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**To cite this article:** Audrey S. Koh, Esther D. Rothblum, Henny M.W. Bos, Nicola Carone & Nanette K. Gartrell (2023): Sperm donor relations among adult offspring conceived via insemination by lesbian parents, Journal of Reproductive and Infant Psychology, DOI: [10.1080/02646838.2023.2227867](https://doi.org/10.1080/02646838.2023.2227867)

**To link to this article:** <https://doi.org/10.1080/02646838.2023.2227867>



Published online: 02 Jul 2023.



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## Sperm donor relations among adult offspring conceived via insemination by lesbian parents

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### ABSTRACT

**Aim:** The present study examined how adult offspring of lesbian parents relate to their anonymous, open-identity, or known donors.

**Design:** An online survey of 75 donor-conceived offspring of lesbian parents, aged 30–33 years, participating in Wave 7 of a U.S. 36-year longitudinal study of planned lesbian-parent families was conducted. Offspring were asked about donor type, motivations for contacting the donor, terminology for the donor, relationship quality, means of relationship maintenance, impact of donor contact on offspring's other family members, and their feelings about the donor.

**Results:** Twenty offspring with anonymous donors and 15 with open-identity donors whom they had not contacted felt comfortable not knowing their donors. Forty offspring knew their donors – anonymous, contacted through an online registry ( $n = 7$ ), open-identity, contacted ( $n = 9$ ), or known since childhood ( $n = 24$ ). Offspring who had contacted their donor since age 18 had their motivations fulfilled after contact, got along well with him, did not view him as a relative, and had told most family members about their contact, without detriment. Whether the donor was unknown or known at this stage of their lives, most offspring were satisfied with their contact level.

**Conclusion:** This cohort of donor-conceived offspring of lesbian parents was among the first to reach adulthood during a time of technological advances in DNA testing, giving access to anonymous donors via online registries. The results inform donors, families, mental health providers, medical providers and public policymakers, on whether, how, and to what degree donor-conceived offspring optimally make donor contact.

### ARTICLE HISTORY

Received 11 April 2023

Accepted 14 June 2023

### KEYWORDS

Anonymous sperm donor; DNA online registry; donor insemination; donor relationship; lesbian parents; open-identity sperm donor

## Introduction

Sperm donor insemination (DI) increased 29% globally between 2016 and 2019 and is currently legal in 43 nations (International Federation of Fertility Societies, 2019). In the U.S., DI multiplied more than threefold between 2013 and 2017 (Arocho et al., 2019). The use of DI by lesbian women has also grown considerably over the past four decades. In 1982, the Sperm Bank of California was the first family planning facility to provide DI to all women, regardless of their marital status or sexual orientation (The Sperm Bank of California, 2022a). The following year, this same sperm bank founded open-identity donation (i.e. donor information would be available to offspring at age 18) as an alternative to donor anonymity (The Sperm Bank of California, 2022b). Other sperm banks in the U.S. have followed these policies. Some nations now prohibit donor anonymity, arguing that offspring have a right to know their paternal genetic origins (Cohen et al., 2016), but donor anonymity is still required in others (Calhaz-Jorge et al., 2020). These options facilitated women conceiving through DI and creating lesbian-parent families despite societal, legal, and public health hostility against gender and sexuality diverse parent (GSDP) families.

The first generation of DI-conceived offspring from GSDPs are now in their 30s (Gartrell, 2021). This cohort's fourth decade coincides with age-related, societal, and technological changes that may affect offspring's views and relationships with their donors. Offspring are likely more independent of parental influence and potentially less constrained by concerns that initiating donor contact might disrupt their family relationships (Canzi et al., 2019; Hertz et al., 2013; Jadva et al., 2009). Aging can bring health problems (i.e. offspring's own medical concerns), precipitating questions about a donor's medical history (Indekeu et al., 2021). As offspring start building their own families, they may contemplate the genetic and personal implications of their own parenthood and desire donor discourse (Indekeu et al., 2021; Jadva et al., 2010). In the past decade, ethical and legal support for a child's right to know their genetic origins has grown, which may spur offspring to contact their donors (Daar et al., 2018; Indekeu et al., 2021). Finally, there has been an exponential growth of direct-to-consumer (DTC) DNA testing, social media, and voluntary registries with genetic-linking services that offer to identify anonymous donors and donor half-siblings (Indekeu et al., 2021). All of these factors may have affected the amount or quality of donor contact now that DI-conceived offspring have reached adulthood.

