Wellbeing of gay fathers with children born through surrogacy: A comparison with lesbian-mother families and heterosexual IVF parent families

Van Rijn – van Gelderen, L.[1,*], Bos, H.W.M.[1], Jorgensen, T.D.[1], Ellis-Davies, K.[2,3], Winstanley, A.[3], Golombok, S.[4], Rubio, B.[5], Gross, M.[6], Vecho, O.[7], & Lamb, M.E[3]

Author affiliations and addresses

[1]Research Institute of Child Development and Education, University of Amsterdam, Nieuwe Achtergracht 127, 1018 VZ, Amsterdam, The Netherlands. [2]Division of Psychology, Nottingham Trent University, 50 Shakespeare St, Nottingham NG1 4FQ, United Kingdom [3]Department of Psychology, University of Cambridge, Free School Lane, Cambridge CB2 3RQ, United Kingdom [4]Centre for Family Research, University of Cambridge, Free School Lane, Cambridge CB2 3RQ, United Kingdom [5]IFSTTAR Versailles, 25 Allée des Marronniers, F-78000 Versailles, France [6]Centre d'études en sciences sociales du religieux, Centre National de la Recherche Scientifique, Ecole des Hautes études en Sciences Sociales, 10 Rue Monsieur le Prince, 75006 Paris, France [7]Université Paris Nanterre, 200 Avenue de la République, 92000 Nanterre, France

*Correspondence address: L.vanRijn-vanGelderen@uva.nl

Running title: Wellbeing of gay fathers with children

Abstract

Study question: Are there differences in levels of parental wellbeing (parental stress, psychological adjustment, and partner relationship satisfaction) between gay-father families with infants born through surrogacy, lesbian-mother families with infants born through donor insemination, and heterosexual-parent families with infants born through IVF?

Summary answer: There were no differences in parental wellbeing.

What is known already: The only other study of parental wellbeing in gay-father families formed through surrogacy (mean age children: 4 years old) found no difference in couple relationship satisfaction between these families and lesbian-mother families formed through donor insemination and heterosexual-parent families formed without assisted reproductive technologies.

Study design, size, duration: This cross-sectional study is part of an international research project involving 38 gay-father families, 61 lesbian-mother families, and 41 heterosexual-parent families with 4-month-olds. In each country (the U.K., the Netherlands, and France), participants were recruited through several sources, such as specialist lawyers with expertise in surrogacy (for the recruitment of gay fathers), lesbian and gay parenting support groups, fertility clinics (for the recruitment of lesbian and heterosexual parents), and/or online forums and magazines.

Participants/materials, setting, methods: During a home visit when their infants were between 3.5 and 4.5 months old, participants completed standardized measures of parental stress, parental psychological adjustment (anxiety and depression), and partner relationship satisfaction.

Main results and the role of chance: All parents reported relatively low levels of parental stress, anxiety, and depression, and were all relatively satisfied with their intimate relationships. After controlling for caregiver role (primary or secondary caregiver role), there

were no significant family type differences in parental stress, $p = .949$, depression, $p = .089$, anxiety, $p = .117$, or relationship satisfaction, $p = .354$.

Limitations, reasons for caution: The findings cannot be generalized to all first-time ART parents with infants because only families from relatively privileged backgrounds participated.

Wider implications of the findings: Our findings may have implications for the development of policy and legislation in relation to these new family forms, as well as the regulation of surrogacy in the Netherlands and France. In addition, our findings might encourage professional organizations of obstetricians and gynecologists in these countries to recommend that requests for assisted reproduction should be considered regardless of the applicants' sexual orientation.

Study funding/competing interest(s):

This research was supported, under the auspices of the Open Research Area (Application BO 3973/1-1; Principal Investigator, Michael E Lamb), by grants from the UK Economic and Social Research Council (ESRC; Grant ES/K006150/1; Principal Investigator, Michael E. Lamb), The Netherlands Organisation for Scientific Research (NWO; Grant NWO 464-11-001, Principal Investigator, Henny Bos), and the French Agence Nationale de Recherche (ANR ; Grant ANR-12-ORAR-00005-01, Principal Investigator, Olivier Vecho) whose support is gratefully acknowledged. There were no competing interests.

