

1     **Transition to parenthood and quality of parenting among gay, lesbian and heterosexual**  
2                                     **couples who conceived through assisted reproduction**

3     **Abstract**

4     Little research has focused on the emotions felt during pregnancy and early parenthood as  
5     well as the initial quality of parenting displayed by first-time parents who conceived using  
6     assisted reproduction technologies (surrogacy, donor insemination, and in vitro fertilization).  
7     Research on primary and secondary caregivers in gay, lesbian, and heterosexual families is  
8     especially sparse. The current study examined 35 gay-father families, 58 lesbian-mother  
9     families and 41 heterosexual-parent families with their infants. Families were assessed at  
10    home when their infants were 4 months old ( $\pm 14$  days), and each parent participated in an  
11    audio-recorded standardized semi-structured interview in which we explored parental feelings  
12    during pregnancy, feelings about the parental role, perceived parental competence, the  
13    enjoyment of parenthood, expressed warmth and emotional over-involvement of parents.  
14    Heterosexual parents reported less positive feelings in early pregnancy than lesbian parents,  
15    while gay parents reported less positive feelings at the end of pregnancy than lesbian mothers  
16    and more positive feelings about parenthood during the first post-partum weeks than  
17    heterosexual parents. There was no interaction between family type and caregiver role on  
18    reported feelings, or on perceived competence, enjoyment, warmth, and involvement. The  
19    present findings elucidate the transition to parenthood among first-time parents conceiving  
20    through assisted reproductive technologies, and especially contribute to our knowledge about  
21    gay fathers who became parents through surrogacy.

22    **Key words:** *gay fathers, lesbian mothers, assisted reproduction technologies, transition to*  
23    *parenthood, parental warmth*

24

25

## Introduction

26           The number of couples pursuing parenting using assisted reproductive technologies  
27 (ARTs) has increased in Western societies over recent decades (Ferraretti et al., 2012), and a  
28 growing number of children have been born following the use of ARTs (Adamson et al.,  
29 2006). The procedures involved include *in vitro* fertilization (IVF), sperm donation, egg  
30 donation, embryo donation, and surrogacy. Initially designed for infertile heterosexual  
31 couples, with the first baby born via IVF in 1978 (Steptoe & Edwards, 1978), these  
32 techniques have increasingly been used by single women and by same-sex couples (Friedman,  
33 2007; Johnson & O'Connell, 2002). There are important differences between heterosexual  
34 parents and same-sex parents who have utilized ARTs. For example, many heterosexual users  
35 have experienced infertility whereas infertility is not the main reason why same-sex intended  
36 parents use ARTs. Same-sex couples choose ART because they wish to raise children from  
37 birth (Bigner & Jacobson, 1989; Lev, 2006) and because ARTs allow them to have biological  
38 connections to their children (Lev, 2006; Mitchell & Green, 2007; Murphy, 2013).

39           Heterosexual and same-sex couples who conceive using ARTs are similar in that they  
40 face difficulties becoming parents. For heterosexual parents, a history of infertility can be  
41 associated with increased psychological distress relating to both the infertility and the  
42 infertility treatment (Ellison & Hall, 2003). In addition, it may diminish self-esteem (Gibson  
43 Ungerer, Tennant et al., 2000), due in large part to the importance given to childbearing and  
44 to the transition to parenthood for both women and men in Western societies. In some  
45 countries, same-sex couples lack access to ARTs and receive less legal, cultural, and  
46 institutional support (Riskind, Patterson, & Nosek, 2013). Moreover, they have to overcome  
47 public beliefs that children should ideally be raised in traditional families with both mothers  
48 and fathers (Van de Meerendonk & Scheepers, 2004). Thus, both heterosexual and same-sex  
49 couples who conceive using ARTs have to cope with the stress induced by social stigma

50 which may result in higher parenting stress and thus may affect the transition to parenthood  
51 and the quality of parenting (Bos, van Balen, & van den Boom, 2004) which in turn affect  
52 child functioning (e.g., Patterson, 1988). Understanding the experience of gay-father, lesbian-  
53 mother and heterosexual parents as they become parents is especially significant in light of  
54 the increasing numbers of couples using ARTs. The present research therefore focused on the  
55 transition to parenthood and on the quality of parenting in families conceived by means of  
56 ARTs: surrogacy in the gay-father families, insemination with donor sperm in the lesbian-  
57 mother families and in vitro fertilization (IVF) in the heterosexual-parent families.

