

Adolescents of the US National Longitudinal Lesbian Family Study: the impact of having a known or an unknown donor on the stability of psychological adjustment

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Submitted on October 23, 2010; resubmitted on November 15, 2010; accepted on November 23, 2010

BACKGROUND: The current study is based on the US National Longitudinal Lesbian Family Study (NLLFS), which was designed to document the development of the first generation of lesbian families with children conceived through donor insemination. Data were collected in five waves, first at insemination or during pregnancy, and subsequently when the index children were 2, 5, 10 and 17 years old. The study is ongoing, with a 93% retention rate to date. The purpose of the current investigation was to assess changes in psychological adjustment of the index offspring between the time that they were 10 and 17 years old (T4 and T5) and to examine the effects of having a known or an as-yet-unknown donor.

METHODS: The total T5 sample consisted of 78 adolescents. The mothers in 74 families completed a Child Behaviour Checklist (CBCL) on their offspring at both T4 and T5: 26 of these offspring had been conceived through known sperm donors and 48 through unknown donors. Changes in psychological adjustment were assessed through computations of stability coefficients between T4 and T5 on all CBCL subscales, and by means of a general linear model (GLM).

RESULTS: On 10 out of 11 CBCL subscales, the stability coefficients were not significantly different for adolescents with known and unknown donors. Findings from the GLM showed that no main effect for donor type was found; for offspring in both donor groups thought problems and rule-breaking behaviour were higher and scores on social problems and aggressive behaviour were lower at T5 than T4.

CONCLUSIONS: The development of psychological well-being in the offspring of lesbian mothers over a 7-year period from childhood through adolescence is the same for those who were conceived through known and unknown donors.

Key words: sperm donation / anonymity / psychological adjustment / lesbian families / adolescence

Introduction

One of the major decisions that lesbian women face in the process of becoming a parent is whether to inseminate using the sperm of a known donor (e.g. an acquaintance, friend or relative) or an unknown donor (Gartrell *et al.*, 1996). In the USA, many fertility clinics offer the option of using the sperm of a permanently anonymous donor or that of a donor who may be met by the offspring when she or he reaches the age of 18 (identity-release donor) (Scheib *et al.*, 2005). In the research literature, permanently

unknown and identity-release donors of offspring younger than 18 years old are termed 'as-yet-unknown donors' (Bos and Hakvoort, 2007). Although there is considerable debate about the potential impact of these donor types on children's psychological adjustment (Hunfeld *et al.*, 2004; Dempsey, 2008; Gerrits, 2008; Lawrence *et al.*, 2010), insufficient data are available to guide lesbian women in choosing a donor, and to inform them of the long-term associations between donor selection and the well-being of offspring.

The three most commonly cited reasons why lesbians prefer unknown donors (permanently anonymous or identity release) are

as follows: they want to raise their children without interference from a third party; they want the family unit to have a clear delineation and legal definition (Haimes and Weiner, 2000; Goldberg, 2006; Kranz and Daniluk, 2006); or they do not want the comother's parenting status to be threatened by the presence of a known donor (Ben-Ari and Livni, 2006; Goldberg, 2006). Lesbians who select known donors typically do so because: (i) they believe that children have the right to know their genetic origins and/or to form relationships with their donors early in life; and (ii) they worry that children conceived by unknown donors might experience psychological and identity problems during adolescence or later in life (Baetens et al., 1996; Baetens and Brewaeys, 2001; Almack, 2006; Goldberg, 2010).

Vanfraussen et al. (2002, 2003a,b) assessed the experiences of children (mean age 10 years) whose lesbian mothers had chosen unknown donors. Nearly 50% of the children in this survey wanted to have more information about their donors and were especially curious about their donors' physical features and personalities. Children who wished to know more about their donors did not differ in self-esteem or emotional and behavioural functioning from their counterparts who did not share this curiosity.

Scheib et al. (2005) conducted a study among 12- to 17-year olds who were growing up in lesbian families ($n = 12$), single-mother families ($n = 11$) and heterosexual families ($n = 6$) and had been conceived through identity-release donors. Of the 12 participating adolescents who were growing up in lesbian families, 7 said that they planned to seek information about their donors when they were age-eligible; however, this percentage (69%) was not significantly higher or lower than the percentage of the children of the single mothers or heterosexual couples who reported the same. The most-mentioned areas of interest concerned the donor's character, family and appearance; again, no significant differences were found between the three above-mentioned groups (Scheib et al., 2005).

Longitudinal studies are needed in order to examine the developmental impact of donor type on the well-being of offspring. One of the initial longitudinal studies of children raised in lesbian families from birth and conceived through donor insemination (DI) was carried out in the UK, with data collection when the offspring were 6 (Golombok et al., 1997), 12 (MacCallum and Golombok, 2004) and 19 years old (Golombok and Badger, 2010). At 6 years of age, the 30 offspring of lesbian mothers perceived themselves to be less cognitively and physically competent than their 41 counterparts in heterosexual two-parent families (with naturally conceived children) (Golombok et al., 1997). At the age of 12, there were no significant differences in social and emotional development between the 25 children in the lesbian families and the 38 in the two-parent heterosexual families that were still participating in the follow-up (MacCallum and Golombok, 2004). However, at the age of 19, the 20 young adults with lesbian mothers who were still involved in the study demonstrated lower levels of anxiety, depression, hostility and problematic alcohol use and higher levels of self-esteem compared with those ($n = 36$) reared in traditional father–mother families (Golombok and Badger, 2010). None of the reports on this longitudinal cohort contained an assessment of differences in psychological adjustment based on donor types.