Keywords

Gay father, surrogacy, parental stress, anxiety, depression, partner relationship satisfaction

Introduction

Gay men now have opportunities to become parents within same-sex relationships (i.e., "planned gay father families"), through, for example, adoption and surrogacy. Some researchers have studied planned gay-father families who adopted children (e.g., Farr et al., 2010; Goldberg & Smith, 2013; Golombok et al. 2014). The two existing studies on gay father families created through a surrogacy arrangement have focused on families with older children (Baiocco et al., 2015; Golombok et al. 2017). The present research focused on planned gay families and compared them on three important determinants of parental and child functioning (parental stress, parental psychological adjustment, and partner relationship satisfaction) with parents in lesbian-parent families and heterosexual-parent families whose infant offspring were also conceived by means of assisted reproductive technologies (ARTs), namely insemination with donor sperm (DI) for the lesbian mother families and *in vitro fertilization (*IVF) for the heterosexual parent families.

Gay fathers choosing surrogacy

An increasing number of gay men are choosing surrogacy as their route to parenthood (Bos et al., 2016). There are two types of surrogacy: (1) genetic (or traditional) surrogacy, whereby the sperm of one of the prospective gay fathers is used to fertilize the surrogate's egg in an artificial insemination procedure; and (2) gestational surrogacy, in which a woman's egg(s) is/are fertilized with the sperm of one of the prospective gay fathers by means of an IVF procedure in a laboratory, after which the embryo is transferred to the surrogate's womb (Lev, 2004). Gay men who want to become parents through surrogacy usually opt for gestational surrogacy (e.g., Blake et al., 2017).

Gay couples may choose surrogacy for various reasons. For example, they may prefer surrogacy to adoption because they want at least one parent to have a biological link to the child (e.g., Blake et al. 2017). The route through surrogacy, however, is complicated. In some

countries, including France, surrogacy is forbidden (Depadt, 2015). In other countries, such as the United Kingdom (U.K.) and the Netherlands, intended parents can compensate surrogates for their expenses but it is illegal to advertise for a surrogate or to offer surrogacy services (see Dutch Penal Code of 1993, article 151b; 151c; Surrogacy Arrangements Act, 1985), and there may still be barriers that restrict gay men's access to clinics arranging gestational surrogacy. For example, in the Netherlands, clinics can conduct gestational surrogacy for couples for medical reasons only (Boele-Woelki et al., 2011). In many countries, therefore, gay couples seeking parenthood through gestational surrogacy travel to countries where surrogacy is allowed and where there are no regulations that deny access to gay couples (Vonk & Boele-Woelki, 2012). This means that the procedures are expensive, currently between $90,000 and more than $120,000 (Gays with Kids, 2016).

Family stress theory and the unique circumstances of gay fathers

Since the surrogacy route to parenthood for gay couples is a relatively new one, little is known about the parental stress, psychological adjustment, and relationship satisfaction experienced by these fathers when their children are only a few months olds. The birth of a couple's first child brings about many changes in the household (e.g. increases in household labor associated with caring for the baby; Deutsch, 2001) which might be stressful. According to family stress theory, high levels of parental stress may be associated with parental psychological problems, and partner relationship dissatisfaction (Patterson, 1988), which in turn might be associated with children's adjustment (e.g., Stone et al., 2016). Higher levels of parental stress are associated with dysfunctional parent–child relationships and less positive parenting behaviors (e.g., Anthony et al., 2005). A meta-analysis conducted by McCabe (2014) showed that mothers with lower levels of psychopathology exhibited higher levels of positive parenting behavior, such as warmth and adaptive control. With regard to couple relationship satisfaction, it has been shown that positive attitudes towards partners

allow parents to participate in engaging, consistent, and inductive parenting practices (e.g., Krishnakumar & Buehler, 2000).

All parents experience some degree of parental stress and psychological problems or difficulties in their partner relationships while rearing children. However, the circumstances of gay-father families might be somewhat different from those of lesbian-mother and heterosexual-parent families. This is not only because it is rare for men to be primary caregivers and it is commonly supposed that men are less nurturing (Golombok et al., 2014), but also because gay fathers may be exposed to greater prejudice than lesbian women (e.g. Golombok, et al. 2017). Based on the sexual minority stress model, one could also assume that gay fathers may be stigmatized in relation to their sexual identity (e.g., Meyer, 2003). The exposure to sexual minority stressors might have a negative influence on the levels of parental stress, parental psychological adjustment, and partner relationship satisfaction.

Nevertheless, studies of gay adoptive parents have shown that these fathers report less stress than population norms would predict (e.g. Farr et al., 2010) and lower levels of parental stress and depression than are reported by heterosexual couples with adopted children (Golombok et al., 2014). However, the situation might be different for gay fathers who conceive through surrogacy. Although the only existing study of parental wellbeing in gay father families formed through surrogacy found no difference in couple relationship satisfaction between these families and lesbian-mother and heterosexual-parent families, the children in that study averaged 4 years of age (Baiocco et al., 2015). During infancy, the unique circumstances of gay-father families using surrogacy may be more salient because their experiences are still fresh.