Information on the DI adult offspring of GSDPs is limited by several factors. First, the pioneering generation of these offspring reached the eligibility age for open-identity donor contact relatively recently. Second, there is a long history of discrimination against gender and sexuality diverse (GSD) people who wish to inseminate (Calhaz-Jorge et al., 2020; Gregory et al., 2022). Third, GSDPs grappled with economic, legal, psycho-social, and genetic complexities in navigating donor options (Mamo & Alston-Stepnitz, 2015). Child-custody and legal concerns steered some parents towards anonymous and open-identity donors over known donors. Providing the option of donor contact when the offspring reached adulthood – and could pursue their own preferences and be less vulnerable to custody claims – made open-identity DI an attractive alternative (Gartrell et al., 2015). These factors have all restricted the participant pool for research on adult DI offspring of lesbian parents and their donors.

The evaluation of donor relationships is further complicated by terminology that has evolved over time. The customary donor types are 'anonymous', 'open-identity', and 'known (since childhood)', but these categories are neither static nor reflect the lived experiences of donors and offspring. With advances in DNA testing and registries, donor anonymity is no longer guaranteed (Braverman & Schlaff, 2019; Hodson et al., 2022). In the current study, we will additionally use the terms 'unknown donors' (anonymous donors and open-identity donors who remain unknown to the offspring) and 'known donors' (anonymous donors whom offspring contacted through DI registries, open-identity donors whom offspring contacted since age 18, and donors who were known by the offspring since childhood).

In light of all these factors, there is scant information on DI offspring and donors that have included GSDP adult offspring. A Donor Sibling Registry (connecting donor-conceived individuals with a common donor) study analysed family form (lesbian or heterosexual parents), DI disclosure, and features of donor contact. For offspring of lesbian couples, DI disclosure occurred at an earlier age; the contact was primarily initiated by their parents; donors were viewed more often as a 'donor' rather than a 'father'; and there were fewer who felt that (anonymous) donors should identify themselves, compared with heterosexual-couple families (Hertz et al., 2013). A Sperm Bank of California study analysing offspring who requested open-identity donor information also included GSDP families. Offspring requested donor information at a median age of 18.1, mainly motivated by curiosity about possible shared physical or personality features. However, the study focused on characteristics of offspring seeking donor-identity, rather than the donor relationship (Scheib et al., 2017). The current study, based on Wave 7 of the U.S. National Longitudinal Lesbian Family Study (NLLFS), aims to address the information gap on adult DI offspring of GSDPs by exploring when, why and how they contact their sperm donors, and how they feel about their donors and donor relationship.

The U.S. NLLFS started in 1986 aiming to provide prospective data on the first generation of intended lesbian-parent families (Gartrell et al., 1996). Wave 6 interviews (at offspring age 25) were the first to be conducted after offspring became eligible to contact their open-identity donors. At that time, 61% of offspring had unknown (40% anonymous, unknown; 21% open-identity, unknown), and 39% had known (10% open-identity, contacted since age 18; 29% known since childhood) donors. One-third of the 24 offspring with open-identity donors had met them by age 25 ( $n = 8$ ). Most offspring with anonymous and still unknown donors felt comfortable about not knowing them. Among offspring with known donors, two-thirds had ongoing donor relationships, half considered their donors as acquaintances, and most were satisfied with their relationship (with no difference between those with donors known since childhood versus those contacted since age 18) (Koh et al., 2020).

Research on how DI offspring from planned lesbian-parent families feel about their donors and DI is essential, as these findings may help future GSDPs, sperm donors, DI offspring, gamete banks and fertility clinics, donor registries, and public health and government policy advisors understand the ramifications of the expanded panoply of sperm donor types: anonymous donors who remain unknown; anonymous donors whom offspring have identified through DI registries; open-identity donors, still unknown; open-identity donors, contacted since age 18; and donors known since childhood.

Due to the importance of understanding more about DI offspring views towards their donors and their own DI conception, and the sparsity of such information, the current study addressed this gap by exploring the relationships between adult DI offspring of lesbian parents and their donors. The following key questions were examined: Now that the offspring are adults, how are donor types distributed? How do offspring feel about having unknown donors? Regarding donors contacted since age 18, how are these relationships? What is the satisfaction level with all donor types?