58         Although the routes to parenthood might be different, becoming parent is a major life  
59 event for both heterosexual and same-sex individuals and all new parents have to cope with  
60 novel experiences. According to Belsky (1984), the transition to parenthood generates  
61 changes in the couple's relationship, with consequences for parenting quality, parent-child  
62 relationships, and children's psychological wellbeing. The arrival of the first baby also causes  
63 major changes in the couple's working life (Cappuccini & Cochrane, 2000; Mercer, 2004). In  
64 heterosexual couples, one of the greatest sources of conflict during the transition to  
65 parenthood is the division of household labor (Cowan & Cowan, 1992), especially regarding  
66 child care (Belsky & Pensky, 1988). New heterosexual parents often report increasingly sex-  
67 stereotyped roles and expectations, with mothers expected to assume primary responsibility  
68 for parenting and become the primary caregivers (McBride, Brown, Bost, Shin, & Vaughn,  
69 2005; Wall & Arnold, 2007). In same-sex couples, the assignment of parenting roles depends  
70 on other factors and tends to be more egalitarian (Farr & Patterson, 2013) with satisfaction  
71 regarding the division of household labor positively associated with relationship satisfaction  
72 (Tornello, Kruczkowski, & Patterson, 2015).

73         Research on the transition to parenthood has largely focused on heterosexual families  
74 with naturally conceived children. Studies have shown that pregnant women have more

75 negative feelings towards pregnancy and less positive feelings about parenthood than do men  
76 (Hildingsson & Thomas, 2014), and that both maternal and paternal satisfaction increases in  
77 the months following birth (Hudson, Elek, & Fleck, 2001). Concerning same-sex parents,  
78 research on the transition to parenthood has mainly investigated how couples make decisions  
79 about conception (Dempsey, 2013; Goldberg, 2006), their perceptions of social support  
80 (Bergman, Rubio, Green, & Padron, 2010) and their relationship quality (Goldberg & Sayer,  
81 2006). Little is known about parental feelings during pregnancy and feelings about parental  
82 roles after birth in parents using ARTs to conceive, although early caregiving patterns  
83 influence parents-infant interactions and in turn perceptions of pleasure and gratification  
84 associated with the parenting role (Hudson et al., 2001). For heterosexual parents, suffering  
85 induced by infertility can arouse negative feelings such as fear of miscarriage during  
86 pregnancy (Mathews & Mathews, 1986), and anxiety (McMahon, Ungerer, Beaurepaire,  
87 Tennant, & Saunders, 1997). Gay couples may be anxious about the fetus's and the  
88 surrogate's health (Kleinpeter, 2002) and may be concerned about the surrogate's pregnancy  
89 (Ziv & Freund-Eschar, 2015). Gay fathers thus might experience negative feeling during  
90 pregnancy especially during their first experience of overseas surrogacy. The current study  
91 therefore aimed to compare the parental feelings during pregnancy and early feelings about  
92 parental roles in same-sex parent families and heterosexual-parent families who conceived  
93 using ARTs.

94 Research on early experiences of parenthood has largely focused on heterosexual  
95 families. In a study of assisted reproduction families, IVF-mothers of 4-month-old infants felt  
96 less able to understand their infants' signals and to soothe them than natural-conception  
97 mothers (McMahon & Gibson, 2002) but were equally sensitive to their infants (Gibson,  
98 Ungerer, McMahon et al., 2000). For fathers, there were no differences between those with  
99 IVF- and naturally conceived children in perceptions of parenting competency. Although

100 studies of heterosexual families show ART parents and those who conceived spontaneously  
101 report similar levels of parental satisfaction (Gameiro et al., 2011), social stigma and the  
102 lower self-esteem related to infertility may adversely affect perceptions of parental  
103 competence (Gibson, Ungerer, Tennant et al., 2000). Early parenting by same-sex couples has  
104 not been studied but lesbian and heterosexual mothers with older children experience of  
105 parenthood similarly and report the same levels of parental competence and nurturing (for a  
106 review see Golombok & Tasker, 2015). Some studies of parenting by same-sex adoptive  
107 couples have found equivalent parenting skills in adoptive gay fathers and heterosexual  
108 fathers (Goldberg & Smith, 2009; Golombok et al., 2014), and no differences between  
109 children with gay and heterosexual adoptive parent in well-being and adjustment (Farr,  
110 Forssell, & Patterson, 2010). Moreover, no significant differences were found on children's  
111 well-being between gay fathers and heterosexual parent (Bos, Kuijper, & Gartrell, 2017).  
112 Studies of gay-father families formed through surrogacy show positive parenting outcomes  
113 (Baiocco et al., 2015), but gay fathers are exposed to stigma regarding their sexual identity  
114 (Goldberg, 2010) and it is widely believed that fathers are less nurturing than mothers (see  
115 Biblarz & Stacey, 2010). This may result in negative parenting experiences for gay fathers.  
116 The present study therefore was designed to compare the experiences of parenting during the  
117 first month after birth in gay-father families, lesbian-mother families, and heterosexual-parent  
118 families formed using ARTs.