In addition to being exposed to sexual minority stressors, gay fathers with infants born through surrogacy may also confront other stressors resulting from the fact that surrogacy is less familiar and so its use by gay parents may be considered less acceptable (e.g., media

accounts of surrogacy often focus on negative or illegal practices; Van den Akker et al., 2016). During the surrogate's pregnancy, the fathers may be concerned about her health and that of the baby because of the medical risks associated with gestational surrogacy (Damelio & Sorensen, 2008). These gay fathers thus face unique circumstances that might have a negative influence on their parental wellbeing, especially if they are first-time parents.

Current study

The aim of the study was to examine levels of parental wellbeing (parental stress, psychological adjustment, and partner relationship satisfaction) in gay-father families with infants born through surrogacy. The gay-father families were compared with lesbian-mother families with children born through donor insemination and heterosexual-parent families with infants born through IVF. The lesbian families controlled for the number of same-sex parents in the family as well as the use of gamete donation; the heterosexual families comprised a comparison group of traditional families who used ARTs to conceive.

We also examined levels of parental wellbeing associated with caregiver role (primary versus secondary), taking into account family type (gay/lesbian/heterosexual), because one of the greatest sources of conflict for couples during the transition to parenthood is the division of labor, especially regarding who will be the primary caregiver (Belsky & Pensky, 1988).

Materials and Methods

Participants

The participants in the present research were involved in an international research project on gay couples who became parents through surrogacy. The project was carried out by researchers in the U.K., the Netherlands, and France who recruited 38 gay- father families, 61 lesbian-mother families, and 41 heterosexual-parent families. In all families (N = 140) both parents participated in the study. Ethical approval was granted by the appropriate

committees at the three home institutes, namely University of Cambridge, University of Amsterdam, and Centre Universitaire des Saints-Pères.

Data were collected from both parents in each family when the infants were on average 3.7 months old (*SD* = 0.59). Fifteen percent of the families had twins. About 55% of the infants were female. The parents had been in their current relationships for between 2 and 21 years; the average duration was 8.1 years (*SD* = 3.73). Almost 80% of the parents were married or in civil partnerships. Their ages ranged from 22 to 59 years (*M* = 34.8, *SD* = 5.07). About two-thirds (63%) of the parents were employed fulltime. Most families (71%) had an annual household income of more than 42,365 US dollars. The majority of the British and Dutch parents were White (96.2%); no information about the ethnicity of the French parents was available (it was not permissible to obtain information about the ethnic background of participants in France). Only nine of the families (6%) lived in rural areas. The remaining families resided in small (46 families; 33%), medium (44 families; 31%), and large cities (41 families; 29%). As shown in Table I, there were no significant differences between the family types with respect to the age of the infants, the infants' gender, or annual family income. However, there were significant differences between the family types with respect to the number of twins, whether the parents were cohabiting or were married/registered civil partners (marital status/civil partner registration), relationship duration, and where the families lived (residency).

The parent who was most involved with the child on a day-to-day basis was labeled as the primary caregiver and the co-parent was labeled as the secondary caregiver. To identify the primary and the secondary caregiver in each family, six items on the "Who does what" instrument (Cowan & Cowan, 1990) were used. Both parents were asked who was responsible for their infant's weekday care: (1) when getting up, during breakfast, and when dressing the infant, (2) during the day from 9.00 a.m. to 1.00 p.m., (3) during the day from

1.00 p.m. to 5.00 p.m., (4) when having dinner, during playtime, at bedtime, (5) in the evening until midnight, and (6) when the infant needed care in the middle of the night. Response options ranged from 1 ("*I do it all*") to 9 ("*Partner does it all*"). The primary caregiver was therefore the parent with the lower average score on these six items. In eight of the families (6%), both parents had the same average score on the abovementioned six items and in 34 families (24%) one of the parents in a family unit had a missing value on one of the six items. To establish who was the primary and secondary caregiver in these 42 families, the answer to the question "During the past week, who spent most time with [name infant(s)]?" (asked by the research assistant when arranging the home visit) was used to identify the parent with the primary caregiver role. Primary and secondary caregivers in the different types of families differed in age and working status (see Table I). There were no family type differences regarding the ethnic identity of the primary and secondary caregivers in the Dutch and British families.

Procedure

In each country, participants were recruited through specialist lawyers with expertise in surrogacy (for the recruitment of gay fathers), parenting support groups, fertility clinics (for the recruitment of lesbian and heterosexual parents), and/or online forums and magazines. Inclusion criteria concerning methods of conception were: Gay-father families had to have used surrogate carriers, lesbian-mother families had to have used sperm donors, and heterosexual-parent families had to have used IVF without sperm or egg donation. All families gave written informed consent.

