggression, Child Happiness, Child Controlling, Child Affectionate and Child Rejecting) were entered into a MANOVA. There was no overall difference between the two family types, $F(5, 82) = .79, p = .56$ (Table 4.3.6).

Table 4.3.6. Means, SD, F, p, d and 95% CI values for comparisons of fathers' representations of the child between family types.

	Egg donation (n= 56)		IVF (n= 32)		F (1, 88)	p	d	95% CI
	M	SD	M	SD				
Child Aggression	2.02	.65	1.86	.70	1.14	.29	-	[1.82, 2.10]
Child Happiness	3.27	.52	3.38	.52	.86	.36	-	[3.12, 3.42]
Child Controlling	1.91	.63	1.66	.62	3.36	.07	-	[1.68, 1.95]
Child Affectionate	3.54	.61	3.58	.54	.11	.75	-	[3.43, 3.68]
Child Rejecting	1.35	.56	1.30	.57	.49	.49	-	[1.23, 1.47]

Fathers' global codes

Fathers' PDI global codes were analysed separately using one-way ANOVAS (see Table 4.3.7). The test for paternal *Coherence* was significant at the adjusted alpha level of .01, $F(1, 86)=6.71$, $p=.01$, indicating lower levels of coherence in egg donation than in IVF fathers' representations of their relationship with their child. The effect size was moderate ($d=.42$).

Table 4.3.7. Means, SD, F, p, d and 95% CI values for comparisons of fathers' PDI global codes between family types

	Egg donation (n= 56)		IVF (n= 32)		F (1, 86)	p	d	95% CI
	M	SD	M	SD				
	Reflective functioning	2.95	.09	3.08				
Coherence	3.10	.08	3.42	.11	6.71	.01	.42	[3.07, 3.45]
Richness of perceptions	3.01	.09	3.28	.12	3.08	.08	-	[2.96, 3.38]

Children's representations of the father-child relationship

The Positive Parental Affect and Negative Parental Affect BPI subscales were analysed using a MANOVA. Pillai's trace was non-significant, $F(2, 83)=1.61$, $p=.21$, indicating no group difference in children's representations of the father-child relationship (see Table 4.3.8). The majority of children's scores on the Positive Parental Affect scale indicated positive father-child relationship quality, with 92.1% (41 egg donation, 41 IVF) of children scoring in the above average range. Six children (5 egg donation, 6.8%, 1 IVF) obtained average scores; the remaining 1.1% (1 IVF) obtained a below average score.

Similarly, the majority (80.7%) of children in both groups represented their fathers as low in anger and hostility (32 egg donation, 39 IVF). Eleven children (12.5%, 9 egg donation, 2 IVF) obtained average scores, and six children (6.8%, 5 egg donation, 1 IVF) represented their fathers as expressing higher than average levels of anger and hostility.

Table 4.3.8. Means, *SD*, *F*, *p*, *d* and 95% CI values for comparisons of children’s BPI representations of their fathers between family types.

	Egg donation (n= 46)		IVF (n= 43)		F (1, 89)	<i>p</i>	<i>d</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Positive Parental Affect	5.67	.73	5.59	.79	.30	.58	-	[5.47, 5.79]
Negative Parental Affect	4.95	1.03	5.28	.77	2.92	.10	-	[4.91, 5.30]

4.4. Quality of parent-child interaction

Quality of mother-child interaction

Emotional Availability

Mothers' scores on the four parent Emotional Availability (EA) scales and children's scores on the two child Emotional Availability (EA) scales were entered into a MANOVA. No significant group differences were found on any of the parent or child dimensions of dyadic emotional availability, $F(6, 107) = .54, p = .78$. Group means are presented in Table 4.4.1.

Table 4.4.1. Means, SD, F, p, d and 95% CI values for group comparisons of mothers' and children's scores on the EA Dimensions

	Egg donation (n= 67)		IVF (n= 47)		F (6, 107)	p	d	95% CI
	M	SD	M	SD				
<i>Mother</i>								
Sensitivity	24.72	2.91	24.57	2.82	.07	.80	-	[24.13, 25.19]
Structuring	24.64	3.14	24.70	2.65	.01	.92	-	[24.12, 25.21]
Non-intrusiveness	23.19	3.54	22.12	3.83	2.36	.13	-	[22.06, 23.43]
Non-hostility	26.43	2.38	26.18	2.40	.31	.58	-	[25.89, 26.77]
<i>Child</i>								
Responsiveness	24.45	3.29	24.46	2.68	0	.99	-	[23.89, 25.02]
Involvement	23.83	3.51	23.81	3.17	0	.98	-	[23.20, 24.44]

Emotional Availability direct global scores

Figures for adaptive/impaired mother-child interaction are provided in Table 4.4.2. The majority of both egg donation mothers (67.2%) and IVF mothers (70.2%) showed adaptive sensitivity; this was also true of mothers' structuring, with 74.6% of egg donation mothers and 68.1% of IVF mothers obtaining scores in the adaptive range. Similarly, 80.6% of egg donation mothers and 80.9% of IVF mothers showed adaptive non-hostility towards their child. Fewer mothers in both groups showed adaptive levels of non-intrusiveness (56.7% egg donation, 42.6% IVF). Chi-square analyses revealed no significant differences in adaptive functioning between egg donation and IVF mothers for any of the Emotional Availability caregiver dimensions.

Approximately two-thirds of egg donation (62.7%) and IVF (68.1%) children demonstrated adaptive responsiveness. Similar proportions of children displayed adaptive involvement of their mothers, with 62.7% of egg donation and 59.6% of IVF children demonstrating adaptive involvement. Chi-square analyses showed no significant group differences for either of the two Emotional Availability child dimensions.

Quality of father-child interaction

Emotional Availability

Fathers' scores on the four parent Emotional Availability (EA) scales and children's scores on the two child Emotional Availability (EA) scales were entered into a MANOVA. No significant differences were found between groups on any of the parent or child dimensions of dyadic emotional availability, $F(96, 82) = .88, p = .52$. Group means are presented in Table 4.4.3.

Table 4.4.2. Results of Chi-square analyses comparing the frequency of adaptive vs. impaired interactions for mothers' and children's EA direct global scores between family types

Emotional Availability Dimension	Egg donation (n= 67)	IVF (n= 47)	χ^2 (1)	<i>p</i>
Sensitivity				
Adaptive <i>n</i> (%)	45 (67.2%)	33 (70.2%)	0.12	.73
Structuring				
Adaptive <i>n</i> (%)	50 (74.6%)	32 (68.1%)	0.56	.44
Non-intrusiveness				
Adaptive <i>n</i> (%)	38 (56.7%)	20 (42.6%)	2.22	.14
Non-hostility				
Adaptive <i>n</i> (%)	54 (80.6%)	38 (80.9%)	<0.01	.97
Child Responsiveness				
Adaptive <i>n</i> (%)	45 (62.5%)	32 (68.1%)	0.01	.92
Child Involvement				
Adaptive <i>n</i> (%)	42 (62.7%)	28 (59.6%)	0.11	.74

Emotional Availability direct global scores

The Direct Global Score from each Emotional Availability dimension was used to categorise fathers and children as adaptive or impaired. Figures for adaptive/impaired father-child interaction are provided in Table 4.4.4.

Most egg donation (66.1%) and IVF fathers (76.7%) showed adaptive sensitivity. Similarly, the majority of egg donation and IVF fathers demonstrated adaptive levels of non-intrusiveness (80% and 64.4% respectively) and non-hostility (83.3% and 81.4% respectively). Fathers in the egg donation group showed somewhat lower levels of adaptive structuring than IVF fathers, with half (50.8%) of egg donation fathers compared to two thirds of IVF fathers (66.7%) demonstrating adaptive structuring. However, Chi-square analyses revealed no statistically significant group differences on any of the Emotional Availability caregiver dimensions.

Table 4.4.3. Means, SD, *F*, *p*, *d* and 95% CI values for group comparisons of fathers' and children's scores on the EA Dimensions

	Egg donation (n= 59)		IVF (n= 30)		<i>F</i> (6, 82)	<i>p</i>	<i>d</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
<i>Father</i>								
Sensitivity	23.83	3.64	25	3.22	2.21	.14	-	[23.48, 24.97]
Structuring	22.39	4.40	24	4.45	2.65	.11	-	[21.99, 23.87]
Non-intrusiveness	23.85	3.44	24.25	3.63	.26	.61	-	[23.25, 24.72]
Non-hostility	26.13	3.33	26.77	2.34	.32	.57	-	[26.11, 27.05]
<i>Child</i>								
Responsiveness	24.31	3.76	25.10	3.70	.90	.35	-	[23.79, 25.36]
Involvement	24.20	4.30	24.78	3.73	.06	.81	-	[23.94, 25.37]

Similar proportions of egg donation and IVF children demonstrated adaptive responsiveness towards their father (67.8% and 76.7% respectively). Most egg donation (69.5%) and IVF children (80%) demonstrated adaptive involvement of their fathers. Chi-square analyses revealed no significant group differences in either of the Emotional Availability child dimensions.

Table 4.4.4. Results of Chi-square analyses comparing the frequency of adaptive vs. impaired interactions for fathers' and children's EA direct global scores between family types

Emotional Availability Dimension	Egg donation (n= 59)	IVF (n= 30)	χ^2 (1)	<i>p</i>
Sensitivity				
Adaptive <i>n</i> (%)	39 (66.1%)	23 (76.7%)	1.05	.34
Structuring				
Adaptive <i>n</i> (%)	30 (50.8%)	20 (66.7%)	2.02	.18
Non-intrusiveness				
Adaptive <i>n</i> (%)	38 (64.4%)	24 (80%)	2.29	.15
Non-hostility				
Adaptive <i>n</i> (%)	48 (81.4%)	25 (83.3%)	.05	.99
Child Responsiveness				
Adaptive <i>n</i> (%)	40 (67.8%)	23 (76.7%)	.76	.46
Child Involvement				
Adaptive <i>n</i> (%)	41 (69.5%)	24 (80%)	1.12	.33

4.5 Child adjustment

In order to assess children's psychological adjustment, mothers' and fathers' scores on the Strengths and Difficulties Questionnaire (SDQ) were averaged to make a composite Parent SDQ Externalising Problems score and a Parent SDQ Internalising Problems score.⁵⁵ These variables were then entered into a MANOVA, which was significant, $F(2, 109) = 3.16, p = .04$.

Univariate tests were therefore examined. A significant group difference was found on the Externalising Problems subscale, $F(1, 110) = 6.37, p = .01$, such that egg donation children showed higher levels of externalising problems than their IVF counterparts. The effect size was moderate ($d = .49$). The univariate test for Parent SDQ Internalising Problems was non-significant (see Table 4.5.1).

Next, teachers' Externalising Problems subscale scores and Internalising Problems subscale scores were analysed using a MANOVA. There was a significant overall difference between groups, $F(2, 78) = 3.82, p = .03$. A marginally significant group difference was found in teacher-rated Externalising Problems, $F(1, 79) = 4.32, p = .04$, such that egg donation children were found to be marginally higher in externalising problems than IVF children.⁵⁶ There was also a significant group difference for teachers' Internalising Problems scores, $F(1, 79) = 5.63, p = .02$, such that egg donation children were rated as higher in internalising problems than IVF children. The effect size was moderate ($d = .54$).

No demographic or fertility variables were found to be correlated with parent Externalising subscale scores or with Teacher Externalising or Internalising subscale scores.

For the parents' questionnaire, the majority (95.5%) of children's scores fell within the typical range of scores. Five (4.5%) children scored above the threshold for probable psychiatric disorder (1 IVF, 4 egg donation). For the teachers' questionnaire, 75 children (92.6%) scored

⁵⁵ Where fathers' scores were unavailable, mothers' scores were used.

⁵⁶ At the adjusted alpha level of .03. As teachers' Externalising subscale scores markedly violated the assumptions of normality of distribution and homogeneity of variance, a Mann-Whitney U test was conducted to verify this finding. The test approached significance, $U = 962, p = .08$.

in the typical range (34 IVF, 41 egg donation), with six (7.4%) children scoring above the threshold for probable psychiatric disorder (1 IVF, 5 egg donation).

Child psychiatric problems

Based on interview transcripts rated by a clinical child psychologist⁵⁷, thirteen (10.7%) children were classified as having a psychological problem (8 egg donation, 5 IVF). Psychological problems were rated as either dubious or trivial, slight but definite, or definite and marked and ratings were given to indicate the type of problem present. Three children were rated as having an emotional problem (1 egg donation, 2 IVF); two children were rated as having a developmental problem (1 egg donation, 1 IVF); 3 children were rated as having a conduct problem (3 egg donation); two children were rated as having a hyperkinetic problem (1 egg donation, 1 IVF), and three children were rated as having a mixture of symptoms (2 egg donation, 1 IVF). A Fisher's Exact test found no group differences regarding the prevalence of child psychological problems, $p = .77$.

Berkeley Puppet interview

The Berkeley Puppet Interview (BPI) Depression, Overanxiousness and Strengths and Competencies subscales were entered into a MANOVA. No group differences were found in children's self-reported adjustment, $F(3, 79) = 1.26, p = .29$ (see Table 4.5.1).

Children's scores on the Depression scale indicated good levels of adjustment in both groups, with the majority (87.4%, 39 egg donation, 37 IVF) of children obtaining above average scores. Ten (11.5%, 4 egg donation, 6 IVF) children obtained an average score, whilst one child (egg donation) obtained a below average score on the Depression scale. Similarly, children's scores on the Overanxiety scale indicated good levels of adjustment, with children in both groups obtaining an above average score (70.5%, 31 egg donation, 31 IVF). Nineteen children (21.6%, 10 egg donation, 9 IVF) obtained average scores, and seven children (7.9%, 5 egg donation, 2 IVF) obtained a below average score. The majority (84.3%) of children scored

⁵⁷ Child psychologist was blind to family type.

above average on the Strengths and Competencies scale (38 egg donation, 32 IVF); the remaining children (15.7%, 5 egg donation, 8 IVF) obtained average scores, with no children indicating below average functioning on the Strengths and Competencies scale.

Table 4.5.1. Means, *SD*, *F*, *p*, *d* and 95% CI values for group comparisons of parent-rated and teacher-rated child SDQ externalising and internalising scores and child-rated BPI child adjustment scales

	Egg donation (n= 66)		IVF (n= 46)		<i>F</i> (1,110)	<i>p</i>	<i>d</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Parent SDQ: externalising	6.11	3.18	4.67	2.64	6.37	.01	.49	[4.95, 6.10]
Parent SDQ: internalising	2.67	2.33	2.38	2.09	.45	.51	-	[2.13, 2.30]

	Egg donation (n= 46)		IVF (n= 35)		<i>F</i> (1, 79)	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Teacher SDQ: externalising	3.11	3.52	1.69	2.30	4.32	.04	.48
Teacher SDQ: internalising	4.28	3.89	2.40	3.00	5.63	.02	.54

	Egg donation (n= 43)		IVF (n= 40)		<i>F</i> (3, 79)	<i>p</i>	<i>d</i>	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
BPI: depression	5.31	.72	5.45	.69			[5.23, 5.54]	
BPI: overanxiousness	4.78	.86	5.0	.78	1.26	.29	-	[4.73, 5.08]
BPI: strengths and competencies	5.34	.68	5.22	.75			[5.13, 5.44]	

4.6 Family functioning in singleton-only egg donation families

To ascertain whether the inclusion of twin data was significantly altering the findings, group comparisons of family functioning comparing own-gamete IVF and egg donation families were rerun omitting data from twin families. For brevity, findings are only reported when they differed following the exclusion of twin families.

Parental psychological health

Fathers' psychological wellbeing

Analyses of fathers' psychological wellbeing, couple relationship quality, perceived social support and psychological resilience were rerun without twin data. The remaining sample consisted of 61 egg donation fathers and 31 IVF fathers.

Upon reanalysis, all of the results were the same except for the MANOVA with the EDS, TAI and PSI questionnaire scores (Table 4.6.1). Whereas analysis with the full sample found significant differences between groups on all three measures, the analysis including only singleton fathers found no significant differences between fathers' depression ($F(1, 82) = 4.84, p = .03$) or anxiety ($F(1, 82) = 3.80, p = .06$) scores at the adjusted alpha level of .02. This suggests that the inclusion of twin fathers in the sample contributed to the higher levels of depression and anxiety in the egg donation fathers.

As with the full sample, the univariate test for paternal PSI revealed a significant difference between fathers' parenting stress scores, $F(1, 82) = 6.04, p = .02$, such that singleton egg donation fathers reported significantly higher levels of parenting stress than IVF fathers. The effect size was moderate ($d = .60$). Covariates were therefore explored as per the original analysis; however, no demographic or fertility variables were found to correlate with paternal PSI scores.

Table 4.6.1. Means, *SD*, *F*, *p*, *d* and 95% CI values for comparisons of fathers' psychological health by family type in singleton-only families

	Egg donation (n= 56)		IVF (n= 28)		<i>F</i> (3, 82)	<i>p</i>	<i>d</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
EDS	6.52	4.84	4.5	3.61	3.80	.06	-	[33.24, 36.45]
TAI	36.07	7.95	32.39	5.43	4.84	.03	-	[4.95, 6.89]
PSI	66.21	17.26	57.32	11.62	6.04	.02	.60	[59.83, 66.73]

Quality of the parent-child relationship

Mothers' representations of the mother-child relationship

The sample of singleton mothers who contributed to the Parent Development Interview data comprised 61 egg donation mothers and 41 IVF mothers. Singleton-only mothers no longer significantly differed in their representations of their children as aggressive, $F(1, 101) = 4.58$, $p = .04$.⁵⁸ This suggests that differences in mothers' representations their child as aggressive in the original analysis were attributable to the inclusion of twin data.

Whereas analysis with the full sample showed marginal group differences in maternal overall *Coherence*, analysis with singleton-only mothers found a significant group difference on PDI *Coherence*, $F(1, 101) = 5.37$, $p = .02$, with egg donation mothers being rated as less coherent than IVF mothers. The effect size was small ($d = .47$). As the result was significant, covariates were examined as per the original analysis; however, no demographic or treatment variables were found to correlate with mothers' PDI coherence. This finding suggests that singleton-only mothers are less coherent in their narratives than the full samples including twin mothers.

⁵⁸ At the adjusted alpha level of .01.

