RUNNING TITLE: Donor Conception Identity Questionnaire

TITLE: The Donor Conception Identity Questionnaire: Associations with mental health and searching for and finding donor connections

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Capsule: Scores on the Donor Conception Identity Questionnaire (DCIQ) correlate with measures of psychological and social wellbeing and differ between donor conceived adults searching and not searching for their donor connections.

Abstract

Objective: To understand how the Donor Conception Identity Questionnaire (DCIQ) correlates with mental health and explore differences on the DCIQ between donor conceived people who were actively searching for donor connections to those who were not and those who had found their donor connections to those who had not.

Design: Cross sectional survey.

Subjects. 88 donor conceived adults ranging in age from 18 to 70 (Mean = 34.27 years, median = 31 years). 39 participants were actively searching for their donor connections, and 49 were not.

Exposure: Donor conception identity was measured using a questionnaire and scores were correlated with existing measures of mental health.

Main outcome measures: Participants completed the DCIQ and measures of wellbeing, satisfaction with life, identity, pride and stigma.

Results: Factor analysis of items from the DCIQ identified four domains: 1. Concern and preoccupation, 2. Internalised stigma, 3. Pride and acceptance, and 4. Openness and understanding. The identified factors correlated with scales of psychological and social wellbeing. Active searchers scored higher than non-active searchers on 'Concern and preoccupation' $F(1, 79) = 7.543$, $p = .007$ and 'internalised stigma' ($F(1, 79) = 4.355$, $p = .040$). Donor conceived individuals who had found their donor connections scored lower on 'internalised stigma' $F(1, 79) = 7.071$, $p = .009$ and higher on 'openness and understanding' ($F(1, 79) = 6.083$, $p = 0.016$) compared to those who had not found their donor connections.

Conclusion: The findings of the present study show that cores on the DCIQ correlate with existing measures of psychological and social wellbeing. Furthermore, donor conceived individuals searching for their donor connections differ from those not actively searching on key domains of the DCIQ. Implications for future avenues of study, and for support for donor conceived people are discussed.

Keywords: Donor connections, donor linking, donor conception, sperm donation, egg donation, identity, DCIQ

Introduction

There is variation in how donor conceived individuals feel about their conception and the importance they place on finding their donor and others conceived using the same donor who have different parent/s. Some donor conceived individuals feel angry, upset, or confused about their conception (1,2,3) whilst others feel positively or indifferent about this (4,5). Factors such as the age of disclosure have been found to be associated with more positive feelings about donor conception (2, 6, 7) and closer family relationships 8,9, with those told early in childhood feeling more positively and having closer family relationships than those told later in childhood or as adults.

Many donor conceived individuals actively search for, or are found by, their donor connections (10) although estimating the level of interest in donor linking is difficult as it is dependent on donor conceived people being aware of the method of their conception and participating in research on this topic. Estimates from The Sperm Bank of California suggest that a third of eligible families requested their donor's identity (11) and in Sweden approximately 7% of eligible adults had requested information about their donor by 2020 (12). Donor conceived individuals' reasons for searching for their donor include wanting to learn more about the donor (e.g., their appearance, interests, reasons for donation, and medical information), in order to satisfy feelings of curiosity, and to answer questions about their own identity (1,2,13,14, 15, 16, 17, 18, 19). Potential associations between donor conceived individuals' interest in finding their donor connections and within-family factors (e.g., age of disclosure, number/gender of parents) have been highlighted (10). In a recent study of donor conceived individuals with open-identity at age 18 donors, those who learned of their conception later in life were significantly more

interested in information about their heritage and medical background, and in establishing contact with the donor's family, than were those who had experienced earlier disclosure (12). Other factors, such as the influence of psychological wellbeing on interest in the donor and same-donor peers, are less well understood. The two studies to have looked at this (18, 12) found no associations between these variables. Very little is also known about associations between different factors and experiences of identifying the donor and/or same-donor peers.

Within the psychological literature, donor conceived people with anonymous or open-identity at age 18 donors are sometimes likened to adopted individuals who may also know little about their families of origin. While important for all individuals, identity development becomes more complex when differences from family members are present (20). For adopted children, unlike children who are genetically related to their parents, not knowing about their birth family can lead to them questioning who their birth family is, how they may be similar or different to them, and how birth family members fit into their world (21). Adopted individuals have been shown to vary in the extent to which they reflect on their adoptive status, from those who show limited exploration through to preoccupation, where being adopted takes up significant psychological and emotional energy (22,23). It is thought that the salience of adoption to one's identity may be associated with factors such as initiating a search for birth family (21,23).