The families were assessed at home when their infants were between 3.5 and 4.5 months old. Before the home visits, the parents completed an online questionnaire (protected by a unique password for each parent) on their demographics, and during the visit both parents separately completed an online questionnaire.

Measures

All instruments had been validated in studies carried out in the U.K. or in the United States (Abidin, 2012; Cox et al., 1987; Spielberger & Gorsuch, 1983). The parental stress, anxiety, and depression instruments had been translated and validated in French studies (Bigras et al., 1996; Guedeny & Fermanian, 1998; Spielberger et al., 1993). Only the instrument that was used to measure depression had been validated in the Netherlands (Pop et al., 1992). When no French or Dutch versions of the instruments had been validated, the items were translated into French and Dutch, respectively, and were back-translated into English.

Parental stress. Parental stress was assessed using the Parental Distress subscale of the short version of the Parenting Stress Index (Abidin, 2012). This subscale consists of 12 items (e.g., "I feel alone and without friends") with response categories ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). Scores ranged from 12 to 60; higher scores indicated greater parental stress. For our sample, the internal consistency for the parental stress subscale was good (Cronbach's $\alpha = .85$).

Parental psychological adjustment. The Trait Anxiety Scale (T-Anxiety) of the State-Trait Anxiety Inventory – adult version (Spielberger & Gorsuch, 1983) was used to measure the parents' general level of anxiety. Parents rated the frequency with which they experienced 20 feelings or emotions from 1 (*almost never*) to 4 (*almost always*). An example item is: "I feel inadequate." Scores ranged from 20 to 80, with higher scores reflecting a higher level of anxiety. For our sample, internal consistency was high (Cronbach's $\alpha = .87$).

Data on the parents' depressive symptoms were obtained using the Edinburgh Postnatal Depression Inventory (Cox et al., 1987). Parents rated 10 items (e.g., "I have been sad or miserable") from 0 (*not at all*) to 3 (*yes, all the time*). Scores ranged between 0 and 30, with higher scores indicating higher levels of depression (scores > 10 indicate clinically relevant

levels of depression) (Cox et al., 1987). Internal consistency was adequate for our sample (Cronbach's $\alpha = .64$).

Relationship satisfaction. Relationship satisfaction was measured using the Golombok Rust Inventory of Marital State (Rust et al., 1986), which has been used in previous studies of lesbian couples with children (e.g., Brewaeys et al., 1997). Parents rated 28 items (e.g., "Our relationship is continually evolving") on a scale of 0 (*strongly agree*) to 3 (*strongly disagree*). Scores range from 0 to 84, with higher scores indicating poorer relationship quality (Rust et al., 1986).

Analysis Plan

The data gathered for the present investigation were dyadic in nature, meaning that both parents in each family completed the same measures. Structural equation modeling (SEM) accounts for the dependence of observations nested within dyads using a multivariate framework for analyzing differences in means (Peugh et al., 2013) similar to the way lack of independence is handled in repeated-measures ANOVA, but with less restrictive assumptions. Furthermore, the SEM framework allows "robust means modeling" so that test statistics are robust with respect to non-normality as well as the heterogeneity of variances (Fan & Hancock, 2012).

SEMs were fitted to eight variables (primary and secondary caregivers' responses to measures of parenting stress, anxiety, depression, and relationship satisfaction) in each of three groups (gay, lesbian, and heterosexual parents). Due to some missing data, all eight means, eight variances, and 28 covariances were freely estimated in each group using full information maximum likelihood (FIML), which is the gold standard for handling missing data (Little et al., 2014) under the standard missing-at-random (MAR) assumption. Descriptive statistics, however, were calculated using complete cases for each variable, or pairwise complete observations for correlations.

The SEMs were fitted using R statistical software (version 3.3.3) with the *lavaan* package (version 0.6-1). In each analysis, hypotheses were tested using a robust likelihood ratio test (LRT) statistic, distributed as a χ^2 random variable with *df* equal to the number of equality constraints being tested.

To analyze the parental stress, psychological adjustment, and relationship satisfaction scores for parents in the three family types, an SEM was fitted in which the means for an outcome variable were constrained to be equal across the three groups. The saturated model estimated six separate means for each outcome (i.e., for each of two caregivers in each of the three groups), whereas the constrained model estimated only two means for each outcome variable (e.g., parental stress): one for the primary caregivers across all groups, and another for the secondary caregivers. Thus, these tests had 6 – 2 = 4 *df*. In these analyses, the familywise Type I error rate was controlled by testing each of the four outcomes using a Bonferroni-corrected $\alpha = .05 / 4 = .0125$ as the criterion for statistical significance.

