

Parenting stress and its association with perceived agreement about the disclosure decision in parents following donor conception

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Key words

Gamete donation, oocyte donation, sperm donation, parenthood, relationship quality, relationship satisfaction, heterosexual, cohort study

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Conflict of interest

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Introduction

Following conception with oocyte (OD) or sperm donation (SD), families have been found to function well (1), and donor-conceiving parents in general report similar

Abstract

Introduction. For many donor-conceiving heterosexual parents, the process of deciding whether and what to tell children about their genetic origin is challenging. We hypothesized that incomplete couple agreement about disclosure could be associated with parenting stress. The aim of the study was to investigate: (1) parenting stress levels among heterosexual parents of young children following gamete donation and (2) whether parenting stress is related to perceived agreement about disclosure of the donor conception to the children. **Material and methods.** This study is part of the longitudinal multicenter Swedish Study on Gamete Donation and included a total of 213 heterosexual parents with children aged 1–4 years following oocyte donation ($n = 103$) and sperm donation ($n = 110$). Parents individually completed a questionnaire that included validated instruments on parenting stress (SPSQ) and relationship quality (ENRICH), as well as a study-specific measure on disclosure agreement. Multiple regression analysis was applied. **Results.** Incomplete couple agreement on disclosure to the children was not statistically significantly associated with increased levels of parenting stress. Relationship satisfaction consistently and significantly accounted for variation in parenting stress levels, indicating that relationship satisfaction had a buffering impact on parenting stress. **Conclusions.** Parental stress does not appear to be negatively influenced by incomplete couple agreement about disclosure to children. As children grow up, reaching agreement about what to tell the child about the donor conception might become more relevant for couples' stress related to parenthood.

Abbreviations: ENRICH, Evaluating and Nurturing Relationship Issues, Communication and Happiness; OD, oocyte donation; SD, sperm donation; SPSQ, Swedish Parenthood Stress Questionnaire; SSGD, Swedish Study on Gamete Donation.

levels of parenting stress as naturally conceiving families (2–4). However, a specific challenge for parents following donor conception is the decision whether, when and how they will tell their child that he or she was donor-conceived. Previous research on donor conception indicates that the decision about (non-)disclosure is challenging for

many heterosexual parents and that it is influenced by a complex body of psychological and social factors, including couple dynamics (5,6).

In a 10-year follow-up study of heterosexual donor-conceiving families (7), comparisons of subgroups indicate that levels of parenting stress are related to the disclosure decision. Among mothers of one-year-old children following OD or SD, those who intended to disclose reported lower parenting stress levels compared with mothers who did not plan to disclose or were undecided. For fathers a more complex pattern emerged. Among families with seven-year-old children, having started the disclosure process was related to lower parenting stress among fathers following OD and with higher parenting stress in fathers following SD (7). Furthermore, general research on family function shows that parenting stress is linked to the child's age (8), the parents' sex (9), and the quality of the parents' relationship (10). However, there is a lack of knowledge about whether disagreement regarding the disclosure decision plays a role in women's and men's psychological well-being as parents. The majority of donor-conceiving parents reach an agreement regarding this decision, but up to a third of parents have difficulties coming to an agreement (6,11–13). Some couples agree intuitively, but many go through a complex decision process. Couples who initially disagree about the disclosure decision often come to an agreement through negotiation of one partner's views, with one parent deferring his or her own views to the other's (14). Doing so can be experienced as giving the other parent a higher parental authority and may result in feeling threatened in one's own parental identity and role as a parent. Parents in general differ regarding which demands of parenthood are perceived as threatening to the parental role or identity (15).

