RBMO

ARTICLE

Two decades of psychological adjustment of donor-conceived offspring of lesbian parents: examining donor contact and type

BIOGRAPHY

Nicola Carone, psychoanalytic psychotherapist and Associate Professor of Dynamic Psychology at the University of Rome Tor Vergata, Italy, mainly researches parenting and attachment in diverse family structures, the intergenerational transmission of attachment and the psychodynamic assessment of parenting. In 2020, he joined the National Longitudinal Lesbian Family Study team.

Nicola Carone[1,*], Audrey S. Koh[2], Henny M. W. Bos[3], Esther D. Rothblum[4,5], Nanette K. Gartrell[5,6]

KEY MESSAGE

Donor-conceived offspring of lesbian parents show healthy psychological adjustment across 21 years, regardless of donor type or contact. This longitudinal study emphasizes stable family relationships, the minimal impact of donor-related factors and the importance of flexible policies and support systems in navigating evolving genetic-linking technologies and diverse family structures.

ABSTRACT

Research question: How stable is psychological adjustment in donor-conceived offspring of lesbian parents over 21 years, considering developmental stages, donor type and impact of donor contact?

Design: Data were drawn from the US National Longitudinal Lesbian Family Study, a cohort of 70 donor-conceived offspring (71.43% heterosexual, 90.00% White) assessed across four developmental stages — childhood (age 10 years, Wave 4), adolescence (age 17, Wave 5), emerging adulthood (age 25, Wave 6) and established adulthood (ages 30–33, Wave 7). From parental reports, 34.29% had an anonymous donor, 34.29% a known donor and 31.43% an open-identity donor. At Waves 4 and 5, parents completed the Child Behavior Checklist to assess their child's psychological adjustment, while at Waves 6 and 7 the offspring assessed their psychological adjustment by completing the 120-item Achenbach Adult Self-Report. Growth curve models, stability coefficients and developmental pathway analyses explored trajectories by donor type, while a multivariate analysis examined differences by donor contact.

Results: Across donor types, internalizing, externalizing and total problem behaviours showed low relative but high absolute stability, with fluctuations below clinical thresholds. Externalizing and total problem behaviours declined from childhood to adolescence, increased in emerging adulthood and stabilized in established adulthood. Donor type and contact did not significantly impact behavioural outcomes. Over 80% of offspring consistently scored within the normal range across all stages.

[1] Department of Systems Medicine, University of Rome Tor Vergata, Rome, Italy.
[2] Department of Obstetrics, Gynecology and Reproductive Sciences, School of Medicine, University of California, San Francisco, CA, USA.
[3] Sexual and Gender Diversity in Families and Youth, Research Institute of Child Development and Education, Faculty of Social and Behavioral Sciences, University of Amsterdam, Amsterdam, The Netherlands.
[4] Department of Women's Studies, San Diego State University, San Diego, CA, USA.
[5] Williams Institute, University of California, Los Angeles School of Law, Los Angeles, CA, USA.
[6] Research Institute Child Development and Education, Faculty of Social and Behavioral Sciences, University of Amsterdam, Amsterdam, The Netherlands.

*Corresponding author. E-mail address: nicola.carone@uniroma2.it (N. Carone). https://doi.org/10.1016/j.rbmo.2025.105020
1472-6483/
Declaration: The authors report no financial or commercial conflicts of interest.

KEY WORDS

Anonymity
Lesbian parents
Open-identity
Psychological adjustment
Sperm donation

Conclusions: Findings underscore the psychological resilience of donor-conceived offspring of lesbian parents, irrespective of donor type or contact. This challenges assumptions about donor-related effects on adjustment, highlighting the importance of family relationships. Flexible, family-centred support and consideration of evolving genetic-linking technologies are recommended for policy-makers and practitioners.

INTRODUCTION

The recent rise in donor insemination usage is noteworthy, with a global increase of 29% between 2016 and 2019 (*Horton et al., 2022*). In the USA over 400,000 women used this method in health facilities between 2015 and 2017 (*Arocho et al., 2019*), with 43% of these users identifying as sexual minority women (*Arocho et al., 2019*). However, these figures probably under-represent actual usage due to at-home insemination and under-reporting. Globally, donor insemination is now legal in 43 countries (*Horton et al., 2022*), marking a significant shift from its historical restriction to heterosexual couples. Since the 1980s, sperm banks have expanded access to include unmarried women and lesbian-identified intended parents, reflecting broader societal and legal recognition of diverse family structures (*Hertz et al., 2017*; *Horton et al., 2022*; *Sperm Bank of California, 2024*) among the populations now accessing donor insemination (*Arocho et al., 2019*).

Landmark changes began in 1982 when the *Sperm Bank of California (2024)* became the first facility to offer donor insemination to all women, regardless of marital status or sexual orientation. The following year, the same institution introduced open-identity donation, allowing donor-conceived offspring to access donor information at age 18 years, a policy subsequently adopted by other US sperm banks (*Sperm Bank of California, 2024*; *Valido et al., 2025*). Despite these advancements, policies regarding donor anonymity remain divided globally. Some countries mandate donor anonymity, while others prioritize the offspring's right to know their genetic origins (*Calhaz-Jorge et al., 2020*; *Cohen et al., 2016*).

The debate around the fundamental human right to know one's genetic history led several jurisdictions, including Australia, Austria, Finland, Germany, Norway, Switzerland, the Netherlands, the UK and New Zealand, to enact legislation removing donor anonymity. In the USA, jurisdictions such as California and Washington have implemented legislation that facilitates access to donor medical information and identity, permitting donors to determine whether they wish to remain anonymous or be identifiable (*ESHRE Working Group on Reproductive Donation et al., 2022*). By contrast, Colorado's Senate Bill 22-224, enacted in 2022 and scheduled to take effect in 2025, requires all gamete donors to be open-identity (https://leg.colorado.gov/bills/sb22-224). In this context, existing research highlights the importance of access to genetic origins for donor-conceived offspring, with the majority of adolescents (e.g. *Persaud et al., 2017*; *Scheib et al., 2005*) and adults (e.g. *Beeson et al., 2011*; *Indekeu and Hens, 2019*; *Jadva et al., 2009*; *Koh et al., 2020*; *Scheib et al., 2017*; *Turner and Coyle, 2000*) expressing curiosity and wanting to know more about their ancestry when asked about their donor.

As an alternative to an anonymous donor, lesbian parents may opt for a known donor — often someone they trust or have a pre-existing relationship with. This choice may stem from discomfort with using anonymous genetic material or a desire for their child to have knowledge of or contact with their biological father, even if his social role is minimal (*Chabot and Ames, 2004*). Some parents also select a known donor to provide a male role model for the child (*Goldberg and Allen, 2007*). However, known donation requires ongoing negotiation regarding the donor's involvement, as parents may fear legal or emotional complications, such as the donor asserting parental rights or disrupting the family dynamics (*Chabot and Ames, 2004*; *Goldberg and Allen, 2007*, *2013*).

Lesbian parents may also select an open-identity donor, where the donor's identifying information is accessible to the offspring once they reach a certain age (this being 18 years in most countries). This option provides a middle ground, allowing families to access basic donor information at the time of insemination with the potential for future contact (*Goldberg and Allen, 2013*; *Lingiardi et al., 2016*). While open-identity donation can reduce feelings of genetic discontinuity often associated with anonymous donation (*Turner and Coyle, 2000*), it does not guarantee the donor's willingness to engage in contact later, which could lead to psychological challenges for offspring (*Scheib et al., 2017*; *van den Broeck et al., 2013*). Adoption research suggests that open arrangements involving information sharing and contact generally enhance well-being, but the uncertainty in open-identity donation may still create feelings of frustration, grief or loss of control for donor-conceived individuals (*Farr and Grotevant, 2019*).

In recent years, technological advances in the reproductive field have transformed the landscape of such consolidated donor-type categories (anonymous, known, open-identity). The exponential rise of direct-to-consumer (DTC) DNA testing, social media and genetic-linking services, such as donor connection websites (e.g. the Donor Sibling Registry) and family matching services (e.g. the Sperm Bank of California), has made it easier than ever for donor-conceived individuals to locate anonymous donors and connect with donor siblings (*Indekeu et al., 2021*). While these developments may expand possibilities to access complete genetic information, they also have the potential to disrupt existing family dynamics, especially in cases of anonymous donation, in which it was assumed that it was not possible to obtain more information about the donor or contact him. The long-term consequences of these changes on the adjustment of the donor-conceived offspring remain unknown.