We also analyzed the scores on parental stress, psychological adjustment, and relationship satisfaction across caregiver roles (primary versus secondary) by constraining means to be equal across those two groups. This constrained model estimated only three means for each outcome variable: one for gay-father families (both parents), one for lesbian-mothers families (both parents), and one for heterosexual-parent families (both parents); thus, these tests had 6 – 3 = 3 *df*. In these analyses, the familywise Type I error rate was controlled by testing each of the four outcomes using a Bonferroni-corrected $\alpha = .05 / 4 = .0125$ as the criterion for statistical significance.

Results

Table II shows mean scores and standard deviations for parental stress, anxiety, depression, and relationship satisfaction as reported by the primary and secondary caregivers in each family type (gay-father families, lesbian-mother families, and heterosexual-parent

families). The mean score on parental stress for all parents was 21.9 (*SD* = 6.75). The average scores for anxiety were 33.2 (*SD* = 7.50), for depression 4.4 (*SD* = 2.93), and for relationship satisfaction 20.9 (*SD* = 8.43). See Table III for correlations between parental stress and the anxiety, depression, and partner relationship satisfaction variables. Further tests of differences between the correlations within the different groups and different partners are presented in the supplementary material.

Family Type

The average levels of parental stress, anxiety, depression, and relationship satisfaction for gay fathers were 22.0 (*SD* = 8.39), 31.9 (*SD* = 7.30), 4.0 (*SD* = 2.95), and 21.0 (*SD* = 9.84), respectively. For the lesbian mothers, the average scores were 21.6 (*SD* = 6.25), 33.9 (*SD* = 7.44), 4.6 (*SD* = 2.92), and 20.1 (*SD* = 8.11), respectively. For parents in heterosexual families, the average scores were 22.3 (*SD* = 5.26), 33.4 (*SD* = 7.72), 4.6 (*SD* = 2.92), and 22.0 (*SD* = 7.34), respectively.

After controlling for caregiver role (primary or secondary caregiver role), there were no significant family type differences in parental stress, $\chi^2(4) = 0.72$, $p = .949$, depression, $\chi^2(4) = 8.08$, $p = .089$, anxiety, $\chi^2(4) = 7.38$, $p = .117$, or relationship satisfaction, $\chi^2(4) = 4.40$, $p = .354$. Thus, no post hoc tests were conducted.

Caregiver Role

For the primary caregivers the average scores for parental stress, anxiety, depression, and relationship satisfaction were 22.7 (*SD* = 6.99), 33.6 (*SD* = 7.73), 4.7 (*SD* = 3.04), and 21.0 (*SD* = 8.75), respectively. The average scores for the secondary caregivers were 21.2 (*SD* = 6.42), 32.8 (*SD* = 7.26), 4.1 (*SD* = 2.80), and 20.8 (*SD* = 8.13), respectively.

After controlling for family type, there were no significant differences between the primary and secondary caregiver on parental stress, $\chi^2(3) = 4.67$, $p = .197$, anxiety, $\chi^2(3) =$

3.40, $p = .334$, depression, $\chi^2(3) = 9.88$, $p = .020$, or relationship satisfaction, $\chi^2(3) = 2.79$, $p = .425$. No post hoc tests were thus conducted.

Discussion

Our study was the first to investigate parental wellbeing (parental stress, psychological adjustment, and partner relationship satisfaction) in a sample of gay fathers with infants born through surrogacy, and to compare them with lesbian-mother families formed through donor insemination and heterosexual-parent families formed through IVF, in order to control for the use of assisted reproduction. It was assumed that levels of parental involvement might also influence the new parents' levels of parental stress, psychological adjustment, and partner relationship satisfaction. Therefore, the caregiver role was also taken into account.

The parents in our study reported relatively low levels of parental stress, anxiety and depression, regardless of family type or caregiver role. Further, the parents in all family types and regardless of their caregiver roles were relatively satisfied with their intimate relationships. There were no significant effects for family type or caregiver role. However, we did find a non-significant trend towards lower levels of depression for the primary gay fathers when compared to the lesbian and heterosexual parents, which is in line with the finding of Golombok et al. (2014) for adoptive gay fathers.