## Materials and methods

### *Study design*

The U.S. NLLFS has prospectively followed a cohort of lesbian-parent families from the offspring's conception, through childhood, and into adulthood (Gartrell et al., 1996). Current study participants were 30–33-year-old adults whose parents enrolled in the ongoing community-based NLLFS between 1986 and 1992, while inseminating or pregnant with these index offspring. During Wave 1, prospective lesbian parents were solicited for participation through notices in lesbian/gay periodicals, women's bookstores, and at lesbian events. Due to an extended recruitment phase, there was a 5.5-year difference between the birth of the youngest and oldest index offspring. The parents have been surveyed in seven waves since 1992 with the offspring surveyed since age 10 (Gartrell & Bos, 2010; Gartrell et al., 2005, 2018). The NLLFS had 84 planned lesbian-parent families at onset and 76 families still participating at Wave 7, yielding a 90% family retention rate. With Sutter Health Institutional Review Board approval, each offspring received an email describing the study's purpose and procedure, including its voluntary and confidential nature. After obtaining informed consent, the survey was conducted through a protected online program. Participants received a \$60 gift card. Wave 7 data were collected between March 2021 and November 2022. Demographic information on the total analytic sample of 75 NLLFS offspring is shown in Table 1. There were approximately equal numbers of female and male participants as well as two who were gender nonbinary; participants were mostly white, college graduates, and in a partnered relationship.

### *Measures*

#### *Donor types*

Offspring were asked about the donor, using the customary three donor types that their parents selected at conception, and the contemporary subcategorizations reflecting increased online identification of donors: anonymous (still unknown; contacted through DI registries); open-identity (still unknown; contacted since age 18); and known since childhood. They were asked their age upon contacting the donor, if after age 18.

#### *Comfort with unknown donors*

Offspring with still unknown donors (anonymous, unknown; open-identity, unknown) were asked 'How do you feel about not knowing your donor?' (1 = very uncomfortable, to 5 = very comfortable).

**Table 1.** Demographics of offspring ( $N = 75$ ).

Variable	<i>n</i>	%
Sex assigned at birth		
Female	39	52.0
Male	36	48.0
Gender identity <sup>1</sup>		
Cisgender	73	97.3
Gender nonbinary	2	2.7
Age, <i>M</i> ( <i>SD</i> ) <sup>2</sup>	30.9	0.9
Race/Ethnicity		
People of colour <sup>3,4</sup>	7	9.3
White	68	90.7
Educational level		
Some college	7	9.3
College degree	38	50.7
More than college	30	40.0
Sexual orientation <sup>5</sup>		
Straight/heterosexual	51	68.0
Gay/lesbian	3	4.0
Bisexual	7	9.3
Queer	13	17.3
Other	1	1.3
Ongoing committed relationship, yes	59	78.7
Have children, yes	8	10.7

Note. <sup>1</sup> The question on gender identity was: 'Do you currently describe yourself as man, woman, or transgender?' The two offspring who responded 'transgender' indicated on a follow-up question 'How would you describe your gender identity in your own words?' that they were 'gender nonbinary'. Cisgender offspring were those whose sex assigned at birth was the same as their gender identity when they completed the survey. <sup>2</sup> Age range: 30–33. <sup>3</sup> Based on Wave 6 information. <sup>4</sup> African American/Black:  $n = 3$ , Latina/or Hispanic:  $n = 1$ , Other or mixed:  $n = 3$ . <sup>5</sup> Due to rounding, the total percentage is 99.9%.

### *Relationship with donors contacted since age 18*

Offspring with donors contacted since age 18 (open-identity; contacted through DI registries) were asked: 'Which of the following questions motivated you to meet/contact your donor?' (multiple checklist answers allowed); 'Thinking back to your main reasons for meeting/contacting your donor, do you feel that these have been fulfilled?' (1 = no, definitely not, to 5 = yes, very much so); 'Do you consider your donor a(n)?' (multiple checklist answers allowed); 'How do you get along with your donor?' (1 = very badly, to 5 = very well); 'Do you have an ongoing relationship with your donor?' (no, yes); 'If yes, how do you maintain your contact with your donor?' (multiple checklist answers allowed). These offspring were further asked: 'Have you told anyone about your meeting/contact with your donor?' (multiple checklist answers allowed); 'What impact has meeting/contacting your donor had on your relationship with your family member(s)?' (1 = negative, 2 = mixed, neutral or not sure, 3 = positive); 'Did your donor also meet/have contact with any of your family members?' (no, yes; If 'yes', with whom? multiple checklist answers allowed).