The first generation of donor insemination-conceived offspring of lesbian parents has now reached their 30s (*Koh et al., 2023a*, *2023b*), entering established adulthood — a distinct developmental phase spanning ages 30—45 years. This phase is characterized by significant changes in physical health and well-being, cognitive development, career and family responsibilities, and romantic relationships (*Mehta et al., 2020*). Understanding how the offspring of lesbian parents navigate this period is essential, as successes or challenges during this stage can profoundly shape their life trajectories. This understanding is also urgent given the reactionary backlash against lesbian, gay, bisexual, transgender and queer+

(LGBTQ+) rights currently unfolding in the USA (*Kumar et al., 2023*), coinciding with this cohort's transition into established adulthood.

In line with life course theory (*Elder, 1998*), which posits that life changes can alter developmental trajectories, the transitions associated with established adulthood — combined with opportunities for donor-conceived individuals to contact their donor, even in cases of initial anonymity — may contribute to variations in long-term psychological adjustment. These dynamics underscore the importance of exploring how external factors, such as sociopolitical climates and personal milestones, influence the psychological well-being of donor-conceived individuals during this critical stage.

Most previous cross-sectional research during childhood and adolescence found no significant differences between donor-conceived offspring raised in lesbian-parent families and their counterparts raised in heterosexual two-parent families concerning problem behaviour, well-being and emotion regulation (for reviews, see *Bos and Gartrell, 2020*; *Talbot et al., 2024*). Similarly, a Dutch longitudinal study of lesbian-parent families formed through donor insemination found no differences in the psychological adjustment of donor-conceived children and adolescents of lesbian parents compared with the children and adolescents of heterosexual two-parent families (*Bos et al., 2007*; *van Rijn-van Gelderen et al., 2015*).

Very little is known about the psychological adjustment of the donor-conceived adult offspring of lesbian parents. While existing research generally indicates that donor conception is not associated with adverse mental health outcomes, diminished quality of life or negative perceptions of one's origins (e.g. *Hammarberg et al., 2023*; *Jadva et al., 2023*, *2025*; *Koh et al., 2019*), these studies have not examined outcomes in relation to family structure — specifically, whether individuals were raised in lesbian-parent, single-mother or heterosexual-parent families (for an exception, see *Groundstroem et al., 2025*).

Relatedly, no prior study sought to examine how the offspring's psychological adjustment may differ in lesbian-parent families who used anonymous donors, those who used identifiable donors and those who used known donors, except for studies conducted by the current authors' research team (*Bos and Gartrell, 2011*; *Carone et al., 2021b*). Nor have studies examined whether contact with the donor may contribute to such variations, regardless of the donor's status at conception. The absence of these data is likely to be due to the fact that only relatively recently has prospective donor identifiability became legally enforced in some jurisdictions, meaning that individuals with the right to request information have not yet, or have only recently, come of age.

The US National Longitudinal Lesbian Family Study (NLLFS) represents a unique opportunity to examine whether and to what extent donor type and contact with the donor influence the psychological adjustment of the first generation of donor insemination-conceived offspring of lesbian parents during established adulthood. The NLLFS was initiated in 1986 to follow prospectively a cohort of lesbian-parent families formed through donor insemination from offspring conception through childhood (age 10 years, Wave 4), adolescence (age 17, Wave 5) and emerging adulthood (age 25, Wave 6) into adulthood (age 30–33, Wave 7) (*Bos et al., 2024*; *Carone et al., 2024*; *Gartrell et al., 1996*). The NLLFS collected data on the offspring's psychological adjustment spanning 21 years, obtaining reports from the both the parents (at Waves 4 and 5) and the offspring (at Waves 6 and 7) reports.

At the time of the first wave of data collection, when parents were pregnant or undergoing insemination, the donor preferences among the 84 participating planned families were almost equally divided among anonymous, known and open-identity. However, when discussing the pros and cons of their family arrangement, some prospective parents were concerned that donor insemination might one day be a problem for their offspring, particularly if they had an anonymous donor (*Gartrell et al., 1996*).

One previous longitudinal study based on NLLFS data from ages 10 to 17 years found no differences in parent-reported problem behaviours by donor type (categorized as 'known' versus 'as-yet-unknown donor'), with 83.8% and 91.9% of all offspring scoring in the normal range for internalizing and externalizing behaviours, respectively (*Bos and Gartrell, 2011*). These results were confirmed by a further NLLFS study when the offspring reached 25 years of age, indicating that psychological adjustment was stable over 15 years (from childhood to emerging adulthood) and that internalizing, externalizing and total problem behaviours did not differ by donor type (categorized as 'anonymous' versus 'open-identity' versus 'known'). However, externalizing and total problem behaviours significantly declined from ages 10 to 17 and increased from 17 to 25 years. Irrespective of donor type, most offspring scored continuously within the normal range on problem behaviours (*Carone et al., 2021b*).

Now that the NLLFS offspring have become established adults, there is an opportunity to assess changes or stability in their psychological adjustment by donor type. A further reason for such an investigation is that the milestone of established adulthood now intersects with societal, age-related and technological changes in donor insemination access and usage that may influence the donor-conceived offspring's psychological adjustment. As these individuals become more independent of their parents, they may feel free to contact the donors without fear of disrupting family dynamics (*Canzi et al., 2019*; *Hertz et al., 2013*; *Jadva et al., 2009*). Additionally, age-related health concerns may prompt a need for a donor medical history (*Indekeu et al., 2021*), and the transition to parenthood might spark curiosity about genetic and familial connections (*Indekeu et al., 2021*; *Rothblum et al., 2024*, *2025*). Relatedly, ethical and legal advocacy for the right to know genetic origins has gained traction over the past decade, further encouraging offspring to seek out donors (*Daar et al., 2018*; *Indekeu et al., 2021*).

The present study investigated differences in the stability of psychological adjustment — defined in terms of internalizing, externalizing and total problem behaviours — among the offspring of lesbian parents conceived using an anonymous, known or open-identity sperm donor across four developmental stages: at ages 10 (childhood), 17 (adolescence), 25 (emerging adulthood) and 30–33 (established adulthood). Given the increasing popularity of DTC DNA testing, social media and genetic-linking services, including online registries, which have made donor anonymity more fragile and fluid than originally envisioned, a further exploratory aim was to examine whether potential differences in psychological

adjustment might vary based on the contact NLLFS established adult offspring had (or did not have) with their donor, regardless of the donor's status at conception.

Research on the developmental trajectories of psychological adjustment (*Reitz et al., 2005*) highlights the importance of assessing both relative and absolute stability. Relative stability refers to the consistency of an individual's rank order within a group over time, whereas absolute stability pertains to the extent to which levels of problem behaviour remain constant. Although prior studies have reported no significant differences in psychological adjustment based on donor type (*Bos and Gartrell, 2011*; *Carone et al., 2021b*), it was postulated that offspring conceived via anonymous donors would exhibit lower absolute stability, characterized by a greater increase in behavioural problems over time, compared with those conceived with known or open-identity donors, or those who had established contact with their donor.

In this vein, drawing on life course theory (*Elder, 1998*), it is plausible that contact with a previously anonymous donor could serve as a significant life event capable of altering developmental trajectories. In contrast, no differences in relative stability were anticipated across donor types, given that relative stability is conceptually distinct from absolute stability and is primarily influenced by the mere passage of time (*Reitz et al., 2005*), rather than contextual factors such as donor type or donor contact. Lastly, no a priori hypothesis was formulated regarding the impact of donor contact on psychological adjustment, as this topic remains unexplored in the existing literature.

MATERIALS AND METHODS

Participants

The present longitudinal investigation is based on Waves 4, 5, 6 and 7 of the NLLFS, when the offspring were aged 10, 17, 25 and 30–33 years, respectively. The family retention rate since Wave 1 is 90%, with an initial cohort of 84 families (*Gartrell, 2021*). Given the current study aim, only data available from the four time points were used, for a total sample of 70 offspring. Detailed Waves 4, 5 and 6 demographics are reported elsewhere (*Bos et al., 2008*; *Gartrell and Bos, 2010*; *Gartrell et al., 2018*).