119 In some early studies about quality of parenting, IVF-mothers seemed warmer and  
120 more emotionally involved than natural conception parents (for a review see Golombok &  
121 Tasker, 2015) but other researchers found no family-type differences in warmth (Gibson,  
122 Ungerer, McMahon et al., 2000) or parental involvement (Barnes et al., 2004). Studies of  
123 same-sex parents have shown that lesbian mothers were as warm and responsive as single  
124 heterosexual mothers (MacCallum & Golombok, 2004) or warmer than single heterosexual

125 mothers (Golombok, Tasker, & Murray, 1997), suggesting that lesbian mothers may give  
126 children a “double dose” of warmth (Biblarz & Stacey, 2010). Inconsistent findings have been  
127 reported concerning fathers. Bos (2010) found no differences between gay fathers and  
128 heterosexual fathers who conceived naturally in emotional involvement (i.e., expression of  
129 affection and enjoyment of parenthood) whereas Golombok et al. (2014) reported that gay  
130 adoptive fathers expressed more warmth than heterosexual parents and were similar to lesbian  
131 mothers. However, most studies have focused on parents with preschool age and school-age  
132 children. The first month’s post-partum may be a particularly relevant time to study early  
133 feelings about the parental role and the quality of parenting, as the new parents are actively  
134 forming relationships with their infants during this period (Loutzenhiser & Sevigny, 2008).  
135 Therefore, the present research, focusing on infant period, explored differences in parental  
136 warmth and involvement between first-time heterosexual parents and same-sex parents who  
137 conceived through ARTs.

### 138 *The Current Study*

139 The aim of the present study was to investigate the transition to parenthood by first-  
140 time parents with infants born using ARTs. We compared parental feelings during pregnancy,  
141 early feelings about parental roles, experiences of parenting and the quality of parenting in  
142 three types of families: gay-father families with infants born through surrogacy, lesbian-  
143 mother families with children born through insemination by sperm donation, and  
144 heterosexual-parent families who used IVF (without sperm or egg donation). Firstly, parents  
145 in all three types of families used ARTs which might cause social stigma and parenting stress  
146 which in turn might influence their feelings during pregnancy and early parenthood.  
147 Secondly, the gender composition of the parental dyads varied and these differences might  
148 influence how parents experience the transition to parenthood. Finally, being the primary or

149 secondary caregiver may also influence the way first-time parents experience parenthood and  
150 the parenting role (Deutsch, 2001) so this, too, was explored.

## 151 **Method**

### 152 *Recruitment of participants*

153 The participants in the present study were involved in an international research project  
154 on couples who became parents through assisted reproductive technologies. The project was  
155 carried out by collaborating researchers in France, The Netherlands, and The United Kingdom  
156 (UK). Ethical approval for the study was obtained from the relevant committees at each of the  
157 researchers' home institutions. In each country, participants were recruited through several  
158 sources, such as specialist lawyers with expertise in surrogacy (for the recruitment of gay  
159 fathers), lesbian and gay parenting support groups, infertility support groups (for the  
160 recruitment of heterosexual parents), fertility clinics (for the recruitment of lesbian and  
161 heterosexual parents), and online forums and magazines (for recruitment into all three  
162 groups). According to the inclusion criteria, all participants were couples who had used  
163 assisted reproductive techniques to conceive. Concerning methods of conception, gay-father  
164 families had to have used surrogate carriers with or without egg donation, lesbian-mother  
165 families had to have used anonymous sperm donors with one of the two mothers carrying the  
166 fetus, and heterosexual-parent families had to have used IVF without sperm or egg donation  
167 with mothers carrying the fetus. Additionally, all parents had to be primiparous; families with  
168 singletons or twins were included. Only families who provided active consent were allowed to  
169 participate in the project. One hundred and forty families participated in this international  
170 research project: 38 gay-father families, 61 lesbian-mother families, and 41 heterosexual-  
171 parent families. Both parents in all families were invited to participate in a project that  
172 included an audio-recorded standardized semi-structured interview, standardized  
173 questionnaires online, and video-recorded observations.

174 ***Participants in the current study***

175           The present paper presents results for families who took part in the interview. We thus  
176 excluded three families because the home visit could not be arranged (parents were not  
177 available), one family because only one parent was interviewed, and two more families  
178 because there were missing data. The study reported here thus involves 134 families: 35 gay-  
179 father families, 58 lesbian-mother families and 41 heterosexual-parent-families.