### *Satisfaction with contact level regardless of donor type*

All offspring were asked: 'Regardless of whether or not you have contact with your donor, how satisfied are you with the current level of contact?' (1 = very dissatisfied, to 5 = very satisfied); 'Regardless of whether you have contact with your donor, would you like to

have more contact in the future?' (1= no, satisfied with the current level, 2 = neutral, 3 = yes, would like contact or more contact).

### Data analysis

Descriptive data (frequencies, percentages, means, and standard deviations) were calculated for all variables. All offspring were asked questions about their satisfaction with current and future levels of donor contact. Therefore, it was possible to investigate whether there were significant differences between offspring with: (1) unknown donors (anonymous, unknown; and open-identity, unknown), (2) donors contacted since age 18 (anonymous, contacted through DI registry; and open-identity, contacted since age 18), and (3) a known donor since childhood. Due to the small sample sizes in these different donor-type groups, a nonparametric test (Mann-Whitney U) was employed to assess the differences between these groups on satisfaction level with current contact and expectations for future contact.

## Results

### Donor types

Donor sub-types are shown in [Table 2](#): A total of 35 offspring (47%) had unknown and 40 (53%) had known donors.

### Comfort with unknown donors

The 35 offspring with still unknown donors were comfortable not knowing their donors, with a mean score of 3.94.

### Relationships with donors contacted since age 18

For the 16 offspring who had contacted donors since age 18, motivations for contacting the donor, whether their motivations had been fulfilled, terminology used for the donor, quality of donor relationship, and way(s) in which their relationship was maintained are presented in [Table 3](#). These offspring were further asked about who else they had told about their contact with the donor, the impact of the donor contact on the relationship with their family members, and who else among family members had met the donor, as presented in [Table 4](#).

**Table 2.** Donor types.

	<i>n</i>	%
Donor types		
<i>Anonymous</i>		
Unknown	20	26.7
Contacted through DI registry <sup>1</sup>	7	9.3
<i>Open-identity</i>		
Unknown	15	20.3
Contacted since age 18 <sup>2</sup>	9	12.0
<i>Known since childhood</i>	24	32.0

Note. <sup>1</sup> All but one offspring who contacted their donor also met him. <sup>2</sup> All who contacted their donor also met him.

**Table 3.** Relationship with donor contacted since age 18.

	<i>n</i>	%
Motivations for contacting the donor <sup>1</sup>		
What is he like?	15	93.8
To better understand my ancestral history/family background	10	62.5
Health/genetic questions	10	62.5
What is his family like?	9	56.3
Why did he donate sperm?	9	56.3
To have a better understanding of why I am who I am	9	56.3
To form a relationship	5	31.3
Does he want a relationship with me?	5	31.8
To thank him for being my donor	3	18.8
To incorporate him into my family	1	6.3
Other	1	6.3
Contact motivations fulfilled, <i>M</i> , <i>SD</i> <sup>2</sup>	4.0	1.2
Terminology for the donor <sup>1</sup>		
Sperm donor, but nothing more	8	50.0
Acquaintance	7	43.8
Relative	6	37.5
Close friend	5	31.3
Other	1	6.3
Uncle	0	0
Father	0	0
Quality of donor relationship, <i>M</i> , <i>SD</i> <sup>3</sup>	3.8	0.9
Ongoing relationship with donor, yes	9	56.4
Ways in which relationship is maintained <sup>1,4</sup>		
Emails	9	100.0
Meetings	5	55.6
Phone calls	2	22.2
Other	2	22.2
Social media	1	11.1
Gifts	1	11.1
Letters or cards	0	0.0

Note. Only asked of participants who contacted their donor  $\geq$  age 18 ( $n = 16$ ): open-identity donor ( $n = 9$ ) and anonymous donor contacted through DI registry ( $n = 7$ ). <sup>1</sup> Multiple answers allowed <sup>2</sup> 1 = No, definitely not, to 5 = Yes, very much. Observed minimal and maximal scores were 1.00 and 5.00, respectively. <sup>3</sup> 1 = Very badly, to 5 = Very well. Observed minimal and maximal scores were 3.00 and 5.00, respectively. <sup>4</sup> Based on 9 participants who contacted their donor  $\geq$  age 18 and had an ongoing relationship with the donor.