The National Longitudinal Lesbian Family Study (NLLFS) also has a longitudinal design. It was initiated in 1986 for the purpose of

describing the development of the first generation of lesbian families with DI children in the USA. The NLLFS is the longest-running and largest prospective investigation of lesbian mothers and their children. Data were collected in five waves, namely during insemination or pregnancy (T1) and when the children were 2 (T2), 5 (T3), 10 (T4) and 17 years old (T5). The families will be interviewed again when the offspring are 25 years old.

At the time the NLLFS mothers were pregnant or inseminating (T1), donor preferences were almost equally divided between known donors and unknown donors (permanently anonymous and identity release). Half of the prospective mothers were concerned that DI in itself might one day be problematic for their offspring, especially if the donor was permanently unknown (Gartrell et al., 1996). When the NLLFS offspring were 10 and 17 years old, the maternal report of the Child Behaviour Checklist (CBCL) was used to assess psychological adjustment, and the NLLFS data were compared with the normative scores from age-matched groups (Achenbach, 1991; Achenbach and Rescorla, 2001; see also Gartrell et al., 2005; Gartrell and Bos, 2010). At T4, no differences were found on the internalizing and total problem scores between the NLLFS children and the normative sample. The 10-year-old NLLFS children differed significantly from the normative sample on only one measure: the mean for girls on the externalizing behaviour scale was significantly lower than for normative sample girls (Gartrell et al., 2005). At T5, the NLLFS adolescents demonstrated significantly higher scores on social, school/academic and total competence, and significantly lower scores on social problems, rule-breaking, aggressive and externalizing problem behaviour than their age-matched counterparts in Achenbach's normative sample of American youth (Gartrell and Bos, 2010). The NLLFS findings at T4 and T5 suggest that the offspring in this longitudinal study are demonstrating greater psychological well-being as they mature. However, diversity in the stability of psychological adjustment within the NLLFS sample has not been assessed, particularly in relation to donor type. Adoption studies have shown that youths are curious about their genetic origins especially during the vulnerable period of adolescence (Tiemann et al., 2008). Some have theorized that the absence of information about one's donor may affect adolescent identity and psychological development (Baran and Pannor, 1993; Landau, 1998; Turner and Coyle, 2000).

The aim of the present study was to examine the influence of having a known or an as-yet-unknown donor on the psychological adjustment of 17-year-old adolescents in planned lesbian families. Because the CBCL was used when the NLLFS offspring were 10 and 17 years old, it was possible to explore the effect of donor type from a developmental perspective. First, we examined whether there are differences in the T4 and T5 CBCL scores for NLLFS adolescents conceived by known and by as-yet-unknown donors. As in other developmental studies on adolescent well-being or problem behaviour, we made a distinction between relative stability (consistency of an individual's rank order within a group) and absolute stability (constancy in the absolute level of well-being or problem behaviour over time). In the current investigation, we assessed the relative and absolute stability in the children's psychological adjustment between T4 and T5, and whether there were differences or similarities between offspring with known donors and those with as-yet-unknown donors.

Materials and Methods

The Institutional Review Board of the California Pacific Medical Center approved the NLLFS study design. Data gathering for the current report was completed in May 2009.

Participants

The NLLFS has been following 84 planned lesbian families since the mothers were inseminating or pregnant with the index offspring. Between 1986 and 1992, prospective lesbian mothers were recruited via announcements distributed at lesbian events, in women's bookstores and in lesbian newspapers throughout metropolitan Boston, San Francisco and Washington, DC, USA. At T5, when the index offspring were 17 years old, 78 (93% retention) of the families were still participating in this ongoing study. One family was excluded from the T5 analyses because they had not returned all parts of their T5 survey instruments. The total T5 sample therefore consisted of 77 families and 78 adolescents (including one set of twins). The T5 families are predominantly middle class, Caucasian and Jewish or Christian. The family constellations consisted of 31 continuously coupled, 40 separated-mother and 6 single-mother families. A detailed description of the NLLFS T5 demographics is provided in earlier reports (Gartrell and Bos, 2010; Gartrell *et al.*, 2010; Bos and Gartrell, *in press*).

Procedure

At each time interval, informed consent was obtained from the mothers before they were interviewed and given questionnaires to complete. At T5, each mother gave consent to her and her 17-year-old child's participation. The child was then contacted, and she or he gave consent before completing an online questionnaire.