180           The parent who was most involved with the baby on a day-to-day basis was labeled as  
181 the primary caregiver and other parent was labeled as the secondary caregiver. To identify the  
182 primary and secondary caregivers in each family, 6 items on the “Who does what” instrument  
183 (Cowan & Cowan, 1990) were used. Both parents were asked who was responsible for their  
184 infant’s weekday care: (a) when getting up, during breakfast, and when dressing the infant, (b)  
185 during the day from 9.00 a.m. to 1.00 p.m., (c) during the day from 1.00 p.m. to 5.00 p.m., (d)  
186 when having dinner, during playtime, at bedtime, (e) in the evening until midnight, and (f)  
187 when the infant needed care in the middle of the night. Response options ranged from 1 (“*I do*  
188 *it all*”) to 9 (“*Partner does it all*”). The primary caregiver was therefore the parent with the  
189 lower average score on these six items. In eight families (5.71%) both parents had the same  
190 average score on the abovementioned six items and in 34 families (24.29%) one of the parents  
191 in a family unit had a missing value on one of the six items. Therefore, in these 42 families,  
192 the answer to the question “*During the past week, who spent most time with [name*  
193 *infant(s)]?*” (asked by the research assistant when arranging the home visit) was used to  
194 identify the primary caregiver.

195           Demographics characteristics for these 134 families are specified in Table 1. Nineteen  
196 (14%) had twins and 115 families (86%) had singleton. Gay couples were more likely to have  
197 twins (31%) than lesbian couples (5%) and heterosexual couples (12%) ( $\chi^2(2) = 12.56, p <$   
198  $.01$ ). About 44% of the infants were male and 56% female, with no difference between gay,



199 lesbian, and heterosexual couples ( $\chi^2(2) = 0.36, ns$ ). A two-way analysis of variance of  
200 parents' age with family type and caregiver role as independent variables revealed no  
201 significant effect for caregiver role,  $F(1, 257) = 0.64, p > .05$  and a significant effect for  
202 family type,  $F(2, 257) = 26.62, p < .001$ . A *Bonferroni post hoc* test revealed that gay fathers  
203 were older ( $M = 38.63, SD = 6.11$ ) than lesbian mothers ( $M = 33.16, SD = 4.05$ ) and  
204 heterosexual parents ( $M = 34.85, SD = 4.89$ ) ( $p_s < .001$ ). The interaction between caregiver  
205 role and family type was not significant,  $F(2, 257) = 2.60, p > .05$ . Parents had been in  
206 relationships between 2 and 16.5 years, with an average duration of 8.13 years ( $SD = 3.62$ ).  
207 Relationship duration differed by family type ( $F(2, 131) = 9.43, p < .001$ ); a *Bonferroni post*  
208 *hoc* test revealed that relationship duration was shorter for lesbian parents ( $M = 6.77, SD =$   
209  $2.77$ ) than for gay parents ( $M = 9.86, SD = 4.15$ ) and heterosexual parents ( $M = 8.13, SD =$   
210  $3.62$ ). There were also group differences in relationships status ( $\chi^2(2) = 7.88, p < .05$ ), with  
211 lesbian couples more likely to be married or in civil partnerships (91%) than gay couples  
212 (69%) or heterosexual couples (76%). Families lived in large (29%), medium (33%), or small-  
213 sized cities (33%), and 6% lived in rural settings. Residential location differed by family type  
214 ( $\chi^2(6) = 13.78, p < .05$ ) with more gay parents living in medium or large cities (77%) than  
215 lesbian parents (61%) and heterosexual parents (47%). There were no significant group  
216 differences in family income ( $\chi^2(4) = 7.06, ns$ ). Working status differed by family type for  
217 primary caregivers ( $\chi^2(4) = 11.61, p < .05$ ) with more lesbian mothers than gay parents and  
218 heterosexual parents having part-time jobs. Differences were also found for secondary  
219 caregivers ( $\chi^2(4) = 10.55, p < .05$ ) with fewer heterosexual parents having part-time jobs than  
220 gay parents and lesbian parents.

## 221 ***Procedure***

222 The families were assessed at home when their infants were 4 months old ( $\pm 14$  days),  
223 by one or two investigators trained in the study techniques. Infants' postnatal and corrected

224 age at the 4-month visit did not differ by family types. Before the home visit, the parents each  
225 completed online questionnaires (protected by unique passwords for each parent) on their  
226 demographics characteristics and on their infant's temperament. During the home visit, each  
227 parent participated in an audio-recorded standardized semi-structured interview. Data  
228 unrelated to the scope of this paper were also collected during the visit (each parent completed  
229 standardized questionnaires online and participated in three video-recorded observations).

### 230 *Measures*

231 Data regarding parental feelings during pregnancy, feelings about the parental role,  
232 and parental experiences of parenting, warmth and involvement were collected by means of  
233 an interview designed to measure the quality of the parenting. Responses to the relevant items  
234 might be influenced by the temperament of the infant, so we also asked the parents to  
235 complete a questionnaire about the infant's characteristics.