### *Satisfaction with contact level regardless of donor type*

All 75 offspring representing all donor types reported no significant differences by donor type on offspring satisfaction with current level of contact with their donor nor on wishes for future contact, as presented in Table 5.

## Discussion

To our knowledge, this is the first study to focus on the relationships between adult DI offspring from GSDPs and their sperm donors. In the 36<sup>th</sup> year of the U.S. NLLFS at Wave 7, these 30–33-year-olds were among the first generation of DI children from lesbian-parent families, now including offspring who have contacted their donors through DI registries. Offspring's relationships were analysed by donor type – unknown (anonymous, unknown; open-identity, still unknown) or known (anonymous, contacted through DI registries; open-identity, contacted; known since childhood) – including donor terminology, motivations for contact, relationship



**Table 4.** Donor impact on relationship with others.

	<i>n</i>	%
Disclosure of donor contact to others <sup>1</sup>		
Friends	15	93.8
Biological parent	14	87.5
I would tell anyone	14	87.5
Nonbiological parent	13	81.3
Partner/Spouse <sup>2</sup>	10	76.9
Sibling(s) with whom offspring was raised	10	62.5
Half-sibling(s) with whom offspring was not raised	9	56.3
Grandparents	8	50.0
Other family members	7	43.8
Other non-family members	5	37.5
Mother's current partner or spouse	2	12.5
My children	0	0.0
I haven't told anyone	0	0.0
Impact of donor contact on relationship with others, <i>M, SD</i> <sup>3</sup>		
Biological parent	2.2	0.4
Nonbiological parent	2.1	0.5
Sibling(s) with whom offspring was raised	2.3	0.5
Sibling(s) with whom offspring was not raised	2.8	0.5
Partner/Spouse	2.3	0.5
Donor met/contacted any of your family members, yes	10	62.5
Donor met/contacted <sup>1,4</sup>		
Biological parent	7	70.0
Nonbiological parent	6	60.0
Sibling(s) with whom offspring was raised	6	60.0
Sibling(s) with whom offspring was not raised	5	50.0
Other	4	40.0
Partner/Spouse <sup>5</sup>	2	15.4
Children	0	0.0

Only asked of those participants who contacted their donor  $\geq$  age 18 ( $N = 16$ ): open-identity donor ( $n = 9$ ) and anonymous donor contacted through DI registry ( $n = 7$ ). <sup>1</sup> Multiple answers allowed. <sup>2</sup> Percentage based on those who contacted their donor  $\geq$  age 18 and were in a partner/spouse relationship. <sup>3</sup> 1 = Negative, to 3 = Positive. <sup>4</sup> Based on the 10 participants who answered 'yes' to question of whether their donor met/had contact with any other family members. <sup>5</sup> Based on participants who answered 'yes' to question of whether their donor met/had contact with any other family members and were in a partner/spouse relationship.

maintenance and quality, impacts of contact on offspring's other family, and feelings about donors.

### Offspring with unknown donors

Most offspring with still unknown donors felt comfortable not knowing their donors. Three factors, probably interrelated, may have contributed to offspring comfort in not knowing their donors: early age of disclosure of their DI origins; GSDPs; and family-identity cohesion. Due to the absence of a father within single-mother and lesbian-parent families, DI is organically discussed with offspring at an early age (Jadva et al., 2009; Mamo & Alston-Stepnitz, 2015). A Donor Sibling Registry study showed differences by family type regarding donors, with earlier DI disclosure (73% versus 16% of offspring 'always knew', while 0% versus 40% were told of DI after age 18), and less frequent endorsement that the donor should make himself known (24% versus 53%), in lesbian-couple, versus heterosexual-couple families, respectively (Hertz et al., 2013).