Measures

Donor type

At T2, each birth mother was asked to specify how her child was conceived (i.e. by using a known or an unknown donor). If the donor was unknown, the birth mother was asked to indicate whether the donor was permanently unknown or whether her child had the option of meeting the donor when he or she reached the age of 18 (Gartrell *et al.*, 1999). At T5, the 17-year-old offspring were asked, 'If your donor is unknown, how do you feel about not knowing your donor?' (possible answers: 0 = regret, 1 = no opinion about this, 2 = don't care). The NLLFS adolescents with potentially knowable donors were asked at T5 whether they planned to contact their donors when they reached the age of 18 (possible answers: 0 = no, 1 = yes, 2 = don't know).

Adolescent psychological adjustment

Behavioural problems, assessed by means of the CBCL, were used as indices of psychological adjustment in the NLLFS offspring (Achenbach, 1991; Achenbach and Rescorla, 2001). When the NLLFS offspring were 10 years old (T4), their mothers were asked to complete a CBCL, rating the index children's behaviour during the previous 6 months by checking '0 = not true', '1 = somewhat or sometimes true' or '2 = very true or often true' (Achenbach, 1991). When the NLLFS offspring were 17 years old (T5), the mothers were again asked to assess their children's behaviour on the CBCL. The current report is based on CBCLs completed by one mother per family. In most cases ($n = 69$), this was the birth mother. If the birth mother was not available (e.g. because she was too busy), a CBCL completed by the comother was used.

The CBCL is known for its validity, reliability, internal consistency and factor structure (Achenbach, 1991; Achenbach and Rescorla, 2001).

It consists of 113 problem behaviour items. The parent's scores on these items were tabulated so that the adolescent's problem behaviour could be rated on eight syndrome scales: (1) anxious/depression (e.g. 'too fearful or anxious'; Cronbach's α : T4 = 0.81; T5 = 0.84), (2) withdrawn (e.g. 'too shy or timid'; Cronbach's α : T4 = 0.68; T5 = 0.72), (3) somatic complaints (e.g. 'stomach aches'; Cronbach's α : T4 = 0.70; T5 = 0.73), (4) social problems (e.g. 'gets teased a lot'; Cronbach's α : T4 = 0.73; T5 = 0.38), (5) thought problems (e.g. 'can't get his/her mind off certain thoughts'; Cronbach's α : T4 = 0.68; T5 = 0.64), (6) attention problems (e.g. daydreams or gets lost in his/her thoughts'; Cronbach's α : T4 = 0.62; T5 = 0.83), (7) rule-breaking behaviour (e.g. 'skips school'; Cronbach's α : T4 = 0.51; T5 = 0.81) and (8) aggressive behaviour (e.g. 'gets in many fights'; Cronbach's α : T4 = 0.83; T5 = 0.86). As a group, the syndrome scales anxious/depression, withdrawn and somatic complaints constitute a broad-band scale known as 'internalizing problem behaviour' (Cronbach's α : T4 = 0.91; T5 = 0.92). Likewise, the subscales rule-breaking behaviour and aggressive behaviour constitute a broad-band scale identified as 'externalizing problem behaviour' (Cronbach's α : T4 = 0.80; T5 = 0.90). The 113 items contribute to the total problem behaviour score (Cronbach's α : T4 = 0.94; T5 = 0.95).

Achenbach and Rescorla (2001) have developed a technique to discriminate between normal and deviant scores on the CBCL. Following the procedure of the CBCL manual (Achenbach, 1991; Achenbach and Rescorla, 2001), the T values for internalizing and externalizing problem behaviour were used to determine which fell within the deviant or normal ranges. Deviant scores are defined by Achenbach and Rescorla (2001) as greater than or equal to the 93rd percentile ($T \geq 65$) in the combined borderline and clinical ranges.

Statistical analyses

A complete CBCL at both T4 and T5 was obtained on 74 index offspring (38 girls and 36 boys). These provided the data for the current longitudinal analyses. The 74 offspring for whom CBCL scores were obtained at both time intervals did not differ significantly from the total sample on social demographic variables.

To assess whether there were differences in the T4 and T5 CBCL scores for NLLFS girls and boys, and for those conceived by known or unknown donors, for both T4 and T5, a 2 (gender: 0 = girl, 1 = boy) \times 2 (donor type: 0 = known donor, 1 = as-yet-unknown donor) multivariate analysis of variance (MANOVA) was conducted. In both MANOVAs, CBCL syndrome scales (anxious/depression, withdrawn, somatic complaints, social problems, thought problems, attention problems, rule-breaking behaviour, aggressive behaviour) and internalizing, externalizing and total problem behaviour were entered as dependent variables.

Stability coefficients between the T4 and T5 syndrome and broad-band scale scores were calculated by Pearson's correlation coefficients. By computing these stability coefficients, it was possible to determine to what extent NLLFS offspring preserved their rank orders, regardless of changes in the group scores. In the literature, this analysis has been used to assess relative stability in CBCL scores (Verhulst and Van der Ende, 1992; Verhulst and Wattum, 1993; Reitz *et al.*, 2005). Stability coefficients were conducted for known and as-yet-unknown donors separately. Fisher's Z -transformations were used to determine differences in donor type for the stability coefficients.