Fathers' representations of the father-child relationship

Fifty egg donation fathers and 26 IVF fathers contributed to the Parent Development Interview when twin data was omitted. Reanalysis of fathers' PDI factor scores found no group differences in fathers' representations of themselves as angry without twin data included, $F(1, 75) = 3.99, p = .05$.⁵⁹ These results suggest that the inclusion of twin data in the full sample partially accounts for the differences found in fathers' representations of themselves as confident and as angry parents.

Child adjustment

With twin data excluded, 60 egg donation and 39 IVF parent-rated SDQ scores were available for analysis. Whereas the MANOVA for the full sample was significant, the MANOVA for singleton-only data became non-significant, $F(2, 96) = 2.30, p = .11$. However, inspection of the univariate tests showed that, as with the full sample, a significant group difference existed in parent-rated child externalising problems, such that egg donation children were rated as higher in externalising problems than own-gamete IVF children, $F(1, 97) = 4.65, p = .03$ (see Table 4.6.2)⁶⁰. The effect size was small to moderate ($d = .46$). This suggests that the inclusion of twin data does not account for the higher levels of child externalising problems in the egg donation group.

With twin data excluded, 40 egg donation and 28 IVF teacher-rated SDQ scores were available for analysis. As with the full sample, the MANOVA was significant, $F(2, 65) = 3.44, p = .04$. Whereas analysis with the full sample showed a marginal group difference in child externalising problems, analysis with singleton-only data revealed a significant group difference in externalising problems at the adjusted alpha level of .03. Egg donation children were rated as higher in externalising problems than own-gamete IVF children, $F(1, 66) = 5.12, p = .03$. The effect size was moderate ($d = .59$). However, unlike the analysis with the full sample, no group differences were found in teacher-rated levels of child internalising

⁵⁹ At the adjusted alpha level of .03.

⁶⁰ Significant at the adjusted alpha level of .03.

problems, $F(1,68)= 4.21, p= .05$.⁶¹ This suggests that the inclusion of twin data significantly contributed to group differences in teacher-rated levels child internalising problems.

Table 4.6.2. Means, *SD*, *F*, *p*, *d* and 95% CI values for group comparisons of parent-rated and teacher-rated child SDQ externalising and internalising scores in singleton-only families

	Egg donation (n= 60)		IVF (n= 39)		<i>F</i> (1,99)	<i>p</i>	<i>d</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
	Parent SDQ: externalising subscale	5.89	2.98	4.62				
Parent SDQ: internalising subscale	2.68	2.35	2.41	1.99	.36	.55	-	[2.13, 3.02]

	Egg donation (n= 40)		IVF (n= 28)		<i>F</i> (1, 68)	<i>p</i>	<i>d</i>	95% CI
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
	Teacher SDQ: externalising subscale	3.23	3.70	1.46				
Teacher SDQ: internalising subscale	4.48	3.99	2.61	3.21	4.21	.05	-	[2.79, 4.62]

⁶¹ At the adjusted alpha level of .03.

4.7. Factors associated with children's externalising problems

Egg donation children were found to show higher levels of externalising problems than IVF children. Linear regression analyses were conducted to establish to what extent family type contributed to children's levels of externalising problems over and above family process variables. The sample available for the regression analysis was less than the entire sample size ($N= 88$), as a full data set was not possible for all participants (see section 2.2), and the regression analysis only includes participants for whom data was available for all predictor variables. However, a widely accepted recommendation is that there should be approximately ten data points for each predictor variable in the model (Peduzzi et al., 1996; Prescott, 2018). As such, the present sample was considered adequate for conducting regression analyses.

In the first instance, associations were explored between parent-rated SDQ externalising problems scores and 1) family demographic variables including maternal, paternal and child age, child sex, whether or not the child was a twin, number of siblings at home, education level and income; 2) treatment variables including number of years trying to conceive and number of IVF cycles taken to have the child; 3) mothers' psychological wellbeing as assessed by the Edinburgh Depression Scale (EDS), Trait Anxiety Inventory (TAI), Parenting Stress Index (PSI), Multidimensional Scale of Perceived Social Support (MSPSS), Brief Resilience Scale (BRS) and the Golombok-Rust Inventory of Marital State (GRIMS); fathers' psychological wellbeing, as above; 4) the maternal representational variables of Positive Mother, Unsupported Mother, Angry Mother, the five PDI child variables and the global variables Reflective Functioning, Coherence, and Richness of Perceptions; 5) the paternal representational variables of Positive Father, Angry Father, and the aforementioned PDI child and global variables; 6) the measures of Emotional Availability (EA) including maternal EA factor scores and paternal EA factor scores.

The regression analysis was carried out in five steps. First, a hierarchical regression model was created in which the first step contained demographic variables that were found to correlate with parent-rated SDQ externalising scores. Secondly, the mother psychological wellbeing variables that were found to correlate with the outcome variable were added. Third, father

psychological wellbeing variables that were found to correlate with the outcome variable were added. Fourth, the parent representational variables that were found to correlate with the outcome variable were added. Finally, family type was added to the model to examine whether family type independently accounted for additional variance in the outcome variable.

Child externalising problems

Table 4.7.1 provides results of the correlational analyses. Significant positive associations were found between child SDQ externalising scores and child sex ($r = -.21, p = .03$) such that boys obtained higher SDQ externalising scores than girls. Significant positive associations were also found between child SDQ externalising scores and several maternal psychological wellbeing variables. Associations were found between SDQ externalising scores and mothers' levels of parenting stress (PSI, $r = .46, p < .001$), anxiety (TAI, $r = .31, p = .001$), depression (EDS, $r = .26, p = .006$), relationship satisfaction (GRIMS, $r = .27, p = .005$) and perceived social support (MSPSS, $r = -.22, p = .02$), such that higher child SDQ externalising problems were associated with higher levels of parenting stress, anxiety and depression, and lower levels of marital satisfaction and perceived social support. Similarly, positive associations were found between child SDQ externalising scores and paternal parenting stress (PSI, $r = .56, p < .001$), anxiety (TAI, $r = .39, p > .001$) and depression (EDS, $r = .28, p < .001$), such that higher levels of paternal parenting stress, anxiety and depression were related to higher child SDQ externalising scores.

Children's SDQ externalising scores were also associated with the representational variables of Positive Mother ($r = -.25, p = .008$), Angry Mother ($r = .28, p = .004$) and Unsupported Mother ($r = .26, p = .007$), such that higher SDQ externalising scores were associated with less positive maternal self-representations, and more angry and unsupported maternal self-representations. SDQ externalising scores were also associated with maternal Reflective Functioning ($r = -.21, p = .03$), and maternal representations of the child as happy ($r = -.48, p < .001$) and as aggressive ($r = .39, p < .001$), such that higher SDQ externalising scores were associated with poorer maternal Reflective Functioning, lower levels of child happiness and higher levels of child aggression.

Table 4.7.1. Correlational analyses of relationships between parent-rated SDQ externalising and family process variables

		SDQ Externalising Score	
		<i>r</i>	<i>p</i>
1. Demographic	Mother's age	.19	.06
	Father's age	.19	.06
	Child's age	.18	.06
	Child sex	-.21	.03
	Twin vs singleton	.12	.20
	Number of siblings at home	-.09	.33
	Education level	-.07	.48
	Income	.04	.65
2. Treatment	No. years conceiving	.06	.52
	No. IVF cycles to have child	-.02	.84
3a. Maternal psych. Wellbeing	EDS	.26	.01
	TAI	.31	.001
	PSI	.46	<.001
	MSPSS	-.22	.02
	BRS	-.13	.16
	GRIMS	.27	.01
3b. Paternal psych. wellbeing	EDS	.28	<.001
	TAI	.39	<.001
	PSI	.56	<.001
	MSPSS	.05	.61
	BRS	-.16	.13
	GRIMS	-.12	.27
4a. Maternal representations	Positive Mother Factor Score	-.25	.01

		SDQ Externalising Score	
4a. Maternal representations cont.	Angry Mother Factor Score	.28	.004
	Unsupported Mother Factor Score	.26	.08
	Reflective Functioning	-.21	.03
	Coherence	-.11	.25
	Richness of Perceptions	-.13	.17
	Child Aggression	.39	<.001
	Child Happiness	-.48	<.001
	Child Controlling	.16	.11
	Child Affectionate	-.10	.29
	Child Rejecting	.05	.60
4b. Paternal representations	Positive Father	-.13	.25
	Angry Father	-.02	.87
	Reflective Functioning	-.16	.14
	Coherence	-.13	.22
	Richness of Perceptions	-.18	.09
	Child Aggression	.04	.69
	Child Happiness	-.08	.46
	Child Controlling	.08	.49
	Child Affectionate	.01	.92
	Child Rejecting	-.17	.12
5. Emotional Availability	Mother-child EA factor score	-.14	.15
	Father EA factor score	-.10	.37

As the maternal psychological wellbeing variables were highly inter-correlated (see Table 4.7.2), and in order to avoid issues of multicollinearity, maternal parenting stress (PSI) was selected as an index of maternal psychological wellbeing as it correlated most strongly with the outcome variable. Similarly, as the paternal wellbeing variables were highly inter-

correlated, paternal parenting stress (PSI) was selected as an index of paternal psychological wellbeing as it correlated most strongly with the outcome variable.⁶²

Table 4.7.2. Intercorrelations of maternal mental health variables and paternal mental health variables (Parenting Stress Index, Trait Anxiety Inventory, Edinburgh Depression Scale, Multidimensional Scale of Perceived Social Support, Brief Resilience Scale, and Golombok-Rust Inventory of Marital State)

	PSI	TAI	EDS	MSPSS	BRS
Mothers					
TAI	.66**				
EDS	.60**	.76**			
MSPSS	-.42**	-.34**	-.40**		
BRS	-.28**	-.53**	-.37**	.05	
GRIMS	.55**	.56**	.49**	-.38**	-.38**
Fathers					
TAI	.69**				
EDS	.54**	.73**			
MSPSS	-.26*	-.33**	-.26**		
BRS	-.53**	-.55**	-.57**	.16	
GRIMS	.41**	.37**	.22*	-.59**	-.12

* $p < .05$, ** $p \geq .001$

A hierarchical regression was then carried out (see Table 4.7.3). The first stage of the analysis included child sex. This model did not significantly predict child SDQ externalising scores, $F(1, 88) = 2.92$, $p = .09$, and explained only 3% of the variance in child SDQ externalising scores ($R^2 = .03$, adjusted $R^2 = .02$).

Mother's parenting stress (PSI) was then added to the model. This model significantly predicted SDQ externalising scores, $F(2, 88) = 14.21$, $p < .001$, and explained 25% of the variance in scores ($R^2 = .25$, adjusted $R^2 = .23$). The addition of maternal parenting stress was a significant improvement in the predictive power of the model ($\Delta R^2 = .22$, $p < .001$).

⁶² See note on alternative predictors below

Father's parenting stress (PSI) was added at stage three. This model significantly predicted child SDQ externalising scores, $F(3, 88) = 16.41, p < .001$, and explained 37% of the variance ($R^2 = .37$, adjusted $R^2 = .34$). The addition of paternal parenting stress at this stage significantly improved the predictive power of the model ($\Delta R^2 = .12, p > .001$).

Maternal representations of themselves as angry, and of their children as happy, were entered into the fourth stage of the model. This model significantly predicted SDQ externalising scores, $F(5, 88) = 13.17, p < .001$, and explained 44% of the variance in scores ($R^2 = .44$, adjusted $R^2 = .41$). The addition of these variables significantly improved the predictive power of the model ($\Delta R^2 = .08, p = .01$).

Finally, family type was added in the fifth stage of the model. Model four also significantly predicted SDQ externalising scores, $F(6, 88) = 10.90, p < .001$, and also explained 44% of variance in scores ($R^2 = .44$, adjusted $R^2 = .40$). However, the addition of family type did not significantly improve the predictive power of the model ($\Delta R^2 = .001, p = .65$).

As shown in Table 4.7.3, paternal parenting stress and mothers' representations of themselves as angry were the only predictors to significantly, independently contribute to the model when all predictors were included. The strongest predictor of children's SDQ externalising problems was fathers' parenting stress ($\beta = -.37, t = 3.64, p < .001$), such that higher levels of fathers' parenting stress predicted higher child SDQ externalising scores. Mothers' representations of themselves as angry also independently predicted SDQ externalising scores ($\beta = .19, t = 2.06, p = .04$), such that angrier mother self-representations were predictive of higher child externalising problems. Although maternal parenting stress significantly contributed to the model at stages two and three, the inclusion of Angry Mother and Child Happiness at stage four rendered the individual contribution of maternal parenting stress non-significant. The addition of family type at the final stage failed to improve the predictive power of the model; this indicates that family processes rather than family structure were predictive of higher levels of children's externalising problems.

Note on alternative predictors

A model that included a composite Maternal Mental Health variable at stage two⁶³ instead of maternal parenting stress also significantly predicted child SDQ externalising, $F(2, 87) = 12.55$, $p < .001$, although the model explained less of the variance in SDQ externalising scores than the model presented above ($R^2 = .23$, adjusted $R^2 = .21$).

Similarly, a model which included a composite Paternal Mental Health variable at stage three instead of paternal parenting stress significantly predicted child SDQ externalising, $F(3, 87) = 13.89$, $p < .001$. However, the model explained less of the variance in SDQ externalising scores than the model presented above ($R^2 = .33$, adjusted $R^2 = .31$).

A model which included Positive Mother and Child Aggression at stage three also significantly predicted child SDQ externalising, $F(4, 106) = 7.80$, $p < .001$, although the model explained less of the variance in SDQ externalising scores than the model presented above ($R^2 = .32$, adjusted $R^2 = .28$).

⁶³ These composite variables were created by factor analysing the maternal mental health variables and paternal mental health variables (EDS, TAI and PSI) and then creating Maternal Mental Health and Paternal Mental Health factor scores, such that higher factor scores indicate higher levels of maternal and paternal mental health problems.

Table 4.7.3. Hierarchical multiple regression analysis predicting parent-rated child SDQ externalising problems (n= 88)

	<i>b</i>	<i>SE b</i>	<i>B</i>
<i>Stage 1</i>			
Constant	6.95	.96	
Child sex	-1.06	.62	-.18
<i>Stage 2</i>			
Constant	2.30	1.27	
Child sex	-.90	.55	-.15
Maternal PSI	.07	.01	.45***
<i>Stage 3</i>			
Constant	-.75	1.40	
Child sex	-.62	.51	-.11
Maternal PSI	.04	.01	.28**
Paternal PSI	.07	.02	.40***
<i>Stage 4</i>			
Constant	3.48	2.48	
Child sex	-.52	.51	-.09
Maternal PSI	.03	.01	.18
Paternal PSI	.07	.02	.38***
Angry Mother	.62	.29	.20*
Child Happiness	-1.00	.59	-.16
<i>Stage 5</i>			
Constant	3.55	2.50	
Child sex	-.57	.52	-.10
Maternal PSI	.02	.01	.17
Paternal PSI	.06	.02	.37***
Angry Mother	.60	.30	.19*
Child Happiness	-1.00	.59	-.16
Family type IVF v ED	.36	.56	.04

Note. $R^2 = .03$ for Stage 1; $\Delta R^2 = .22$ for Stage 2 ($p < .001$); $\Delta R^2 = .12$ for Stage 3 ($p < .001$); $\Delta R^2 = .08$ for Stage 4 ($p = .01$); $\Delta R^2 = .001$ ($p = .65$) * $p < .05$, ** $p < .01$, *** $p < .001$

4.8 Family processes: child externalising problems in egg donation families

As family type was not found to predict children's externalising problems, linear regression analyses were conducted for the egg donation families only to further explore factors that may be associated with egg donation children's higher levels of externalising problems.

Correlational analyses were conducted to explore associations between the outcome variable (parent-rated SDQ externalising scores) and possible predictor variables, in order to ascertain which variables should be entered into the regression. Relationships were explored between SDQ externalising problems and 1) family demographic variables including maternal, paternal and child age, child sex, whether or not the child was a twin, number of siblings at home, education level and income; 2) treatment variables including number of years trying to conceive and number of IVF cycles taken to have the child; 3) mothers' psychological wellbeing as assessed by the Edinburgh Depression Scale (EDS), Trait Anxiety Inventory (TAI), Parenting Stress Index (PSI), Multidimensional Scale of Perceived Social Support (MSPSS), Brief Resilience Scale (BRS) and the Golombok-Rust Inventory of Marital State (GRIMS); fathers' psychological wellbeing, as above 4) the maternal representational variables of Positive Mother, Unsupported Mother, Angry Mother, the five PDI child variables and the global variables Reflective Functioning, Coherence, and Richness of Perceptions; 5) the paternal representational variables of Positive Father, Angry Father, and the aforementioned PDI child and global variables; 6) maternal and paternal Emotional Availability factor scores.

The regression was then carried out in three steps. The first stage included maternal mental health variables that correlated with the outcome variable. The second stage included paternal mental health variables that correlated with the outcome variable. The final stage included maternal representational variables that correlated with the outcome variable.

Child externalising problems

Table 4.8.1 summarises the significant results of the correlational analyses. Significant associations were found between maternal depression (EDS, $r = .33$, $p = .01$), anxiety (TAI, $r = .32$, $p = .01$) and parenting stress (PSI, $r = .49$, $p < .001$) and SDQ externalising scores, such that

higher levels of maternal depression, anxiety and parenting stress were associated with higher levels of child externalising problems. Similarly, significant associations were found between SDQ externalising scores and paternal depression (EDS, $r = .28, p = .03$), anxiety (TAI, $r = .44, p < .001$) and parenting stress (PSI, $r = .62, p < .001$), such that higher levels of paternal depression, anxiety and parenting stress were associated with higher child SDQ externalising scores. Positive associations were also found between SDQ externalising scores and mothers' representations of themselves as angry and as unsupported, such that higher levels of child externalising problems were associated with higher levels of mothers' representations of themselves as angry ($r = .34, p = .02$) and unsupported ($r = .29, p = .01$). Finally, mothers' representations of their child as aggressive ($r = .39, p = .001$) and as happy ($r = -.49, p < .001$) were associated with SDQ externalising scores, such that more aggressive and less happy representations of the child were associated with higher levels of child externalising problems.