The importance of donor conception to one's identity and how this relates to different aspects of donor conceived individuals' experiences, such as those relating to their emotional, psychological and social wellbeing, and those specific to donor conception, such as their level of interest in donor linking, is not well understood. Outside of donor conception, identity resolution has been found to be linked with wellbeing including satisfaction with life (24), positive wellbeing

(25), and anxiety (26). Although identity exploration is most salient during adolescence, it continues to be open to further changes throughout adult life (27). For donor conceived individuals, identity may be altogether more complex. For example, the literature has shown that for some donor conceived individuals, donors are part of a family story about how wanted the donor conceived child was and how grateful to the donor the family are (28, 29). For other donor conceived individuals, their donor conception is either not shared with them, or may be disclosed as a secret that should not be shared beyond the immediate family (30,31, 32). These different experiences are in some ways like the experiences of individuals with minoritised identities, such as LGBTQ+ identities, or the members of minoritised families, e.g., LGBTQ+ families, for whom both positive identity aspects (e.g., pride in the LGBTQ+ identity) and minority stressors (e.g., LGBTQ+ identity-related stigma) have been found to relate to mental health outcomes (33) . In a recent study comparing the mental health outcomes of donor conceived and non-donor conceived young adults, donor conceived young adults who reported higher levels of stigma relating to disclosing their donor conception status to others were more likely to score lower on measures of wellbeing than those who reported lower levels of stigma (Jones et al., forthcoming).

How identity influences and is influenced by contact with the donor and/or same-donor peers is under-researched. Yet the importance of donor conception and of identifying donor connections to identity is often referred to in the literature. In Harrigan et al.'s (2015) (34) study, donor conceived individuals described that not having knowledge about the donor (a result of the legal framework of donor anonymity) meant they had incomplete self-knowledge, with participants describing themselves as 'half a person' or that 'part of us is missing'. Relatedly, several, primarily qualitative, research studies have shown that finding donor connections can

lead to a greater sense of self, and a sense of belonging (35, 36, 14, 15). However, researchers have also identified the range of outcomes that can result from making donor connections (e.g., from the very positive to the very negative (16, 37)).

In van den Akker et al.'s (2015) (38) study, identity was measured among donor conceived adults using the Aspects of Identity Questionnaire (AIQ; 39), which distinguishes between personal, social and collective components of identity through items such as my personal values and moral standards (personal identity), my popularity with other people (social identity), and my race or ethnic background (collective identity). The items are scored to produce three different 'identity orientations': personal identity orientation, social identity orientation, and collective identity orientation. Van den Akker et al. (2015) found no differences in participants' identity orientations based on whether they had found, or were still searching for, donor connections through the UK's voluntary Donor Conceived Register (then UK Donor Link). This is perhaps contrary to what might have been expected given the literature discussed above that suggests that finding donor connections leads to a sense of belonging and that, among individuals who are adopted, there may be an association between how salient adoption is to identity and initiating a search for birth family (21,23).

Only one study to date has used a more specific measure of donor conception identity. The Donor Conception Identity Questionnaire (DCIQ), developed by the present study's lead author, and used in the research on which this article is based, was first used by Slutsky et al. (2016) 40. The DCIQ was developed and adapted from previous studies of donor conception (2,16) as well as studies examining adoption identity (41,42,43,44). Slutsky et al.'s (2016) (40) research explored associations between the way adolescents had integrated knowledge of donor

conception into their subjective sense of identity and parent-child relationship quality. Using the DCIQ alongside the Friends and Family Interview (45), a measure designed to assess security of attachment in middle childhood and adolescence, Slutsky et al. (2016) found that adolescents who were securely attached to their parents were more interested in exploring their donor conception.

The present study had two aims. The first aim was to validate the DCIQ by understanding how scores on the DCIQ correlated with existing scales of mental health, stigma, pride, and identity. The second aim was to examine if donor conception identity, as measured by the DCIQ, differed based on search status, i.e., between donor conceived individuals who were actively searching and those who were not actively searching for their donor connections, and by their donor linking status, i.e., between those who had found their donor connections and those who had not.