To assess changes between T4 and T5 on mean scores of the CBCLs and to identify differences in the absolute stability of psychological adjustment vis-à-vis donor type, a repeated measures model (general linear model, GLM) with one within-factor (time: 0 = T4, 1 = T5) and one between-factor (donor type: 0 = known donor, 1 = as-yet-unknown

donor) was used (Verhulst and Van der Ende, 1992; Verhulst and Watum, 1993; Reitz et al., 2005).

Finally, the developmental pathways from T4 to T5 were explored for those NLLFS offspring who at either time interval scored within the deviant range on internalizing and externalizing problem behaviour, separately for unknown and as-yet-unknown donors. First, the NLLFS offspring were divided into four groups, representing the four possible developmental pathways, namely (i) those who scored in the deviant range at both T4 and T5; (ii) those who scored in the deviant range at T4 and in the normal range at T5; (iii) those who scored in the normal range at T4 and in the deviant range at T5; and (iv) those who scored in the normal range at both assessments (T4 and T5). This procedure was followed for any offspring who scored in the deviant range on either internalizing or externalizing problems. Secondly, a χ^2 test was used to compare the percentages of offspring in these four groups who had been conceived through known donors with the percentages of those with as-yet-unknown donors, for internalizing and externalizing problems separately.

Results

Donor type

Of the 74 NLLFS offspring who were used for current longitudinal analyses, 26 (35.1%) were conceived using known sperm donors and 48 (64.9%) using unknown donors. Of those conceived by unknown donors, 18 (37.5%) have the option of meeting their donors when they reach the age of 18, whereas for the remaining 30 (62.5%) adolescents, their donors will remain permanently unknown. As to their feelings as adolescents about having as-yet-unknown donors, 19 of the 48 (39.6%) indicated at T5 that they did not care that their donor was unknown, 11 (22.9%) said that they regretted not knowing their donor and 18 (37.5%) had no opinion about this issue. Of the 18 adolescents who have the option of meeting their donors when they turn 18, 12 reported that they plan to contact their donors, 4 said that they would not and 2 were uncertain.

Psychological adjustment at T4 and T5

For T4 and T5, no main effects were found for gender [T4: Wilks's $\lambda = 0.86$, $F(10,74) = 0.99$, $P > 0.05$, T5: Wilks's $\lambda = 0.88$, $F(10,74) = 0.87$, $P > 0.05$] or donor type [T4: Wilks's $\lambda = 0.82$, $F(10,74) = 1.36$, $P > 0.05$, T5: Wilks's $\lambda = 0.84$, $F(10,74) = 1.18$, $P > 0.05$]. The interactions of gender \times donor type for T4 and T5 were also not significant, Wilks's $\lambda = 0.92$, $F(10,74) = 0.54$, $P > 0.05$ (T4) and Wilks's $\lambda = 0.81$, $F(10,74) = 1.47$, $P > 0.05$.

Relative and absolute stability of psychological adjustment between T4 and T5

To analyse the relative and absolute stability in psychological adjustment between T4 and T5 and the role of having known versus as-yet-unknown donors, the NLLFS adolescent girls and boys were combined since no significant gender differences at T4 and T5 were found.

Relative stability

The relative stability of the CBCL syndrome and broad-band scales between T4 and T5 was assessed through Pearson's r correlations computed separately for NLLFS offspring with known and unknown donors. These stability coefficients are shown in Table I.

Table I Stability coefficients between T4 and T5, separately for each problem behaviour scale (based on CBCL maternal reports) for NLLFS offspring with known and as-yet-unknown^a donors.

	Known donors (n = 26)	As-yet-unknown ^a donors (n = 48)
Syndrome scales		
Anxious/depression	0.45***	0.28*
Withdrawn	0.46*	0.28*
Somatic complaints	0.57**	0.08
Social problems	0.32	0.03
Thought problems	0.48*	0.13
Attention problems	0.60***	0.39**
Rule-breaking behaviour	0.23	0.25
Aggressive behaviour	0.44*	0.26
Broad-band scales		
Internalizing	0.44*	0.26
Externalizing	0.46*	0.35*
Total problem behaviour	0.54***	0.40**

^aAs-yet-unknown' includes permanently unknown donors, and donors who may be contacted when the offspring reach the age of 18.

* $P < 0.05$.

** $P < 0.01$.

*** $P < 0.001$.

For offspring with known donors, the coefficients ranged from 0.23 to 0.60. According to Cohen's criteria (Cohen, 1977), all but three of these coefficients can be regarded as medium (between 0.30 and 0.50); the remaining three are considered large (> 0.50). Attention problems showed the highest stability coefficient ($r = 0.60$). As shown in Table I, for offspring with as-yet-unknown donors, the coefficients range from 0.03 to 0.40; according to Cohen's criteria (Cohen, 1977), three coefficients can be regarded as medium (between 0.30 and 0.50), and the remainder are either small (between 0.10 and 0.30) or very small (lower than 0.10). Also for the offspring with as-yet-unknown donors, attention problems showed the highest stability coefficient ($r = 0.39$).

Fisher's Z -transformations were used to test whether there were donor type differences in stability coefficients. The stability for NLLFS offspring with as-yet-unknown donors on somatic complaints was significantly lower than for those with known donors ($Z = -2.21$, $P < 0.05$).