Due to the limited sample size ($n = 57$), and as the maternal mental health variables were known to be highly inter-correlated, only maternal parenting stress (PSI) was included at the first stage of the model, as it was most strongly correlated with the outcome variable. For the same reason, paternal parenting stress was entered at stage two, and Angry Mother and Child Happiness were selected to be entered at the third stage of the model. Alternative models including the maternal mental health and paternal mental health composite variables, Unsupported Mother and Child Aggression were also explored.

A hierarchical multiple regression was subsequently conducted (Table 4.8.2). Maternal parenting stress (PSI) was entered at the first stage of the model. This model significantly predicted SDQ externalising scores, $F(1, 56) = 21.98, p < .001$ and explained 29% of the variance in SDQ externalising scores ($R^2 = .29$, adjusted $R^2 = .27$).

Paternal parenting stress (PSI) was then added to the second stage of the model. This model also significantly predicted SDQ externalising scores, $F(2, 56) = 22.80, p < .001$ and explained 46% of the variance ($R^2 = .46$, adjusted $R^2 = .44$). The addition of paternal parenting stress significantly improved the predictive power of the model, $\Delta R^2 = .17, p < .001$.

Table 4.8.1. Correlational analyses of associations between parent-rated SDQ externalising scores and family process variables within egg donation families

		SDQ Externalising Score	
		<i>r</i>	<i>p</i>
Maternal psychological wellbeing	EDS	.33	.01
	TAI	.32	.01
	PSI	.49	<.001
Paternal psychological wellbeing	EDS	.28	.03
	TAI	.44	<.001
	PSI	.62	<.001
Maternal representations	Angry Mother	.34	.02
	Unsupported Mother	.29	.01
	Child Aggression	.39	.001
	Child Happiness	-.49	<.001

Mothers' angry self-representations and representations of their child as happy were then added to the final stage of the model. This model also significantly predicted SDQ externalising scores, $F(4, 56) = 16.43, p < .001$ and explained 56% of the variance ($R^2 = .56$, adjusted $R^2 = .52$). The addition of Angry Mother and Child Happiness significantly improved the predictive power of the model, $\Delta R^2 = .10, p = .01$.

As shown in Table 4.8.2, paternal parenting stress, mothers' representations of themselves as angry and mothers' representations of the child as happy all significantly, independently contributed to the model when all predictors were included. The strongest predictor of egg donation children's SDQ externalising problems was paternal parenting stress ($\beta = .46, t = 4.27, p < .001$), such that higher levels of paternal parenting stress were predictive of higher child SDQ externalising scores. Maternal representations of themselves as angry also

independently predicted SDQ externalising scores ($\beta = .21, t = 2.11, p = .04$), such that angrier maternal self-representations predicted higher child SDQ externalising scores. Mothers' representations of their child as less happy was also found to predict child SDQ externalising scores ($\beta = -.21, t = -1.97, p = .05$), with lower levels of child happiness predicting higher levels of externalising behaviour problems. Whilst maternal parenting stress was initially predictive of child SDQ externalising scores, the addition of the representational variables Angry Mother and Child Happiness rendered its independent contribution non-significant, although marginally so ($\beta = .20, t = 1.82, p = .07$). The model indicates that elevated levels of paternal parenting stress, higher levels of maternal anger and lower levels of child happiness, as perceived by mothers, are associated with higher levels of child externalising problems in the egg donation group.

Table 4.8.2. Hierarchical multiple regression analysis predicting parent-rated child SDQ externalising problems within egg donation families ($n = 57$)

	<i>b</i>	<i>SE b</i>	<i>B</i>
<i>Stage 1</i>			
Constant	.41	1.23	
Mother PSI	.08	.02	.53***
<i>Stage 2</i>			
Constant	-3.02	1.36	
Mother PSI	.05	.02	.31**
Father PSI	.09	.02	.47***
<i>Stage 3</i>			
Constant	2.92	3.16	
Mother PSI	.03	.02	.20
Father PSI	.08	.02	.46***
Angry Mother	.74	.35	.21*
Child Happiness	-1.48	.75	-.21*

Note. $R^2 = .29$ for Stage 1; $\Delta R^2 = .17$ for Stage 2 ($p < .001$); $\Delta R^2 = .10$ for Stage 3 ($p < .01$). * $p < .05$, ** $p < .01$, *** $p < .001$

Note on alternative predictors

A model which included the composite Maternal Mental Health variable at stage one instead of maternal parenting stress also significantly predicted child SDQ externalising, $F(1, 56)=9.12$, $p=.004$, although the model explained considerably less of the variance in SDQ externalising scores than the model presented above ($R^2=.14$, adjusted $R^2=.13$).

Similarly, a model which included the composite Paternal Mental Health variable at stage two instead of paternal parenting stress significantly predicted child SDQ externalising, $F(2, 56)=16.91$, $p<.001$, but the model explained less of the variance in SDQ externalising scores than the model presented above ($R^2=.39$, adjusted $R^2=.36$).

A model which included Unsupported Mother and Child Aggression at stage three also significantly predicted child SDQ externalising, $F(4, 56)=14.89$, $p<.001$. However, this model explained less of the variance in SDQ externalising scores than the model presented above ($R^2=.53$, adjusted $R^2=.50$).⁶⁴

⁶⁴ Child aggression significantly independently contributed to the model ($\beta=.29$, $p=.01$); however, Unsupported Mother did not independently contribute to the model ($\beta=.07$, $p=.50$)

4.9. Donor threat

4.9.1. Associations with donor threat

Correlational analyses were conducted to explore whether identity-release egg donation mothers' levels of perceived donor threat were associated with any family demographic or process variables. Associations were explored between donor threat and (i) demographic variables (ii) treatment variables, (iii) maternal mental health variables (iv) paternal mental health variables (v) maternal representational variables (vi) paternal representational variables (vii) child representational variables (viii) observational measures of mother-child and father-child relationship quality, and (ix) child adjustment variables.

Table 4.9.1 summarises the results of the correlational analysis. Donor threat was found to correlate with mothers' representations of themselves as angry ($r = .30, p = .05$), such that higher levels of angry mother self-representations were associated with higher levels of perceived donor threat. Donor threat was also associated with mothers' levels of hostility ($r = .30, p = .05$), where higher levels of maternal hostility were related to higher levels of perceived donor threat.

Donor threat was also found to negatively correlate with children's self-representations of their strengths and competencies, such that higher levels of maternal donor threat were associated with children's perceptions of themselves as less socially competent ($r = -.42, p = .03$).

Table 4.9.1. Correlational analyses of relationships between maternal donor threat and family process variables within egg donation families.

		Donor threat	
		<i>r</i>	<i>p</i>
1. Demographic	Mother's age	.06	.69
	Father's age	-.12	.43
	Child's age	.09	.54
	Child sex	.28	.06
	Twin vs singleton	-.10	.52
	Number of siblings at home	-.23	.14
	Education level	-.07	.64
	Income	-.14	.37
2. Treatment	No. years conceiving	.10	.53
	No. IVF cycles to have child	-.03	.86
3a. Maternal psych. wellbeing	EDS	-.09	.57
	TAI	.05	.75
	PSI	.01	.93
	MSPSS	.18	.29
	BRS	-.21	.19
	GRIMS	.17	.29
3b. Paternal psych. wellbeing	EDS	-.39	.10
	TAI	-.25	.11
	PSI	-.25	.11
	MSPSS	.12	.45
	BRS	.14	.37
	GRIMS	-.17	.31
4a. Mat. representations	Positive Mother Factor	-.03	.86
	Angry Mother Factor	.30	.05
	Unsupported Mother Factor	.10	.52
	Hostility	.30	.05

		Donor threat	
	Reflective Functioning	.10	.50
	Coherence	.25	.10
	Richness of Perceptions	.28	.06
	Child Aggression	-.007	.97
	Child Happiness	.25	.10
	Child Controlling	.05	.74
	Child Affectionate	.16	.30
	Child Rejecting	-.33	.09
4b. Pat. representations	Positive Father Factor	.17	.28
	Angry Father Factor	-.27	.09
	Reflective Functioning	-.09	.58
	Coherence	-.17	.29
	Richness of Perceptions	-.09	.58
	Child Aggression	-.08	.61
	Child Happiness	-.12	.45
	Child Controlling	-.03	.85
	Child Affectionate	-.15	.34
	Child Rejecting	.07	.68
4c. Child representations	Positive Maternal Affect	-.30	.12
	Negative Maternal Affect	-.17	.35
	Positive Paternal Affect	-.001	.99
	Negative Paternal Affect	-.15	.45
	Depression	-.13	.50
	Over-anxiousness	-.23	.22
	Strengths & competencies	-.42	.03
5. Emotional Availability	Mother-child dyadic EA factor	.12	.42
	Father EA factor	.24	.15
6. Child adjustment	Parent SDQ externalising	-.09	.53
	Parent SDQ internalising	-.03	.85

4.9.2 Within-group predictors of mothers' angry self-representations

Due to the finding that donor threat was associated with Angry Mother factor scores and given that mothers' self-perceived anger significantly predicted child SDQ externalising scores in the egg donation group, regression analyses were conducted to examine the extent to which perceived donor threat predicted mothers' angry self-representations, over and above other family process variables.

Correlational analyses were therefore conducted to explore other associations between family processes and mothers' angry self-representations. Associations were explored between Angry Mother factor scores and (i) demographic variables, (ii) treatment variables, (iii) maternal mental health variables, (iv) paternal mental health variables, (v) the maternal representational variables of Reflective Functioning, Coherence, Richness of Perceptions and the five Child PDI variables; (vi) paternal representational variables, (vii) child representational variables, (viii) observational measures of mother-child and father-child relationship quality and (ix) child adjustment variables.

The regression was carried out in four steps. Demographic variables that were found to correlate with Angry Mother factor scores were entered at stage one. Child variables that were found to correlate with Angry Mother factor scores were entered at the second stage. Any representational variables that were found to correlate with Angry Mother factor scores were entered at stage three. Finally, donor threat was entered at stage four.

Angry Mother factor score

Table 4.9.2 provides results of the correlational analyses. In addition to donor threat (see above), Angry Mother factor scores were associated with number of siblings at home, such that having more children at home was associated with higher maternal anger ($r = .28, p = .02$). Angry Mother factor scores were also associated with maternal representations of the child as aggressive ($r = .42, p < .001$) and happy ($r = -.31, p = .01$), such that maternal representations of the child as more aggressive and less happy were associated with higher maternal anger.

As reported above, Angry Mother factor scores were also associated with parent-rated SDQ externalising scores.

Due to the very limited sample size ($n= 44$), Child Aggression was selected as the representational variable to be entered at stage three. An alternative model with Child Happiness at stage three was also explored.⁶⁵

The hierarchical multiple regression was conducted with number of siblings entered into the first stage of the model. This model significantly predicted Angry Mother factor scores, $F(1, 44)= 5.04$, and explained 11% of the variance in Angry Mother factor scores ($R^2= .11$, adjusted $R^2= .09$).

Child SDQ externalising scores were entered into the second stage of the model. This model also significantly predicted Angry Mother factor scores, $F(2, 44)= 4.03$, $p= .03$, and explained 17% of variance in Angry Mother factor scores. However, the addition of child SDQ externalising to the model did not significantly improve the predictive power of the model, $\Delta R^2= .06$, $p= .10$.

Mothers' representation of the child as aggressive was entered into the third stage of the model. This model also significantly predicted Angry Mother factor scores, $F(3, 44)= 5.60$, $p= .003$, and explained 30% of the variance ($R^2= .30$, adjusted $R^2= .25$). The addition of Child Aggression to the model significantly improved the predictive power of the model, $\Delta R^2= .13$, $p= .01$.

⁶⁵ This model did not significantly predict Angry Mother factor scores, $F(3, 44)= 2.67$, $p= .06$; it accounted for less of the variance than the model presented above ($R^2= .17$, adjusted $R^2= .11$) and the addition of Child Happiness did not significantly improve the predictive power of the model, $\Delta R^2= .003$, $p= .71$.

Table 4.9.2. Correlational analyses of relationships between Angry Mother factor scores and family process variables within egg donation families

		Angry Mother factor score	
		<i>r</i>	<i>p</i>
1. Demographic	Mother's age	-.07	.56
	Father's age	-.12	.33
	Child's age	.09	.44
	Child sex	.05	.67
	Twin vs singleton	.17	.16
	Number of siblings at home	.28	.02
	Education level	-.26	.06
	Income	-.23	.07
2. Treatment	No. years conceiving	-.13	.27
	No. IVF cycles to have child	.24	.06
	Identity-release donor threat	.30	.05
3a. Maternal psych. Wellbeing	EDS	.01	.99
	TAI	.16	.19
	PSI	.22	.08
	MSPSS	.10	.45
	BRS	-.06	.67
	GRIMS	.04	.78
3b. Paternal psych. wellbeing	EDS	-.14	.30
	TAI	.01	.94
	PSI	.02	.86
	MSPSS	.08	.54
	BRS	.08	.56
	GRIMS	-.02	.89
4a. Maternal representations	Reflective Functioning	-.24	.06
	Coherence	-.08	.49

		Angry Mother factor score	
4a. Maternal representations cont.	Richness of Perceptions	-.11	.36
	Child Aggression	.42	<.001
	Child Happiness	-.30	.01
	Child Controlling	.08	.54
	Child Affectionate	-.23	.06
	Child Rejecting	.03	.78
4b. Paternal representations	Positive Father	-.07	.61
	Angry Father	-.09	.53
	Reflective Functioning	-.09	.51
	Coherence	-.07	.63
	Richness of Perceptions	-.12	.39
	Child Aggression	.07	.63
	Child Happiness	-.26	.06
	Child Controlling	.03	.84
	Child Affectionate	-.16	.26
	Child Rejecting	.05	.72
4c. Child representations	Depression	-.05	.73
	Overanxiousness	-.16	.28
	Strengths & Competencies	-.20	.20
	Mother Anger & Hostility	-.19	.20
	Father Anger & Hostility	-.09	.53
	Mother Warmth & Enjoyment	-.25	.10
	Father Warmth & Enjoyment	-.18	.23
5. Observed Emotional Availability	Mother-child dyadic EA factor score	-.17	.17
	Father EA factor score	.02	.89
6. Child adjustment	SDQ internalising	-.12	.33
	SDQ externalising	.29	.02

Finally, donor threat was added to the last stage of the model. This model significantly predicted Angry Mother factor scores, $F(4, 44) = 7.45, p < .001$, and explained 44% of the variance in Angry Mother factor scores ($R^2 = .44$, adjusted $R^2 = .38$). The addition of Donor Threat significantly improved the predictive power of the model, $\Delta R^2 = .14, p = .004$.

As shown in Table 4.9.3, all predictors apart from child SDQ externalising scores contributed significantly to the model. Within the egg donation families, the strongest predictor of mothers' angry self-representations was donor threat ($\beta = .38, p = .004$), such that higher levels of perceived threat from identity-release egg donation predicted higher Angry Mother factor scores. Mothers' representations of their child as aggressive predicted mothers' angry self-representations at a similar magnitude ($\beta = .37, p = .01$), such that mothers' representations of their child as more aggressive were predictive of angrier maternal self-representations. The number of siblings at home in egg donation families was also predictive of mothers' angry self-representations ($\beta = .31, p = .02$), with higher numbers of children at home predicting higher Angry Mother factor scores. This model indicates that together, elevated levels of perceived donor threat, perceived child aggression, and higher numbers of children at home are predictive of identity-release egg donation mothers' angry self-representations.

Table 4.9.3. Hierarchical multiple regression analysis predicting Angry Mother factor scores within egg donation families ($n = 44$)

	<i>b</i>	<i>SE b</i>	<i>B</i>
<i>Stage 1</i>			
Constant	-.06	.17	
No. siblings at home	.44	.20	.33*
<i>Stage 2</i>			
Constant	-.46	.29	
No. siblings at home	.39	.19	.29*
SDQ Externalising	.07	.04	.24
<i>Stage 3</i>			
Constant	-1.26	.40	
No. siblings at home	.30	.18	.23
SDQ Externalising	.02	.04	.05
Child Aggression	.46	.17	.42**
<i>Stage 4</i>			
Constant	-1.98	.43	
No. siblings at home	.41	.17	.31*
SDQ Externalising	.03	.04	.10
Child Aggression	.42	.15	.37*
Donor Threat	.37	.12	.38**

Note. $R^2 = .11$ for Stage 1; $\Delta R^2 = .06$ for Stage 2 ($p > .05$); $\Delta R^2 = .10$ for Stage 3 ($p < .01$); $\Delta R^2 = .14$ for Stage 4 ($p = .004$) * $p < .05$, ** $p < .01$, *** $p < .001$

Chapter 5: Discussion

The present study examined egg donation parents' understanding of, and thoughts and feelings about, donor identifiability, and functioning within families created via identifiable egg donation, when children were in early childhood. The study found that a minority of parents either incorrectly understood the principles of identity-release donation, or believed that they had used an anonymous donor. It was also found that mothers had complex and sometimes contradictory feelings about the prospect of future donor-child contact, and used a number of strategies to manage those feelings in day-to-day life. The possibility of future donor-child contact was represented by some mothers as an essential opportunity to be embraced; access to the donor's identifying information was often represented as the child's essential identity information, and as a gateway to a broader family network. Conversely, donor-child contact was perceived by several mothers as a threat to the mother-child relationship, to the child, and to the donor. Despite a substantial proportion of mothers perceiving identity-release donation as a threat to some degree, most mothers had either begun telling, or intended to tell, their child about their method of conception, including telling them about their right to access the donor's identifying information in the future.

Families created via identifiable egg donation were found to be functioning well in terms of parental psychological health, parent-child relationship quality and child adjustment, with few differences found between family types. However, where group differences were identified, these reflected poorer functioning in egg donation families than own-gamete IVF families. Differences between parents' psychological health in the two family types were associated to some extent with the egg donation parents' older age and twin parenthood. Egg donation mothers and fathers were also found to express more negative representations of the parent-child relationship than IVF parents. However, no group differences were found between observed parent-child interaction quality, with parents and children in both groups demonstrating positive interaction quality. Egg donation children were found to be rated as higher in externalising problems by their parents than IVF children; however, most of the variance in children's externalising scores was explained by paternal parenting stress and maternal anger, and not by family type. The following chapter provides an in-depth discussion

of these findings, before summarising the present study's strengths and limitations and its implications for future policy and practice.