Materials and methods

Data for this study are drawn from a larger survey-based investigation examining the experiences and wellbeing of donor conceived adults in the UK. In line with the approach of this investigation, the present study reflects a conceptual shift towards studying donor conceived individuals' experiences in a balanced perspective, i.e., recognising the potential challenges and strengths that may be part of this experience, particularly as they relate to identity (e.g., both positive identity aspects, and minority stressors) (Jones et al., in preparation). This approach is underpinned by recent psychological theorisations of identity that are based on what we know from the empirical literature about the members of minoritised groups and families (33), and the

existing literature on donor conception that has shown variability in experiences (see Introduction and Zadeh et al., 201628 and 201729).

The survey was designed in consultation with the UK's largest community networks for donor conception families (Donor Conception Network) and donor conceived people (Donor Conceived Register Registrants' Panel, now Donor Conceived UK). It was piloted by five donor conceived people prior to launch, and was live, via the survey software tool Qualtrics, between January and August 2022.

The survey was advertised by the Donor Conception Network (DCN) and Donor Conceived Register Registrants' Panel (DCRRP) via mailing lists and social media. It was also circulated by the research team and others on social media and university mailing lists. Snowball sampling was also employed. The inclusion criteria for the study were: born through gamete donation (egg, sperm, or embryo donation); aged over 18; and living in the UK. Ethical approval was awarded by the UCL IOE Research Ethics Committee. The study was also approved by the Donor Conception Network Research Ethics Committee. All participants provided written consent to take part in the survey.

Participant characteristics

Eighty-eight donor conceived adults took part in the study, ranging in age from 18 to 70 years (Mean = 34.27 years, median = 31 years). Demographic information for the sample can be found in Table 1. Most of the sample were conceived using donor sperm and identified as female. All were born following anonymous donation. Overall, 39 participants described themselves as

actively searching for their donor connections, and 49 did not. Most participants found out about the study through the DCRRP (n=45, 51%) or DCN (n=22, 25%).

Measures

The scores from the DCIQ were compared to existing questionnaires of mental health, satisfaction with life, identity, pride and stigma. This validation process, often referred to as construct validity, is important in evaluating psychological questionnaires to ensure that the questionnaire measures the concepts that it is designed to evaluate.

Mental Health Continuum Short Form (46)

The Mental Health Continuum Short Form is a 14-item measure of the emotional, social and psychological components of wellbeing that asks respondents to indicate how often in the last month they experienced particular feelings associated with positive mental health on a 6-point scale ranging from 0 (never) to 5 (every day). An example item includes 'during the past month, how often do you feel that you had experiences that challenged you to grow and become a better person?'. The scale has been evaluated in different countries including United Kingdom, Netherlands, Hong Kong, India, Japan, Malaysia and Vietnam, with reported internal consistency ranging from .74-.94 (47, 48) Total scores can range from 6 to 70, with higher scores indicating flourishing mental health and wellbeing. Cronbach's alpha of the present study was .910.

Satisfaction With Life Scale (49)

The Satisfaction With Life Scale (SWL) is a brief questionnaire designed to evaluate overall life satisfaction. Five statements are rated on a 7-point scale ranging from strongly disagree to strongly agree. An example item is 'So far I have gotten the important things I want in life'. A total score ranging from 5 to 35 is calculated, with higher scores suggesting an individual feels greater global satisfaction with their life circumstances. Scores ranging from 5-9 indicate extreme dissatisfaction, a score of 20 indicates neutral satisfaction, and scores of 31-35 indicate extreme satisfaction. The scale has been reported to show high internal consistency and reliability 50. Cronbach's alpha of the present study was .890.

Identity-confusion subscale from the modified Erikson Psychosocial stage inventory MEPSI (51)

The Modified Erikson Psychosocial Stage Inventory explores the degree to which individuals identify with psychosocial attributes as an adult. It is informed by Erikson's theory of eight stages of identity development. The full scale has previously been used with adolescents, young adults, adults and elderly adults (52). The Identity-Confusion subscale comprises of 10 items that examine the extent to which an individual has resolved the developmental stage of identity exploration and crisis. A sample item is 'I change my opinion of myself a lot'. After the relevant items have been reversed scored, the mean is calculated with a range of 1 to 5, whereby higher scores represent more positive attributes, i.e., a more resolved understanding of identity, and lower scores suggest greater identity confusion. The reliability of subscale scores has been reported to be good to excellent (52). Cronbach's alpha of the present study was .891.