At Wave 7, 36 (51.43%) identified as cisgender female offspring and 34 (48.57%) as cisgender male offspring. Their mean age was 30.97 (SD = 0.93), and all were born in the USA. Based on the parents' reports at Wave 4, all had been conceived through donor insemination: 24 (34.29%) had an anonymous donor, 24 (34.29%) a known donor and 22 (31.43%) an open-identity donor. A majority of offspring identified as White (n = 63, 90.00%), with the remaining identifying as African American/Black (n = 3, 4.29%), Latina/o or Hispanic (n = 1, 1.43%) or other/mixed (n = 3, 4.29%). At Wave 7, half (n = 35, 50.00%) had completed a college degree, with the remainder reporting some college but no college degree (n = 6, 8.57%) or more than a college degree (n = 29, 41.43%). Regarding their sexual orientation, most self-identified as heterosexual (n = 50, 71.43%) and a smaller number as lesbian, gay, bisexual or queer (n = 20, 28.57%) (a detailed report on the offspring's sexual orientation can be found in *Carone et al., 2024*).

Procedure

At Waves 4 and 5, the parents provided informed consent before completing paper-and-pencil questionnaires, and their offspring were interviewed. By Waves 6 and 7, the offspring were legal adults and gave their own written informed consent to participate. Each participant who completed an online survey in Waves 5–7 received compensation equivalent to $60 (e.g. in the form of a gift card). The Institutional Review Board at Sutter Health approved the study (SHIRB no. 20.070–2; IRBNet no. 348911–23, approval date 27 March 2024).

Donor type

At Wave 4, parents were asked about the sperm donor type used to conceive (answer options: anonymous, known or open-identity).

Contact with the donor

At Wave 7, the offspring were asked, 'Have you met/contacted your donor?' Answer options were: 1 = No, my donor is permanently unknown; 2 = No, I could have when I turned 18, but have not yet done so; 3 = Yes, I have known my donor since I was a child; 4 = Yes, I met my open-identity donor after I turned 18; 5 = Yes, I contacted my open-identity donor after I turned 18, but have not met him; and 6 = Yes, my donor was unknown but I found him through a registry and then met him. Answer options 1 and 2 were recoded as 'No, I did not contact him', while answer options 3–6 were recoded as 'Yes, I contacted him'.

Offspring psychological adjustment

At Waves 4 and 5, parents completed the Child Behavior Checklist (CBCL; *Achenbach and Rescorla, 2001*) to assess their child's psychological adjustment over the previous 6 months. The CBCL is a standardized, internationally validated 113-item checklist that evaluates behavioural and emotional problems on a scale from 0 to 2 (0 = not true; 1 = somewhat or sometimes true; and 2 = very true or often true). It includes three broad-band scales: internalizing behaviour problems (32 items related to somatic complaints, anxiety, depression and withdrawn behaviours; Cronbach's α: Wave 4 = 0.91, Wave 5 = 0.91), externalizing behaviour problems (35 items related to disruptive, aggressive and delinquent behaviours; Cronbach's α: Wave 4 = 0.80, Wave 5 = 0.88) and total problem behaviour (113 items providing a summary score for both internalizing and externalizing problems, as well as attention, thought and social problems; Cronbach's α: Wave 4 = 0.94, Wave 5 = 0.94). In most cases (n = 69, 98.57%), the birth parent completed the questionnaire; however, in one case the birth parent was unavailable (due to being too busy) and the co-parent filled it out instead.

At Waves 6 and 7, offspring assessed their psychological adjustment over the previous 6 months by completing the 120-item Achenbach Adult Self-Report (ASR; *Achenbach and Rescorla, 2003*) on a 3-point Likert scale (0 = not true, 1 = somewhat or sometimes true, and 2 = very true or often true) via a secure online portal. The scores were tabulated on the 39 items related to internalizing problems (comprising the anxious/depressed, withdrawn and somatic complaints subscales; Cronbach's α: Wave 6 = 0.89, Wave 7 = 0.91) and the 35 items pertaining to externalizing problems (comprising aggressive, rule-breaking and intrusive behaviour subscales; Cronbach's α: Wave 6 = 0.85, Wave 7 = 0.87). Furthermore, all 120 individual items were summed into a total problem behaviour scale (including internalizing and externalizing behaviour problems and thought and attention problems; Cronbach's α: Wave 6 = 0.92, Wave 7 = 0.93).

In both the CBCL and ASR, the total raw score for each scale represents a sex- and age-specific summary of all items, which is then converted to a standardized *T*-score. Higher *T*-scores reflect greater levels of internalizing, externalizing and total problem behaviours. *T*-scores were used throughout all the analyses to account for sex and age differences across waves and to ensure consistency between the two related measures of psychological adjustment. According to the procedures outlined in the CBCL and ASR manuals (*Achenbach and Rescorla, 2001*, *2003*), the *T*-scores for internalizing, externalizing and total problem behaviours were used to categorize the offspring as being within either the deviant or normal range. *Achenbach and Rescorla (2001*, *2003*) define deviant scores as those that fall at or above the 93rd percentile ($T \geq 65$), which includes both the borderline and clinical ranges.

Data analysis

All analyses were conducted using R software (lme4 package; *R Core Team, 2021*). Considering the evidence of gender differences in psychological adjustment (*Achenbach and Rescorla, 2001*, *2003*), three linear mixed models were as a preliminary conducted one for each outcome to assess the potential impact of gender on internalizing, externalizing and total problem behaviours. Relative stability coefficients for internalizing, externalizing and total problem behaviours were calculated using Pearson's correlation coefficients between Waves 4 and 7, Waves 5 and 7, and Waves 6 and 7. By computing these stability coefficients, it was possible to determine the extent to which the NLLFS offspring preserved their rank orders, regardless of changes in the group scores. Stability coefficients were calculated separately for offspring with an anonymous, known or open-identity donor. Fisher's *Z*-transformation was employed to compare relative stability across donor type groups.

The absolute stability was examined in two ways. First, changes in internalizing, externalizing and total problem behaviours over time, by donor type, were investigated, resulting in three growth curve models, one for each outcome. Second, internalizing, externalizing and total problem behaviour scores at the four time intervals were dichotomized as falling in the deviant ($T \geq 65$) or normal range, separately for anonymous, known and open-identity donors. Given that some expected cell counts were lower than 5, Fisher's exact test was used to compare the percentages of offspring in each developmental pathway for internalizing, externalizing and total behaviour problems, by donor type. Finally, a multivariate analysis of variance (MANOVA) was conducted to examine potential differences in internalizing, externalizing and total problem behaviour by donor contact at Wave 7.

RESULTS

Psychological adjustment of NLLFS female and male offspring over time

Linear mixed models indicated that cisgender female and male offspring did not differ on their internalizing (estimate = 2.73, SE = 1.54, $P = 0.081$), externalizing (estimate = 0.68, SE = 1.48, $P = 0.649$) and total problem (estimate = 1.38, SE = 1.61, $P = 0.393$) behaviours over time. Therefore, the offspring's sex assigned at birth was excluded from the following analyses. TABLE 1 displays the means and standard deviations of *T*-scores for psychological adjustment by the sex assigned at birth and donor type, across the four waves.

Relative stability of psychological adjustment

Pearson correlation coefficients were calculated to assess how consistently the offspring maintained their rank order despite any changes in the group's average scores (TABLE 2). Higher coefficients indicated greater stability of problem behaviours over time. For offspring with anonymous donors, the correlations were weak (coefficients lower than 0.30; *Cohen, 1977*) from Wave 4 to Wave 7, and Wave 5 to Wave 7, but strong (coefficients higher than 0.70; *Cohen, 1977*) from Wave 6 to Wave 7. In contrast, the associations for offspring with known donors showed moderate correlations (coefficients between 0.30 and 0.70; *Cohen, 1977*) across all four developmental stages. Finally, the associations for offspring with open-identity donors were weak from Wave 4 to Wave 5, and Wave 5 to Wave 6, but moderate to strong from Wave 6 to Wave 7.

Overall, taking into account the extent of the coefficients' sizes and Fisher's *Z*-transformations, the offspring in the three donor groups showed equally relative low stability (consistency of their rank order within the group) in their internalizing, externalizing and total problem behaviours across each developmental stage comparison. This was particularly evident in the comparison of internalizing and total problems between those offspring with known or with open-identity donors from Wave 4 to Wave 7.

Changes in psychological adjustment by donor type over time

Changes in psychological adjustment over time, by donor type, were examined using three growth curve models — one for each outcome. In cases of overall significant difference in means (where fixed effects were significant), within-subjects contrasts were examined to understand where those differences occurred or whether the problem behaviour changed over time in a linear fashion or following a curve with variable degrees of steepness and corresponding to an acceleration or deceleration in a particular age (by showing quadratic or cubic growth).