5.1. Discussion of qualitative results

5.1.1 Parents' misunderstandings about identity-release egg donation

The finding that a significant minority of parents had an unclear understanding of the details of identity-release gamete donation was unexpected. Around one third of both mothers and fathers demonstrated a misunderstanding of identity-release donation. The types of misunderstanding fell into two broad categories: some parents demonstrated uncertainty about what, if anything, their child could learn about the donor in the future, whereas others expressed the belief that they had used a fully anonymous egg donor to conceive. It is plausible that these parents' focus was fixed on falling pregnant after, in some cases, many years of trying, and that they did not have the psychological resources available to research the specifics of egg donation legislation. This explanation is supported by evidence from a study of Dutch sperm donation parents' experiences of the psychological counselling they had received during the treatment phase. A number of parents reported that before and during treatment, they had mainly focused on becoming pregnant and did not consider issues of disclosure or future donor-child contact (Visser et al., 2016). Many stated that only after childbirth did these topics become pertinent, and many wished that they had been able to access practical, professional advice once their child had been born. Currently, regulatory bodies in the UK recommend that clinics offer one counselling session to prospective parents prior to treatment with donor gametes (HFEA, 2019b). However, follow-up care is not standard practice. A recent review of gamete donation counselling suggests the need for a shift away from a focus on the psychological evaluation of prospective parents, towards a psycho-educational approach that utilises a combination of information sharing and strategy building, throughout the family life-course (Crawshaw & Daniels, 2019). The Nuffield Council on Bioethics report on donor conception in 2013 also recommended post-birth counselling for parents of donor conceived children (Nuffield Council on Bioethics, 2013). It is likely that some of the parents in the present study would benefit from an extended period of counselling after childbirth, or from a more diverse selection of formats for accessing information about raising a donor conceived child, such as workshops on disclosure and donor-child contact (Indekeu & Lampic, 2018).

Also of note is the finding that, of the parents who did not understand identity-release donation, more fathers than mothers did not know, or could not remember, whether their child could access identifying information about the donor (7 mothers, 11 fathers), whereas more mothers than fathers mistakenly believed that the donor was fully anonymous (6 mothers, 2 fathers). It is possible that as these fathers share a genetic link with their child, they did not engage with the implications of egg donation as fully as the mothers did. This is supported by Kirkman (2008)'s findings that whilst some egg donation mothers expressed the belief that the experiences of genetic and non-genetic parenthood may differ, their partners denied or downplayed the existence of such differences.

This asymmetry is also in line with the finding that mothers are more likely than fathers to begin the disclosure process and maintain conception-related communication within donor conceived families, particularly in egg donation families (Blake et al., 2010). The adoption literature, too, demonstrates that adoption-related communication mostly falls to mothers, although adoptive fathers have been found to become more involved in adoption-related communication as the child grows older (Freeark et al., 2008; Wrobel et al., 2003). These findings are consistent with the sociological concept of "emotion work", which refers to the active management one one's own and others' emotions in order to facilitate harmonious family functioning, and requires effortful regulation negotiation (Pfeffer, 2010). Emotion work has consistently been found to be gendered, with women conducting the majority of the emotion work within their families (DeVault, 1999; Elliott & Umberson, 2008; Hochschild, 1990)⁶⁶. Engaging with the details and practicalities of identity-release donation may arguably fall under the remit of emotion work, and so may fall disproportionately to women in egg donation families.

5.1.2 Parents' disclosure intentions

Half of identity-release egg donation mothers had begun the disclosure process by the time their children were aged five, and a further 36% intended to tell their child, but had not yet

⁶⁶ It is important to note that although most of the research on emotion work has been developed in the context of a heteronormative gender binary, more recent work with LGBTQI+ partners demonstrates that engagement in emotion work is determined not by sex, but rather by gender constructions and gender ideologies (Pfeffer, 2010; Erickson, 2005; Minnotte, Stevens, Minnotte & Kiger, 2007).

begun to do so. Of the mothers that understood the principles of identity-release, the majority (91%) had informed, or intended to inform, their child about their right to access the donor's identifying information. The UK Longitudinal Study of Reproductive Donation Families found that 41% of anonymous egg donation families had begun the disclosure process by the time the child was aged seven (Blake et al., 2014). These findings suggest that, rather than reducing disclosure rates, the removal of donor anonymity is concurrent with a continuing trend towards openness in ART families (ASRM Ethics Committee, 2018; Isaksson et al., 2011b, 2012; Readings et al., 2011).

It is interesting to note that all mothers who understood the implications of identity-release egg donation had either begun to, or planned to, tell their child about how they were conceived; this is a particularly noteworthy finding given the not insubstantial level of threat many of these mothers perceived from the prospect of future donor-child contact. As many of the parents in this sample were advised by their clinic to disclose to their child in their early years, or otherwise had come to this conclusion during their own research, it is possible that mothers considered early disclosure the officially sanctioned and therefore correct course of action, despite their own feelings about the prospect. As Freeman (2015) notes, the introduction of donor identification system automatically ascribes significance to the genetic link between donor and child; this legislative change has been viewed by some as the further geneticisation of the family, and it may compound the belief in some donor conception parents that knowledge of one's genetic origins is crucial to the optimal development of personal identity (Turkmendag, 2012).

Conversely, amongst those mothers who did not understand the implications of identity-release donation, almost half were either undecided about whether to, or planned not to, disclose their use of egg donation to their child. This group constituted all of the mothers who were unsure whether to, or planned not to, tell. It is possible that the co-occurrence of these mothers' lack of understanding of identity-release donation, and their disinclination to disclose their use of egg donation, reflects a subsample of mothers who are less able to accept that they had had to use donor eggs to conceive. Some donor conception parents have been found to deliberately disengage from donor information to manage the psychological and emotional load of having needed to use donor gametes (Widbom et al., 2021; Zadeh et al.,

2016), and to facilitate the feeling of being able to fully own the identity of being the child's parent (Imrie et al., 2020). It is therefore possible that these mothers were, perhaps unconsciously, participating in a pattern of defensive denial that Konrad (2005) describes as an 'active not knowing', although further research into these mothers' motivations for non-disclosure will be necessary to answer this question directly.

5.1.3 Mothers' thoughts and feelings about identity-release egg donation

When reflecting on the prospect of future donor-child contact, egg donation mothers' narratives demonstrated considerable ambivalence, with mothers expressing complex and sometimes contradictory feelings. This study is the first to explore UK egg donation mothers' perspectives on identity-release donation when children are in early childhood, and the findings offer insights into the complex nature of navigating non-genetic parenthood, as well as the specific challenges of identity-release donation. The findings suggest that mothers use multiple strategies to make sense of, and manage their feelings about, their use of identity-release egg donation in day-to-day life. These findings are in line with the limited evidence from studies of identity-release sperm donation families, with some parents variously demonstrating comfort with, concerns about, and ambivalent feelings towards future donor-child contact (Isaksson et al., 2016; Widbom et al., 2021).

That a substantial number of mothers perceived identity-release donation as threatening is important, and suggests that for some mothers, identity-release contributes to a perception of the donor as an ongoing and salient presence that may put pressure on relationships within the family unit. This finding is consistent with studies examining mothers' motivations for choosing anonymous egg donors, where mothers expressed a preference for anonymous donation to protect the mother-child relationship (Laruelle et al., 2011; Rubin et al., 2015). Some mothers' representations of donor information and donor-child contact as threatening suggests that identity-release donation may be a destabilising force; this is in line with egg donation mothers' descriptions of access to donor information as "a burden" (Rubin et al., 2015) and as contributing to a picture of "long-term insecurity" (Stuart-Smith et al., 2012).

The most commonly expressed concern about identity-release donation was that donor-child contact would somehow threaten or impact the quality of the mother-child relationship. This ranged from mothers feeling a threat to their identity/legitimacy as mothers, to expressions of concern that the child and donor would be drawn to each other, and that the child would ultimately reject the mother in favour of the donor. The very limited literature on identity-release egg donation provides some supporting evidence for this finding. In the first phase of the present study, when the children were still infants, some mothers expressed concerns that the donor would want to claim the child in the future (Imrie et al., 2020). Some of these mothers also reported that it took time to, or that they were yet to, fully feel that they were the infant's "real" mother. Identity-release sperm donation parents have also expressed concern about whether donor-child contact would make their children question the authenticity of the father-child relationship (Isaksson et al., 2016).

The literature on disclosure amongst children conceived with anonymous donors also provides some subtle evidence of perceived threat to the parent-child relationship; a study of single mothers by choice and heterosexual partnered mothers who had used sperm donation found that fewer partnered mothers than single mothers had disclosed their use of donor conception to their child (Freeman et al., 2016). Amongst the participants that had not disclosed, partnered mothers were significantly more negative about disclosure than single mothers. Similarly, a study of single mothers, lesbian couple and heterosexual couple parents found that, whilst rates of disclosure were relatively high across all groups, heterosexual couple parents were significantly less likely to disclose their use of sperm donation to their child (Scheib et al., 2003). These findings may suggest a desire amongst heterosexual-couple donor conceiving couples to protect the non-genetic parent from the perceived threat of the absence of a genetic link; however, as neither study reports parents' reasons for disclosure hesitancy, this can only be speculation.

Mothers' concerns that the donor-child relationship may be more 'real' than the mother-child relationship is indicative of a way of thinking that endorses the perspective that genetic relatedness confers upon the parent a natural affinity with the child that is 'given', and trumps a non-genetic connection that must be 'made' over time (Carsten, 2004). These perspectives provide evidence of the sociological concept of 'genetic thinking', whereby the broad cultural

frame of biogenetic relatedness in the family plays out in how people approach family life (Edwards & Strathern, 2000; Nordqvist, 2017). Such cognitions presuppose that the genetic parent is automatically competent; subsequently, non-genetic parents are unable to tap into these cultural understandings of parenthood as “simply given” (Nordqvist, 2017). The effects of such genetic thinking may be compounded by the geneticisation of society in recent years due to advances in biomedical technology (Clarke et al., 2010; Latimer, 2013). Further, cognitions such as these may be particularly difficult for egg donation mothers to challenge due to discourses surrounding the egg as “inalienable” from the mother; the conceptualisation of female reproduction as a natural unity between conception, pregnancy and birth may amplify the threat posed by the absence of a genetic link between mother and child (Melhuus, 2012; Spilker & Lie, 2007). It is therefore possible that identity-release egg donation mothers, in particular, may have to engage with, and potentially struggle with, the discourse of genetic thinking, and to navigate through it in order to secure their role as a parent (Nordqvist, 2017).

The threat of the genetic connection between donor and child was also evident in the strategy of emphasising parenthood used by some mothers. Mothers referred to the importance of both gestational and social parenthood in the mitigation of this perceived threat. In discussing their use of egg donation, some mothers compared themselves favourably against adoptive mothers, emphasising the role of gestation and childbirth in establishing both a bond with the child, and a feeling of legitimacy in the mother role. Similar strategies have been reported in other studies of egg donation families, with mothers emphasising their biological connection with their child in lieu of a genetic one (Imrie et al., 2020; Nordqvist & Smart, 2014). Nordqvist (2017) refers to this process as the renegotiation of the ‘genetic hegemony’, substituting the centrality of genetic relatedness with the biological relatedness of gestation and labour. Some studies have suggested that amongst egg donation mothers, the gestational relationship compensates for the lack of a genetic link (Becker, 2000), and that gestation facilitates emotional connection with the infant by allowing mothers to create an internal world into which the child will be received (Figueiredo et al., 2007). However, other studies have found that, whilst gestation aids the bonding process, it is not necessarily enough to outweigh concerns about, and the challenges of, non-genetic motherhood (Kirkman, 2008; Imrie et al., 2020).

Mothers' emphasis of the importance of the parenting experience has been acknowledged elsewhere in the identity-release donation literature. Imrie and colleagues (2020) found that egg donation mothers minimised the role of the donor, whilst emphasising their own characteristics as an important factor in their infant's developing personality. Similarly, Widbom et al. (2021) found that fathers of adult children conceived via sperm donation vacillated between emphasising the importance of "doing" parenthood and the difficulty of not "being" the genetic father; whilst taking comfort in the parent-child relationship that had developed over time, some fathers still felt that their child obtaining their donor's identity constituted a threat to the legitimacy of their fatherhood.

This tension between 'doing' parenthood and legitimately 'being' a mother was evident in the present analysis: some mothers expressed concerns about their child accessing the donor's identifying information, but they reassured themselves with the possibility that developing a strong mother-child bond over time would mean their child would be less interested in obtaining the donor's identity in the future. Interestingly, this runs counter to findings that suggest that secure mother-child attachment relationships are associated with more positive feelings about, and more interest in, in the donor, whereas insecure mother-child attachment relationships have been found to relate to a more negative view of the donor and of donor conception more generally (Slutsky et al., 2016; Zadeh et al., 2017). Similar patterns have also emerged within the adoption literature, with higher levels of observed family cohesion (i.e., more positive communicative processes and less conflict) relating to higher levels of children's preoccupation with, and positive feelings about, adoption (Farr et al., 2019). It is possible that the warmth, responsiveness and availability characteristic of secure attachment relationships and accepting parenting styles may translate to an emotionally secure family environment in which children can explore topics surrounding donor conception and adoption.

That some mothers managed their feelings of threat by distancing themselves from the donor is consistent with studies investigating mothers' motivations for choosing anonymous egg donors (Greenfeld & Klock, 2004; Hershberger et al., 2007; Stuart-Smith et al., 2012). Many of the mothers in this study demonstrated a desire to distance themselves from the donor by

minimising the donor's role in the child's conception, often referring to the donor and their contribution in a depersonalising way such as "*she's served her purpose*" and "*it was just an egg*". This approach echoes the attitudes of mothers selecting anonymous over known donation, where anonymous donation was chosen to establish and maintain explicit boundaries between the donor and the recipient family, and to limit the donor's perceived intrusion into family life (Hershberger et al., 2007; Hudson, 2020). The minimisation of the donor's contribution has also been found to aid the parental claiming and bonding process for mothers of identity-release egg donation infants (Imrie et al., 2020). This distancing strategy has also been observed in studies of identity-release sperm donation parents; whilst some fathers demonstrated comfort in discussing the topic of sperm donation within the family unit, they simultaneously demonstrated discomfort with, or avoidance of, discussing the donor as a person or their adult child's interaction with the donor (Widbom et al., 2021).

The threat of the genetic link shared by donor and child, and the threat management strategies of emphasising parenthood and distancing employed by some mothers in this study, can also be understood through the lens of Kirk (1964)'s role handicaps and parents' strategies of rejection and acknowledgement of difference. Within the adoption literature, Kirk described adoptive parents' rejection of differences between their family and non-adoptive families as including behaviours such as avoiding references to the child's birth family, depersonalising the child's birth parents, and repressing memories of the pre-adoptive period. Conversely, acceptance of difference was conceptualised as parents' willingness to engage with their experience of infertility, to facilitate conversation about adoption, and displaying empathy towards the child's birth family. In the current study, the egg donation mothers who perceived threat from future donor-child contact, who emphasised gestational and social parenthood, and who distanced themselves from, and minimised, the donor, could be broadly seen to be assuming a rejection-of-difference stance. Conversely, the mothers who embraced the identity-release process as an opportunity, represented identity-release as a gateway to a family network, demonstrated interest in finding out more about the donor and showed willingness to facilitate donor-child contact could be viewed as assuming an acceptance-of-difference stance.

Brodzinsky & Huffman (1988) suggest that a rejection-of-difference strategy may be most beneficial to family functioning at the beginning of the adoption life cycle to help establish a secure family unit. A subsequent transition towards an acknowledgment-of-difference strategy has been proposed as children begin to develop the cognitive skills necessary to understand the basics of their genetic origins (Lo & Cashen, 2020). The current findings suggest that similar processes may occur within families of 5-year-old children born through identity-release egg donation. The fact that roughly equal proportions of mothers in this study predominantly perceived donor-child contact either as a threat or as an opportunity may reflect a transitional point between endorsing a rejection-of-difference strategy whilst children were infants, towards an acknowledgement-of-difference strategy as children reach the age at which their understanding of biological relatedness is beginning to grow, and at which disclosure is advised by fertility regulators and clinics (Solomon et al., 1996; Brodzinsky, 2011). The mothers in this study may therefore be attempting to reposition the donor, and their use of egg donation, within the context of beginning to discuss their conception stories with their five-year-olds. Whether egg donation mothers' rejection- or acknowledgement-of-difference cognitions become more optimally balanced as time passes, and whether these cognitions are related to family functioning outcomes, remains to be established.

The findings also revealed that some mothers felt that identity-release donation posed a threat to the wellbeing of their child. Most commonly, these mothers expressed concerns about the donor failing to meet their child's expectations, or otherwise disappointing or taking advantage of them in some way. Similar concerns have been reported in studies of identity-release sperm donation parents' views on their children accessing donor information. Scheib et al. (2003) found that, although most parents felt that identity-release was the best option for their child, over half expressed concerns about the identity-release process, including worries about whether the donor would be willing to meet their child, and whether the donor would live up to the child's expectations. A recent qualitative study found that some sperm donation mothers raised concerns that in conversations with their child, they had inadvertently idealised the donor, and that subsequently meeting the donor would ultimately be a disappointing experience for their child (Isaksson et al., 2016). This is congruent with findings in the current study that some mothers feared they would either idealise, or dislike, the donor, and that such perceptions may impact their child's experience

of accessing donor information. These results are consistent with Stuart-Smith et al. (2012)'s findings that mothers' feelings about their egg donors tended to polarise in the absence of available information about the donor.

Similar findings have been reported from studies of adoptive parents navigating the process of communication with their children's birth families. For example, MacDonald and McSherry (2011) found that in situations where children's birth mothers became inconsistently- or non-responsive, adoptive parents would limit or cease contact to protect their child from rejection or disappointment. As identity-release donor conceived children must wait until the age of eighteen to initiate contact with their donors, they are likely to be more psychologically mature and therefore potentially less vulnerable than their counterparts in open adoption arrangements who begin the process of contact with their birth family earlier in childhood. Furthermore, as previously discussed, children conceived through egg donation are born into the family that raises them and will not experience separation from their birth mother. It is therefore possible that donor conceived children would not be at the same level of psychological risk as adopted children, despite their mothers' concerns. Studies of adult offspring conceived via identity-release sperm donation have found some participants to express intense disappointment when their donors refused their requests for contact, although it must be noted that most adult children reported having positive or neutral experiences of contact with their donors (Scheib et al., 2017). Whether or not this finding would generalise to identity-release egg donation samples remains to be seen; this is a particularly pertinent question considering evidence suggesting that egg donors are less likely to want to be involved in their donor offspring's lives than sperm donors (Lampic et al., 2014).