Swedish legislation prohibits anonymous gamete donation, and children have the legal right to obtain identifying information about their donors when they have reached sufficient maturity. The National Board of Health and Welfare in Sweden (16) emphasizes that parents play a key role in disclosing the child's origin to the child, and pretreatment counseling includes discussion of the psychosocial aspects of parenthood following donor conception and disclosure issues. Incomplete couple agreement on disclosure (including perceptions of disagreement, partial agreement, and being unsure about agreement) has previously been found to be related to reduced relationship quality in heterosexual donor-conceiving parents (11). By extension, we hypothesized that incomplete couple agreement on disclosure could be related to other measures of emotional well-being, such as parenting stress. Knowledge on how agreement regarding disclosure is associated with parenting stress could have implications

for counseling and support programs for parents following donor conception. The aim of the present study was twofold: to investigate parenting stress in donor-conceiving parents of young children and to investigate whether parenting stress is related to perceived couple agreement about disclosure of the donor conception to the child.

Material and methods

The present study is part of the prospective longitudinal Swedish Study on Gamete Donation (SSGD). The SSGD is a multicenter, population-based study that is investigating psychosocial aspects of OD and SD among heterosexual and lesbian recipient couples in comparison with heterosexual couples undergoing in vitro fertilization with their own gametes (17,18), as well as among oocyte and sperm donors (19).

Participants and procedure

Recruitment took place from 2005 to 2008 at all seven clinics in Sweden (Stockholm, Gothenburg, Uppsala, Umeå, Linköping, Örebro, and Malmö) that offer treatment with gamete donation. All heterosexual couples starting treatment with OD or SD were consecutively approached regarding study participation. Inclusion criteria were completion of at least one round of donation treatment and the ability to read Swedish.

Baseline data for the SSGD were collected at the start of the treatment start (T1) and two months later (T2). The third time point (T3) for data collection occurred when the child was one to four years old. From 2007 to 2011, parents with children aged one to four years who had been conceived through gamete donation among the SSGD participants were sent a questionnaire that included validated self-report instruments and study-specific items. Participants completed the questionnaire individually. Two reminders were sent to non-responders, and parents who returned the questionnaire received a gift voucher worth €12.

At inclusion in the main study (T1) the response rates were 72% for heterosexual recipients of donor oocytes

Key Message

Donor-conceiving parents who perceive themselves not to be in complete agreement about what to tell their child about his or her genetic origins, report similar parenting stress levels compared with parents who perceive themselves to be in complete agreement.

Table 1. Participant demographics.

	Total, <i>n</i> = 213 (%)	OD parents <i>n</i> = 103 (%)	SD parents <i>n</i> = 110 (%)
Women	110	53 (52)	57 (52)
Men	103	50 (48)	53 (48)
Mean age ^a			
Women	36.7 ± 3.7	37.3 ± 3.7	36.1 ± 3.7
Men	38.9 ± 4.6	39.0 ± 4.6	38.9 ± 4.6
Children			
Toddler ^b	128 (60)	71 (69)	57 (52)
Preschool ^c	85 (40)	32 (31)	53 (48)
Education ^d			
Compulsory (9 years)	9 (4)	4 (4)	5 (5)
Secondary education (10–12 years)	86 (41)	37 (36)	49 (45)
University education	116 (55)	61 (60)	55 (50)

OD, oocyte donation; SD, sperm donation.

^aAge is given in years (±SD).

^bChildren 1–2 years of age.

^cChildren 3–4 years of age.

^dEducational level at T1 (inclusion).

and 81% for heterosexual recipients of donor sperm (17). Among the SSGD participants, 159 individuals had a child following OD; of these individuals, 123 participated in the follow-up survey when the child was aged one to four (T3; response rate of 77%). Similarly, 122 of 174 individuals who had a child following SD participated at T3 (response rate 70%). For the present study, we excluded parents who had used a known donor (for example, a friend; 14 OD parents) and parents who at T3 were not living with the same partner as at the treatment start (*n* = 4). Due to administrative failure, 14 individuals received an incorrect survey. In total, 213 individuals (103 couples and seven individuals) were included (Table 1).