Internalizing behaviours were stable over time [$F(3,201) = 0.92$, $P = 0.431$], and similar among offspring with anonymous, known and open-identity donors [$F(2,67) = 0.38$, $P = 0.683$]. Likewise, they did not change by donor type across offspring age [$F(3,201) = 0.11$, $P = 0.995$]. Overall, the within-subject variance was 21% (intraclass correlation = 0.21; $P < 0.001$) and the model explained 22% of the variance (R^2 conditional = 0.22).

Conversely, externalizing behaviours changed over time [$F(3,201) = 6.03$, $P < 0.001$], following a cubic growth (estimate = −0.32, SE = 0.10, $P = 0.002$); that is, they showed a significant decrease from age 10 to 17, a significant increase from age 17 to 25, and again a significant decrease from age 25 to 31. No differences were seen in externalizing problems by donor type [$F(2,67) = 0.02$, $P = 0.983$], or by donor type across offspring age [$F(6,201) = 0.37$, $P = 0.897$]. Overall, the within-subject variance was 27% (intraclass correlation = 0.27; $P < 0.001$) and the model explained 30% of the variance (R^2 conditional = 0.30).

Finally, total problem behaviour further changed over time [$F(3,201) = 3.16$, $P = 0.026$], declining significantly from age 10 to 17, but increasing significantly from age 17 to 25, and again decreasing from age 25 to 31 (i.e. cubic growth; estimate = −0.30, SE = 0.11, $P = 0.004$).

TABLE 1 MEANS AND STANDARD DEVIATIONS OF INTERNALIZING, EXTERNALIZING AND TOTAL PROBLEM BEHAVIOUR *T*-SCORES ACROSS DEVELOPMENTAL STAGES, BY OFFSPRING SEX ASSIGNED AT BIRTH AND DONOR TYPE

Behaviour measurement	Anonymous donors (*n* = 24)		Known donors (*n* = 24)		Open-identity donors (*n* = 22)	
	Male offspring (*n* = 10)	Female offspring (*n* = 14)	Male offspring (*n* = 9)	Female offspring (*n* = 15)	Male offspring (*n* = 15)	Female offspring (*n* = 7)
Age 10 (Wave 4)						
Internalizing behaviour	52.92 (13.58)	46.57 (9.97)	53.96 (13.42)	47.87 (8.73)	54.68 (13.18)	48.29 (8.29)
Externalizing behaviour	52.50 (10.73)	51.40 (9.06)	52.15 (12.46)	48.39 (8.70)	52.12 (9.18)	44.86 (6.23)
Total problem behaviour	50.71 (11.61)	48.00 (9.17)	51.87 (15.13)	47.13 (7.87)	50.64 (10.66)	43.91 (6.42)
Age 17 (Wave 5)						
Internalizing behaviour	47.20 (9.62)	49.43 (9.65)	45.46 (9.93)	49.87 (10.34)	49.53 (9.56)	47.43 (5.94)
Externalizing behaviour	42.20 (7.86)	48.57 (9.79)	43.44 (8.75)	46.73 (9.25)	46.47 (10.83)	42.86 (6.62)
Total problem behaviour	42.60 (10.71)	47.29 (9.79)	41.67 (10.48)	48.13 (10.22)	45.67 (11.48)	41.86 (6.52)
Age 25 (Wave 6)						
Internalizing behaviour	51.90 (9.23)	49.93 (11.74)	52.11 (9.03)	49.33 (8.33)	54.47 (8.63)	45.86 (10.72)
Externalizing behaviour	44.70 (8.81)	49.36 (9.12)	49.33 (9.61)	47.13 (6.95)	51.20 (7.89)	46.71 (8.30)
Total problem behaviour	48.70 (9.90)	48.43 (11.23)	51.67 (11.95)	48.00 (8.49)	53.13 (8.29)	47.29 (13.12)
Ages 30–33 (Wave 7)						
Internalizing behaviour	53.70 (12.36)	46.86 (12.38)	48.22 (12.85)	51.40 (7.13)	52.00 (10.51)	50.14 (8.92)
Externalizing behaviour	44.80 (14.24)	45.21 (10.80)	44.67 (8.53)	46.27 (8.92)	46.47 (8.68)	41.43 (6.43)
Total problem behaviour	50.10 (12.72)	45.57 (13.50)	47.11 (11.26)	49.53 (7.58)	48.33 (9.61)	47.14 (7.22)

n = 70.

All data are presented as mean (standard deviation) *T*-scores.

At Waves 4 and 5, internalizing, externalizing and total problem behaviours were assessed by a parent completing the Child Behaviour Checklist; at Waves 6 and 7, problem behaviours were assessed by the offspring completing the Achenbach Adult Self-Report. Deviant scores (both borderline and clinical) were defined as $T \geq 65$.

Offspring with anonymous, known and open-identity donors reported similar levels of total problem behaviours [$F(2,67) = 0.04$, $P = 0.959$]; likewise, total problem behaviour scores did not vary by donor status across offspring ages [$F(6,201) = 0.24$, $P = 0.964$]. Overall, the within-subject variance was 24% (intraclass correlation = 0.24; $P < 0.001$) and the model explained 27% of the variance (R^2 conditional = 0.27).

Developmental pathways from age 10 to 17 to 25 to 30–33 years

Among the 70 offspring, the large majority scored consistently within the normal range on internalizing (*n* = 56, 80.00%), externalizing (*n* = 58, 82.86%) and total problem (*n* = 56, 80.00%) behaviours. There were no differences between those who had an anonymous, a known or an open-identity donor. Relatedly, none of the offspring had deviant scores across all four developmental periods for any psychological adjustment variables. TABLE 3 shows a detailed overview of developmental pathways categorized by donor type.

Differences in internalizing, externalizing and total problem behaviour at ages 30–33 years, by donor contact

At Wave 7, MANOVA indicated no differences in internalizing, externalizing and total problem behaviour between those who contacted their donor and those who did not (Wilks' $\lambda = 0.92(3,66)$, $P = 0.147$, $\eta^2_P = 0.078$; univariate effects are presented in TABLE 4).

DISCUSSION

The present study uniquely allowed for the assessment of psychological adjustment over a 21-year span in the first cohort of offspring of lesbian parents who used anonymous, known or open-identity sperm donors. The study examined (dis) continuity in problem behaviours by donor type, measuring relative and absolute stability. As postulated, internalizing, externalizing and total problem behaviours showed low relative stability across time, regardless of donor type. This finding, in light of the overall positive adjustment of the NLLFS offspring, is not concerning; it simply reflects that individuals' rankings within their donor-type groups changed over time. In addition, it aligns with prior research showing that the longer the interval between assessments, the lower the relative stability of problem behaviours (*Reitz et al., 2005*).

The observed cubic growth pattern in externalizing and total problem behaviours underscores the complexity of developmental transitions. While externalizing and total problem behaviours decreased during adolescence, they increased in emerging adulthood before stabilizing in established adulthood. These findings align with developmental theories (e.g. *Reitz et al., 2005*) suggesting that transitional life stages often present heightened emotional and behavioural

TABLE 2 RELATIVE STABILITY OF PSYCHOLOGICAL ADJUSTMENT ACROSS DEVELOPMENTAL STAGES, SEPARATELY FOR EACH PROBLEM BEHAVIOUR SCALE FOR NLLFS OFFSPRING AND DONOR TYPE

Behaviour measurement	Anonymous donors (*n* = 24)	Known donors (*n* = 24)	Open-identity donors (*n* = 22)	*Z*, anonymous vs known donors	*Z*, anonymous vs open-identity donors	*Z*, known vs open-identity donors
Wave 4 – Wave 7						
Internalizing behaviour	−0.17	0.34	−0.30	−1.70	0.44	2.10[f]
Externalizing behaviour	−0.13	0.41[a]	−0.07	−1.84	−0.19	1.6
Total problem behavior	−0.05	0.45[b]	−0.35	−1.73	1.00	2.69[g]
Wave 5 – Wave 7						
Internalizing behaviour	−0.11	0.34	0.27	−1.51	−1.22	0.24
Externalizing behaviour	0.01	0.37	−0.07	−1.23	0.25	1.45
Total problem behaviour	−0.11	0.34	0.07	−1.51	−0.57	0.90
Wave 6 – Wave 7						
Internalizing behaviour	0.71[c]	0.38	0.73[c]	1.58	−0.13	−1.67
Externalizing behaviour	0.83[c]	0.61[d]	0.80[c]	1.55	0.28	−1.23
Total problem behaviour	0.81[c]	0.53[e]	0.69[c]	1.74	0.88	−0.81

n = 70.