**Table 5.** Contact level with donor ( $N = 75$ ).

	Total sample ( $N = 75$ )	Unknown donor <sup>1</sup> ( $n = 35$ )	Contacted donor at $\geq$ age 18 <sup>2</sup> ( $n = 16$ )	Known donor since childhood ( $n = 24$ )	Known donor since childhood versus Unknown donor		Contacted donor at $\geq$ age 18 versus Unknown donor		Contacted donor at $\geq$ age 18 versus Known donor since childhood	
					Mann-Whitney $U$	$p$	Mann-Whitney $U$	$p$	Mann-Whitney $U$	$p$
Satisfaction with current level of contact <sup>3</sup>					415.00	.934	230.50	.289	151.50	.237
<i>M</i>	4.04	4.06	3.88	4.13						
<i>SD</i>	0.99	1.11	0.72	0.99						
Future contact <sup>4</sup>					353.50	.275	248.50	.490	178.00	.681
<i>M</i>	1.91	1.80	1.94	2.04						
<i>SD</i>	0.77	0.76	0.68	0.86						

Questions were asked of all offspring, regardless of their donor type.<sup>1</sup> Anonymous, unknown and open-identity, unknown. <sup>2</sup> Anonymous, contacted through DI registry and open-identity, contacted at  $\geq$  age 18. <sup>3</sup> 1 = Very dissatisfied, to 5 = Very satisfied. Observed minimal and maximal scores were 1.00 and 5.00, respectively. <sup>4</sup> 1 = No, satisfied with the current level, 2 = Neutral, 3 = Yes, would like contact or more contact. Observed minimal and maximal scores were 1.00 and 3.00, respectively.

Family type has been associated in a different way with offspring interest in contacting donors. Another Donor Sibling Registry study found that interest in donor relationships was higher among single-mother, compared to two-parent, offspring (Beeson et al., 2011). The Sperm Bank of California analysis of offspring eligible for their donor’s identity found fewer requests from offspring of heterosexual-couple families, possibly because some offspring were unaware of their DI conception, compared to offspring of lesbian-couple families (Scheib et al., 2017).

It is possible that conversations with offspring about legal concerns of the time and the reasons for choosing a specific donor type within the context of their GSDP family, contributed to feeling comfortable about not knowing the donor (Koh et al., 2020). Age-appropriate, early discussions about their DI origins have been associated with children’s positive integration of this information (Daar et al., 2018) and accepting family cohesion without donor contact (Andreassen, 2023; Hertz et al., 2013). Socialization of children with other families who selected anonymous or identity-release donors may have contributed to some offspring feelings of completeness with their similar family and donor situation. It has also been posited that offspring and family members’ complete incorporation of their nonbiological parent (e.g. in GSDP or heterosexual-couple families using DI) could decrease interest in donor contact (Beeson et al., 2011; Hertz et al., 2013).

All of these factors may be relevant to the NLLFS offspring with still unknown donors embracing their family unit as complete (Mamo & Alston-Stepnitz, 2015), and thus being comfortable with their donor type. It should be noted however, that offspring may have motivations and desires for donor contact regardless of their satisfaction with their family of origin.

### *Offspring with donors contacted since age 18*

Despite studies suggesting reasons for new interest in donor contact as offspring reach adulthood (Braverman & Schlaff, 2019; Lampic et al., 2022), this was not found in the NLLFS. Only one additional person contacted their open-identity donor after age 25, bringing this total to nine. With technological advances in DNA testing, by Wave 7 there was a new category: anonymous donors contacted through DI registries. Seven offspring met in this manner, constituting 9.3% of all offspring or 43.8% of all of offspring who contacted their donors after age 18. Burgeoning DTC DNA databases have grown to an estimated 41.9 million total profiles in 2022, many of which market their 'genetic relative-finder' services (International Society of Genetic Genealogy, 2021). Registries for donor-conceived (DC) people may result in even more offspring availing themselves of contact with donors who intended to be anonymous. In the U.S., donor-linking services for DI offspring are provided by some sperm banks and other private registries. Outside the U.S., registries have been mandated by some governments, including jurisdictions where only open-identity release DI is now permitted (ESHRE Working Group Reproductive Donation et al., 2022; Indekeu et al., 2021). Nearly all NLLFS offspring who contacted their donors since age 18 were motivated by wanting to find out what he is like, but other frequent reasons were to understand their family history, find out more about his family, understand why he donated sperm, and gain a better understanding of themselves. Generally, the offspring felt that their expectations about contacting their donor had been fulfilled.