236 *Parent interview.* Each parent was interviewed separately using an adaptation of a  
237 standardized semi-structured interview designed by Quinton and Rutter (1988) to assess the  
238 quality of parenting, which had been successfully used in previous studies of non-traditional  
239 families (e.g. Golombok, Cook, Bish, & Murray, 1995; Golombok et al., 2017). In the current  
240 study, some questions were adapted to be suitable for parents with infants or were removed  
241 because the content was not relevant for parents of infants, and additional questions relating  
242 to the pregnancy were also asked. Thus, lengthy and detailed questioning was used to elicit  
243 information about the infants and the parents' responses, with reference to the parents'  
244 feelings about pregnancy, the parents' feeling about the parental role, the parents' feelings  
245 about the infant, relationships within the family unit, babysitting, and child care (e.g., "*How*  
246 *did you feel when you first found out the surrogate/you/your partner was pregnant?*"; "*How*  
247 *did you feel about having him/her/them home in the first few weeks after birth?*"; "*How do*  
248 *you feel about leaving him/her/them in the daycare?*"; "*How did you fell about the role of*

249 *looking after the baby, with the others roles you have in the family/work?").* Using a detailed  
250 and standardized coding criteria taking into account in-depth information obtained from the  
251 parents' responses as well as the assessment of nonverbal aspects of the parents' responses  
252 (Golombok et al., 1995; Golombok et al., 2017; Quinton and Rutter, 1988) researchers  
253 completed the rating described below.

254 The following variables were coded: (a) *feelings at the beginning of pregnancy*, rated  
255 on a 4-point scale from 0 (*high anxiety*) to 3 (*happy*), assessed the parent's feelings when they  
256 first found out about the pregnancy; (b) *feelings at the end of pregnancy*, rated on a 4-point  
257 scale ranging from 0 (*high anxiety*) to 3 (*happy*), evaluated the parent's feelings during and at  
258 the end of pregnancy; (c) *initial feelings about parental role*, rated on a 5-point scale from 0  
259 (*rejecting*) to 4 (*happy*), assessed feelings about being a parent during the first post-partum  
260 weeks; (d) *current feelings about parental role*, rated on a 5-point scale from 0 (*rejecting*) to  
261 4 (*happy*), assessed feelings about being a parent when the infant was 4 months old; (e)  
262 *perceived competence*, rated on a 4-point scale from 0 (*a lot of difficulties*) to 3 (*no*  
263 *difficulties*), evaluated the parent's sense of competence, the level of problems associated with  
264 parenting, and parental beliefs about other parent's experiences; (f) *enjoyment of parenthood*,  
265 rated on a 4-point scale ranging from 0 (*none*) to 3 (*a great deal*), measured expressed  
266 enjoyment as well as reservations about parenthood; (g) *expressed warmth*, rated on a 6-point  
267 scale from 0 (*none*) to 5 (*high*), evaluated the parent's tone of voice, facial expressions and  
268 gestures when talking about their infant, spontaneous expressions of warmth, sympathy, and  
269 concern about any difficulties experienced by the infant, as well as enthusiasm and interest in  
270 the infant as a person; and (h) *emotional over-involvement*, rated on a 4-point scale ranging  
271 from 0 (*little or none*) to 3 (*enmeshed*), measured the extent to which family life and the  
272 parent's emotions were centered on the baby, the extent to which the parent was  
273 overconcerned or overprotective regarding the child, and the extent to which the parent had

274 interests apart from those relating to the child. In order to calculate inter-rater reliabilities,  
275 20% of the interviews were coded by a second coder; intra-class correlation coefficients for  
276 these variables ranged from .76 to .96.

277 *Infant temperament.* The primary caregiver completed the Infant Characteristics  
278 Questionnaire (ICQ; English version: Bates, Freeland, & Lounsbury, 1979; French version:  
279 Bertrais, Larroque, Bouvier-Colle, & Kaminski, 1999; Dutch version: Kohnstamm, 1984), an  
280 instrument designed to measure parental perceptions of infant temperament. This instrument  
281 produces scores on Fussy/Difficult, Unadaptable, Dull, and Unpredictable subscales, with  
282 higher scores representing more difficult temperaments. For the current analyses, scores on  
283 the 7-item Fussy/Difficult subscale were combined to create the covariate used in the analyses  
284 reported below. Parents were asked to rate their infants' behavior (e.g., *How easy or difficult*  
285 *is it for you to calm or soothe your baby when he/she is upset?*) using a 7-point scale (1 =  
286 *easier behavior*; 7 = *most problematic behavior*), with higher scores representing more fussy  
287 temperament. The internal consistency coefficient for the Fussy/Difficult subscale was  
288 adequate ( $\alpha = .71$ ).