Z represents the Fisher *r*-to-*z* transformation, applied to assess the significance of the difference between the two correlation coefficients, across each developmental stage comparison (Wave 4 versus Wave 7; Wave 5 versus Wave 7; Wave 6 versus Wave 7), for the three groups (anonymous versus known donors; anonymous versus open-identity donors; known versus open-identity donors).

[a] $P = 0.044$.

[b] $P = 0.029$.

[c] $P < 0.001$.

[d] $P = 0.002$.

[e] $P = 0.008$.

[f] $P = 0.036$.

[g] $P = 0.007$.

For coefficients without any superscript letter, $P > 0.06$.

NLLFS, National Longitudinal Lesbian Family Study.

challenges. Importantly, these changes remained below the threshold for clinical concern. Additionally, neither donor type nor the interaction between donor type and offspring age significantly impacted any behavioural domains analysed.

The increase in externalizing and total problem behaviours during the transition from adolescence to emerging adulthood across all donor groups may also reflect the challenges associated with this life stage, and it is consistent with previous NLLFS waves (*Bos and Gartrell, 2011*; *Carone et al., 2021b*). Relatedly, although established adults may still struggle to manage multiple demands in work and relationships, this period also brings several rewards, including, for many, a stronger sense of self and increased social and professional confidence (*Mehta et al., 2020*). This may explain the decrease in externalizing and total problem behaviour from ages 25 to 30–33 years.

While the absence of donor-type differences in problem behaviours may appear to diminish its clinical significance, understanding behavioural trajectories over time provides deeper insight. To explore this further, the developmental pathways of externalizing, internalizing and total problem behaviours were analysed, comparing individuals in the normal versus deviant ranges across donor-type or donor-contact groups. Across the entire NLLFS sample, around 80% of offspring consistently scored in the normal range for these behaviours at all four time points, and none continuously fell into the deviant (borderline or clinical) range.

Coupled with no differences in internalizing, externalizing and total problem behaviour between those who contacted their donor and those who did not by age 30–33, these findings suggest robust psychological resilience among the NLLFS offspring, irrespective of donor type. In addition, this dovetails with the finding that the NLLFS adult offspring overall were satisfied with their level of donor contact, regardless of donor type (*Koh et al., 2023b*). Relatedly, the findings echo abundant research conducted in previous developmental periods, especially childhood and adolescence, showing that donor-conceived offspring raised in lesbian-parent families exhibit comparable psychological outcomes to their peers raised in heterosexual-parent families (*Bos and Gartrell, 2020*; *Bos et al., 2007*; *van Rijn-van Gelderen et al., 2015*).

Furthermore, these findings underscore that the donor-conceived offspring's psychological adjustment is not inherently compromised, regardless of how they navigate their relationships with their genetic origins. In this context, the minimal impact of donor type on behavioural outcomes challenges prevailing assumptions that knowledge of, or contact with, a donor directly influences psychological well-being (*Shenfield, 2002*). Nonetheless, prior research has indicated that early disclosure, before age 7 years, is associated with more positive family relationships and higher levels of well-being (*Ilioi et al., 2017*). Moreover, the manner in which genetic origins are discussed within

TABLE 3 DISTRIBUTION BY LONGITUDINAL CHANGES IN PSYCHOLOGICAL ADJUSTMENT ACROSS DEVELOPMENTAL STAGES, BY DONOR TYPE

Behaviour measurement over time	Total group (*n* = 70)	Anonymous donors (*n* = 24)	Known donors (*n* = 24)	Open-identity donors (*n* = 22)	Fisher's exact test *P*-value
	n (%)	*n* (%)	*n* (%)	*n* (%)	
Internalizing behaviour					.665
Normal W4 → Normal W5 → Normal W6 → Normal W7	56 (80.00)	19 (79.17)	21 (87.50)	16 (72.73)	
Normal W4 → Normal W5 → Normal W6 → Deviant W7	3 (4.29)	2 (8.33)	0 (0.00)	1 (4.55)	
Normal W4 → Normal W5 → Deviant W6 → Deviant W7	2 (2.86)	1 (4.17)	0 (0.00)	1 (4.55)	
Normal W4 → Deviant W5 → Normal W6 → Normal W7	2 (2.86)	0 (0.00)	1 (4.17)	1 (4.55)	
Deviant W4 → Normal W5 → Normal W6 → Normal W7	4 (5.71)	1 (4.17)	1 (4.17)	2 (9.09)	
Deviant W4 → Deviant W5 → Normal W6 → Normal W7	1 (1.43)	1 (4.17)	0 (0.00)	0 (0.00)	
Deviant W4 → Deviant W5 → Normal W6 → Deviant W7	1 (1.43)	0 (0.00)	1 (4.17)	0 (0.00)	
Deviant W4 → Normal W5 → Normal W6 → Deviant W7	1 (1.43)	0 (0.00)	0 (0.00)	1 (4.55)	
Externalizing behaviour					.898
Normal W4 → Normal W5 → Normal W6 → Normal W7	58 (82.86)	20 (83.33)	19 (79.17)	19 (86.36)	
Normal W4 → Normal W5 → Normal W6 → Deviant W7	1 (1.43)	1 (4.17)	0 (0.00)	0 (0.00)	
Normal W4 → Normal W5 → Deviant W6 → Normal W7	2 (2.86)	0 (0.00)	1 (4.17)	1 (4.55)	
Normal W4 → Deviant W5 → Normal W6 → Normal W7	2 (2.86)	0 (0.00)	1 (4.17)	1 (4.55)	
Deviant W4 → Normal W5 → Normal W6 → Normal W7	7 (10.00)	3 (12.50)	3 (12.50)	1 (4.55)	
Total problem behaviour					1.000
Normal W4 → Normal W5 → Normal W6 → Normal W7	56 (80.00)	19 (79.17)	19 (79.17)	18 (81.82)	
Normal W4 → Normal W5 → Normal W6 → Deviant W7	2 (2.86)	2 (8.33)	0 (0.00)	0 (0.00)	
Normal W4 → Normal W5 → Deviant W6 → Deviant W7	1 (1.43)	0 (0.00)	0 (0.00)	1 (4.55)	
Normal W4 → Deviant W5 → Normal W6 → Normal W7	1 (1.43)	0 (0.00)	1 (4.17)	0 (0.00)	
Normal W4 → Normal W5 → Deviant W6 → Normal W7	2 (2.86)	0 (0.00)	1 (4.17)	1 (4.55)	
Deviant W4 → Normal W5 → Normal W6 → Normal W7	5 (7.14)	1 (4.17)	2 (8.33)	2 (9.09)	
Deviant W4 → Deviant W5 → Normal W6 → Normal W7	1 (1.43)	1 (4.17)	0 (0.00)	0 (0.00)	
Deviant W4 → Deviant W5 → Normal W6 → Deviant W7	1 (1.43)	0 (0.00)	1 (4.17)	0 (0.00)	
Deviant W4 → Normal W5 → Deviant W6 → Deviant W7	1 (1.43)	1 (4.17)	0 (0.00)	0 (0.00)	

Total *n* = 70.

Deviant scores indicate scores at the 93rd percentile or higher ($T \geq 65$) in the combined borderline and clinical ranges (*Achenbach and Rescorla, 2001*, *2003*). Some percentages may not equal 100 due to rounding.

W, Wave.

families has been shown to influence key developmental outcomes in later stages, including attachment security, identity formation and curiosity about one's origins (*Carone et al., 2020*; *Carone et al., 2021a*; *Farr and Grotevant, 2019*; *Groundstroem et al., 2025*; *Slutsky et al., 2016*). Therefore, future research should further investigate the role of family-level processes — such as communicative practices and parental attitudes toward conception — in shaping the psychological adjustment of donor-conceived offspring.

In contrast to what life course theory (*Elder, 1998*) would predict in relation to alterations in developmental trajectories following life changes (e.g. for offspring establishing contact with a donor who had initially been an anonymous donor) and the changes associated with the four different developmental periods examined (childhood, adolescence, emerging adulthood and established adulthood), the overall positive adjustment of established adults of lesbian parents from ages 10 to 30–33 years probably reflects the resilience developed by this cohort and the adaptive strategies that lesbian-parent families developed to cope with the long history of stigmatization associated with their family structure (*Bos et al., 2024*; *Carone et al., 2022*).