A perhaps surprising finding was that a small number of mothers felt that identity-release donation may pose a threat not to themselves or their child, but to the donor. In some instances, this was voiced as the broader concern that donor identifiability would discourage potential donors from donating. This worry echoes concerns that, in the context of a donor shortage in the UK, the change in UK law implementing identity-release donation would worsen the ongoing shortage (Craft & Thornhill, 2005; Pennings, 2012; Turkmendag, 2012). In other instances, mothers expressed concerns that the identity-release system would prove disruptive to the donors' personal lives. Mothers spoke of not wanting to "*rock the boat*" and

of the potentially damaging impact of donor offspring “*appearing out of nowhere*”. These findings are similar to concerns raised by mothers of children conceived via sperm donation that future contact from their child might be awkward for the donor and his family (Isaksson et al., 2016).

The second dominant theme resulting from the thematic analysis reflected the views of a small number of mothers who demonstrated neutrality towards the prospect of donor-child contact, and emphasised the importance of the rights and desires of their child over and above their own personal feelings. These mothers tended to endorse a child-led approach, demonstrating a willingness to support their child without showing active interest or enthusiasm on a personal level. A similar pattern has been found amongst some parents of adult children conceived via sperm donation: Widbom et al. (2021) found that whilst many parents wished to distance themselves from the identity-release process, a minority encouraged and supported their offspring on their journey to obtain donor information, but expressed a lack of personal curiosity about the donor as a person. Elsewhere, identity-release gamete donation parents have been found to give neutral responses about whether future donor-child contact was a positive or negative feature of gamete donation (Isaksson et al., 2011). Brewaeys and colleagues (2005) noted that parents’ positive feelings about disclosure to the child do not necessarily translate into interest in having contact with the donor in the future. It could be that the neutrality demonstrated by these mothers reflects a certain amount of psychological distance mothers may be maintaining, whilst simultaneously supporting their child’s right to access information about their genetic origins.

The third dominant theme was that identity-release donation represents an opportunity to be embraced. This was most frequently expressed by mothers referring to the donor’s identifying information as essential information to which the child had a fundamental right. This perspective is congruent with the limited research that exists regarding identity-release donor conception parents’ motivations for disclosure. In a study of egg and sperm recipients two months after treatment, 90% of respondents stated that the child had a right to the donor’s identifying information (Isaksson et al., 2011), and the child’s right to know was cited as a main reason for subsequent disclosure amongst donor sperm recipients at follow-up seven years later (Isaksson et al., 2016).

This belief in the child's right to the donor's identifying information is also demonstrated by some mothers viewing identity-release as an opportunity, and positioning themselves as the facilitators of donor-child contact. A similar role has been reported amongst identity-release sperm donation mothers; when discussing their approach to the disclosure process, mothers represented themselves as "process managers", demonstrating the belief that a responsibility of gamete donation parenthood is to initiate the disclosure process and keep it moving forward (Isaksson et al. 2016). Parallels can be drawn between this attitude and adoption communication, wherein parents explore the meaning of adoption within their lives, facilitate discussion about adoption in an emotionally supportive environment, and potentially facilitate contact between the birth and adoptive families (Brodzinsky, 2005). This subset of mothers seems particularly comfortable with, and oriented towards, acknowledging their child's dual connection to both their own family and the donor. Whether this attitude is associated with any differences in family functioning warrants future empirical verification.

Mothers in this study also represented the donor's identity as essential identity information that their child would need to develop a full and positive self-concept. This is in line with theories of identity development that position knowledge of one's biological origins as an essential factor that contributes to identity development (Erikson, 1980) and that, as such, donor conceived people are deprived of one key component of self-knowledge (Benward, 2012). Evidence in support of this perspective comes from studies of adult donor conceived offspring who report a wish to trace their donor to feel more complete in their identity (Blyth, 2012; Van Den Akker et al., 2015). This perspective has also been found amongst sperm donation parents, with some mothers ascribing a biopsychosocial role to the donor by designating shared donor-child physical or personal characteristics as identity-relevant information (Goldberg & Scheib, 2015; Widbom et al., 2021). The present study extends this literature by demonstrating that some egg donation mothers, too, conceptualise the donor's identity as identity-relevant information for their children.

A final noteworthy finding is the representation of identity-release by some mothers as a gateway to a broader family network. A minority of mothers represented the donor as an alternative parent figure in the circumstances of their death; this was often spoken about in

context of their older age as parents. Other studies have found older parents to express concerns about their mortality and their child's subsequent wellbeing (Braverman, 2017; Chen & Landau, 2015); it is therefore possible that donor identifiability proved reassuring to this subgroup of mothers. Whilst some heterosexual-couple donor conception parents have been found to minimise the donor's significance in family life (Burr, 2009; Grace & Daniels, 2007; Kirkman, 2003), some studies have found parents of donor conceived children to represent the donor in terms of family and kinship (Goldberg & Scheib, 2015; Widbom et al., 2021; Zadeh et al., 2016). For example, 36% of single mothers in one study cited the desire to extend the family as a motivation to trace their sperm donor (Goldberg & Scheib, 2015); similarly, some mothers have been found to "redraw" the family landscape to position the donor as a father in identity-release sperm donation families (Widbom et al., 2021). However, as these findings are all based on studies of sperm donation families, they may not directly apply to egg donation samples. Moreover, the mothers that positioned the donor as a family member in Widbom et al. (2021)'s study were typically from families where the social father was absent through death or divorce, and none of the fathers framed the donor in this way. As egg donation mothers already inhabit the mother role, representations of the donor as a parental figure in the present study are all the more surprising.

More commonly, mothers represented identity-release donation as a gateway to a network of donor siblings. This was often, but not always, discussed in the context of their child being an only child, and accompanied by hopes that a network of donor siblings might provide support and comfort to their child in the future. Research from the broader parenting literature also attests to concerns amongst many parents about raising only-children, with siblings often positioned as providing children with the social skills and support necessary for optimal adjustment (Coan et al., 2018; Veenhoven & Maykel, 1989). Within the donor conception literature, studies suggest that fostering and maintaining same-donor offspring relationships is more straightforward than maintaining a donor-child relationship (Freeman et al., 2014; Scheib, McCormick et al., 2020), although it has also been found that donor conceived offspring are more likely than their parents to represent same-donor offspring as family members (Hertz & Mattes, 2011; Hertz et al., 2017). The present study adds to this literature by showing that some egg donation mothers conceptualise identity-release donation as providing their child with access to a broader family network.

5.2 Family Functioning in egg donation families in early childhood

5.2.1. Parent psychological wellbeing

The majority of mothers in both egg donation and own-gamete IVF families were psychologically well-adjusted. Mothers' levels of depression were just above population norms (Arias de la Torre et al., 2021; Smith et al., 2013). Twenty-two percent of the sample scored at or above the clinically significant cut-off for probable depression. However, no significant group differences in mothers' levels of depression were found; moreover, mothers' levels of anxiety also fell within the normal range. These findings are in line with the first phase of this study which found identifiable egg donation mothers of infants to report similar levels of anxiety and depression to their own-gamete IVF counterparts (Imrie et al., 2019a). Salevaara et al., (2018) also found identity-release egg donation mothers to report similar levels of anxiety and depression to their own-gamete IVF counterparts. The present study therefore adds to the limited literature on maternal psychological functioning when children are in early childhood, and suggests the positive maternal psychological health outcomes that are present when children are in infancy persist into early childhood.

However, egg donation mothers were found to report significantly higher levels of parenting stress than IVF mothers. These results are contrary to previous investigations of parenting stress in identity-release (Imrie et al., 2019a), and anonymous (Golombok et al., 1999; Golombok, et al., 2005; Golombok et al., 2011), egg donation mothers. It has been suggested that older parents may find it more difficult to meet the physical demands of parenting young children (Dobrzykowski & Stern, 2003; Meyer, 2020); however, in the present study, levels of maternal parenting stress were unrelated to maternal age and other demographic or treatment variables. Moreover, the group difference in maternal parenting stress remained significant when twin data were excluded.

It is possible that the elevated levels of parenting stress amongst egg donation mothers reflect an indirect effect of the significantly lower levels of relationship satisfaction and perceived social support amongst egg donation mothers. Egg donation mothers reported significantly lower levels of social support from their significant other than did IVF mothers. As the

availability of emotional and social support is known to buffer the negative effects of parenting stress (Goldberg & Smith, 2014; Parkes et al., 2015), it is possible that egg donation mothers' poorer relationship satisfaction and perceptions of their partners as less supportive may contribute to their elevated levels of parenting stress. This explanation is supported by the fact that egg donation mothers' PSI scores were significantly correlated with both their GRIMS scores and MSPSS significant other subscale scores, such that higher levels of parenting stress were associated with poorer relationship satisfaction and lower levels of perceived significant other social support.⁶⁷ Together, these findings provide only partial support for hypothesis 1a in that parenting stress was the only indicator of poorer psychological wellbeing amongst egg donation mothers.

As hypothesised, fathers' psychological wellbeing differed between groups, with egg donation fathers reporting higher levels of depression, anxiety, and parenting stress than their own-gamete IVF counterparts. Although egg donation fathers' depression and anxiety scores were higher than IVF fathers' scores, the mean scores for both groups were within the normal range and so are not indicative of psychopathology in either group. Ten fathers (all egg donation) scored above the clinically significant cut-off for anxiety; this equates to 10.5% of the total sample, which is in line with population estimates of anxiety prevalence of 7.3-11.6% (Craske & Stein, 2016). Egg donation fathers' older age relative to IVF fathers partially accounted for their elevated levels of depression, although the difference between groups remained significant after controlling for paternal age.

This finding is contrary to findings from studies of egg donation families created using anonymous donation, where egg donation fathers of young children were found to report lower levels of anxiety than IVF fathers (Golombok et al., 1999), and similar levels of anxiety and depression compared to unassisted conception fathers (Casey et al., 2013). However, the current study differs in that the sample comprises identity-release egg donation families. The first phase of this study showed a similar trend in paternal mental health, with fathers of identity-release egg donation infants reporting higher levels of depression than their IVF

⁶⁷ Correlation between PSI and GRIMS, $r = .60$, $p < .001$; correlation between PSI and MSPSS significant other, $r = -.30$, $p = .003$

counterparts (Imrie et al., 2019a). As with the present findings, Imrie et al. (2019) also found that advanced paternal age amongst egg donation fathers partially accounted for group differences in depression. Higher depressive symptoms have also been found elsewhere amongst older ART fathers when children are in early to middle childhood (Boivin et al., 2009). It appears that fathers' higher levels of psychological distress may persist from infancy into early childhood in identifiable egg donation families. This finding adds to the very limited literature regarding fathers' psychological wellbeing in egg donation families.

Of note is the finding that, when comparisons between family types were rerun omitting twin data, no group differences were found in fathers' levels of depression or anxiety. This suggests that twin parenthood, combined with the older age of egg donation fathers, contributed to the group differences in fathers' psychological wellbeing. Fathers of twins have been found to report more symptoms of depression and anxiety during infancy (Vilks et al., 2009) and up to a year post-partum (Glazebrook et al., 2001; Wenzel et al., 2015) than fathers of singletons, although little is known regarding twin fathers' psychological wellbeing when children are in early childhood. The present study shows that the association between twin parenthood and poorer paternal mental health identified in infancy by Imrie et al. (2019a) persists into early childhood.

As with the mothers in this sample, egg donation fathers were also found to experience higher levels of parenting stress relative to IVF fathers. Interestingly, egg donation parents' levels of parenting stress were significantly higher than that of their IVF counterparts, even when twin data were excluded, suggesting that elevated levels of parenting stress were not attributable to the challenges unique to parenting twins. Studies of parenting stress in families with twins born through assisted reproduction have provided mixed results, with some studies suggesting an increased risk of parenting stress amongst parents of multiples (Freeman, Golombok, Olivenness, Ramogida, & Rust, 2007; Olivenness et al., 2005). The present findings are more in line with studies that have found no group differences in parenting stress between parents of twins and parents of singletons (Ellison et al., 2005).

That egg donation mothers reported significantly poorer relationship satisfaction than IVF mothers is contrary to much of the previous literature regarding couple relationship quality

in egg donation families. Egg donation couples have generally been found to be satisfied with their romantic relationships (Sydsyö et al 2014; Golombok et al., 1999), including those in the first phase of the present study (Imrie et al., 2019a). However, it is important to view the current findings in the context of the fact that significantly more IVF mothers had separated from their partners since the first phase of the study than egg donation mothers. It is possible that egg donation mothers' poorer relationship satisfaction reflects a tendency amongst egg donation mothers to remain in unsatisfactory relationships whereas their IVF counterparts may not. Tentative evidence in support of this explanation comes from findings that, despite egg donation mothers experiencing significantly lower relationship satisfaction, rates of relationship dissolution were similar amongst egg donation and unassisted conception mothers over a seven-year period (Blake et al., 2012). Furthermore, exploration of covariates in the present study revealed that group differences in maternal relationship quality were accounted for by egg donation mothers' older age. Older parents have been found to express less warmth towards, and perceive less warmth from, each other compared to their younger counterparts (Boivin et al., 2009), and expressed warmth and affection within the couple relationship have consistently been found to decline over the relationship-course (Dush et al., 2008; van Laningham et al., 2001). It therefore appears that group differences in mothers' relationship quality in this sample can be explained by egg donation mothers' significantly older age, relative to their IVF counterparts.

The finding from the present study that egg donation mothers perceive significantly lower levels of social support than own-gamete IVF mothers is consistent with findings from the first phase of the study (Imrie et al., 2019a). Specifically, egg donation mothers in the present phase perceived significantly lower levels of social support from their partners and from their family. These findings are congruent with results from the European Study of Assisted Reproduction Families, where egg donation mothers were found to rate their partners as less reliable in parenting support than IVF mothers (Murray et al., 2006). It is possible that the difference in egg donation mothers' perceived levels of support from their partners was associated with their lower levels of relationship satisfaction, such that egg donation mothers who were dissatisfied with the partner relationship also felt a lack of support from their partner, and vice versa. This explanation is supported by the fact that mothers' GRIMS scores and MSPSS Significant Other subscale scores were significantly, negatively correlated, with

higher levels of relationship problems correlating with lower levels of perceived support. Previous studies have found that advanced maternal age is associated with less support from family members amongst mothers of infants (Bornstein et al., 2006; Imrie et al., 2019a) and amongst adoptive parents (McKay & Ross, 2010). This result therefore suggests that mothers that have used identifiable egg donation may have family members who are less able or available to provide support when their children are in early childhood. That mothers' MSPSS Family subscale scores were marginally, negatively associated with maternal age provides support for this explanation.

No group differences were found in fathers' relationship quality or perceived social support. This is consistent with much of the literature on egg donation fathers' relationship functioning and perceived social support (Golombok et al., 2004; Imrie et al., 2019a; Sydsjö et al., 2002). Almost all the fathers in both groups reported moderate to high levels of perceived social support; this was corroborated by fathers' PDI Support Need and Support Satisfaction ratings, with mean scores indicating low need for, and high satisfaction with, support amongst fathers in both groups. Mismatches between egg donation mothers' and fathers' perceived social support may reflect gendered differences in how men and women are socialised to perceive the structure and function of social support, wherein men are typically socialised to value autonomy, self-reliance, and pragmatism over emotional support (Matud et al., 2003; Olson & Shultz, 1994; Reevy & Maslach, 2001). As such, the relative role and perceived importance of social support may differ between mothers and fathers. Alternatively, mismatches between mothers' and fathers' perspectives may be explained by the fact that, as more fathers than mothers were the primary earners in this sample, with mothers consequently taking more of the parenting load, fathers were less involved in the day-to-day care of their child and may therefore have felt less need for support.

Finally, no group differences were found in either mothers' or fathers' levels of resilience, with most parents in both groups scoring in the normal range. It has broadly been acknowledged in the literature that resilience is a complex construct that has proved difficult to consistently conceptualise and measure, and that ideally, measures of resilience should reflect a multi-level perspective that encompasses not only the individual level, but also the temporal dimension of responding to adversity (Windle et al., 2011; Luthar et al., 2000;

Masten, 2008). Meyer (2015) notes that resilience is only comprehensible in its relationship with stress. It is therefore plausible that, more than five years on from treatment and its related stresses, measures of resilience may not have been the most appropriate measure with this sample at this phase.

The numerous different approaches to conceptualising resilience have subsequently given rise to questions regarding the extent to which resilience researchers are measuring resilience, or whether they are instead tapping into entirely different experiences (Windle et al., 2011). As such, research has increasingly turned to establishing the extent to which resilience overlaps with other constructs such as social support, self-efficacy, and coping (Gillespie et al., 2007; Earnovilino-Ramirez, 2007; Van der Hallen et al., 2020). For example, whilst resilience can be thought of as the adaptive capacity to recover from stressful situations in the face of adversity, coping refers to the behavioural and cognitive strategies used to handle and manage specific stressful events (Wu et al., 2020). A recent network analysis has subsequently demonstrated coping and resilience to be distinct, yet related, constructs (Van der Hallen et al., 2020). It is possible that measures of coping may prove more fruitful than measures of resilience in future studies of egg donation families, as these may provide a clearer picture of how egg donation parents cope with specific challenges throughout the family life-course, from treatment, to disclosure, to eventual donor-child contact.

5.2.2. Parent-child relationship quality

In terms of the quality of the mother-child relationship as assessed by the Parent Development Interview, few differences were found between egg donation and IVF mothers' representations of themselves as parents, their representations of their child, or their global scores of reflective functioning, coherence, and richness of perceptions. Most mothers in both groups were rated as high in warmth and joy, low in hostility and disappointment, moderate to high in competence, child focus and attachment awareness, and low to moderate in anger. Similarly, their representations of their children were rated as high in affection, moderate to high in happiness, and low in rejecting and controlling behaviour. Fathers' representations of the father-child relationship were similarly positive, with fathers in both groups rated as high in warmth and joy, very low in hostility and disappointment, and low to moderate in anger. In both groups, fathers represented their children as low in aggressive, controlling and rejecting behaviours, and moderate to high in happiness and affection.