### 289 ***Statistical Analysis***

290 For descriptive analyses, Pearson correlations coefficients were calculated using the  
291 IBM Statistical Package for the Social Sciences (SPSS) Statistics 19 for Windows. To  
292 investigate the transition to parenthood by first-time parents with infants born using ARTs, we  
293 used multilevel modeling (with HLM 7.01, Raudenbush, Bryk, & Congdon, 2013), because  
294 parents (Level 1) were nested within couples (Level 2), and therefore we took into account the  
295 within-couple dependency on the outcome variable scores (Smith, Sayer, & Goldberg, 2013).  
296 At level 1, parents were distinguished by caregiver role, and at level 2, comparisons were  
297 made on all parents independently of caregiver role. In line with Belsky's (1984) model of the  
298 determinants of parenting, measures of parental characteristics (caregiver role and parent

299 gender), child characteristics (infant temperament, number of baby), and contextual factors  
300 (family type) were distinguished. At level 1, caregiver role and parent gender were entered as  
301 predictors. At Level 2, family type was entered as a predictor and both child temperament and  
302 the number of children (singleton versus twins) were entered as covariates. As family type  
303 was a categorical variable, a dummy variable was created. For each model, a first analysis  
304 was run with heterosexual parents as the reference category. Then, in order to test for the  
305 difference between gay parents and lesbian parents, a second analysis was run with lesbian  
306 parents as the reference category.

## 307 **Results**

### 308 *Descriptive statistics and correlations*

309 Descriptive statistics for measures based on gender, family type and caregiver role are  
310 presented in Table 2. Looking at mean levels of the studied variables across the total sample,  
311 parents reported high levels of positive feelings at the beginning of pregnancy ( $M = 2.39$ ,  $SD$   
312  $= 0.85$ ), moderately high levels of positive feelings at the end of pregnancy ( $M = 2.07$ ,  $SD =$   
313  $0.97$ ), moderately high levels of positive initial feelings about the parental role ( $M = 2.98$ ,  $SD$   
314  $= 0.99$ ), high levels of positive current feelings about the parental role ( $M = 3.38$ ,  $SD = 0.72$ ),  
315 high levels of perceived competence and enjoyment of parenthood (respectively  $M = 2.33$ ,  $SD$   
316  $= 0.64$ , and  $M = 2.55$ ,  $SD = 0.67$ ), moderately high levels of expressed warmth ( $M = 3.70$ ,  $SD$   
317  $= 1.26$ ), and low levels of emotional over-involvement with the child ( $M = 0.59$ ,  $SD = 0.80$ ).

318 Correlations among the studied variables are presented in Table 3. Correlational  
319 analyses revealed significant positive associations between feelings during pregnancy and  
320 feelings regarding parenthood during the first months after the baby's birth: the more feelings  
321 at the beginning of pregnancy were positive, the more positive feelings were at the end of  
322 pregnancy and the more positive were the initial feelings about parenthood. When parents  
323 reported positive feelings at the end of pregnancy, they were more likely to evaluate their

324 experiences of parenting and perceive competence positively. Moreover, there were  
325 significant correlations between feelings at the end of pregnancy and feelings towards the  
326 child: higher positive feelings at the end of pregnancy were associated with less emotional  
327 over-involvement with the child. Finally, all inter-correlations among initial positive feelings  
328 about parenthood, current positive feelings about parenthood, parental experiences and  
329 perceived competence, enjoyment of the child, and expressed warmth were positive and  
330 significant.

### 331 ***Multilevel modeling***

332 Table 4 presents results for the models with heterosexual families as the reference  
333 family type category. The analysis revealed that lesbian parents expressed more positive  
334 feelings at the beginning of pregnancy ( $M = 2.55, SD = 0.69$ ) than heterosexual parents ( $M =$   
335  $2.14, SD = 0.97$ ) ( $\beta = .52, SE = .18, p < .01$ ), with no significant difference between gay  
336 parents and heterosexual parents. Lesbian parents also expressed more positive feelings at the  
337 end of pregnancy ( $M = 2.34, SD = 0.79$ ) than heterosexual parents ( $M = 1.98, SD = 1.02$ ) ( $\beta =$   
338  $.51, SE = .19, p < .01$ ), and gay parents expressed less positive feelings at the end of pregnancy  
339 ( $M = 1.73, SD = 1.06$ ) than heterosexual parents ( $M = 1.98, SD = 1.02$ ) ( $\beta = -.44, SE = .22, p <$   
340  $.01$ ). The analysis with lesbian parents as the reference category for the family type variable  
341 also revealed that lesbian parents reported more positive feelings at the end of pregnancy ( $M$   
342  $= 2.34, SD = 0.79$ ) than gay parents ( $M = 1.73, SD = 1.06$ ) ( $\beta = -.95, SE = .26, p < .001$ ).  
343 Moreover, gay parents expressed more initially positive feelings about the parental role ( $M =$   
344  $3.27, SD = 0.74$ ) than heterosexual parents ( $M = 2.85, SD = 1.05$ ) ( $\beta = .37, SE = .18, p < .05$ ).