None of the offspring thought of their donor as a father. They were more likely to consider him as just a sperm donor, an acquaintance, or a relative. These results correspond to theories about offspring of lesbian parents neither embracing nor missing a father within their family (Andreassen, 2023; Hertz et al., 2013) and de-emphasising genetic asymmetry within the family by favouring family over genetic ties (Andreassen, 2023). No offspring reported negative relations with their donor; about half got along well and half were neutral. Over half had an ongoing relationship with the donor, most frequently via email.

Most offspring told their parents, friends, their own partner/spouse, and would tell anyone about contacting the donor, and many offspring had also informed their siblings and grandparents. The impact of disclosure on the offspring's other family relationships was mixed or neutral. Donors had also met most offspring's parents and same-household siblings.

### *Offspring of all donor types*

Regardless of whether they had met their donor, on average, the satisfaction with the level of donor contact was relatively high. Offspring responded neutrally about wanting more donor contact in the future. Cohesive family bonds nurtured from an early age may lead some offspring to feel complete with their family identity even without donor contact (Andreassen, 2023; Mamo & Alston-Stepnitz, 2015).

### *Strengths, limitations, and future directions*

Our study has important strengths. First, due to the start of the NLLFS when DI was first openly offered to GSDPs anywhere in the world, this study examined a first-generation cohort of adult DI offspring of lesbian parents and their relationships with their donors. Second, the diversity in donor types offered a rich view of donor

relationships, including offspring who recently discovered their donors through DI registries, and offspring who chose not to pursue donor contact – an understudied subgroup (Beeson et al., 2011; Zhang, 2021). Third, the information derives from the largest, longitudinal, and longest-running study of intended lesbian-parent families and their offspring. With its 90% family retention rate and prospective nature, the findings are not skewed by over-representation of offspring who were already content or dissatisfied with their donors or donor type. It is also not biased by representation of only offspring seeking previously anonymous donors as in studies from gamete-donation or donor sibling registries or internet-based groups.

Limitations of this study are its small and nonrepresentative nature. Participant numbers are limited because this first generation of GSDP DI offspring have just passed from emerging adulthood to adulthood, and because of the recency of donor discoverability using DI registries. This study started when most GSD people were too closeted or resource-challenged to allow for a large recruitment – much less a population-based study. The NLLFS sample consists of U.S., mostly white, and highly educated individuals, not representative of the entire population of DI offspring of GSDPs.

Future longitudinal studies would benefit from larger, more diverse samples of GSDPs and their offspring. Finally, data on DI offspring may not be transferable to offspring of oocyte donors. Future analyses of all types of gamete donation will be helpful as more individuals use gamete donation, gestational surrogacy, and/or other advanced reproductive technologies to forge new family types (Golombok, 2020) and novel, unstudied relationships.

## Conclusions

With increasing use of DI by GSDP and cisgender heterosexual parents worldwide, these findings on offspring and their donors can be instructive to individuals contemplating donated gametes, gamete donors, DC offspring, and the medical and mental health professionals who counsel them. DC offspring are starting to become parents and may consider these findings as they discuss grandparent(s) and donors with their own children.

More government entities are requiring donor-identity release programs with an increasing trend towards universal transparency (Calhaz-Jorge et al., 2020). Because of their relative newness plus age thresholds for release of donor information, inquiries to registries with legislated donor-identity release will increase in the coming years (e.g. requests to the Netherlands Fiom KID-DNA Database only began in 2020; requests to the UK DC Register will start in 2023) (ESHRE Media Press Releases, 2022; International Society of Genetic Genealogy, 2021). The NLLFS findings may inform policy for public health professionals, ethicists, sperm and oocyte banks, infertility clinics, and donor registries and DNA genealogy-search services on whether, how, and to what degree affected parties optimally make contact.

Our data from the 36-year U.S. NLLFS suggesting that early and open discussions of DI origins contribute to offspring's donor-satisfaction supports the practice of transparency within all types of families using gamete donations. The plethora of gamete donation options and resulting kinship types are expanding into uncharted areas, with implications for families, gamete banks and gene registries (both private and public), and policymakers.

## Acknowledgments

The authors thank the participants and their families.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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## Attestation statement

Data regarding any of the subjects in the study have not been previously published. Data will be made available to the editors of the journal for review or query upon request.

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