Absolute stability

Consistency among NLLFS offspring in their absolute levels of anxious/depression, withdrawn behaviour, somatic complaints, social problems, thought problems, attention problems, rule-breaking behaviour, aggressive behaviour, and internalizing, externalizing and total problem behaviour over time in conjunction with donor type was measured with a repeated measures model (GLM) with one within-factor (time) and one-between factor (donor type). Means and standard deviations for time and donor type and significant differences are reported in Table II.

Table II Means and standard deviations of problem behaviours (based on CBCL maternal reports) at age 10 (T4) and 17 (T5) for NLLFS offspring with known versus as-yet-unknown^a donors.

	T4						T5						Time	P-value
	Donor status						Donor status							
	Total group		Known		As-yet-unknown		Total group		Known		As-yet-unknown			
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD		
Anxious/depression	3.30	3.23	3.22	2.86	3.35	3.44	2.99	3.26	2.86	2.95	3.06	3.45	0.35	0.554
Withdrawn	1.54	1.82	1.70	2.22	1.45	1.58	1.83	2.04	1.89	1.79	1.80	2.19	0.68	0.411
Somatic complaints	1.09	1.64	0.89	1.48	1.20	1.73	0.95	1.78	1.04	1.90	0.90	1.73	0.07	0.786
Social problems	1.80	2.20	1.70	2.27	1.86	2.18	0.86	1.15	0.71	0.98	0.66	1.24	13.70	0.001
Thought problems	0.50	0.87	0.81	1.15	0.33	0.63	1.24	1.90	1.61	2.15	1.04	1.74	9.24	0.003
Attention problems	2.64	2.82	3.11	3.25	2.39	2.56	2.68	3.01	3.11	3.41	2.44	2.76	0.01	0.961
Rule-breaking behaviour	0.80	1.17	0.78	1.10	0.85	1.29	1.86	2.72	1.61	2.28	2.00	2.96	7.75	0.006
Aggressive behaviour	5.75	4.81	5.48	5.27	5.90	4.59	2.58	3.50	2.32	3.52	2.72	3.51	19.93	0.001
Internalizing	5.75	5.38	5.74	5.22	5.76	5.53	5.77	6.17	5.79	5.36	5.76	6.63	0.01	0.980
Externalizing	6.55	5.52	6.33	6.00	6.67	5.31	4.45	5.62	3.93	5.33	4.74	5.81	5.30	0.023
Total problems	21.11	17.27	21.70	19.01	20.78	16.42	16.58	15.72	16.71	15.96	16.50	15.74	2.75	0.009

High scores reflect poor psychological adjustment.

^a'As-yet-unknown' includes permanently unknown donors, and donors who may be contacted when the offspring reach the age of 18.

Table III Distribution by longitudinal changes in problem behaviour and donor status.

	Known donor	As-yet-unknown donor ^a	Total group	Known donor versus as-yet-unknown donor	
	n (%)	n (%)	n (%)	χ^2	P-value
Internalizing problem behaviour					
Deviant T4 → deviant T5	1 (03.8)	1 (02.1)	2 (02.7)	1.48	0.686
Deviant T4 → normal T5	1 (03.8)	5 (10.4)	6 (08.1)		
Normal T4 → deviant T5 ^a	2 (07.7)	2 (04.2)	4 (05.4)		
Normal T4 → normal T5	22 (84.6)	40 (83.3)	62 (83.8)		
Externalizing problem behaviour				0.01	0.995
Deviant T4 → deviant T5	0 (0.0)	0 (0.0)	0 (0.0)		
Deviant T4 → normal T5	1 (03.8)	2 (04.2)	3 (04.1)		
Normal T4 → deviant T5 ^a	1 (03.8)	2 (04.2)	3 (04.1)		
Normal T4 → normal T5	24 (92.3)	44 (91.7)	68 (91.9)		

^a'As-yet-unknown' includes permanently unknown donors, and donors who may be contacted when the offspring reach the age of 18.

The results demonstrate main effects for time [Wilks's $\lambda = 0.60$, $F(11,140) = 8.36$, $P < 0.001$] but not for donor type [Wilks's $\lambda = 0.89$, $F(11,140) = 1.60$, $P > 0.05$] or for the interaction between time and donor type [Wilks's $\lambda = 0.94$, $F(11,140) = 0.75$, $P > 0.05$]. As shown in Table III, for social problems, thought problems, rule-breaking behaviour, aggressive behaviour, externalizing problem behaviours and total problem behaviour, significant differences were found in the scores between T4 and T5. Scores on thought problems and rule-breaking behaviour were higher at T5 than T4. Scores on social problems and aggressive behaviour were lower at T5 than T4. Compared with T4, the T5 scores on externalizing behaviour and total problems were also lower.