345 Caregiver role predicted emotional over-involvement, with primary caregivers  
346 reporting more emotional over-involvement ( $M = 0.72, SD = 0.87$ ) than secondary caregivers  
347 ( $M = 0.45, SD = 0.71$ ) ( $\beta = -.24, SE = .10, p < .05$ ). There were no caregiver role differences in  
348 feelings during pregnancy, feelings about the parental role, perceived competence, enjoyment

349 of parenthood and expressed warmth. There were also no gender of parent differences in  
350 feelings during pregnancy, feelings about the parental role, perceived competence, enjoyment  
351 of parenthood, expressed warmth and emotional over-involvement.

## 352 Discussion

353 This study explored the transition to parenthood and the quality of parenting in first-  
354 time parents who conceived using assisted reproductive technologies (ARTs) and revealed  
355 strikingly few differences between gay-father families, lesbian-mother families, and  
356 heterosexual-parent families. At the beginning of pregnancy, lesbian couples reported more  
357 positive feelings than heterosexual couples. At the end of pregnancy, lesbian couples reported  
358 more positive feelings than heterosexual and gay couples. Gay couples reported less positive  
359 feelings than heterosexual parents at the end of pregnancy but expressed more positive  
360 feelings about the parental role during the first post-partum weeks than heterosexual parents.  
361 In all types of families, primary caregivers were more likely to report greater emotional over-  
362 involvement than the secondary caregivers.

363 Feelings during pregnancy were related to feelings about the parenting role during the  
364 first four post-partum months. Parents who had more positive feelings during pregnancy  
365 reported experiencing higher levels of competence 4 months post-partum. Feelings  
366 concerning parenting during the first weeks at home were also associated with positive  
367 feelings about the parenting role at 4 months, as well as perceived competence, enjoyment of  
368 and warmth.

369 Differences between gay couples and the other couples at the end of the pregnancy  
370 may be explained by the fact that their pregnancies were experienced more remotely. Gay  
371 parents reported that, although they were frequently in contact with the surrogates, the fact  
372 that they were not physically present during the pregnancies generated “*fear about missing*  
373 *the baby’s birth*” or “*fear of administrative or legal difficulties that delayed them from coming*

374 *home with their baby*” which in turn made their feelings less positive. Gay couples choose  
375 surrogacy in order to ensure their biological relatedness and legal status but this generated  
376 anxiety during pregnancy which was sometimes exacerbated by legal obstacles (Ryan &  
377 Berkowitz, 2009).

378 By contrast, difficulties related to the infertility of heterosexual couples may explain  
379 differences between them and lesbian couples during pregnancy. The heterosexual parents  
380 had experienced infertility and had to use IVF, whereas the lesbian mothers chose ART as a  
381 way of becoming parents. Moreover, IVF is a more stressful procedure than donor  
382 insemination. Indeed, heterosexual parents indicated that conceiving children through IVF  
383 was an “*exhausting*” and “*stressful process*”. They also reported being anxious throughout the  
384 pregnancy, resulting in “*waiting to tell relatives and friends about the pregnancy*”, “*fear of*  
385 *having a miscarriage in the first trimester*” and “*being afraid that pregnancy would be*  
386 *terminated prematurely*”. Such feelings have also been reported in other studies exploring the  
387 emotional reactions of heterosexual parents who used IVF (Mathews & Mathews, 1986;  
388 McMahon et al., 1997).

389 The current findings with respect to feelings during pregnancy and those about the  
390 parental role are consistent with other reports that feelings during pregnancy are associated  
391 with feelings both in the perinatal period and into toddlerhood (e.g., de Cock et al., 2016).  
392 During pregnancy, more positive feelings are related to better prenatal health practices and  
393 measures of the children’s well-being (Lindgren, 2001; Van den Bergh & Simons, 2009).  
394 Positive parental evaluations of their capacities and competence affect their motivation,  
395 satisfaction, and behaviors (Hudson et al., 2001). The current study was the first to document  
396 these associations on the part of parents who conceived using ARTs.