In light of the sexual minority hypothesis of Meyer (2003), which assumes that experiences of rejection because of sexual orientation are related to mental health problems, the absence of significant differences in levels of parental stress, parental psychological adjustment, and relationship satisfaction might be somewhat surprising. Conceivably, there were no differences because all the fathers and mothers had experienced difficulty fulfilling their wish to become parents, and that, having overcome the obstacles, they experienced relatively high levels of wellbeing (Taubman-Ben-Ari & Spielman, 2014). In addition, the

fact that all the parents (regardless of family type) had encountered difficulties fulfilling their wish to become fathers or mothers might explain the absence of differences between primary and secondary caregivers. Another explanation may be that, because parenthood is not a common choice for gay men, becoming a parent might be experienced as a happy triumph over the widespread message that gay men and lesbian women are not supposed to become parents (Armesto, 2002), and this might influence their psychological adjustment in a positive way (Erez & Shenkman, 2016). Another explanation might be that, for gay men, being a father represents conformity to traditional heterosexual gendered parental roles and may thus enhance a sense of belongingness, social acceptance, and social support from significant others, like friends and family members (e.g., Bergman et al., 2010; Kama, 2011; Sumontha et al., 2016) which, in turn, might enhance the wellbeing of same-sex couples with children.

Furthermore, secondary caregivers in gay-father families in our sample had fewer full-time jobs than secondary caregivers in heterosexual-parent families (but not than those in lesbian-mother families). This indicates that gay fathers with infants conceived through surrogacy divide the household caregiving tasks more evenly than heterosexual couples, which is in line with previous research on male same-sex couples who had their children via surrogacy (Tornello et al., 2015).

Several limitations need to be acknowledged. First, the sample size made it impossible to take into account differences between the three countries in which the participants lived. Such differences should be explored in larger studies because of differences between the U.K., the Netherlands, and France with regard to policy and social attitudes towards gay and lesbian individuals and same-sex parenting (Takács et al., 2016). A Monte Carlo power analysis showed that we had sufficient power to detect large effects between family types but not necessarily smaller ones – and sufficient power to detect moderate effects between caregiver roles. This implies that there might be small differences between the family types

and between caregiver roles which we were not able to discover because of the small sample sizes. Secondly, all parents had moderate to high socioeconomic status and were mostly White. As such, the findings cannot be generalized to the whole population of first-time ART parents with infant children. In addition, poorer family finances have been linked to lower parental well-being (e.g., Bøe et al., 2014) and it is thus possible that the average levels of parental well-being of less economically privileged gay fathers, lesbian mothers, and heterosexual parents who conceive through ART may be lower than reported by the parents in our sample. Furthermore, the families were recruited using nonprobability sampling techniques, such as specialist lawyers with expertise in surrogacy. Such recruitment techniques have been criticized because they may hamper generalizability (Meyer & Wilson, 2009). In addition, participating parents might have sought to enhance their scores to exaggerate their wellbeing. However, this could be true for parents in all three groups, because all the families had used ARTs.

Notwithstanding these limitations, our findings may have implications for the development of policy and legislation in relation to these new family forms, as well as the regulation of surrogacy. Same-sex marriage is recognized in all three countries that we studied, but the situation regarding same-sex parenthood and especially surrogacy differs. For example, in France, surrogacy is illegal and lesbian couples do not have access to ARTs. In the U.K. and the Netherlands, lesbian couples have access to ARTs and gestational surrogacy is allowed, but commercial surrogacy is forbidden and it is illegal to advertise for or offer to be a surrogate for payment. Our findings might encourage policymakers in the Netherlands and France to change their laws and break down the barriers that prevent gay couples from fulfilling their wish to become parents through surrogacy. Our findings might also encourage professional organizations of obstetricians and gynecologists in these countries to recommend that requests for assisted reproduction should be considered regardless of the applicants'

sexual orientation, as both the Human Fertilisation and Embryology Act in the United Kingdom and the ethics committee of the American Society for Reproductive Medicine did in 2008 (The Ethics Committee of the American Society for Reproductive Medicine, 2009).

Acknowledgements

The authors wish to thank Ellen van Reemst, Jeanine Baartmans, Mathilde Brewaeys, Marie Michal-Schmelck, and Julie Brément for their help with collecting the data. We also would like to thank the families for participating.

Authors' roles

As principal investigators, M.L., H.B, O.V., were responsible for the design of the study in collaboration with S.G., M.G., K.E-D., A.W., L.v.R., and B.R. Data were collected by L.v.R, H.B., K.D., A.W., B.R., O.V., and M.G under the oversight of K.E-D. T.J. and H.B. conducted data analysis. L.v.R. and H.B. interpreted results and drafted this manuscript. All authors contributed to its revision and have approved the final version for publication.