Pride subscale of the Gender Minority Stress and Resilience Measure (53)

The pride subscale (8 items) of the Gender Minority Stress and Resilience Measure scale was adapted for use with donor conceived individuals. The subscale examines the extent to which an individual feels proud of their identity. A sample item is 'I am proud to be a person who is donor conceived' The items are scored from 0 (strongly disagree) to 4 (strongly agree), with the relevant items being reverse scored. The items are summed and then averaged to create a mean score ranging from 0 to 4, with higher scores representing higher levels of community connectedness and pride respectively, e.g., greater resilience factors. Each of the 9 scales have been reported to have good criterion and convergent validity (54). Cronbach's alpha for the Pride subscale of the present study was .803.

Disclosure concerns subscale of the HIV Stigma Scale (55)

The disclosure concerns subscale (10 items) of the HIV Stigma Scale was adapted for use with donor conceived individuals. The original scale comprises of 40 items with four subscales that assess how people living with HIV experience stigma. The disclosure concerns subscale assesses a person's worries or concerns about telling others about their HIV status. The adapted subscale explored the extent to which individuals experience stigma relating to telling and talking to others about their donor conception. A sample item is 'In many areas of my life, no one knows I am donor conceived'. The items are scored from 1 (strongly disagree) to 4 (strongly agree) with relevant items being reverse scored. The item scores are then totalled, with high scores indicating greater stigma regarding disclosure. The reported internal consistency for the original scale has been found to range from acceptable to excellent (Cronbach's alpha ≥ 0.70) (56). Cronbach's alpha of the present study was .897.

Donor Conception Identity Questionnaire

The Donor Conception Identity Questionnaire (DCIQ) was developed and adapted from previous studies of donor conception (2,16) as well as studies examining adoption identity (41,42,43,44). The original questionnaire was developed by the first author specifically for a study of donor conceived adolescents to examine the relationship between parent-child attachment quality and donor conception identity (40). As there was no existing measure of donor conception identity, the researchers created a questionnaire by drawing from research on adoption and donor conception. The items were checked for face validity by researchers with expertise in the field of donor conception, adoption and psychometrics. As the questionnaire was not standardised, and no scoring system or norms were available, the authors conducted factor analysis on the questionnaire items which resulted in a two-factor solution based on 16 or the 25 items of the questionnaire. Given the sample size of the original study was small (N=19) and not all items were used in the final analysis, the present study repeated the factor analysis using all items of the questionnaire. The questionnaire comprises of 25 items, with each item rated on a 5-point scale ranging from 1 'Strongly disagree' to 5 'Strongly agree'. In the present study, a principal component analysis (PCA) with varimax rotation was conducted on the 25 items of the DCIQ. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .851. Bartlett's test of sphericity $X2$ = 1313.56, df = 253, p = <.001, indicated that correlations between items were sufficiently large for PCA. An initial analysis was run and a 6-factor solution with eigenvalues above 1 was found. Analysis of the scree plot showed that a 4-factor solution was more appropriate. The factor analysis was rerun with eigenvalues >1.1. Two items had low

communalities scores and were removed. The final model accounted for 66.02% of the variance. The items and factor loadings can be seen in Table 2. The 4 factors were described as follows: *Concern and preoccupation* (8 items, Cronbach's alpha = .874) included items such as "I have thought a great deal about donor conception" and "After a conversation about donor conception I tend to feel upset"; *Internalised stigma* (6 items, Cronbach's alpha = .877) including items such as "I try to avoid the topic of donor conception because it raises a lot of questions" and "I feel embarrassed if others know I am donor conceived"; *Pride and acceptance* (6 items, Cronbach's alpha = .872) including items such as "Being donor conceived makes me feel special and "Being donor conceived is just part of who I am"; and *Openness and understanding* (4 items, Cronbach's alpha = .572) including items such as "I am happy to tell anyone about my donor conception" and "I understand myself better because I have thought about who I am in relation to my parents and my donor". To score the questionnaire, negatively loading items were reversed and all the items for each subscale were summed to produce a score for each. The *Concern and preoccupation* subscale ranges from 8-40 with higher scores indicating greater concern and preoccupation with being donor conceived; the I*nternalised stigma* subscale ranges from 5-25 with higher scores reflecting more severe internalised stigma about being donor conceived; the *Pride and acceptance* subscale ranges from 6- 30 with higher scores reflecting more positive feelings and pride in being donor conceived; and the *Openness and understanding* subscale ranges from 4-20 with higher scores indicating greater exploration of donor conception and greater willingness to discuss donor conception with others. (See Appendix A for questionnaire and scoring key).