While the findings provide valuable insights, several limitations should be acknowledged. The cisgender and predominantly White sample limited generalizability to more diverse populations. Future studies would benefit from including a sample in which race, ethnicity and gender identity intersect to offer a more representative perspective on the psychological adjustment of the donor-conceived offspring of lesbian parents.

The demographic homogeneity of this sample may have influenced the findings in several ways. Existing research indicates that experiences related to race, ethnicity

TABLE 4 DIFFERENCES IN INTERNALIZING, EXTERNALIZING AND TOTAL PROBLEM BEHAVIOURS AT AGES 30–33 YEARS, BY DONOR CONTACT

Behaviour measurement	Offspring who contacted their donor (n = 38)	Offspring who did not contact their donor (n = 32)	F(df)	P-value	η^2_P
	Mean (SD)	Mean (SD)			
Internalizing behaviour	50.45 (10.79)	50.37 (10.62)	0.001	0.978	<0.001
Externalizing behaviour	44.89 (10.06)	45.56 (9.39)	0.081	0.776	0.001
Total problem behaviour	48.55 (10.87)	47.38 (9.88)	0.221	0.640	0.003

Total n = 70.

The category of offspring who contacted their donor included offspring who had known their donor since they were a child, offspring who met their open-identity donor after they turned 18 years, offspring who contacted their open-identity donor after they turned 18 but had not met him and offspring whose donor was unknown but they had found him through a registry and then met him. The category of offspring who did not contact their donor included offspring whose donor was permanently unknown and offspring who could have contacted him when they turned 18 but had not yet done so.

F(df), P-value, and η^2_P refer to univariate effects.

and gender identity can significantly shape family dynamics, access to support systems and experiences of stigma (*Goldberg, 2023*), all of which are relevant to psychological adjustment in donor-conceived families. In predominantly White, cisgender samples, there may be greater societal acceptance of non-traditional family forms or more access to resources that buffer against minority stress, potentially leading to more favourable psychological outcomes (*Fish and Russell, 2018*). Therefore, the relatively low levels of behavioural problems observed in this study might, at least in part, reflect the social privilege and stability afforded to this specific demographic group. Future research should seek to include more racially, ethnically and gender-diverse samples to examine how intersecting identities may differentially impact the psychological adjustment of donor-conceived offspring in lesbian-parent families. In addition, the study did not explore potential moderators such as socioeconomic status, family functioning or the quality of parent–offspring relationships, which might influence psychological adjustment (*Carone et al., 2021a*; *Farr and Grotevant, 2019*; *Slutsky et al., 2016*).

A further limitation was that the study spans decades, during which societal attitudes and technologies have evolved significantly, thereby broadening opportunities for more diverse social groups to pursue parenthood (*Arocho et al., 2019*; *Hertz et al., 2017*; *Horton et al., 2022*). These shifts might have affected the comparability of data across time points. Finally, while this was the first longitudinal study to consider the influence of donor type spanning 21 years on the offspring's psychological adjustment, it was not possible to explore the nuanced nature of these interactions — such as emotional outcomes, frequency and quality (*Indekeu and Hens, 2019*, *Indekeu et al., 2021*; *Koh et al., 2023b*) — due to the relatively small cell size. For a similar reason, the categories of offspring who contacted their donor and those who did not at Wave 7 consisted of different subgroups. This did not necessarily reflect the multiplicity of experiences of donor-conceived offspring and the related consequences for their psychological adjustment. Finally, it is also possible that the relatively small group sizes limited the statistical power of the analyses, potentially preventing the detection of small effect sizes.

Notwithstanding these limitations, the findings offer several implications for reproductive psychology and broader discussions on donor conception. The limited impact of donor type and donor contact on psychological adjustment suggests that policies should prioritize family choice and flexibility over rigid frameworks around sperm donation. However, the rise of genetic-linking technologies necessitates transparent communication about the potential for future contact. Relatedly, advances in genetic-linking technologies, such as DTC DNA testing, complicate the traditional categorizations of donor types and require a re-evaluation of the boundaries between anonymous, known and open-identity donation, particularly for offspring with anonymous donors who are now vulnerable to unanticipated contact. As a result, donor conception policies should be re-evaluated to account for the dynamic nature of family identities in the digital age and guide families in navigating this new landscape.

Examining the findings more closely, the stability of psychological adjustment across donor types highlights the fundamental role of family relationships in shaping offspring well-being (*Bos and Gartrell, 2020*). This underscores the importance of fostering supportive family environments, regardless of the specific donor arrangements. Additionally, although the fluctuations in externalizing and total problem behaviours remained below clinical thresholds, they point to the value of targeted interventions, particularly during adolescence and emerging adulthood. If required, such interventions may be especially critical during adolescence, a formative period for identity development (*Erikson, 1968*), when the offspring of lesbian parents might navigate unique challenges in establishing a sense of individuality and distinctiveness from their peers (*Turner and Coyle, 2000*).

Moreover, finding sperm donors and donor siblings can significantly influence an individual's sense of family and relatedness (*Koh et al., 2023a*, *2023b*). For offspring with lesbian parents, traditional biological ties are no longer the sole defining element of kinship; instead, a constellation of biological and social connections collectively forms the foundation of family relationships (*Mamo and Alston-Stepnitz, 2015*). As a result, donor-conceived adolescents in these families may benefit

from guidance and support in integrating the unique aspects of their family structure and their knowledge of their donor insemination conception into their broader sense of identity (*Frith et al., 2018*). This holistic approach to understanding family and identity formation is vital for ensuring the well-being of donor-conceived offspring.

Such an approach would align with the existing donor conception literature, highlighting the complex and nuanced processes involved in establishing contact with donor relations and their implications for well-being and identity development. In this regard, a recent study by Jadva and colleagues investigating donor conception-related identity and associated mental health outcomes found that offspring actively seeking contact with their donor relations reported higher levels of internalized stigma and preoccupation with donor conception compared with those who were open to contact but not actively searching (*Jadva et al., 2025*). Furthermore, the study found that offspring who had already established contact with their donor relations demonstrated greater openness and understanding, along with lower levels of internalized stigma related to their donor conception.

Relatedly, in emerging adulthood, offspring often begin contemplating their future parenthood (*Arnett, 2007*). For donor-conceived offspring raised by lesbian parents, this process may involve reflecting on how their own non-traditional family background shapes their plans for having children and how they might explain their donor conception to their future children (*Rothblum et al., 2024*). The possibility that these individuals may require support during this critical transitional phase cannot be dismissed, highlighting the need for mental health practitioners to be equipped to provide guidance and assistance should such needs arise.

In conclusion, the present study highlights the psychological resilience of established adult offspring of lesbian parents (*Bos and Gartrell, 2020*; *Bos et al., 2024*), irrespective of donor type or contact. These findings contribute to the broader field of reproductive psychology, providing practitioners and policy-makers with valuable insights to support diverse family structures while navigating the evolving challenges posed by technological advancements and societal shifts. This support is especially critical for lesbian parents and their offspring in the USA, who are currently facing an unprecedented reactionary backlash against LGBTQ+ rights and issues (*Kumar et al., 2023*), potentially jeopardizing their overall well-being and adjustment in the years to come.

REFERENCES

Achenbach, T.M., Rescorla, L.A., 2001. Manual for ASEBA School-Age Forms and Profiles. University of Vermont, Research Center for Children, Youth, and Families, Burlington, VT, USA.

Achenbach, T.M., Rescorla, L.A., 2003. Manual for the ASEBA Adult Form and Profiles. University of Vermont, Research Center for Children, Youth, and Families, Burlington, VT, USA.

Arnett, J.J., 2007. Emerging adulthood: What is it, and what is it good for? Child Dev Perspec 1, 68–73. https://doi.org/10.1111/j.1750-8606.2007.00016.x.

Arocho, R., Lozano, E.B., Halpern, C.T., 2019. Estimates of donated sperm use in the United States: National Survey of Family Growth 1995-2017. Fertil Steril 112, 718–723. https://doi.org/10.1016/j.fertnstert.2019.05.031.

Beeson, D.R., Jennings, P.K., Kramer, W., 2011. Offspring searching for their sperm donors: How family type shapes the process. Hum Reprod 26, 2415–2424. https://doi.org/10.1093/humrep/der202.

Bos, H.M.W., Gartrell, N.K., 2011. 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. Hum Reprod 26, 630–637. https://doi.org/10.1093/humrep/deq359.