Attachment research demonstrates the importance of parental representations of the parent-child relationship for children's attachment security (Solomon & George, 1999) and later adjustment (Madigan et al., 2007; Splaun et al., 2010). Warm, positive and accepting parenting during early childhood is also particularly important from a developmental perspective, as high-quality parent-child relationships contribute towards the formation of developmental pathways that underpin later emotional, affective, social and cognitive processes (Bornstein & Leventhal, 2015; Osher et al., 2020). Taken together, these findings are indicative of high-quality parent-child relationships, and should prove reassuring to egg donation parents, particularly those concerned about forming a secure attachment relationship with a non-genetically related child.

Nevertheless, as hypothesised, where group differences were found, these reflected less optimal parent-child relationships in the egg donation than the IVF families. Egg donation mothers were rated as significantly more angry than IVF mothers, although it must be noted that mean scores reflected moderate levels of anger in both groups. Egg donation mothers also viewed their children as more aggressive and more controlling than did IVF mothers.

Whilst group differences in mothers' representations of their child as aggressive became non-significant after twin data were omitted, group differences in child controlling behaviour and maternal anger remained significant.

That egg donation mothers represented their children as more controlling than IVF mothers is contrary to findings from the first phase of the current study (Imrie et al., 2019b). Mothers' representations of the child as controlling at the current phase were unrelated to any other demographic or treatment variables. It is possible that, as egg donation children were more likely to be only-children than their IVF counterparts, and due to dominant cultural stereotypes of only-children as selfish and spoiled (Blake, 1981; Falbo & Polit, 1986; Mancillas, 2006), egg donation mothers perceived their children as more dominating of their time and attention.

That egg donation mothers were found to be higher in anger runs counter to previous findings with younger samples; the first phase of the present study found low representations of maternal anger in identity-release egg donation mothers (Imrie et al., 2019b), as did a study of egg donation families with anonymous donors when the children were aged two (Golombok et al., 2005). It has been suggested that the potential for future donor-child contact implicit in identity-release egg donation may pose a unique threat to mothers who have conceived via egg donation, and that the anticipation of donor-child contact may put pressure on the mother-child relationship (Imrie et al., 2019b; Lampic et al., 2014). The qualitative analyses undertaken in the present study confirmed the presence of this threat to a certain degree, with a significant proportion of mothers perceiving at least some threat from the possibility of future donor-child contact. When analyses were conducted to examine whether this perceived threat influenced family functioning, higher levels of perceived donor threat were found to be associated with mothers' representations of themselves as more angry and as more hostile towards their child, and with children's BPI representations of themselves as less competent.

These findings are particularly noteworthy given the group differences that were found in mothers' angry self-representations, and given that maternal angry self-representations significantly predicted child externalising problems in the egg donation group. Regression

analyses confirmed the association between maternal anger and donor threat, such that donor threat was a significant, independent predictor of variation in maternal self-perceived anger. In addition to the number of children at home and maternal representations of the child as aggressive, donor threat explained a further 14% of variance in maternal anger. This study therefore provides tentative evidence for an association between the threat that identity-release donation poses to some mothers and family processes implicated in child adjustment outcomes.

It is important to note that, due to the moderate sample size, the findings of these analyses must be interpreted with caution. The problem of model overfitting can occur when the model includes more predictor variables than the sample warrants. This can lead to the artificial inflation of a regression model's estimated R^2 (Austin & Steyerberg, 2015; Prescott, 2018). A general rule of thumb is to include ten observation points for every predictor variable included in the model (Peduzzi et al., 1996; Prescott, 2018), but with some studies suggesting that the accurate estimation of regression coefficients is possible with a ratio of observation points to predictor variables as low as 2:1 (Austin & Steyerberg, 2015)⁶⁸. As such, although small, the present sample size was considered to be adequate for the accurate estimation of regression coefficients. Nevertheless, it will be necessary to establish validity with a larger, separate sample before drawing any firm conclusions. Despite these caveats, these results provide an insight into the unique challenges of mothering a non-genetically related child with an identifiable egg donor.

In line with hypothesis 2b, group differences in fathers' representations of the father-child relationship also reflected relatively poorer functioning in the egg donation group. Comparisons of the Angry Father and Positive Father factor scores also revealed that egg donation fathers were rated as perceiving themselves as significantly more angry and less positive than their IVF counterparts. Group differences in paternal anger appeared to be attributable to twin parenthood, as this difference became non-significant when analysed without twin data. As depressive and anxious symptoms are known risk factors associated

⁶⁸ Austin & Steyerberg (2015) recommend that, in small sample settings, the adjusted R^2 statistic may be more robust than the standard R^2 . Doing so would mean that the model including identity-release threat would explain 38%, rather than 44% of the variance in Angry Mother factor scores.

with the quality of parental representations (Rosenblum et al., 2002; Schechter et al., 2005), it is possible that the egg donation fathers' poorer psychological health is linked to their less positive representations of themselves as parents. That fathers' levels of anxiety were found to correlate negatively with Positive Father factor scores, and positively with Negative Father factor score provides some support for this explanation.⁶⁹

Although poorer parent-child interaction quality was expected within egg donation families, this hypothesis was not supported, with no differences found between groups for either mother-child or father-child dyads. The majority of mothers and fathers demonstrated adaptive levels of sensitivity, structuring, non-hostility and non-intrusiveness, and the majority of children were involving of, and responsive to, their parents. It is interesting to note that egg donation parents' more negative representations of the parent-child relationship were not evident in the observational measure. It is possible that, as the observational tasks were relatively short in duration, egg donation parents may have been responding in a socially desirable manner to make their interactions appear more optimal than usual. However, a benefit of the Emotional Availability coding system is that as the dimensions are dyadic constructs, the parent cannot "look good" without the child (Biringen, 2008). If the parent were to attempt to demonstrate more optimal behaviour than usual, this would be registered by the child and a mismatch would subsequently be evident in the child's behaviour. It is therefore difficult for individual members of the dyad to "fake good" without the coder picking up on this incongruity (Biringen, 2008; Biringen et al., 2014).

It is also possible that, as older parents who have had to use ART to conceive, egg donation parents may set themselves particularly high standards, or lack confidence, in their parenting ability, and their representations of themselves may therefore be more negative than the reality of their behaviour. It has been suggested that parents who have used IVF may feel that, due to the difficulty experienced in trying to conceive, they have no right to feel anger and frustration in the parenting role; as such, they may struggle to assimilate the negative aspects of parenting into their experience and may therefore tend to present themselves with

⁶⁹ Correlation between paternal TAI and Positive Fathers factor scores, $r = -.22$, $p = .05$; correlation between paternal TAI and Negative Father factor scores, $r = .23$, $p = .05$.

an idealised picture of parenting (McMahon, Gibson, Leslie, Cohen, & Tennant, 2003). Adoptive parents have also been reported to feel pressure to become “*perfect parents*” after their long wait to have children (McKay & Ross, 2010). Further, egg donation mothers of infants have been found to initially lack confidence in the parenting role (Kirkman, 2008; Imrie et al., 2019b). Although it is not known how this finding may translate to fathers of egg donation children in early childhood, it is possible that the combination of twin parenthood and the longer wait to become fathers may influence the extent to which they represent themselves as competent, positive parents. Ultimately, despite these small differences in egg donation parents’ representations of themselves as parents, the findings from this phase of the study indicate positive parent-child relationships.

The present study is the first to measure children’s perspectives of family relationships with an identity-release egg donation sample. Children’s responses on the Berkeley Puppet Interview suggested few differences between egg donation and IVF children’s perspectives on the quality of their relationships with their parents, with children in both family types rating their mothers and fathers as high in warmth and enjoyment, and low in anger and hostility. The egg donation children represented their mothers as higher in warmth and enjoyment than did the IVF children; however, a non-parametric test failed to replicate this finding. It is possible that this significant difference was an artefact of the data being significantly skewed and kurtotic. Inspection of group means showed that the ratings for maternal warmth and enjoyment were moderate to high in both groups, with slightly higher means in the egg donation group. This finding is consistent with the only other study to examine children’s perspectives of the parent-child relationship quality in egg donation families in middle childhood (Blake et al., 2014). Whereas children in unassisted conception families reported a decline in shared activities with their mother over time, egg donation children reported consistently high levels of shared interests and activities with their mother. It is possible that the particularly long wait to become a parent means that egg donation mothers are particularly dedicated to parenthood (Golombok et al., 2006), which may be reflected in egg donation children’s perceptions of their mothers especially warm parents.

5.2.3. Child adjustment

The vast majority of children (95.5% of the total sample) had parent-rated SDQ scores that fell within the normal range. Ratings of the children's psychological adjustment by a child psychiatrist blind to family type indicated that a small proportion (10.7%) were classified as having a psychological problem, with no group differences in the proportion of children classified as such (5 IVF children, 8 egg donation children). This proportion is just below population norms (NHS England, 2018). These findings confirm that egg donation children are broadly well-adjusted in early childhood. These findings are consistent with results from studies of anonymous egg donation families that have found children to be well-adjusted, at comparable levels to unassisted conception (Golombok et al., 2006; Golombok et al., 2011; Golombok et al., 2013) and IVF (Golombok et al., 1999, Murray et al., 2006) children.

However, the present study's final hypothesis was supported in that egg donation children were reported as displaying significantly higher levels of externalising problems than IVF children. This finding was corroborated by teachers' reports, where group comparisons also found egg donation children to demonstrate significantly higher levels of externalising problem behaviours. Group differences in child externalising behaviour remained when analyses were rerun without twin data, suggesting that egg donation children's elevated levels of externalising problems were not attributable to the presence of twins within the sample. This is perhaps unsurprising given findings that suggest more optimal psychosocial adjustment amongst twins compared to singletons (Anderson et al., 2016; Anderson et al., 2014; Pulkkinen et al., 2003; Robbers et al., 2010). That children were rated as higher in externalising problems is consistent with one other UK-based study of egg donation families, where egg donation children aged between 5-9 years were rated by their fathers as significantly higher in conduct problems compared to sperm donation and IVF children (Shelton et al., 2009). However, it must be noted that, as in the Shelton et al. (2009) study, the levels of externalising problems reported in this sample are in line with population norms (Meltzer et al., 2003; NHS England, 2018) and so should not be a cause for concern.

An interesting finding of this study was that family processes, rather than family type, were predictive of children's levels of externalising problems. Specifically, paternal parenting stress

and maternal angry self-representations, but not family type, independently and significantly predicted variation in SDQ externalising scores. This finding was confirmed by regression analyses that explored within-group predictors of child externalising scores within the egg donation group. These analyses found that paternal parenting stress and maternal angry self-representations, but also maternal representations of the child as happy, each significantly predicted child externalising problem scores, and together explained 56% of the variance in SDQ externalising scores.

The relationship between parenting stress and child externalising problems is well established, with studies demonstrating a consistent association between parenting stress and child behaviour problems over time (Bayer et al., 2008; Benzies et al., 2004; Stone et al., 2015). Most research focuses on maternal parenting stress in relation to child externalising problems; the present study therefore contributes to the literature by demonstrating that this association may also be found between paternal parenting stress and child externalising problems. It must be noted that, as these data are cross-sectional, no inferences can be made about the causal role of parenting stress on child behaviour problems. Although parenting stress levels during the preschool years have been found to predict child problem behaviours at age five (Crnic et al., 2005), it is also plausible to suggest that higher levels of child behaviour problems may lead to elevated levels of parenting stress. Indeed, some findings point to the co-evolution of parenting stress and child behaviour problems over time (Stone et al., 2015), with evidence emerging of a possible transactional model whereby parenting stress and child behaviour have a dynamic and reciprocal effect upon one another throughout the family life-course (Mackler et al., 2015; Sameroff & Mackenzie, 2021).

The present findings also add to the very limited literature that suggests that maternal representations of the attachment relationship can have associations with child outcomes. Egg donation mothers' higher levels of self-perceived anger, and perceptions of their children as less happy, were predictive of increased SDQ externalising scores. The only other study to have examined maternal attachment representations and child outcomes found that infants of mothers with unbalanced representations of their child gave less positive emotion regulation responses during the Still Face procedure, compared to infants of mothers with balanced representations (Rosenblum et al., 2002). Madigan et al. (2007) also found that

mothers' unresolved attachment representations of their relationship with their own parents⁷⁰ mediated the association between mothers' problematic parenting behaviours at twelve months and child behaviour problems at two years. This is particularly interesting, given that both egg donation mothers and fathers in the present study were found to be significantly less coherent in their narratives than IVF mothers and fathers. Again, caution must be applied as no inferences can be made about the direction of the relationship between maternal representations and child externalising problems in this sample; however, these findings provide tentative evidence for the influence of maternal attachment representations on child adjustment and warrants further, longitudinal investigation.

⁷⁰ Conceptually related to disorganised attachment, and characterised by odd or inexplicable lapses in their narratives

5.3 Strengths and limitations

One principal strength of the current study is the sample size, which is the largest study to date of parent-child relationships and child adjustment in egg donation families with children in early childhood. The closest comparative study is that of Golombok et al. (2011), which included a sample of 32 families with 7-year-old children born through anonymous egg donation. Egg donation families may be considered a hard-to-reach sample, due to the sensitive nature of the topic and the perceived stigma around infertility and non-genetic parenthood (Daniluk & Koert, 2012; Nachtigall et al., 1997; Parry, 2005a). Thus, the 72 egg donation families who participated in this study can be considered to constitute a relatively large sample. A benefit of this sample size is that it was adequate to detect group differences of medium to large effect sizes in the quantitative analysis, although it is unlikely to have been adequate to detect any small group differences⁷¹. However, the statistical power for group comparisons of fathers' variables was lower as fewer fathers than mothers were available to participate, particularly in the IVF group.

A further strength of this study was the high retention rate from phase one to phase two, particularly amongst the egg donation group (85% egg donation, 77% IVF). Participation at this phase was in line with other studies of gamete donation families (Imrie et al., 2019a; Golombok et al., 1999; Golombok et al., 2004; Golombok et al., 2016). The relatively low attrition rate minimises the risk of selection bias. However, 77% of the egg donation families who were uncontactable, or declined to participate, in this phase had either planned not to, or were unsure whether to, tell their child about their method of conception at phase one. Consequently, the present sample may over-represent participants who favour disclosure and who feel positively about donor-child contact than the full original sample may have been. Previous studies of gamete donor families have found that sperm donation parents who declined to take part did so to keep the nature of the child's conception a secret, and to

⁷¹ Cohen (1992) states that a sample size of 26 is required to detect a large sample difference, a sample size of 64 is required to detect a medium difference, and a sample size of 393 is required to detect a small difference between two independent sample means at $\alpha = .05$.

protect the parents from reminders of their infertility (Cook et al., 1995). This may also be the case with the non-participants in the current study.

This said, the current sample did include parents who planned not to tell their child about how they were conceived, or who were undecided. Moreover, the qualitative analyses revealed a considerable amount of perceived threat from, and ambivalence about, the prospect of donor-child contact, which suggests that the entire sample did not comprise parents with solely favourable attitudes towards disclosure and donor-child contact. The fact that the samples were originally recruited via clinics rather than online support groups or voluntary online registers further limits the chances of this sample being a self-selecting group that attributes particular significance to the donor and to genetic relatedness (Jadva et al., 2011).

This study utilised a multiple-method, multi-informant design. Studies utilising multiple methodologies for data collection have been acknowledged as particularly sound (O'Connor, 2002), and the use of observational measures in tandem with questionnaire measures have been shown to minimise socially desirable responding (Golombok et al., 2011). As some studies in developmental psychology have tended to rely on maternal reports of paternal psychological health and family functioning (Caspi et al., 2001; Phares et al., 2005), a strength of the present study is its use of data reported by both mothers and fathers. However, fewer fathers than mothers participated at this phase, thereby constraining the sample size for some analyses. Low paternal participation rates are a well-documented issue in developmental and family psychology research, with systematic reviews consistently demonstrating much higher recruitment and retention rates amongst mothers than fathers (Davidson et al., 2016; Phares et al., 2005). In the present study, it is possible that, as fathers typically shared a genetic link with their child, fathers felt that they were of less interest as a subject than their partners and children, and so were less motivated to take part. Moreover, as mothers tended to be the first point of contact during initial and subsequent recruitment, it is possible that fathers in this sample felt that the study was intended primarily for their partners and children, rather than themselves. Future studies may therefore benefit from attempting to collect contact details from both parents at the initial recruitment stage, and to conduct all subsequent communication with both parents where possible. Previous

research has also found fathers to be less engaged by the language typically used in recruitment materials, and that a stratified recruitment approach, wherein fathers are targeted using ‘father-specific’ language, may be necessary to increase paternal participation rates (Leach et al., 2018; Bayley et al., 2009; Davidson et al., 2017).

Although fewer fathers than mothers participated, recruitment of both mothers and fathers allowed for a deeper investigation and understanding of these families as dynamic systems (Cox & Paley, 2003; McHale, 2007). Future studies may benefit from including not only parents and children, but other members of the family system who are known to have an important effect on family functioning such as siblings and grandparents (Dunn & Plomin, 1991; Mostafa et al., 2018; Prendeville & Kinsella, 2019; Silverstein et al., 2003).

Data in this study were collected separately from mothers, fathers, and children, further reducing the likelihood of social desirability bias. An additional methodological strength of the study is that measures of child problem behaviour were gathered from children’s teachers in addition to both parents. The response rate from teachers was good amongst both groups (77.8% IVF, 80% egg donation). Teacher-reported SDQ scores significantly correlated with those of parents. Furthermore, group differences were found between both parent-rated and teacher-rated externalising SDQ scores, which adds weight to the finding.

A further strength of this study is that data on children’s psychological adjustment and the quality of the parent-child relationship were also gathered from the children. This is a particularly valuable addition to the literature, as children have been found to be reliable informants regarding the family environment (Ablow et al., 2009) and their own adjustment (Stone et al., 2014). Very few studies of gamete donation families have collected data from children regarding the family environment, and those that have done so indicate that children are reliable informants (Golombok et al., 2017).

The present study is the first to provide an investigation of egg donation mothers’ thoughts and feelings about their use of identifiable donors, and to explore whether these feelings are associated with family functioning. It is also the first to provide information about mothers’ levels of understanding about identity-release donation. What little research does exist

regarding parents' views about identity-release donation tends to focus on sperm donation samples (Isaksson et al., 2016; Widbom et al., 2021; Freeman et al., 2016), and this is also true of studies of family functioning in identity-release gamete donation families. To date, there have been no investigations of family functioning in identity-release egg donation samples in the UK when children are in early childhood, despite the fact that it is currently the only treatment option for prospective parents not wishing to use a known donor. As recent years have seen an increase in the number of IVF cycles using donor eggs (HFEA 2020), it is particularly important to examine family functioning in egg donation families throughout the family life-course.