Search status and linking status

Information on participants' search status was obtained by the following closed response question. "We know that some people actively search for the donor and other people conceived using the same donor (often and here referred to as donor siblings), others are open to being contacted but are not actively searching, and others do not wish to make connections. Which best describes your experience at the moment?" Possible responses were: 1. Actively searching for donor connections, 2. open to making connections but not actively searching, 3. not searching for donor connections. The latter two responses were recoded as 'not actively searching' for the purposes of the present study.

Information on participants' linking status was obtained by the following closed response (Yes/No) question: "Have you identified any donor connections, either recently or in the past?"

Data Analysis plan

Pearson's *r* correlations were conducted to examine the association between the different domains of donor conception identity and measures of positive and negative mental health, stigma, pride and identity. To examine differences in donor conception identity between groups based on searching for donor connections (actively searching versus open to contact) and finding donor connections (Yes, No), multivariate analyses of variance (MANOVA) were conducted followed by univariate analysis of variance (ANOVA). Prior to analysis Cronbach's alpha was calculated for all scales and for the four domains of the DCIQ. Cronbach's alpha measures the internal consistency of items on a scale and is used to evaluate the reliability of a psychometric scale. Cronbach's alpha ranges from 0-1, with acceptable values ranging from 0.70 to 0.95 (57).

Results

Donor conception identity and psychological and social wellbeing

Concern and preoccupation

The *Concern and preoccupation* subscale of the DCIQ was found to correlate positively with the disclosure subscale of the HIV Stigma Scale, $r(86) = .280$, $p = .008$ and to correlate negatively with the pride subscale of the Gender Minority Stress and Resilience Measure, $r(86) = .-.398$, $p < .001$, such that participants who were more concerned and preoccupied about their donor conception also showed greater stigma regarding disclosure and lower levels of pride in being donor conceived.

Internalised stigma

The *Internalised stigma* subscale was positively correlated with the disclosure concerns subscale of the HIV Stigma Scale $r(86) = .858$, $p < .001$ and negatively correlated with the mental health continuum $r(85) = -.378$, $p < .001$, satisfaction with life scale $r(86) = -.263$, $p = .013$, pride subscale of the Gender Minority Stress and Resilience Measure $r(86) = -716$, $p < .001$ and identity-confusion subscale of the MEPSI $r(86) = -.250$, $p = .019$, showing that participants who had more internalised stigma about donor conception showed greater stigma regarding disclosure, lower levels of positive functioning, were less satisfied with their life circumstances, felt lower levels of pride in being donor conceived, and greater identity confusion.

Pride and acceptance

The *Pride and acceptance* subscale was positively correlated with the Mental Health Continuum $r(85) = .276$, $p = .010$, satisfaction with life scale $r(86) = .329$, $p = .002$ and the pride subscale of the Gender Minority Stress and Resilience Measure $r(86) = .800$, $p < .001$. It was negatively correlated with the disclosure concerns subscale of the HIV Stigma Scale $r(86) = -.396$, $p < .001$. Thus, participants who scored higher on the pride and acceptance subscale showed better mental health and wellbeing, were more satisfied with their life circumstances, and showed greater pride in being donor conceived.

Openness and understanding

The *Openness and understanding* subscale was positively correlated with the Mental Health Continuum $r(85) = .304$, $p = .004$, satisfaction with life scale $r(86) = .316$, $p = .003$, the pride subscale of the Gender Minority Stress and Resilience Measure $r(86) = .584$, $p < .001$ and the identity confusion subscale of the MEPSI $r(86) = .244$, $p = .022$. It was negatively correlated with the disclosure concerns subscale of the HIV Stigma Scale $r(86) = -.614$, $p < .001$. Thus, participants who showed greater exploration of donor conception and greater willingness to discuss donor conception with others also showed better mental health and wellbeing, were more satisfied with their life circumstances, showed more pride in being donor conceived, had a more resolved understanding of identity, and had lower levels of stigma regarding disclosure.