Developmental pathways between T4 and T5

As shown in Table III, the majority of the NLLFS offspring scored within the normal range at T4 and T5 on internalizing and externalizing problem behaviour. Only 5.4% (internalizing problem behaviour) and 4.1% (externalizing problem behaviour) of NLLFS offspring had scores that changed across the 7-year time interval between T4 and T5 from normal to deviant range. No significant differences were found between offspring with known and as-yet-unknown donors in the developmental pathways on internalizing ($\chi^2 = 1.48$, $df = 3$, $P > 0.05$) or externalizing problem behaviour ($\chi^2 = 0.01$, $df = 2$, $P > 0.05$). Only one offspring moved from normal at T4 to deviant at T5 in both internalizing and externalizing problem behaviour; this

offspring had a known donor. Six offspring moved from normal at T4 to deviant at T5 in internalizing or externalizing problem behaviour.

Discussion

This study focused on the 7-year stability of the psychological adjustment of offspring in planned lesbian families of the NLLFS. To our knowledge, it is the first to have analysed from a longitudinal perspective CBCL results from a sample of adolescents in lesbian families (Bos and Van Balen, *in press*). Our primary aim was to examine changes in the psychological well-being of NLLFS offspring between T4 and T5, when they were 10 and 17 years old, respectively. We were especially interested in whether stability in psychological adjustment was related to donor status.

At T4 (when the NLLFS offspring were 10 years old) and at T5 (when they were 17 years old), no significant differences were found between those who were conceived by a known donor or an as-yet-unknown donor on the syndrome and broad-band scales of the CBCL. These findings suggest that donor type was not associated with the psychological well-being of NLLFS offspring during childhood or adolescence. Scheib *et al.* (2005) found in their study of adolescents conceived by identity-release donors and raised in lesbian families, single-mother families (solo mothers by choice) and heterosexual father–mother families that the adolescents were especially likely to ask such questions as ‘What’s he like?’, ‘What does he look like?’, ‘What’s his family like?’ and ‘Is he like me?’. The offspring in Scheib’s three groups did not significantly differ on the questions they wanted to ask their donors. In the present study, nearly 23% of the NLLFS adolescents with as-yet-unknown donors stated that they wished they knew their donors, and 67% of those who have the option when they turn 18 to meet their donors plan to do so. The NLLFS adolescents were not asked why they intended to contact their donors nor what they hoped to experience in meeting them. At the next NLLFS follow-up (T6, when the offspring are 25 years old), each offspring with an identity-release donor will be asked if she/he has contacted the donor, the reasons behind the choice to do so or not and, if a meeting with the donor took place, to describe the meeting and any subsequent contact the offspring has had with the donor.

In the current investigation, we also assessed the relative stability (consistency of an individual’s rank order within a group) and absolute stability (constancy in the absolute level of well-being or problem behaviour over time) in the psychological adjustment of the offspring between T4 and T5, and whether there were differences or similarities in the relative and absolute stabilities between offspring with known donors and those with as-yet-unknown donors. The stability coefficients, *i.e.* the likelihood of a correlation between problem behaviour ratings at T4 and T5, were relatively low for those with known and as-yet-unknown donors. The stability of problem behaviour has been shown to be lower over a longer time period (Reitz *et al.*, 2005). In the present study, the time period between T4 and T5 was 7 years, a relatively long interval encompassing most of adolescence.

On the level of the specific syndrome scales, only for somatic complaints were the stability coefficients for adolescents in both donor type groups significantly different, with more stability on this subscale for offspring with known donors than for those with as-yet-unknown

donors. Specifically, offspring with known donors who scored high on somatic complaints at T4 also scored high at T5. If this finding is replicated in other studies of DI offspring, a qualitative investigation may provide more information about the difference in somatic complaints between those with known and as-yet-unknown donors. For the remaining syndrome scales, the stability coefficients were not significantly different for adolescents with known donors and those with as-yet-unknown donors, again suggesting that the donor type is unrelated to psychological development of the offspring. Although no difference in the stability coefficient was found on social problems, the low reliability for this subscale precludes conclusions about this type of behavioural problem.

With regard to absolute stability, no main effects for donor type were found between T4 and T5 on the syndrome or broad-band scales; there were also no interactions between time and donor type on these studied variables. On absolute stability, the results indicate that independent of the donor type, thought problems and rule-breaking behaviour seem to increase over time and that social problems, aggressive behaviour, externalizing and total problem behaviour decrease. The increase in thought problems among the NLLFS adolescents may be associated with acquiring a keener awareness of their minority status during adolescence (Golombok and Tasker, 1996; Rivers *et al.*, 2008; Bos and Gartrell, *in press*). Studies also show that more rule breaking is normal in adolescent development (Reitz *et al.*, 2005).

With regard to the absolute stability, most NLLFS offspring remained in the non-clinical range from T4 to T5, and only seven offspring moved from a normal range at T4 to a deviant range at T5. In this pattern, no differences were found between adolescents with known donors and those with as-yet-unknown donors.