As the present sample consists primarily of White, educated couples, the findings will have limited generalisability to populations of different ethnicities or socioeconomic statuses. However, as egg donation treatment is costly and funding for treatment is limited (HFEA, 2020), IVF and egg donation treatments are less accessible to patients of a lower socioeconomic status. It is therefore plausible to suggest that, although homogenous, the current sample is representative of those who can currently access ARTs in this country (Rubin et al., 2015). Nonetheless, future research would benefit from the recruitment of a larger, more diverse sample in order to improve generalisability.

A final strength of the present study is its use of a mixed-methods approach combining qualitative and quantitative methodologies. Although traditionally viewed as opposing research paradigms, recent work has demonstrated that qualitative and quantitative methodologies can complement each other and add depth of understanding to investigations of parenting (Elliott et al., 2018), counselling (Hanson et al., 2005), and educational psychology (Powell et al., 2008). The present study combined the use of qualitative and quantitative methods to gain a more holistic understanding of mothers' feelings about identity-release donation and how they relate to family functioning.

5.4 Implications for policy and practice

Despite identity-release egg donation being the only available alternative to using a known donor in the UK since 2005, nothing was known about family functioning and child outcomes in families created this way when the children reached early childhood. Beyond the UK, identifiable gamete donation programs are becoming increasingly popular (Skoog-Svanberg et al., 2020; Thaldar, 2020). As such, the present study is of relevance to both UK-based and international clinics currently offering, or considering, identifiable egg donation treatment. The present study adds to the limited body of research pertaining to UK-based identity-release gamete donation families (Golombok et al., 2021; Imrie et al., 2019a; Imrie et al., 2019b; Imrie et al., 2020).

Where differences were found between groups, particularly with regards to paternal psychological wellbeing, findings were typically associated with parental age or twin parenthood. Clinics may wish to consider incorporating advice about how to recognise symptoms of, and access support for, mental health problems into their pre- or post-treatment care plans. This may be particularly helpful for prospective fathers, as men are known to be less likely to access mental health services than women (Galdas et al., 2005; Vogel et al., 2014). Clinics and prospective parents should also consider the importance of establishing social support networks prior to birth, as the current findings suggest that perceived lack of social support amongst egg donation mothers can persist into early childhood.

Of note is that, although significant differences were found between egg donation and IVF children's levels of externalising problems, the vast majority of children in both groups were found to be functioning well, with few symptoms of behavioural or emotional problems. Further, the finding that family processes, rather than family type, are predictive of child externalising problems should reassure those concerned about the potentially negative impact of the absence of a genetic link between mother and child on children's adjustment.

The findings regarding parents' levels of understanding about identity-release donation is worthy of clinics' attention. A significant minority of mothers and fathers had an unclear or

incorrect understanding about the kind of donation they had used to conceive. Current HFEA guidelines state that UK clinics must offer patients one session of counselling about the implications of their treatment type (HFEA, 2019). The guidelines also state that clinics should inform parents of the fact that their child will be able receive non-identifying and identifying information about the donor, and they recommend that this be shared with the child at an early age. However, the findings of this study suggest that there is still a considerable lack of awareness about accessing information about the donor and about the possibility of donor-child contact in the future. This is consistent with findings from studies in which additional information about the donor has been represented by some mothers as an intrusion into family life (Imrie et al., 2020; Zadeh et al., 2016). Rather than simply encouraging parents to access additional information about the donor, clinics may better serve their patients by also acknowledging and normalising the possibility that parents may feel ambivalence towards the availability of donor information.

The qualitative component of the present study revealed that mothers' feelings about identity-release egg donation are complex, and that mothers use a range of strategies to cope with these feelings in day-to-day life. A significant proportion of mothers were still managing the psychological threat of the donor five years after the birth of their child. This suggests that, for some mothers, the challenges of parenting a non-genetically related child with an identifiable donor may not be limited to the pre- and post-natal periods, and that feelings of threat, opportunity, and ambivalence may develop and subside over the family life-course (Widbom et al., 2021). This is particularly pertinent given the findings in the present study linking perceived threat from identity-release donation to more negative maternal representations of the mother-child relationship, and to children's self-concept. These findings should indicate to fertility professionals that patients seeking treatment with donor gametes in the UK may benefit from an extended period of counselling after birth and throughout the family life-course.

Regression analyses in the present study indicated that egg donation mothers' perceptions of identifiable egg donation, rather than their use of egg donation per se, contributed to greater challenges within this group. This is a critical distinction, as parents' perceptions may be open to intervention, thereby providing an opportunity to address and potentially minimise these

challenges. Further therapeutic support such as additional 1:1 counselling sessions, whether post-conception or post-birth, could provide parents with a safe space within which to explore their feelings about, and issues surrounding, their use of identifiable egg donation, in a safe and structured way. Group workshops may similarly prove an effective means for disseminating information to parents of donor conceived children, including additional details about donation type that parents may have been unable or unwilling to engage with at the treatment stage. Workshops may also provide parents that have used identity-release donation with the opportunity to meet with other donor conception parents, thereby facilitating discourse in which their shared experiences, both positive and negative, may be expressed, normalised and legitimised.

As no NHS funded gamete donation treatment is currently available, all treatment is consequently paid for by the intended parents. The question therefore arises as to how these additional forms of impact work are to be funded, in order to reduce any additional cost for recipient parents and thereby maximise uptake. The Nuffield Council on Bioethics report (2013) states that, as clinics are causally and intentionally involved in creating a child that otherwise would not exist, it is part of their professional responsibility to consider the welfare of children resulting from donor gamete treatment. The report therefore suggests that, in addition to being obliged to offer a counselling session at the pre-treatment phase, clinics should routinely offer parents at least one additional support session that could be taken up either post-conception or post-birth, “the cost of which should be included in the overall treatment fee” (Nuffield Council on Bioethics, 2013: 121). Past events, such as workshops provided by non-profit organisations such as the Donor Conception Network have also received public funding, thereby subsidising running costs (House of Lords and House of Commons Joint Committee on Human Rights, 2008). Alternatively, the creation of a podcast series designed to discuss issues surrounding the use of identity-release donor gametes may be a particularly effective method of dissemination, as podcasts have the potential to be low-cost, far-reaching, and suited to those less willing or able to actively participate in in-person workshops. For example, the Victorian Assisted Reproductive Treatment Authority (VARTA) has produced a freely available series of ‘personal stories’ podcasts, in which a range of topics are discussed from the perspectives of both healthcare professionals and individuals receiving ART treatment (VARTA, 2021).

A minority of mothers in the present study had begun discussing the details of identity release with their children, and many others intended on doing so before their child turned eighteen. Despite this, there is a dearth of materials available specifically designed for parents wishing to discuss their use of identifiable egg donation with their young children. For example, the Donor Conception Network, a not-for-profit organisation providing support and information to donor conception families, has an impressive repository of books designed to help parents discuss their use of donor conception with their children, friends, and family. However, despite offering over 40 books aimed at children conceived via various ARTs (Donor Conception Network, 2021), none is specifically aimed at parents who have used identity-release donation. Not only would the creation of such a resource help parents with the practicalities of discussing their use of identifiable donation in an age-appropriate manner, but it would also have the effect of increasing the visibility of identity-release donation as a donation type. Seeing themselves represented amongst these sorts of materials may help normalise identity-release donation for parents that have used this kind of donation, promoting open communication around issues surrounding open identity donation.

Concluding remarks

Although some differences were found between egg donation and own-gamete IVF families, it is important to recognise that the vast majority of families in the present study were functioning well, with scores on all measures of family functioning falling within the normal range. Identifiable egg donation remains a viable and valuable option for those considering it as a route to parenthood. The present study is the first, however, to provide evidence of associations between egg donation mothers' negative perceptions of the prospect of donor-child contact and poorer family functioning outcomes. It will be important for future research to explore these associations, and to continue to investigate parents' perspectives regarding donor identifiability. Examining the mechanisms underlying these associations, alongside developing a nuanced understanding of parents' experiences of using an identifiable donor, will ultimately enable policy makers, clinics, and regulatory bodies to better support families created this way.

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Appendix 1: Study information sheet



CENTRE FOR FAMILY RESEARCH
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The Parent and Baby Study: Follow-up

Thank you for your previous participation in our study of families who have used fertility treatment to start a family. We would like to tell you more about this second phase of the study and what taking part involves.

Why are we doing the study?

This study will act as a follow-up to the study you were involved in previously which looked at child development and parent-child relationships in families who had used fertility treatment to conceive. We are asking families who took part in the first phase of the study to also take part in the current phase in order to see how families are getting along as the children start school. We hope to increase understanding of the roles that parents play in children's development and to broaden public understanding of families' experiences of fertility treatment. We also hope that this study will provide further data that will inform legislators and policy makers around the world in relation to child development, parent-child relationships and fertility treatment.

What does taking part involve?

As part of the study you will be interviewed and asked to fill out questionnaires about your child and your experiences of being a parent. The interview will last approximately 1-1.5 hours and the questionnaires will take about 15-20 minutes to complete. We would also like to ask you and your child to complete a short play task together for 10 minutes which, with your agreement, would be video-recorded.

With your agreement, we would also like to ask your child a few questions about how they find school and about their friends and family, and to invite them to take part in some activities that will focus on the same themes. Together, the short interview and tasks should take your child about half an hour to complete. You are under no obligation to agree to your child taking part in the study, and we will also make it clear to your child that they do not have to take part if they do not want to and may stop the interview at any time, without giving a reason. If you do not wish your child to participate in the study then you may take part without their involvement.

If you live with a partner we would also like to interview them, ask them to complete some questionnaires, and carry out a short play task with your child. This could take place on the same day as your interview or on a separate visit. **However, it is not necessary for your partner to be interviewed in order for you to take part in the study.**

Finally we would like to ask your child's teacher to complete a questionnaire about your child's behaviour at school. This is not necessary in order for you or your child to take part in the study. We

shall not contact your child's teacher unless you give the interviewer the teacher's contact details and permission to send the questionnaire. Teachers will be told that their pupil is participating in a study looking at family life and child development. No further details about the type of families being studied will be given.

The interview can be carried out at a time and place of your choice, and the whole visit will last approximately 2½-3 hours. You are under no obligation to take part. If you wish to withdraw from the study, or if there are any questions that you do not wish to answer, you just need to let the interviewer know.

Will my taking part in this study be kept confidential?

Anything that you, your partner, or your child say during this research will be kept strictly confidential. This means that:

- Personal details of your family will only be known to the research team and the person who interviews you. Personal details, audio and video recordings will be stored in a locked file or a secure computer with access only by the immediate research team.
- Information entered onto the computer for data analysis will not include names/addresses or any other identifying information.
- Information you give us will be primarily used for statistical purposes, and the results will be reported in terms of cases and percentages. If any individual data are presented, the data will be totally anonymous, without any means of identifying the individuals involved.
- When the results of the study are published, you will not be identified as having taken part in the study. Neither will information which might make you identifiable be published.
- The interview recordings may be transcribed for data analysis and some of your responses may be reported in our publications. Your identity will not be disclosed.
- Confidentiality will be broken **only** in the rare circumstance that it was disclosed during the interview that your child was being harmed. In all other cases the privacy, anonymity and confidentiality of you and your family will remain intact.

What will happen to the findings of the research?

The findings will be written up for publication in academic journals and presented at academic conferences and to other specialist groups of professionals involved in working with families and with assisted reproduction. To increase public awareness and understanding we intend to make findings widely available through the media. A report of the study's findings will also be available to participants of the study.

How will my personal data be used?

We will be using any personal information you give us in order to undertake this study and the University of Cambridge will act as the data controller for this purpose. The legal basis for using your personal information is to carry out a task (i.e. academic research) in the public interest. We will keep identifiable information about you for as long as necessary for the study. Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

For further general information about the University of Cambridge's use of your personal data as a participant in a research study, please see <https://www.information-compliance.admin.cam.ac.uk/data-protection/research-participant-data>

Who is doing this research?

The study is headed by Professor Susan Golombok, Director of the Centre for Family Research at the University of Cambridge. Susan Golombok has thirty years' experience of researching parenting and family life in different types of families. The interviews will be carried out by Dr Vasanti Jadva, Senior Research Associate, Dr Susan Imrie, Research Associate, and by Research Assistants, Joanna Lysons and Tatiana Vilsbol.

Who should I contact if I want further information?

If you have any questions about the study please contact Dr Susan Imrie (email: REDACTED FOR CONFIDENTIALITY REASONS, phone: REDACTED FOR CONFIDENTIALITY REASONS). If there is any aspect of the study that concerns you, you may speak to the University of Cambridge Ethics Committee (phone: 01223 766894).

Please keep this information sheet in case you want to contact us at a later time or if there is anything you want to check. *This project has been reviewed by the Psychology Research Ethics Committee of the University of Cambridge and has received ethical approval.*

Appendix 2: Consent form for parents and parental consent for child participation



CENTRE FOR FAMILY RESEARCH
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ID NUMBER:

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| | Delete as
Necessary |
| 1. Have you read the information sheet? | YES/NO |
| 2. Have you had an opportunity to ask questions and discuss this study? | YES/NO |
| 3. Have you received satisfactory answers to your questions? | YES/NO |
| 4. Do you understand that you are free to withdraw from this study at any stage without explanation? | YES/NO |
| 5. Do you understand that all data will be identified only by a code, with personal details kept in a locked file or secure computer with access only by the research team? | YES/NO |
| 6. Do you understand that the study results will be presented at conferences and written up in journals? | YES/NO |
| 7. Do you agree to allow the interview to be recorded? | YES/NO |
| 8. Would you like to receive a summary report of the key findings of the study once the research is complete? | YES/NO |
| 9. May we contact you in the future regarding the research? This would not commit you to take part in further studies. | YES/NO |
| 10. If we have difficulty contacting you in the future using the personal details you have provided to us, may we try to trace you online (e.g. using google, 192, Facebook)? | YES/NO |

The project has received ethical approval from the Psychology Research Ethics Committee of the University of Cambridge.

I agree to participate in the study.

SignedDate.....

Name in Block Letters.....

If you have any questions about the study please contact Dr Susan Imrie (email: REDACTED FOR CONFIDENTIALITY REASONS, phone: REDACTED FOR CONFIDENTIALITY REASONS).



**UNIVERSITY OF
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ID NUMBER:

Delete as
Necessary

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 1. Have you read the information sheet? | YES/NO |
| 2. Do you agree to allow your child to take part in this study? | YES/NO |
| 3. Do you agree to allow the games with your child to be video-recorded?
The recording will not be used or made available for any purposes
other than the research project. | YES/NO |

Signed.....

Name in Block Letters.....

Date.....

Appendix 3: Interview questions

1. Thoughts and feelings about identity-release donation

So the first time we came to see you we asked you some questions about your experiences of fertility treatment when you conceived (child).

So just to check, when you were having treatment to conceive (child), your egg donor was someone the clinic found for you?

Could you tell me a bit about what information you have about the donor?

If parent has requested goodwill message/pen portrait:

- Can you tell me what made you decide to request the additional information? (Why now?)

FOR ALL: Are you happy with the amount of information you have about your donor just now?

Is there anything else would you like to know?

Is there anything else you or (child) will be able to find out in the future?

The last time you took part in the study we asked you whether you thought you'd ever like to know the donor's identity. How do you feel about this now? (do you think you'd like to know the donor's identity?)

- PROBE: Why? Why not
- **IF YES:** Do you think you'd like to have contact with the donor in the future?

Some people tend to think about the donor quite a lot and some people never think about the donor at all, how often do you find you think about (donor) now?

Do you have any concerns about the way in which (child) was conceived?

IF YES: Could you tell me a bit about what's concerning you?

More generally, how often do you think about how you made your family?

Are there particular situations/events that tend to prompt thoughts about it?

2. Couple communication

Do you and [partner] still discuss your experiences of fertility treatment?

- and egg donation?

How often does the topic come up?

- Probe: What kinds of situations tend to prompt these discussions?

Is there anything in particular that you discuss?

How do you feel when you and [partner] talk about this?

3. Telling child about method of conception

When we first met, you mentioned that you (*planned to/had decided not to/were uncertain whether to*) tell [child] about the way s/he was conceived...

What do you think now?

Have you changed your mind at all since we last saw you?

IF CHANGED MIND: What made you change your mind?

FOR ALL: How comfortable do you feel with your decision at the moment?

IF PLANS TO TELL:

Why have you decided to tell (child) about how you made your family?

What age do you think you will tell her/him?

Is there anything that you've done, or thought about doing, to prepare? (e.g. books, forums, DCN)

What kind of discussions, if any, have you and (partner) had about how you'll tell child/the language that you might use?

Do you tend to agree about this?

How do you think you might explain it to (child)?

- What if anything do you plan to say about the donor?

IF KNOWN DONOR:

Do you plan to tell (child) who the donor is?

IF UNDERSTANDS ID-RELEASE:

Do you plan to tell child that they might be able to find out the donor's identity when they're older?

How do you feel about (child) potentially knowing the donor's identity when they're older?

Has this changed since the last time we saw you?

- **IF YES:** Could you say a bit more about how your feelings have changed?

IF ALREADY TOLD:

Why did you decide to tell (child) about how you made your family?

Can you tell me about what you did, if anything, to prepare for telling (child)? (e.g. books, forums, DCN)

What kind of discussions, if any, did you and (partner) have about how you would tell (child)/the language that you might use?

Did you tend to agree about this?

Can you tell me a bit about the first time you told (child) about how you made your family?

PROBES:

- How old was (child)?
- What did you say to (child)?
- Who did the telling?
- What was (child's) reaction?
- How did you feel?

What kind of conversations have you had since then (about how you made your family)?

- Who usually brings up the topic?
-
- Who is usually involved in these conversations?
- What are (child's) questions?

More generally, how do you feel when you talk to (child) about how you made your family?

- **Probe:** why is that? Has this changed over time?

What, if anything, have you told (child) about the donor?

Does (child) show any interest in the donor?

- **IF YES:** How does this make you feel?

How much do you think (child) understands about how they were conceived?

IF CHILD UNDERSTANDS: How do you think (child) feels about it?

Is there anything else you plan to add to this story when they're older?