Donor conception identity and searching for and finding donor connections

The MANOVA found a main effect of 'searching for' ($F(4,76) = 3.414$, $p = <.001$; Wilks' $\Lambda = .848$) and 'finding' ($F(4,76) = 5.306$, $p = .013$; Wilks' $\Lambda = .782$) donor connections. However, the

interaction between the two variables was not significant ($F(4,76) = .508$, $p = .730$; Wilks' $\Lambda = .974$) suggesting that they were independently related to the subscale scores of the DCIQ.As summarised in Table 2, univariate ANOVA's showed a significant difference between search status and *concern and preoccupation*, $F(1, 79) = 7.543$, $p = .007$ and *internalised stigma*, $F(1, 79) = 4.355$, $p = .040$, with active searchers scoring higher than non-active searchers on both domains. Univariate ANOVA's found significant differences between finding status and *internalised stigma* $F(1, 79) = 7.071$, $p = .009$ and *openness and understanding* $F(1, 79) = 6.083$, $p = 0.016$, with donor conceived individuals who had found donor connections scoring lower on internalised stigma and higher on openness and understanding compared to those who had not found their donor connections.

Discussion

The findings of the present study show that donor conceived individuals differ on key domains that tap into aspects of their donor conception identity. Scores on the subscales of the Donor Conception Identity Questionnaire correlate with existing measures of psychological and social wellbeing, providing evidence for the validity of the questionnaire. Furthermore, the DCIQ can differentiate between donor conceived individuals in terms of the ways in which they have integrated knowledge of donor conception into their subjective sense of identity, and this is related to the intensity of their search for donor connections, and the outcomes of that search. Firstly, findings show that all four subscales of the DCIQ relate to different dimensions of wellbeing, including overall emotional, social, and psychological wellbeing, and more specific dimensions, including for example pride and stigma. Each subscale showed good reliability as

measured by Cronbach's alpha, and overall, the subscales showed that more positive donor conception identity was related to better mental health and wellbeing, higher satisfaction with life and greater pride in being donor conceived, whereas more negative donor conception identity was related to lower levels of mental health and wellbeing, greater stigma regarding disclosure, and less pride in being donor conceived. Our findings therefore not only evidence the varying psychological and social implications of being donor conceived for different individuals, but also attest to the value of the DCIQ as a useful tool for researchers who are interested in how donor conception identity relates to psychological and social wellbeing. It is also likely that the DCIQ would be used by health professionals and counsellors whose work can be guided by knowledge of the impact of donor conception on individual identity and provide them with a better understanding of the complexity of donor conception identity. Completion of the DCIQ within a therapeutic setting could inform the practitioner about the stage of identity development their client is at and guide more tailored interventions; further research is now needed to establish the application of the DCIQ in a practical context as well as to explore how donor conception identity changes over time, and the factors that may affect this.

One of the strengths of the present study is that its findings demonstrate the diversity of psychological and social experiences of being donor conceived among donor conceived people in the UK. The psychological wellbeing of donor conceived people has otherwise been systematically studied in two studies of donor conceived young adults to date: the U.S. National Longitudinal Lesbian Family Study of donor conceived individuals raised in two mother families (58), and the UK Longitudinal Study of ART families (8). Both studies found no differences between the psychological wellbeing of donor conceived young adults and adults born without

assisted conception. The present study's findings extend what is known from the existing literature by validating both the negative and positive aspects of the experiences of donor conceived individuals. For example, findings show the psychological toll that being donor conceived takes on some individuals, along with the importance of factors such as pride, acceptance, openness and understanding for other individuals, for whom being donor conceived is experienced differently. Further conceptual work that applies existing psychological theories and concepts such as minority stress (59,60) and flourishing (61) to donor conceived populations is needed to establish whether being donor conceived is, for some individuals, associated with positive components that not only moderate the effects of challenges to wellbeing, but also are in themselves positively associated with it. Some of this conceptual work, that foregrounds strengths-based approaches, is beginning to emerge on LGBTQ+ families and their children, some of whom are donor conceived (61).

Beyond findings relating to the varied implications of being donor conceived for identity and wellbeing, this study offers an important insight into the relationship between searching for and finding donor connections and how individuals feel about being donor conceived. Participants who were actively searching for donor connections showed higher levels of concern and preoccupation and internalised stigma about being donor conceived than non-active searchers. Moreover, those who had found donor connections showed lower levels of internalised stigma and greater levels of openness and understanding than those who had not found connections, suggesting that finding donor connections may facilitate the successful integration of donor conception into one's identity and a willingness to discuss being donor conceived with others. Such findings in turn suggest that the DCIQ may be a valuable resource

for practitioners in the context of supporting individuals who are requesting their donor's identity (as is the case in the UK as of October 2023, and see also Allan, 2017 (62), and Calhaz-Jorge, 2020 (63) for legislation in other jurisdictions). However, it is important to recognise that from the study's cross-sectional findings, causal relationships between variables cannot be established.