Measurements

The Swedish Parenthood Stress Questionnaire (SPSQ) consists of 34 items that measure parenting stress with five subscales (examples of abbreviated items are inside the parentheses): *Incompetence* (“More difficult than expected to raise a child”), *Role Restriction* (“Life controlled by the child’s needs”), *Social Isolation* (“Feeling of loneliness”), *Spouse Relationship Problems* (“Less support than expected from spouse”), and *Health Problems* (“More tired than before”) (20). Responses were given on a five-point Likert scale and reported as the means of the item scores for each subscale and for the whole scale, with higher scores indicating higher levels of parenting stress. There was no cut-off value to indicate high levels of stress for the Swedish version. A normal range for the

total score from the 10th to the 75th percentile was suggested by the authors of the original instrument Parenting Stress Index (21): extremely low levels of parenting stress could indicate minimal commitment to their children. The SPSQ, the Swedish version of the Parenting Stress Index, was modified for psychometric reasons, with acceptable internal homogeneity, test–retest reliability, concurrent validity (22), and good discriminatory validity (8). In the present sample, Cronbach’s alpha was 0.89, which corresponds to Östberg and Hagekull’s (22) measures of internal consistency.

The instrument Evaluating and Nurturing Relationship Issues, Communication and Happiness (ENRICH) (23) was used to assess relationship satisfaction. ENRICH consists of 100 items divided into 10 subscales measuring *Personality, Communication, Financial Management, Conflict Resolution, Leisure Activities, Sexual Relationship, Children and Parenting, Family and Friends, Egalitarian Roles, and Conception of Life*. Responses are given on a five-point Likert scale with the additional option “do not know”. Relationship satisfaction is assessed by the sum of item scores for each subscale and for the whole inventory, with high scores indicating high relationship satisfaction. The Swedish version of ENRICH was adapted to the Swedish context with good discriminatory validity and acceptable test–retest reliability and internal homogeneity (24). In the present study, ENRICH demonstrated high internal consistency ($\alpha = 0.94$).

Perceived couple agreement about disclosure to children was investigated with a study-specific item: “Do you and your partner agree on what to tell your child about how he or she was conceived?” with four response options. Responses were dichotomized into “complete agreement” (Yes, totally) and “incomplete agreement” (Partly; No, not at all; Don’t know). Finally, background data on the parents’ age, sex, child’s age, and type of donation treatment were collected.

Statistical analyses

Missing values were replaced with the participant’s individual mean for a subscale. If more than half of the values of a subscale were missing, then the subscale for that participant was excluded from the analysis. The “do not know” option in the ENRICH inventory was recoded as the midpoint value of the five-point Likert scale. The Mann–Whitney U-test was applied to compare the SPSQ levels between groups due to skewed distribution. The effect sizes were calculated from the z-scores (25). Multiple regression analysis was performed to investigate whether perceived agreement on disclosure accounts for variation in parenting stress levels by controlling for parents’ sex (female/male), child’s age (one to two years/

three to four years), type of donation (OD/SD), and relationship satisfaction. All dichotomous predictor variables were coded (0/1), following the order contained in the parentheses, and the same coding was applied to agreement on disclosure (incomplete/complete). In the first regression model, general parenting stress (the SPSQ total score) was the criterion variable, whereas in the following regression models the underlying concepts of parenting stress (SPSQ subscales) were the criteria variables. In a last step, an interaction term sex and type of donation was added to all models. In all performed models the enter method was applied and both standardized and unstandardized coefficients were calculated. The residuals in the tested models were homoscedastic but did not optimally or exactly meet the criteria for normal distribution throughout all models. In view of the large sample size and the central limit theorem, this was not considered to threaten statistical validity. In all regression models, the observed maximum values for Cook's distance were <0.2, indicating that no observation had an excessive influence on the regression model. Collinearity diagnostics showed that the predictor variables included in the models had high tolerance levels (>0.9) and low values for the variance inflation factor (<1.1), indicating that possible correlations of the predictor variables do not affect the interpretation of the models. In all analyses, the significance level was set at $p < 0.05$. Statistical analyses were performed using IBM SPSS Statistics 23.

Ethical approval was obtained from the Regional Ethical Review Board in Linköping, Sweden (Reference: M29-05, supplement 1-06; Approved: 2005-02-23 and 2006-02-14).