Funding

This research was supported, under the auspices of the Open Research Area (Application BO 3973/1-1; Principal Investigator, Michael E Lamb), by grants from the UK Economic and Social Research Council (ESRC; Grant ES/K006150/1; Principal Investigator, Michael E. Lamb), The Netherlands Organisation for Scientific Research (NWO; Grant NWO 464-11-001, Principal Investigator, Henny Bos), and the French Agence Nationale de Recherche (ANR ; GGrant ANR-12-ORAR-00005-01, Principal Investigator, Olivier Vecho) whose support is gratefully acknowledged.

Conflict of interest

None to declare.

Reference List

Abidin RR. *Parenting stress index*. 4th ed, 2012. PAR, Lutz, Florida, US.

Anthony LG, Anthony BJ, Glanville DN, Naiman DQ, Waanders C, Shaffer S. The relationships between parenting stress, parenting behavior and preschoolers' social competence and behavior problems in the classroom. *Infant Child Dev* 2005; **14** : 133-154.

Armesto JC. Developmental and contextual factors that influence gay fathers' parental competence: A review of the literature. *Psychol Men Masc* 2002; **3** : 67-78.

Baiocco R, Santamaria F, Ioverno S, Fontanesi L, Baumgartner, E, Laghi F, Lingiardi V. Lesbian mother families and gay father families in Italy: Family functioning, dyadic satisfaction, and child well-being. *Sex Res Social Policy* 2015; **12** : 202-212.

Belsky J, Pensky E. Marital change across the transition to parenthood. *Marriage Fam Rev* 1988; **12** : 133-156.

Bergman K, Rubio RJ, Green R, Padrón E. Gay men who become fathers via surrogacy: The transition to parenthood. *J GLBT Fam Stud* 2010; **6**: 111-141.

Blake L, Carone N, Raffanello E.,Slutsky J, Ehrhardt AA, Golombok, S. Gay fathers' motivations for and feelings about surrogacy as a path to parenthood. *Hum Repro* 2017; **32** : 860-867.

Bigras M, LaFreniere PJ, Dumas JE. Discriminant validity of the parent and child scales of the parenting stress index. et al. *Early Educ Dev* 1996; **7** : 167 – 178.

Bøe, Sivertsen B, Heiervang E, Goodman R, Lundervold A.J., Hysing M. Socioeconomic status and child mental health: the role of parental emotional well-being and parenting practices. *J Abnorm Child Psychol* 2014; 42 : 705-715.

Boele-Woelki K, Curry-Sumner I, Schrama W, Vonk M. *Draagmoederschap en illegale opneming van kinderen* [Commercial surrogacy and the unlawful placement of children]. 2011. WODC, Ministerie van Veiligheid & Justitie, The Hague, The Netherlands.

Bos HMW, Tornello S, van Rijn – van Gelderen L. *Childless Gay Men: Predictors of their intentions to have children*. Paper presented at the 31st International Conference of Psychology, Pacifico Yokohama, Yokohama, Japan, July 24 -29, 2016.

Brewaeys A, Ponjaert I, Van Hall EV, Golombok S. Donor insemination: child development and family functioning in lesbian mother families. *Hum Repro* 1997; **6** : 1349- 1359.

Cowan CP & Cowan PA. Who does what? In Touliatos J, Perlmutter BF, Straus MA (eds) *Handbook of family measurement techniques*. 1990. Sage, Beverly Hills, California, US, pp. 447 – 448.

Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Devlopment of the 10-item Edinburgh Postnatal Depression Scale. *Br J Psychiatry*, 1987; **150** : 782-786.

Damelio J, Sorensen K. Enhancing autonomy in paid surrogacy. *Bioethics* 2008; **22**: 269-277.

Depadt V. Chapitre 10. La GPA : vers la légalisation ? *J Int Bioéthique* 2015 ; **26** : 139-151.

Deutsch FM. Equally shared parenting. *Curr Dir Psychol Sci* 2001; **10** : 25-28.

Erez C, Shenkman G. Gay dads are happier: Subjective well-being among gay and heterosexual fathers. *J GLBT Fam Stud* 2016; **12** : 1-18.

Ethics Committee of the American Society for Reproductive Medicine. Access to fertility treatment by gays, lesbians, and unmarried persons. *Fertil Steril* 2009; **92** : 1190-1193.

Farr RH, Forssell SL, Patterson, CJ. Parenting and child development in adoptive families: Does parental sexual orientation matter? *Appl Dev Sci* 2010; **14:** 164-178.

Fan W, Hancock GR. Robust means modeling: An alternative for hypothesis testing of independent means under variance heterogeneity and nonnormality. *J Educ Behav Stat* 2012; **37** : 137–156.

Gays with Kids. https://gayswithkids.com/2015/09/17/the-cost-of-gay-fatherhood/ 2016.