Further limitations of this study include the fact that the sample on whom the research is based were mostly conceived using sperm donation and were mostly female. While studies of donor conceived children and young adults have found few differences in the psychological adjustment of children born following egg, sperm donation or surrogacy 8 and that children born following sperm donation, egg donation or surrogacy can feel positively, negatively or indifferently about their method of conception (2,4,5), whether or not the scale would be similarly useful for those conceived through egg donation or surrogacy cannot be known from the present findings. Moreover, all the individuals taking part in the study were aged 18 and over and the vast majority had been conceived to heterosexual parents. However, the DCIQ has been successfully used in previous research with a sample of adolescents raised in single mother and same-sex female couple families (2), suggesting the potential value of this questionnaire across different cohorts of different ages and across family types. Further work to validate the scale within different contexts and with different populations is now required. In the meantime, the findings of this study will be of importance and value to stakeholders who are presently reflecting upon how best to support donor conceived people, particularly in the context of searching for and finding donor connections.

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654

655 Table 1: Sample characteristics

	X	SD
Age	34.27	10.95
	N	%
Gender		
Female	65	73.9
Male	19	21.6
Nonbinary	4	4.5
Transgender	1	1.1
Sexual orientation		
Straight or Heterosexual	65	73.9
Gay or Lesbian	8	9.1
Bisexual	9	10.2
Other	5	5.7
Missing	1	1.1
Relationship Status	36	40.9
Married/civil partnership	29	33.0
In a relationship	23	26.1
Single	36	40.9
Ethnicity		
White English/Welsh	83	94.3
White Other	4	4.5
Mixed/multiple ethnic	1	1.1
Religion		
No Religion	67	76.1
Christian	18	20.5
Jewish	2	2.3
Buddhist	1	1.1
Education		
GCSEs	6	6.8
A-levels	12	13.6
Undergraduate degree	30	34.1
Postgraduate degree	30	34.1
Diploma	8	9.1
Other	2	2.3
Employment status		
Employed	61	69.3
Unemployed	3	3.4
Studying	7	8.0

Employed and Studying	6	6.8
Other	11	12.5
Family Type		
Heterosexual couple	74	84.1
Same-sex female couple	7	8.0
Single mother	5	5.7
Other	2	2.3
Type of donation		
Sperm donation	79	89.8
Egg donation	7	8.0
Embryo donation	2	2.3
Do you remember the age learnt about donor conception?		
Too young, always known	21	23.9
Yes	67	76.1
Not sure	0	0
If yes, age learnt about donor conception		
7-9	3	4.5
10-14	9	13.4
15-19	8	11.9
20-24	13	19.4
25-29	13	19.4
30-34	6	9.0
35-39	3	4.5
40-44	6	9.0
45-49	4	6.0
50+	1	1.5
Missing	1	1.5
Searching status		
Actively searching	39	44.3
Not actively searching	49	55.7
Found donor connections		
Yes	56	63.6
No	27	30.7

659 Table 2: DCIQ Items with factor loadings for items comprising subscales.

660

	Concern and preoccupation	Internalized stigma	Pride and acceptance	Openness and understanding
Being donor conceived makes me feel special			.874	
I have thought a great deal about donor conception	.755			
After a conversation about donor conception I tend to feel upset	.527			
It's important for me to be in contact with other donor conceived individuals	.629			
I feel like donor conception is something that happened in the past and I am fine where I am	-.721			
I am happy to discuss donor conception with my friends		-.769		
I don't feel bad about being donor conceived			.655	
Being donor conceived is just part of who I am			.747	
I am proud of being donor conceived			.793	
I try to avoid the topic of donor conception because it raises a lot of questions		.824		
Being donor conceived doesn't really matter much to me	-.801			
I feel angry that I am donor conceived			-.589	
I think a lot about the characteristics I might share with my donor	.686			
Donor conception doesn't enter into my life or my decisions at all	-.654			
Knowing the identity of my donor is important to me	.754			
I understand myself better because I have thought about who I am in relation to my parent(s) and donor				.724
I am happy to discuss donor conception with my parent(s)				.541
I feel embarrassed if others know I am donor conceived		.879		
I like to keep my donor conception a secret		.907		
I am happy to tell anyone about my donor conception				.360
I feel ashamed of being donor conceived			-.362	
I worry about being bullied or teased about being donor conceived		.724		
I am still trying to figure out how donor conception relates to who I am				-.371