Results

Participants were evenly distributed between OD and SD, and between men and women (Table 1). At the treatment start, about half of the participants had completed university education. At the time of the present study, the

mean age was 36.7 (SD = 3.7) for women and 38.9 (SD = 4.6) for men, 60% of the children were toddlers, and 40% preschoolers.

Parenting stress

The parenting stress levels are presented for the total group ($n = 213$; Table 2). In comparison with the parents who were in complete agreement, those with incomplete agreement reported statistically significantly higher levels of parenting stress explained by Incompetence and Spouse Relationship Problems. The effect sizes of these differences were small ($r = -0.15$ and $r = 0.18$, respectively).

Parenting stress in relation to perceived agreement about disclosure to children

In the first regression model (Table 3), using the enter method, we explored the impact of perceived agreement on disclosure on general parenting stress (the SPSQ total score) when controlling for parents' sex, age of the child, type of donation, and relationship satisfaction. The model was statistically significant ($F_{5,194} = 17.664$, $p < 0.05$) and explained 31.3% of the variability in the dependent variable. Perceived agreement on disclosure was not a statistically significant predictor in this model, indicating that parenting stress levels are not significantly influenced by agreement about disclosure. Relationship satisfaction was the only statistically significant predictor, with low levels of relationship satisfaction statistically significantly associated with higher general parenting stress, when controlling for the remaining predictors.

In the second step, we explored the impact of perceived agreement on disclosure on underlying concepts of parenting stress (SPSQ subscales) by controlling, as in the previous model, for parents' sex, age of the child, type of donation, and relationship satisfaction (Table 4). All five models were statistically significant ($p < 0.05$) and explained between 7 and 38% of the variability. The

Table 2. Comparison of parenting stress among parents who perceive they have complete or incomplete agreement on disclosure to offspring.

	Total, $n = 213^a$	Complete agreement, $n = 153$	Incomplete agreement, $n = 47$	p -value
General parenting stress (Total score)	2.22 ± 0.48	2.19 ± 0.48	2.29 ± 0.44	0.078
Incompetence	1.73 (1.45–2.09)	1.67 (1.36–2.09)	1.91 (1.55–2.18)	0.035
Role restriction	3.14 (2.71–3.61)	3.14 (2.71–3.62)	3.00 (2.71–3.57)	0.604
Social isolation	1.71 (1.32–2.14)	1.57 (1.43–2.11)	2.00 (1.29–2.43)	0.117
Spouse relationship problems	1.80 (1.40–2.40)	1.80 (1.40–2.20)	2.20 (1.60–2.80)	0.011
Health	2.50 (2.00–3.00)	2.50 (2.00–3.00)	2.50 (2.00–3.00)	0.598

The mean (±SD) is listed for variables with normally distributed data. The median (interquartile range) is listed for variables with non-normally distributed data.

^aFor the two parenting stress subscales, $n = 212$, and for perceived agreement, $n = 200$.

Table 3. Regression model with General Parenting Stress as the criterion variable ($n = 200$).

	General Parenting Stress		
	<i>B</i>	<i>SE B</i>	β
Constant	4.342	0.252	
Perceived agreement on disclosure (incomplete/complete)	0.021	0.068	0.019
Sex (female/male)	-0.034	0.056	-0.036
Child age (toddler/preschooler)	-0.037	0.060	-0.038
Type of donation (OD/SD)	0.089	0.057	0.095
Relationship satisfaction	-0.005**	0.001	-0.561

B, unstandardized regression coefficient; β , standardized regression coefficient; OD, oocyte donation; SD, sperm donation; *SE B*, standard error of the unstandardized regression coefficient.