Goldberg AE, Smith JZ. Predictors of psychological adjustment in early placed adopted children with lesbian, gay, and heterosexual parents. *J Fam Psychol* 2013; **27** ; 431-442.

Golombok S, Blake L, Slutsky J, Raffanello E, Roman GD, Ehrhardt A. Parenting and the adjustment of children born to gay fathers through surrogacy. *Child Dev* 2017. In press.

Golombok S, Mellish L, Jennings S, Casey P, Tasker F, Lamb ME. Adoptive gay father families: Parent–child relationships and children's psychological adjustment. *Child Dev* 2014; **85** : 456-468.

Guedeny N, Fermanian, J. Validation study of the French version of the Edinburgh Postnatal Depression Scale (EPDS): New results about use and psychometric properties. *Eur Psychiatry* 1998; **13** : 83-89.

Kama A. Parading pridefully into the mainstream. In Ben-Porat G and Turner BS (eds) *The contradictions of Israeli citizenship: Land, religion and state.* Routledge, London, UK, pp.180-202.

Krishnakumar A, Buehler C. Interparental conflict and parenting behaviors: A meta-analytic review. *Fam Relat* 2000; **49**: 25-44.

Lev AL (2004). *The complete lesbian and gay parenting guide*. 2004. Penguin, New York, US.
Lev AL. Gay dads: Choosing surrogacy. *Lesbian Gay Psychol Rev* 2006; **7**: 73-77.

Little TD, Jorgensen TD, Lang KM, Moore EWG. On the joys of missing data. *Journal of Pediatr Psychol* 2014; **39** : 151–162.

McCabe JE. Maternal personality and psychopathology as determinants of parenting behavior: A quantitative integration of two parenting literatures. *Psychol Bull* 2014; **140** : 722-750.

Meyer IH (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychol Bull* 2003; **129** : 674-697.

Meyer IH, Wilson PA. Sampling lesbian, gay, and bisexual populations. *J Couns Psychol* 2009; **56** : 23-31.

Patterson JM. Families experiencing stress: I. The Family Adjustment and Adaptation Response Model: II. Applying the FAAR Model to health-related issues for intervention and research. *Fam Syst Med* 1988; **6** : 202-237.

Peugh JL, DiLillo D, Panuzio J. Analyzing mixed-dyadic data using structural equation models. *Struct Equ Modeling* 2013; **20** : 314–337.

Pop VJ, Komproe, IH, Van Son MJ. Characteristics of the Edinburgh post natal depression scale in the Netherlands. *J Affect Disord* 1992; **26** : 105–110.10.

Rust J, Bennun I, Crowe M, Golombok S. The golombok rust inventory of marital state (GRIMS). *Sex Marital Ther* 1986; **1** : 55-60.

Spielberger CD, Gorsuch RL. *State-trait anxiety inventory for adults: Manual, instrument, and scoring guide.* 1983. Mind Garden, Redwood City, California, US.

Spielberger CD, Gorsuch R, Lushene PR, Vagg GA, Jacobs GA. *Manuel de l'inventaire d'*anxiété état-trait. 1993. Editions du Centre Psychologie Appliguée, Paris, France.

Stone LL, Mares SH, Otten R, Engels RC, Janssens JM. The co-development of parenting stress and childhood internalizing and externalizing problems. *J Psychopathol Behav Assess* 2016; **38**: 76-86.

543 Sumontha, J, Farr RH, Patterson, CJ. Social support and coparenting among lesbian, gay, and
544 heterosexual adoptive parents. *J Fam Psychol* 2016; **30 :** 987-997.
545 Surrogacy Arrangements Act. 1985. Her Majesty's Stationary Office, London, UK.
546
547 Takács J, Szalma I, Bartus T. Social attitudes toward adoption by same-sex couples in Europe.
548 *Arch Sex Behav* 2016; x : 1787–1798.
549
550 Taubman–Ben-Ari O, Spielman V. Personal growth following the first child's birth: A
551 comparison of parents of pre-and full-term babies. *Soc Work Res* 2014; **38** : 91-106.
552
553 Tornello SL, Kruczkowski SM, Patterson CJ. Division of labor and relationship quality among
554 male same-sex couples who became fathers via surrogacy. *J GLBT Fam Stud* 2015*;* **11** : 375-394.
555
556 Van den Akker O, Camara I, Hunt B. 'Together… for only a moment': British newspaper
557 constructions of altruistic non-commercial surrogate motherhood. *J Reprod Infant Psychol* 2016;
558 **34**: 271-281.
559
560 Vonk MJ, Boele-Woelki K. Surrogacy and same-sex couples in the Netherlands. *Eur Fam Law*
561 2012;: **17**: 123-139.
562
563