Bos, H.M.W., Gartrell, N.K., 2020. Lesbian-mother families formed through donor insemination. In: Goldberg, A.E., Allen, K.R. (Eds.), LGBTQ-parent families: Innovations in research and implications for practice. 2nd ed. Springer, Cham, pp. 25–44.

Bos, H.M.W., Gartrell, N.K., Peyser, H., van Balen, F., 2008. The USA National Longitudinal Lesbian Family Study (NLLFS): Homophobia, psychological adjustment, and protective factors. J Lesb Stud 12, 455–471. https://doi.org/10.1080/10894160802278630.

Bos, H.M.W., Rothblum, E.D., Carone, N., Koh, A.S., Gartrell, N.K., 2024. Psychological health among adult offspring of lesbian parents at a time of anti-LGBTQ+ oppression. Psychol Sex. https://doi.org/10.1080/19419899.2024.2388252.

Bos, H.M.W., van Balen, F., van den Boom, D.C., 2007. Child adjustment and parenting in planned lesbian-parent families. Am J Orthopsychiatry 77, 38–48. https://doi.org/10.1037/0002-9432.77.1.38.

Calhaz-Jorge, C., De Geyter, C.H., Kupka, M.S., Wyns, C., Mocanu, E., Motrenko, T., Smeenk, J., Vidakovic, S., Goossens, V., 2020. Survey on ART and IUI: legislation, regulation, funding and registries in European countries: The European IVF-monitoring Consortium (EIM) for the European Society of Human Reproduction and Embryology (ESHRE). Hum Reprod Open 1, 1–15. https://doi.org/10.1093/hropen/hoz044.

Canzi, E., Accordini, M., Facchin, F., 2019. 'Is blood thicker than water?' Donor conceived offspring's subjective experiences of the donor: A systematic narrative review. Reprod BioMed Online 38, 797–807. https://doi.org/10.1016/j.rbmo.2018.11.033.

Carone, N., Barone, L., Lingiardi, V., Baiocco, R., Brodzinsky, D., 2021a. Factors associated with behavioral adjustment among school-age children of gay and heterosexual single fathers through surrogacy. Dev Psychol 57, 535–547. https://doi.org/10.1037/dev0001155.

Carone, N., Barone, L., Manzi, D., Baiocco, R., Lingiardi, V., Kerns, K., 2020. Children's

exploration of their surrogacy origins in gay two-father families: Longitudinal associations with child attachment security and parental scaffolding during discussions about conception. Front Psychol 11, 112. https://doi.org/10.3389/fpsyg.2020.00112.

Carone, N., Gartrell, N.K., Rothblum, E.D., Koh, A.S., Bos, H.M.V., 2021b. The stability of psychological adjustment among donor-conceived offspring in the US National Longitudinal Lesbian Family Study from childhood to adulthood: Differences by donor type. Fertil Steril 115, 1302–1311. https://doi.org/10.1016/j.fertnstert.2020.12.012.

Carone, N., Gartrell, N.K., Rothblum, E.D., Koh, A.S., Bos, H.M.W., 2022. Helicopter parenting, emotional avoidant coping, mental health, and homophobic stigmatization among emerging adult offspring of lesbian parents. J Fam Psychol 36, 1205–1215. https://doi.org/10.1037/fam0001020.

Carone, N., Rothblum, E.D., Koh, A.S., Bos, H.M.W., Gartrell, N.K., 2024. Sexual orientation and gender identity among donor-conceived offspring in the US National Longitudinal Lesbian Family Study from adolescence to adulthood. Sex Res Social Policy 21, 704–716. https://doi.org/10.1007/s13178-024-00945-0.

Chabot, J.M., Ames, B.D., 2004. "It wasn't 'let's get pregnant and go do it'": Decision making in lesbian couples planning motherhood via donor insemination. Fam Relat 53, 348–356. https://doi.org/10.1111/j.0197-6664.2004.00041.x.

Cohen, G., Coan, T., Ottey, M., Boyd, C., 2016. Sperm donor anonymity and compensation: An experiment with American sperm donors. J Law Biosci 3, 468–488. https://doi.org/10.1093/jlb/lsw052.

Cohen, J., 1977. Statistical power analysis for the behavioural sciences. Academic Press, New York.

Daar, J., Benward, J., Collins, L., Davis, O., Davis, J., Francis, L., Gates, E., Gitlin, S., Ginsburg, E., Klipstein, S., McCullough, L., Reindollar, R., Ryan, G., Sauer, M., Tipton, S., Westphal, L., Ethics Committee of the American Society for Reproductive Medicine, 2018. Informing offspring of their conception by gamete or embryo donation: An ethics committee opinion. Fertil Steril 109, 601–605. https://doi.org/10.1016/j.fertnstert.2018.01.001.

Elder, Jr, G.H., 1998. The life course as developmental theory. Child Dev 69, 1–12. https://doi.org/10.2307/1132065.

Erikson, E.H., 1968. Identity: Youth and crisis. Norton & Company, New York.

ESHRE Working Group on Reproductive Donation, Kirkman-Brown, J., Calhaz-Jorge, C., Dancet, E.A., Lundin, K., Martins, M., Frith, L., 2022. Good practice recommendations for information provision for those involved in reproductive donation. Hum Reprod Open hoac . https://doi.org/10.1093/hropen/hoac001.

Farr, R.H., Grotevant, H.D., 2019. Adoption. In: Fiese, B.H. (Ed.), APA handbook of contemporary family psychology: Vol. 1. Foundations, methods, and contemporary issues across the lifespan. American Psychological Association, Washington, D.C., pp. 725–741.

Fish, J.N., Russell, S.T., 2018. Queering methodologies to understand queer families. Fam Relat 67, 12–25. https://doi.org/10.1111/fare.12297.

Frith, L., Blyth, E., Crawshaw, M., van den Akker, O., 2018. Searching for "relations" using a DNA linking register by adults conceived following sperm donation. Biosocieties 13, 170–189. https://doi.org/10.1057/s41292-017-0063-2.

Gartrell, N.K., 2021. Overview of the 34-year U.S. National Longitudinal Lesbian Family Study and its 92% retention rate. J GLBT Fam Stud 17, 197–213. https://doi.org/10.1080/1550428X.2020.1861573.

Gartrell, N.K., Bos, H.M.W., 2010. US National Longitudinal Lesbian Family Study: Psychological adjustment of 17-year-old adolescents. Pediatrics 126, 28–36. https://doi.org/10.1542/peds.2009-3153.

Gartrell, N.K., Bos, H.M.W., Koh, A.S., 2018. National Longitudinal Lesbian Family Study—Mental health of adult offspring. N Engl J Med 379, 297–299. https://doi.org/10.1056/NEJMc1804810.

Gartrell, N.K., Hamilton, J., Banks, A., Mosbacher, D., Reed, N., Sparks, C.H., Bishop, H., 1996. The National Lesbian Family Study. Interviews with prospective mothers. Am J Orthopsychiatry 66, 272–281. https://doi.org/10.1037/h0080178.

Goldberg, A.E., 2023. LGBTQ-parent families: Diversity, intersectionality, and social context. Curr Opin Psychol 49, 101517. https://doi.org/10.1016/j.copsyc.2022.101517.

Goldberg, A.E., Allen, K.R., 2007. Lesbian mothers' ideas and intentions about male involvement across the transition to parenthood. J Marriage Fam 69, 352–365. https://doi.org/10.1111/j.1741-3737.2007.00370.x.

Goldberg, A.E., Allen, K.R., 2013. Donor, dad, or…? Young adults with lesbian parents' experiences with known donors. Fam Process 52, 338–350. https://doi.org/10.1111/famp.12029.

Groundstroem, H., Paulin, J., Sydsjö, G., Lampic, C., 2025. Integration of donor conception into identity and parental attachment: adolescents in heterosexual-couple and lesbian-couple families. Reprod BioMed Online 50, 104758. https://doi.org/10.1016/j.rbmo.2024.104758.

Hammarberg, K., Halliday, J., Kennedy, J., Burgner, D.P., Amor, D.J., Doyle, L.W., Juonala, M., Ranganathan, S., Welsh, L., Cheung, M., McLachlan, R., McBain, J., Lewis, S., 2023. Does being conceived by assisted reproductive technology influence adult quality of life? Hum Fertil 26, 1008–1014. https://doi.org/10.1080/14647273.2022.2042860.