Several limitations of the present study are worth noting. First, the findings are based on checklists completed by the mothers about their offspring’s behaviour. Although the CBCL is a valid and reliable instrument (Achenbach and Rescorla, 2001), a more complete indication of adolescent well-being could have been obtained by including the Youth Self-Report (Achenbach and Rescorla, 2001), along with instruments that measure youth self-esteem and self-perceived competences (Rosenberg, 1979; Harter, 1982). Secondly, a convenience sample was used for the NLLFS, which probably resulted in the selection of mothers who were more interested in the topic under investigation, namely the development of lesbian offspring conceived by DI. However, one should keep in mind that when the study began in the 1980s, the targeted population was largely hidden because of the long history of discrimination against lesbian and gay people, so the possibility of recruiting a representative sample of prospective lesbian mothers was even more unrealistic than it is today (Golombok *et al.*, 2003). Finally, the findings of this study may be context specific, in that not all countries offer the option of selecting a permanently anonymous donor.

Notwithstanding these limitations, this study is one of the first to investigate from a longitudinal perspective the effects on the psychological adjustment of offspring who were conceived by lesbian mothers with sperm provided by known or by as-yet-unknown donors. This is an important issue because there is an ongoing debate about the potential impact of these various donor types on psychological adjustment especially during adolescence (Hunfeld *et al.*, 2004; Dempsey, 2008; Gerrits, 2008; Lawrence *et al.*, 2010),

and also because lesbian women themselves have questions about the long-term consequences of donor selection and the well-being of their offspring (Gartrell *et al.*, 1996). Our findings indicate that donor type has no bearing on the development of the psychological well-being of the offspring of lesbian mothers over a 7-year period from childhood through adolescence.

Authors' roles

H.M.W.B. and N.K.G. had full access to all data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: N.K.G. Acquisition of data: N.K.G., Heidi Peyser, Amalia Deck, Carla Rodas, Loes Van Gelderen and Evalijn Draijer. Drafting of the manuscript: H.M.W.B. and N.K.G. Critical revision of the manuscript for important intellectual content: H.M.W.B. and N.K.G. Statistical analysis: H.M.W.B. Obtaining funding: N.K.G., Heidi Peyser, Amalia Deck.

Administrative, technical or material support: Heidi Peyser. Study supervision: N.K.G.

Acknowledgements

We thank Heidi Peyser, Amalia Deck, Carla Rodas, Loes Van Gelderen, Evalijn Draijer and The Williams Institute at UCLA School of Law.

Funding

The NLLFS was awarded grants from The Gill Foundation, the Lesbian Health Fund of the Gay Lesbian Medical Association, Horizons Foundation and The Roy Scrivner Fund of the American Psychological Association. Funding sources played no role in the design or conduct of the study, the management, analysis or interpretation of the data, nor in the preparation, review or approval of the manuscript.

References

- Achenbach TM. *Manual for the Child Behavior Checklist and Revised Child Behavior Profile*. Burlington, VT, USA: University of Vermont Department of Psychiatry, 1991.
- Achenbach TM, Rescorla LA. *Manual for ASEBA School-Age Forms and Profiles*. Burlington, VT, USA: University of Vermont, Research Center for Children, Youth, and Families, 2001.
- Almack K. Seeking sperm: accounts of lesbian couples' reproductive decision-making and understandings of the needs of the child. *Int J Law Policy Fam* 2006;**20**:1–22.
- Baetens P, Brewaeys A. Lesbian couples requesting donor insemination: an update of the knowledge with regard to lesbian mother families. *Hum Reprod Update* 2001;**7**:512–519.
- Baetens P, Pontjaert-Kristoffersen I, Van Steirteghem AC, Devroey P. Counseling lesbian couples in creating a family by artificial insemination by donor. *Hum Reprod* 1996;**11**:79.
- Baran A, Pannor R. *Lethal Secrets: The Psychology of Donor Insemination*. New York, USA: Amistad, 1993.
- Ben-Ari A, Livni T. Motherhood is not a given thing. Experiences and constructed meanings of biological and nonbiological lesbian mothers. *Sex Roles* 2006;**54**:521–531.
- Bos HMW, Hakvoort EM. Child adjustment and parenting in planned lesbian families with known and as-yet-unknown donors. *J Psychosom Obstet Gynecol* 2007;**28**:121–129.
- Bos HMW, Gartrell NK. Adolescents of the USA national longitudinal lesbian family study: can family characteristics counteract the negative effects of stigmatization? *Fam Process* 2010;**49**:559–572.
- Bos HMW, Van Balen F. Children of the new reproductive technologies: social and genetic parenthood. *Patient Educ Couns* 2010;**81**:429–435.
- Cohen J. *Statistical Power Analysis for the Behavioural Sciences*. New York, NY, USA: Academic Press, 1977.
- Dempsey D. ART eligibility for lesbians and single heterosexual women in Victoria: how medicalisation influenced a political, legal and policy debate. *Health Social Rev* 2008;**17**:267–279.
- Gartrell N, Bos HMW. The US national longitudinal lesbian family study: psychological adjustment of 17-year-old adolescents. *Pediatrics* 2010;**126**:1–9.
- Gartrell N, Hamilton J, Banks A, Mosbacher D, Reed N, Sparks CH, Bishop H. The national lesbian family study: 1. Interviews with prospective mothers. *Am J Orthopsychiatry* 1996;**66**:272–281.
- Gartrell N, Banks A, Hamilton J, Reed N, Bishop H, Rodas C. The national lesbian family study: 2. Interviews with mothers of toddlers. *Am J Orthopsychiatry* 1999;**69**:362–369.
- Gartrell N, Rodas C, Deck A, Peyser H, Banks A. The national lesbian family study: 4. Interviews with the 10-year-old children. *Am J Orthopsychiatry* 2005;**75**:518–524.
- Gartrell NK, Bos HMW, Goldberg NG. Adolescents of the U.S. National longitudinal lesbian family study: sexual orientation, sexual behavior, sexual risk exposure. *Arch Sex Behav* 2010 (in press). Epub ahead of print November 6, 2010.
- Gerrits T. *Clinical Encounters: Dynamics of Patient-centred Practices in a Dutch Fertility Clinic*. Amsterdam, The Netherlands: University of Amsterdam, 2008.
- Goldberg AE. The transition to parenthood for lesbian couples. *J GLBT Fam Stud* 2006;**2**:13–42.
- Goldberg A. *Lesbian and Gay Parents and Their Children. Research on the Family Life Cycle*. Washington DC, USA: American Psychological Association, 2010.
- Golombok S, Badger S. Children raised in mother-headed families from infancy: a follow-up of children of lesbian and single heterosexual mothers, at early adulthood. *Hum Reprod* 2010;**25**:150–157.
- Golombok S, Tasker F. Do parents influence the sexual orientation of their children? Findings from a longitudinal study of lesbian families. *Dev Psychol* 1996;**32**:3–11.
- Golombok S, Tasker F, Murray C. Children raised in fatherless families from infancy; family relationships and the socioemotional development of children of lesbian and single heterosexual mothers. *J Child Psychol Psychiatry* 1997;**38**:783–791.
- Golombok S, Perry B, Burston A, Murray C, Mooney-Somers J, Stevens M, Golding J. Children with lesbian parents: a community study. *Dev Psychol* 2003;**39**:20–33.
- Haimes E, Weiner K. Everybody's got a dad. ... Issues for lesbian families in the management of donor insemination. *Social Health Ill* 2000;**22**:477–499.
- Harter S. The perceived competence scale for children. *Child Dev* 1982;**53**:87–97.
- Hunfeld JAM, Passchier J, Bolt LLE, Buijsen MAJM. Protect child from being born: arguments against IVF from heads of the 13 licensed Dutch fertility centres, ethical and legal perspectives. *J Reprod Infant Psychol* 2004;**22**:279–289.
- Kranz KC, Daniluk JC. Living outside of the box: lesbian couples conceived through the use of anonymous donor insemination. *J Fem Fam Ther* 2006;**18**:1–33.