397 The few differences between gay parents’ and heterosexual parents’ feelings about  
398 parental roles during the first post-partum weeks could be explained by the gender



399 composition of the parents. In heterosexual families, the mothers experienced pregnancies and  
400 deliveries which may have affected their feelings during the first post-partum weeks. Some  
401 heterosexual mothers described that the first-weeks as “*difficult*” because the delivery had  
402 sapped their health and energy and others reported difficulties initiating breastfeeding. Such  
403 pain and tiredness have been associated with reduced satisfaction in other research (Bell et al.,  
404 2008; Indraccolo, Bracalente, Di Iorio, & Indraccolo, 2012). Moreover, new heterosexual  
405 fathers sometimes feel helpless and anxious, while perceiving mothers as more experienced  
406 and naturally equipped to provide childcare (Kowlessar, Fox, & Wittowski, 2015). In gay-  
407 father families, by contrast, both parents are men, so neither can experience possible  
408 difficulties caused by delivery or breastfeeding. Instead, participants described their  
409 experiences in egalitarian terms. Gay parents generally appeared to share in domestic and  
410 childcare tasks and to have similar levels of parental involvement (Fossoul, D’Amore,  
411 Miscioscia, & Scali, 2013) whereas in heterosexual families, mothers usually spend more  
412 time in childcare than fathers do. Feelings about parental roles did not differ between  
413 heterosexual parents and lesbian mothers because such pain and tiredness are also probably  
414 true for lesbian mothers. In addition, lesbian mothers’ and gay fathers’ feelings about parental  
415 roles did not differ, probably because both gay fathers and lesbian mothers are more likely to  
416 share childcare and domestic tasks (Gartrell & Bos, 2010).

417         Regardless of family type, primary caregivers reported that their lives were more  
418 centered on childcare and they were more likely to be concerned and protective and have  
419 fewer interests apart from the baby than secondary caregivers, some of whom were engaged  
420 in work outside of home. Nevertheless, the emotional over-involvement scores of the two  
421 groups of caregiver were low, indicating appropriate levels of involvement in both groups

422         Overall, the parents’ quality of parenting, their feelings about parenting, their  
423 perceived competence, and their enjoyment of parenthood, generally did not vary depending

424 on family type or parental gender. Previous studies have also reported similarities with respect  
425 to parenting experiences, parental competence, warmth and responsiveness between same-sex  
426 parents and heterosexual parents (Bos et al., 2004; MacCallum & Golombok, 2004). When  
427 differences have been found, they showed better outcomes for families who had used ARTs  
428 (Golombok & Tasker, 2015; Van Balen, 1996). In the current study, gay fathers conceiving  
429 through surrogacy, lesbian mothers conceiving through donor insemination, and heterosexual  
430 parents conceiving through IVF were equivalently warm, experienced as much pleasure with  
431 and enjoyment of their babies, reported similar levels of competence, and were equivalently  
432 involved.

433 A limitation of the study was the size of the samples. It was not possible, thus, to  
434 explore differences between the parents' feelings during pregnancy and early childhood or the  
435 parents' quality of parenting in the three countries where they lived. Future studies with larger  
436 samples are needed since the legal and cultural contexts in the U.K., France, and the  
437 Netherlands differ quite substantially. Moreover, because all the participants had experienced  
438 planned pregnancies and had moderate to superior incomes, the findings cannot be  
439 generalized more widely. Another limitation could be that participants were asked to describe  
440 their feelings retrospectively; this might have reduced the validity of our findings regarding  
441 the parents' feelings during pregnancy and its association with feelings about parental role at  
442 first weeks. However, the ratings were made taking into account very detailed information  
443 obtained during the interviews as in previous studies using this procedure (e.g., Golombok et  
444 al., 2014). A further limitation was that the poles on the feeling scales ("high anxiety" vs  
445 "happy") might seem not to assess the same construct. It can be assumed, however, that these  
446 are contrasting emotions and detailed coding criteria were used. It might be interesting,  
447 however, to use two distinct scales, one ranging from "unhappy to "happy" and another from  
448 "high anxiety" to "low anxiety" in a future study.

449 Notwithstanding these limitations, the findings make clear that, regardless of sexual  
450 orientation, parents who conceive using ARTs described similar feelings and experiences of  
451 parenthood during the first months of parenthood and expressed as much as warmth and  
452 involvement, although there were small differences between the heterosexual parents and  
453 parents in the other types of families on some dimensions. Therefore, our findings may have  
454 implications for the development of policy and legislation regarding ARTs procedure in the  
455 countries we studied, especially in relation to the laws that prevent same-sex couples from  
456 realizing their wish to become parents and by improving the access to IVF procedure for  
457 heterosexual couples.

458 Further longitudinal research is needed to explore the stability and change in feelings  
459 about parental roles and the quality of parenting, and the mechanisms by which such  
460 trajectories are shaped. Indeed, research on families formed through ARTs advances our  
461 understanding of the psychological consequences for children conceived by surrogacy, sperm  
462 donation and IVF procedure. In particular, the quality of the relationships between parents  
463 conceiving through ARTs and their children, and the impact on child development and secure  
464 attachment should be examined.

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