Hertz, R., Nelson, M.K., Kramer, W., 2013. Donor conceived offspring conceive of the donor: The relevance of age, awareness, and family form. Soc Sci Med 86, 52–65. https://doi.org/10.1016/j.socscimed.2013.03.001.

Hertz, R., Nelson, M.K., Kramer, W., 2017. Donor sibling networks as a vehicle for expanding kinship: a replication and extension. J Fam Issues 38, 248–284. https://doi.org/10.1177/0192513X16631018.

Horton, M., Miller, K., Ory, S.J., Dyer, R.K., Pai, H., Simpson, J.L., Tarlatzis, B., Zegers-Hochschild, F., Ory, S., Bank, E., 2022. International Federation of Fertility Societies' Surveillance (IFFS) 2022: Global trends in reproductive policy and practice. Glob Reprod Health 7, e58.

Ilioi, E., Blake, L., Jadva, V., Roman, G., Golombok, S., 2017. The role of age of disclosure of biological origins in the psychological wellbeing of adolescents conceived by reproductive donation: a longitudinal study from age 1 to age 14. J Child Psychol Psychiatry 58 (3), 315–324. https://doi.org/10.1111/jcpp.12667.

Indekeu, A., Hens, K., 2019. Part of my story. The meaning and experiences of genes and genetics for sperm donor-conceived offspring. New Genet Soc 38, 18–37. https://doi.org/10.1080/14636778.2018.1549476.

Indekeu, A., Janneke, A., Maas, B.M., McCormick, E., Benward, J., Scheib, J.E., 2021. Factors associated with searching for people related through donor conception among donor-conceived people, parents, and donors: A systematic review. Fertil Steril Rev 2, 93–119. https://doi.org/10.1016/j.xfnr.2021.01.003.

Jadva, V., Freeman, T., Kramer, W., Golombok, S., 2009. The experiences of adolescents and adults conceived by sperm donation: Comparisons by age of disclosure and family type. Hum Reprod 24, 1909–1919. https://doi.org/10.1093/humrep/dep110.

Jadva, V., Jones, C., Hall, P., Imrie, S., Golombok, S., 2023. "I know it's not normal but it's normal to me, and that's all that matters": Experiences of young adults conceived through egg donation, sperm donation, and surrogacy. Hum Reprod 38, 908–916. https://doi.org/10.1093/humrep/dead048.

Jadva, V., Jones, C., Zadeh, S., 2025. The Donor Conception Identity Questionnaire: associations with mental health and searching for and finding donor connections. Fertil Steril 123, 322–332. https://doi.org/10.1016/j.fertnstert.2024.08.331.

Koh, A.S., Bos, H.M.W., Gartrell, N.K., 2019. Predictors of mental health in emerging adult offspring of lesbian-parent families. J Lesb Stud 23, 257–278. https://doi.org/10.1080/10894160.2018.1555694.

Koh, A.S., Bos, H.M.W., Rothblum, E.D., Carone, N., Gartrell, N.K., 2023a. Donor sibling relations among adult offspring conceived via insemination by lesbian parents. Hum Reprod 38, 2166–2174. https://doi.org/10.1093/humrep/dead175.

Koh, A.S., Rothblum, E.D., Bos, H.M.W., Carone, N., Gartrell, N.K., 2023b. Sperm donor relations among adult offspring conceived via insemination by lesbian parents. J Reprod Infant Psychol. https://doi.org/10.1080/02646838.2023.2227867.

Koh, A.S., van Beusekom, G., Gartrell, N.K., Bos, H.M.W., 2020. Adult offspring of lesbian parents: how do they relate to their sperm donors? Fertil Steril 114, 879–887. https://doi.org/10.1016/j.fertnstert.2020.05.010.

Kumar, V., Kodipady, A., Young, L., 2023. A psychological account of the unique decline in anti-gay attitudes. Philos Psychol 38, 1391–1425. https://doi.org/10.1080/09515089.2023.2249500.

Lingiardi, V., Carone, N., Morelli, M., Baiocco, R., 2016. "It's a bit too much fathering this seed": The meaning-making of the sperm donor in Italian lesbian mother families. Reprod BioMed Online 33, 412–424. https://doi.org/10.1016/j.rbmo.2016.06.007.

Mamo, L., Alston-Stepnitz, E., 2015. Queer intimacies and structural inequalities: New directions in stratified reproduction. J Fam Issues 36, 519–540. https://doi.org/10.1177/0192513X14563796.

Mehta, C.M., Arnett, J.J., Palmer, C.G., Nelson, L.J., 2020. Established adulthood: A new conception of ages 30 to 45. Am Psychol 75, 431–444. https://doi.org/10.1037/amp0000600.

Persaud, S., Freeman, T., Jadva, V., Slutsky, J., Kramer, W., Steele, M., Steele, H., Golombok, S., 2017. Adolescents conceived through donor insemination in mother-headed families: A qualitative study of motivations and experiences

of contacting and meeting same-donor offspring. Child Soc 31, 13–22. https://doi.org/10.1111/chso.12158.

R Core Team, 2021. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.

Reitz, E., Deković, M., Meijer, A.M., 2005. The structure and stability of externalizing and internalizing problem behavior during early adolescence. J Youth Adolesc 34, 577–588. https://doi.org/10.1007/s10964-005-8947-z.

Rothblum, E.D., Bos, H.M.W., Carone, N., Koh, A.S., Gartrell, N.K., 2024. Adults conceived via donor insemination by lesbian women reflect on their own parenting plans (and their parents reflect on being grandparents). LGBTQ+ Fam Interdiscip J 20, 18–34. https://doi.org/10.1080/27703371.2023.2254270.

Rothblum, E.D., Bos, H.M.W., Koh, A.S., Carone, N., Gartrell, N.K., 2025. Adult offspring of lesbian parents reflect on having been donor conceived: Feelings about their sperm donor and donor siblings. Couple Fam Psychol 14, 16–28. https://doi.org/10.1037/cfp0000256.

Scheib, J.E., Riordan, M., Rubin, S., 2005. Adolescents with open-identity sperm donors: Reports from 12–17 year olds. Hum Reprod 20, 239–252. https://doi.org/10.1093/humrep/deh581.

Scheib, J.E., Ruby, A., Benward, J., 2017. Who requests their sperm donor's identity? The first ten years of information releases to adults with open-identity donors. Fertil Steril 107, 483–493. https://doi.org/10.1016/j.fertnstert.2016.10.023.

Shenfield, F., 2002. To know or not to know the identity of one's genetic parent(s): a question of human rights? In: Healy, D., Kovacs, G., McLachlan, R., Rodrguez-Armas, O. (Eds.), Reproductive medicine in the twenty-first century. Parthenon Publishing Group, Nashville, TN, pp. 78–85.

Slutsky, J., Jadva, V., Freeman, T., Persaud, S., Steele, M., Steele, H., Kramer, W., Golombok, S., 2016. Integrating donor conception into identity development: adolescents in fatherless families. Fertil Steril 106, 202–208. https://doi.org/10.1016/j.fertnstert.2016.02.033.

Sperm Bank of California. History, 2024. Retrieved November, 10, 2024, from https://www.thespermbankofca.org/content/history.

Talbot, C., Hodson, N., Rose, J., Bewley, S., 2024. Comparing the psychological outcomes of donor and non-donor conceived people: A systematic review. BJOG: Int J Obstet Gynaecol 131, 1747–1759. https://doi.org/10.1111/1471-0528.17892.

Turner, A.J., Coyle, A., 2000. 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 15, 2041–2051. https://doi.org/10.1093/humrep/15.9.2041.

Valido, A.A., Harbour, V., Scheib, J.E., 2025. Increase in open-identity sperm donation in the United States since 1996. Fertil Steril. https://doi.org/10.1016/j.fertnstert.2024.09.012.

van den Broeck, U., Vandermeeren, M., Vanderschueren, D., Enzlin, P., Demyttenaere, K., D'Hooghe, T., 2013. A systematic review of sperm donors: Demographic characteristics, attitudes, motives and experiences of the process of sperm donation. Hum Reprod Update 19, 37–51. https://doi.org/10.1093/humupd/dms039.

van Rijn-van Gelderen, L., Bos, H.M.W., Gartrell, N.K., 2015. Dutch adolescents from lesbian-parent families: How do they compare to peers with heterosexual parents and what is the impact of homophobic stigmatization? J Adol 40, 65–73. https://doi.org/10.1016/j.adolescence.2015.01.005.

Received 11 December 2024; received in revised form 4 April 2025; accepted 11 April 2025.