- Landau R. Secrecy, anonymity and deception in donor insemination. *Soc Work Health Care* 1998;**28**:75–89.
- Lawrence RE, Rasinski KA, Yoon JD, Curlin FA. Obstetrician-gynecologists' beliefs about assisted reproductive technologies. *J Psychosom Obstet Gynecol* 2010;**116**:127–135.
- MacCallum F, Golombok S. Children raised in fatherless families since infancy: a follow-up of children of single and heterosexual mothers at early adolescence. *J Child Psychol Psychiatry* 2004;**45**:1407–1419.
- Reitz E, Deković M, Meijer AM. The structure and stability of externalizing and internalizing problem behavior during early adolescence. *J Adolesc* 2005;**34**:577–588.
- Rivers I, Poteat VP, Noret N. Victimization, social support, and psychosocial functioning among children of same-sex and opposite-sex couples in the United Kingdom. *Dev Psychol* 2008;**44**:127–134.
- Rosenberg M. *Conceiving the Self*. New York, NY, USA: Basic Books, 1979.
- Scheib JE, Riordan M, Rubin S. Adolescents with open-identity sperm donors: reports from 12–17 year olds. *Hum Reprod* 2005;**20**:239–252.
- Tieman W, Van der Ende J, Verhulst FC. Young adult international adoptees' search for birth parents. *J Fam Psychol* 2008;**22**:678–687.
- Turner AJ, Coyle A. What does it mean to be a donor offspring? The identity experiences of adults conceived by donor insemination and the implications for counselling and therapy. *Hum Reprod* 2000;**15**:2041–2051.
- Vanfraussen KI, Ponjaert-Kristoffersen I, Brewaeys A. What does it mean for youngsters to grow up in a lesbian family created by means of donor insemination? *J Reprod Infant Psychol* 2002;**20**:237–252.
- Vanfraussen KI, Ponjaert-Kristoffersen I, Brewaeys A. Family functioning in lesbian families created by donor insemination. *Am J Orthopsychiatry* 2003a;**73**:78–90.
- Vanfraussen K, Ponjaert-Kristofferson I, Brewaeys A. Why do children want to know more about the donor? The experience of youngsters raised in lesbian families. *J Psychosom Obstet Gynecol* 2003b;**24**:31–38.
- Verhulst FC, Van der Ende J. Agreement between parents' and adolescents' self-reports of problem behavior. *J Child Psychol Psychiatry* 1992;**33**:1011–1023.
- Verhulst FC, Van Wattum PJ. Two-year stability of self reported problems in an epidemiological sample of adolescents. *Acta Psychiatr Scand* 1993;**87**:322.