661

662 Table 3: Mean (SD) and Univariate analysis of Variance by search status and found donor connections

	X	*SD*	*X*	*SD*	*F*	*p*
	Actively searching		Not actively searching			
Concern and preoccupation	32.18	5.46	28.57	6.95	7.543	.007
Internalised stigma	14.10	5.47	12.32	5.16	4.355	.040
Pride and acceptance	20.95	6.19	21.34	5.61	.297	.587
Openness and understanding	12.54	3.03	13.30	3.59	2.558	.114
	Found donor connections		Not found donor connections			
Concern and preoccupation	31.14	6.41	28.44	6.94	1.570	.214
Internalised stigma	12.25	4.87	15.04	5.88	7.071	.009
Pride and acceptance	20.70	6.09	22.11	5.31	.648	.423
Openness and understanding	13.48	3.09	11.81	3.62	6.083	.016

663 Note: comparisons between active searchers and non-active searchers only with those not interested in
664 contact removed (n = 5)
665

Appendix A Donor Conception Identity Questionnaire (DCIQ)

Please read each of the statements below. Using the scale, rate each statement according to how well it describes you by selecting one of the options: strongly disagree, disagree, neither agree or disagree, agree, strongly agree.

1. I am still trying to figure out how donor conception relates to who I am
2. Being donor conceived makes me feel special
3. I have thought a great deal about donor conception
4. After a conversation about donor conception I tend to feel upset
5. It's important for me to be in contact with other donor conceived individuals
6. I feel like donor conception is something that happened in the past and I am fine where I am
7. I am happy to discuss donor conception with my friends
8. I don't feel bad about being donor conceived
9. Being donor conceived is just part of who I am
10. I am proud of being donor conceived
11. I try to avoid the topic of donor conception because it raises a lot of questions
12. Being donor conceived doesn't really matter much to me
13. I feel angry that I am donor conceived
14. I think a lot about the characteristics I might share with my donor
15. Donor conception doesn't enter into my life or my decisions at all
16. Knowing the identity of my donor is important to me
17. I understand myself better because I have thought about who I am in relation to my parent(s) and donor
18. I am happy to discuss donor conception with my parent(s)
19. I feel embarrassed if others know I am donor conceived
20. I like to keep my donor conception a secret
21. I am happy to tell anyone about my donor conception
22. I feel ashamed of being donor conceived
23. I worry about being bullied or teased about being donor conceived

Scoring:

Each item is rated on a 5-point scale with following scores assigned.

1 Strongly disagree
2 Disagree
3 Neither agree nor disagree
4 Agree
5 Strongly agree

Reverse score items that are negatively loaded so that strongly disagree = 5 and strongly agree = 1. Sum all items for each factor to obtain scores for each of the 4 domains.

Concern and preoccupation
Positively loaded:
3. I have thought a great deal about donor conception
4. After a conversation about donor conception I tend to feel upset
5. It's important for me to be in contact with other DC individuals
16. I think a lot about the characteristics I share with my donor
18. Knowing the identity of my donor is important to me

Negatively loaded (reverse score):
7. I feel like donor conception is something that happened in the past and I am fine where I am
14. Being donor conceived doesn't really matter much to me
17. Donor conception doesn't enter into my life or my decisions at all

Internalised stigma
Positively loaded:
13. I try to avoid the topic of donor conception because it raises a lot of questions
21. I feel embarrassed if others know I am donor conceived
22. I like to keep my donor conception a secret
25. I worry about being bullied or teased about being donor conceived

Negatively loaded (reverse score):
8. I am happy to discuss donor conception with my friends

Pride and acceptance
Positively loaded:
2. Being donor conceived makes me feel special
9. I don't feel bad about being donor conceived
10. Being donor conceived is just part of who I am
12. I am proud of being donor conceived

Negatively loaded (reverse score):
15. I feel angry that I am donor conceived
24. I feel ashamed of being donor conceived

Openness and understanding

Positively loaded:

19. I understand myself better because I have thought about who I am in relation to my parents and my donor

20. I am happy to discuss donor conception with my parent(s)

23. I am happy to tell anyone about my donor conception

Negatively loaded (reverse score):

1. I am still trying to figure out how DC relates to who I am