- **Prompt:** Is there anything else you plan to tell (child) specifically about the donor?

IF KNOWN DONOR:

Does child know who the donor is?

- **IF NO:** Do you plan to tell them the identity of the donor?

IF UNDERSTANDS ID-RELEASE:

Have you told (child) that they might be able to find out the donor's identity when they're older?

IF NO: Do you plan to tell them?

How do you feel about (child) potentially knowing the donor's identity when they're older?

Has this changed since the last time we saw you?

- **IF YES:** Could you say a bit more about how your feelings have changed?

Appendix 4: Information and consent forms for teacher participation

**CONSENT FORM FOR
TEACHER CONTACT**



**UNIVERSITY OF
CAMBRIDGE**

CENTRE FOR FAMILY RESEARCH
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Office: 01223 334510
Fax: 01223 330574
Email: cfr-admin@lists.cam.ac.uk

Participant's ID NUMBER:

1. May we contact your child's teacher to request that they complete a questionnaire about your child's behaviour in school?
(Note that your own participation in the study is not affected by whether or not you agree to your child's teacher being contacted)

Delete as
Necessary
YES/NO

SignedDate.....

Name in Block Letters.....

TEACHER CONTACT DETAILS

ID:.....

Teacher name:

Teacher email:

School name:

School address:

.....

.....



UNIVERSITY OF
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**INFORMATION SHEET FOR
TEACHERS**

PARENT AND CHILD STUDY

A project is being carried out by the Centre for Family Research looking at child development and family relationships. Your pupil [pupil's name] is a participant in this study. We would like you to fill in the attached consent form and questionnaire about your pupil's behaviour, this will take approximately 5 minutes to complete. [Parent's name] have given permission for you to be sent this questionnaire (permission form attached); however you are under no obligation to take part.

If you are happy to take part in this project your results will be completely confidential. This means that:

- Your personal data and your pupil's data will be held in a locked filing cabinet with no identifying information attached. An identification number will be used in place of your and your pupil's name.
- Information entered onto the computer for data analysis will be in the form of numbers and will not include names, addresses or any other identifying information.
- When the results of the research are written up, you will not be identified as having taken part in the study. Neither will information which might make you identifiable be reported.
- We will protect the confidentiality of the information you provide within the limitations of the law.
- Your responses will not be shared with your pupil or their parent(s).
- Confidentiality will be broken **only** in the rare circumstance that it was disclosed that your pupil was being harmed. In all other cases privacy, anonymity and confidentiality will remain intact.

Once you have completed the questionnaire, please return it to us in the prepaid envelope provided. If you would prefer to complete the questionnaire online, please use the following link <http://www.cfr.cam.ac.uk/involvement/teacher-sdq> and use the ID number [XXXX]. Upon receipt of the completed questionnaire you will be sent a £10 gift voucher to thank you for your time.

The project has been reviewed by the Cambridge Psychological Research Ethics Committee and has received ethical approval.

If you have any queries, please do not hesitate to contact Dr Susan Imrie (Research Associate) on REDACTED FOR CONFIDENTIALITY REASONS or REDACTED FOR CONFIDENTIALITY REASONS.

CONSENT FORM FOR TEACHERS



**UNIVERSITY OF
CAMBRIDGE**

CENTRE FOR FAMILY RESEARCH

Department of Psychology

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Fax: 01223 330574

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CONSENT FORM

1. Have you read the accompanying letter? YES/NO

2. Do you understand that you are under no obligation to participate in this study? YES/NO

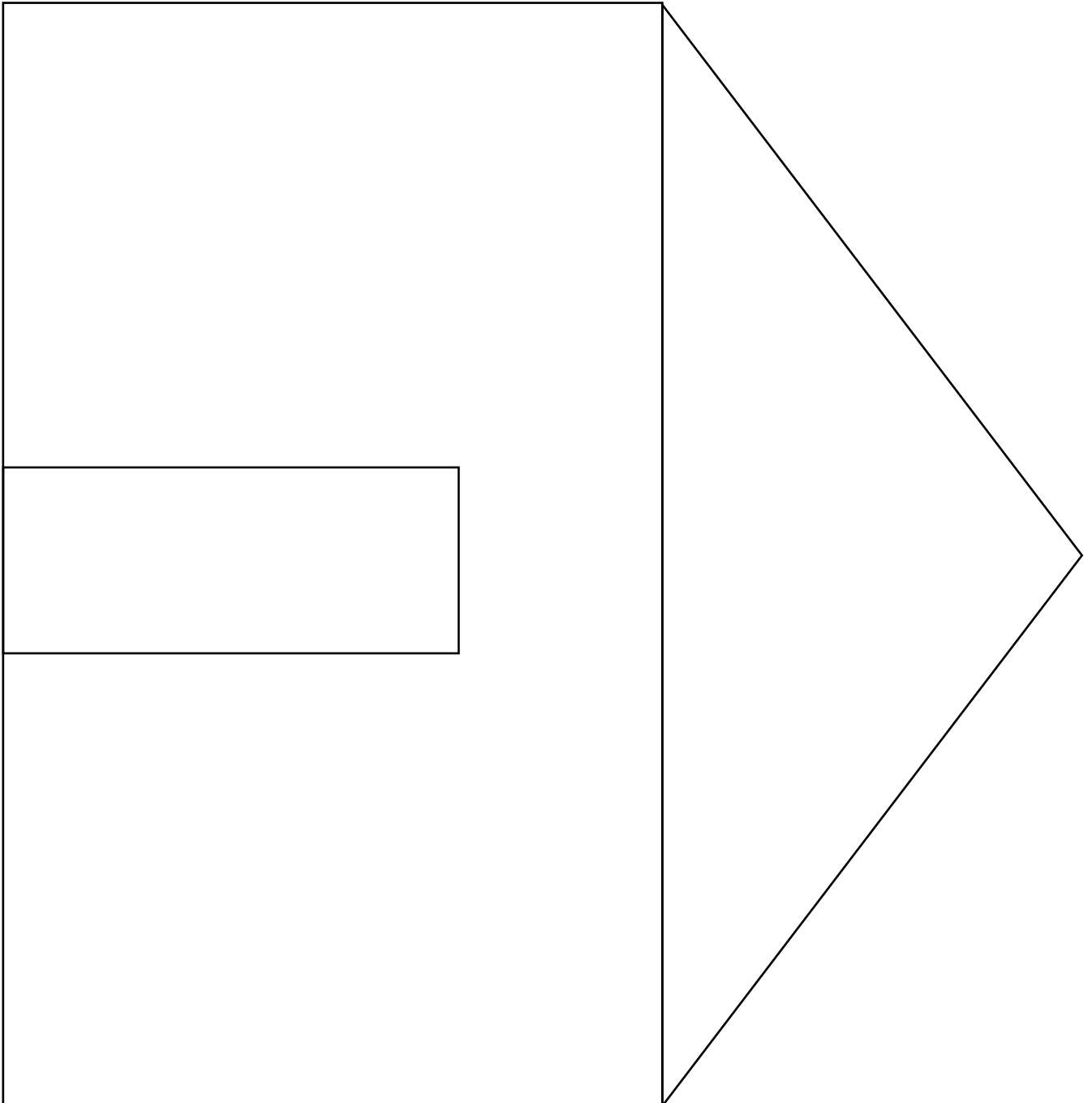
3. Do you agree to take part in this study by completing the enclosed questionnaire? YES/NO

Signed

Name in Block Letters.....

Date.....

Appendix 5: Etch-a-Sketch and jigsaw observational task materials





Appendix 6: 'Phases of thematic analysis' (Braun & Clarke, 2006: 35)

1. Familiarising yourself with the data	Transcribing the data (if necessary), reading and rereading the data, noting down initial ideas.
2. Generating initial codes	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
3. Searching for themes	Collating codes into potential themes, gathering all data relevant to each potential theme.
4. Reviewing themes	Checking if the themes work in relation to the coded extracts (level 1) and the entire data set (level 2), generating a thematic "map" of the analysis.
5. Defining and naming themes	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells; generating clear definitions and names for each theme.
6. Producing the report	The final opportunity of analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

Appendix 7: Transcription protocol

In the interview	In the transcription
Pause <2 seconds	,
Pause >2 seconds	...
Omitted speech	...
Laugh	[laughs]
Text added for explanatory purposes	[text]
Information omitted to ensure participant anonymity	[location] [name]

Appendix 8: Identity-release threat variable codebook

Donor threat measure

Codes range from 1 to 4, with 1= no threat and 4= high threat.

Type of statements that are codable within this measure to distinguish levels of donor threat in parents:

- a) statements regarding mothers' beliefs about whether the donor would "want the child back" if she met the child(ren) she helped to create (Fear-Reclaim). Included in this are statements regarding mothers' fears that donor-child contact may disrupt the mother-child relationship because the donor is 'entitled' to parental rights in some essential way.
- b) statements regarding mothers' beliefs about whether the child would reject the mother if they met/were in contact/knew about the donor. These statements may represent mothers' worries about the permanence of the mother-child relationship as it is projected into the future (Fear-Reject or "Permanence")
- c) related to the fears above, statements regarding mothers' feelings (being fearful or comfortable) with child having contact with donor/ satisfaction with her level of control over the donor's involvement in the child's/family life

1. No threat

To get this code, mothers will repeatedly mention the donor and be very comfortable with child knowing about her, being in touch with her or even meeting her. They should show that they can co-exist with the donor without any difficulty or residual fear. Even if the interview reveals that the parent was worried before, if they are comfortable now and perfectly well adjusted to their use of an identifiable donor and the potential for donor-child contact in the future, they should get a code of 1. Indications may be statements of warm feelings towards the donor plus those that evidence parent being very comfortable or even excited about the child knowing about and potentially having contact with her. They will demonstrate no fear of the donor/ child wanting to 'reclaim' each other, and demonstrate security in the mother-child relationship in the context of future donor-child contact.

Example statements:

"And it doesn't feel like he's in any way not ours, you know, so it's great [laughs]. (...) (About donor:) I would, I'd be very keen to meet her and I'm sure she's a lovely person and we'd get on well. And I'd have no issue, you know, she lives in England, we live here, I don't think she would be wanting to be [child's] mother or anything, you know, so I think we'd only benefit."

"Is there anything else that you or (child) will be able to find out in the future?"

"I do hope that (child) would like to meet her and I hope that she would want to meet us in the future."

"And how do you feel about the boys potentially knowing the donor's identity when they're older?"

If they want to do that then yeah definitely, that's ok with me."

"How do you feel about (child) potentially knowing the donor's identity?"

Quite happy about that, yeah, I'd like to know..."

"How does that make you feel when he's sort of shown interest in [the donor]?"

I think it's really nice because it means that we, I can talk about it a bit more with him because I've been a bit anxious as to how it might play out from him or how he might take it on but actually the fact that he's been curious and we've been able to talk about what it might mean in terms of you don't look like mummy and why you don't like mummy, you might look like this other person when you get to meet them but you also look like your daddy as well and just trying to normalise that a little bit for him so that's been good.

2. A little threat

Mothers coded at this level are generally positive about identity-release donation, as above, but express a small amount of uncertainty or hesitation about the prospect of future donor-child contact. They mention the donor both with gratefulness for their contribution but also express at least once an uncertainty or mild fear that either the donor may want to reclaim the child, that the child would reject them upon learning about/ making contact with the donor, or that the child would want to replace them with the donor in some way in the future. If the parent expresses at least one of these fears in an unresolved way, they should get a code of 2 even if overall they seem comfortable with donor-child contact otherwise.

Example statements:

"I don't know...it's sort of like not decided. You know it'd be nice so she could see what she's given us, yeah. But then...on the other hand, perhaps she's not a very good person, and that's what I wanted, a nice person. Might meet this person and think oh, not very nice, you."

"I: And how would you feel about [child] knowing the donor's identity when he's older?"

"I don't know to be honest. I really don't think that it'd make a difference between me and him, but I could be wrong. Children change as they get older don't they? So, I don't know...no, I don't know about that."

"You know, I think it in an ideal world maybe you wouldn't ever want to tell them because you wouldn't want anything to come between you or what have you. But then I always think about you know a lot of women went to [country] and were getting egg donations in [country] and were going there specifically because [country's] law keeps the details of donor's anonymous and then I'm just thinking you couldn't do that to a child, you know, that's part of them, but they're never ever to know or never ever to find out must be really difficult you know? So I think you know I think it's important that they do know that it's you know, just looking after them as well."

"And it does-, I suppose I'd be lying if I said it wasn't something that does slightly bother me. We've always said we would tell him, but it probably just slightly bothers me how he's going to react to that. And I think probably because it's such quite a while ago now, we probably would have to go back over all the information and then find out you know, because I know when he's sort of eighteen he can, I think he can try and get in touch with them and stuff, so I think I would probably have to go back through the information because I can't even properly remember what the next steps were and what you do and everything..."

"And how do you feel about, how do you feel about him potentially knowing the donor's identity or a bit more when he's older?"

A bit mixed really because I don't want to not tell him that he can get in touch, and obviously you worry that they'll get in touch and he'll like them better there's always that worry isn't there? But you kind of feel like when he's 18, he's an adult so, you know, you know, he's going to make his own informed decisions from there."

3. Moderate threat

At this level, mothers display marked ambivalence about identity-release donation, and repeat one or more of the above fears throughout the interview. Mothers express at least 2 different fears or repeat 1 fear at least twice in the interview regarding donor reclaiming their child, the child rejecting the mother, the mother-child relationship being upstaged by the relationship with the donor, and/or otherwise show that donor-child contact would bring into question their role of the child's sole mother. They are fearful but may rationalise and transcript shows evidence of wrestling with the facts of their child's conception and role of donor in child's life or in family's life. There is obvious discomfort and ambivalence in the situation.

Example statements:

"My biggest worry is obviously that she feels it affects her...that it will affect her feeling that she doesn't belong or she's not...or that she doesn't then see me as her mum, and that's the hard bit of it."

"And do you think that you'd ever like to know the donor's identity or have contact with the donor in the future?"

I'd be quite worried about that because I, I wouldn't know what sort of terms they'd want. So it's like if I could meet her and say thank you and if I could show her what she'd produced, that almost sounds like a lovely thing to be able to do. But I did send her a thank you, you know because you could do that at the time. I think I sent her a necklace. I think I sent the previous donor that we had that failed a mug. I think this one had a necklace, yes I think so. So I'd sort of be worried that she'd then say oh yes and I'd love to get to know [Child] and I'd love... and you sort of think well hold on a minute, no, no, no, no, no, no."

"I think at 18 she has the ability to approach her, but that's up to her, yeah. I mean at the end of the day it's not something that we're going to say you can't do that because she...if she wants to do that that's fine. I would hope that the relationship that we have will warrant that she won't need to find out anymore, but I would hope that I'm going to be strong enough if she needs to eventually [crying]."

"I just don't know how (child's) going to react to that information and what it's going to mean to her and how much of a relationship she's going to want to have with them...there's a lot of fear. So I don't know, I don't really know."

4. High threat

Mothers' statements evidence pervasive fear about the prospect of future donor-child contact, and repeatedly referenced multiple different concerns about identity-release donation. *Mothers' statements demonstrate lots of fear about the donor, constantly mentioning idea that she may want the baby back (as a fact, not an uncertainty), that the child will reject them or their relationship may somehow be altered in the future because of the discovery, disclosure about or contact with the donor. Typically, parents do not wish to disclose because of these fears, even if they acknowledge they may need to (or have already started disclosing) because they think it is best. If they have disclosed already, they feel fearful it will come back to haunt them and destroy their relationship with their child at some point.*

Example statements:

"I think she can find out everything when she's eighteen. That'll be the toughest thing for me because I don't see her as that she's anything other than mine, you know she's kind of all mine(...) that's probably why I nurture and care for her so much more, because I want her to be, to know that I you know absolutely adore the ground she walks on. I don't want her to then say well you were rubbish, I'm going to go and find whose biologically mine or whatever, I want to overcompensate I suppose because I don't want her to go and find(...) I think for me what would upset me is or what worries me I suppose is if they've got siblings, or if [child]'s got siblings that she doesn't know, that's the bit that bothers me because then I think if we'd had more children that would have maybe been easier, but because we haven't the chances are that she's probably got you know biological siblings somewhere and that I think would be interesting for her..."

"Sure, and have you told [child] that she might be able to find out more when she's 18 about the donor?"

No.

So is that something that you plan to tell her more about in the future?

I don't know if I'm honest if I will, I really don't.

Sure, and how do you feel about [child] potentially being able to find out more when she's older?

I'm not sure I'd like it if I'm honest yeah I don't think I would. I don't know. I think I might see it as, as if she wanted to find her then is it cause I've not done my job properly. I don't know."

"Yeah, she'll be able to find out [the donor's] identity in the future, so... I don't know, well yes as I say yes at some point, I don't know when, we'll have to have that conversation with her and with [brother]. But again I don't really want to have that. I know she's entitled to it and it's splashed all over her notes so she's going to find out, but if there was any way of her not finding out I would do that. I would do anything for her not to find that out..."

...Great, thank you. And do you plan to tell her that she might be able to find the donor's identity when she's older? Is that part of the story or not?

Oooo I don't know [laughs]. That I don't know, I'd have to talk with [partner] about that. As I say me, I'd choose to not impart that bit of information but then again if she starts finding out you know with information is so, it's so accessible to find these things out..."

Appendix 9: Intra-class correlation coefficients for Parent Development variables, observational task (EA scales), and Berkeley Puppet Interview variables

<i>PDI</i>		<i>PDI</i>	
Degree of anger	.83	Child anger	.98
Expressed anger	.93	Child happiness	.72
Support need	.81	Child controlling	.82
Support satisfaction	.96	Child affection	.77
Guilt	.90	Child rejection	.77
Joy	.79		
Competence	.79	<i>Globals</i>	
Confidence	.83	Reflective functioning	.78
Child focus	.74	Coherence	.76
Disappointment	.70	Richness of perceptions	.85
Warmth	.89		
Attachment awareness	.76		
Hostility	.74		

<i>EA scales</i>		<i>BPI</i>	
Sensitivity	.82	Mother warmth & enjoyment	.94
Structuring	.87	Father warmth & enjoyment	.99
Non-intrusiveness	.91	Mother anger & hostility	.94
Non-hostility	.82	Father anger & hostility	.98
Responsiveness	.94	Child depression	.90
Involvement	.72	Child over-anxiousness	.90
		Child strengths & competencies	.94