** $p < 0.001$, $R^2 = 0.313$.

predictor of interest, perceived agreement on disclosure, was not statistically significant in any model except Role Restriction ($F_{5,194} = 12.384$; $p < 0.05$; $R^2 = 0.242$). According to that model, parents with complete agreement on disclosure felt more restricted by parenthood in their personal freedom than did parents with incomplete agreement, when adjusting for all remaining predictors. The size of the unstandardized coefficient of perceived agreement on disclosure ($B = 0.250$) shows that perceived agreement on disclosure did not have a large impact on how much parents feel restricted by parenthood. In the Role Restriction model, additional predictors were statistically significant, indicating that being a father, having a preschool-age child, and having high levels of relationship satisfaction were statistically significantly associated with lower stress related to feeling restricted by parenthood.

Relationship satisfaction was a statistically significant predictor in all models, indicating that high levels of satisfaction were associated with low levels of parenting stress (Tables 3 and 4). The remaining predictor variables were not statistically significant, with the exception of the Role Restriction model.

In the third step, we added an interaction term of sex and type of donation to all models to explore the possible importance of the existence or lack of a genetic link between the respondent and the child on parenting stress levels. The interaction term was not statistically significant in any model and did not change the interpretation of the reported models.

Discussion

The present results indicate that not being in complete agreement about what to disclose to children about their donor conception is not associated with increased levels of parenting stress among heterosexual parents of young

Table 4. Regression models with the SPSQ subscales as the criteria variables ($n = 200$).

	Incompetence			Role Restriction			Social Isolation			Spouse Relationship Problems			Health		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Constant	3.386	.328		6.096	.406		3.525	.362		5.449	.366		3.984	.470	
Perceived agreement on disclosure (incomplete/complete)	-.017	.088	-.013	.250*	.109	.147	-.121	.097	-.083	-.122	.099	-.072	.143	.126	.081
Sex (female/male)	-.061	.073	-.056	-.248*	.091	-.172	.217*	.081	.176	-.096	.082	-.067	.085	.105	.057
Child age (toddler/preschooler)	.087	.078	.077	-.334**	.096	-.225	-.009	.086	-.007	.061	.087	.041	-.058	.111	-.037
Type of donation (OD/SD)	.059	.074	.053	.145	.092	.100	.109	.082	.089	.017	.083	.012	.101	.106	.067
Relationship satisfaction	-.004**	.001	-.327	-.007**	.001	-.453	-.004**	.001	-.355	-.008**	.001	-.592	-.004**	.001	-.256

B, unstandardized regression coefficient; β , standardized regression coefficient; OD, Oocyte donation; SD, Sperm donation; *SE B*, Standard error of the unstandardized regression coefficient; SPSQ, Swedish Parenthood Stress Questionnaire.

* $p < 0.05$, ** $p < .001$, $R^2 = .242$ for Role Restriction, $R^2 = .182$ for Social Isolation, $R^2 = .382$ for Spouse Relationship Problems, $R^2 = .070$ for Health.

children. Neither the type of donation (OD or SD) nor the absence of a genetic link between parent and child was related to parenting stress in these donor-conceiving families. However, low levels of parenting stress were consistently associated with high partner relationship satisfaction.

The result that parents' lack of agreement regarding disclosure was unrelated to increased parenting stress, when controlling for other variables, has several possible explanations. First, disclosure might not yet be sufficiently relevant to the majority of the parents of the children in this young age group to have an effect on parenting stress. Previous results for this sample of parents showed that 78% planned to talk with their child about the donor conception at a later time point, most often expressed as "do not know/when the child understands" or "when the child asks" (11). Secondly, the underlying construct of the parenting stress instrument used in the study might not have been sensitive enough to measure existential aspects of parenting, for example, bonding to the child. For instance, qualitative studies have shown that the reasons parents do not tell their children about the donor conception include fear that the parent who lacks a genetic link to the child will no longer be regarded as a "real" parent (26) or even be rejected by the child (27). The SPSQ measures parenting stress mainly on a practical level, not parents' confidence in their relationship with the child or in the child's attachment to themselves as parents. Thirdly, it is possible that existential aspects of parental stress in the present sample of donor-conceiving parents to young children were overshadowed by the stress that arises from adapting to the more practical demands of parenthood (15). Finally, the psychosocial screening of couples seeking donation treatment, including discussions about disclosure, might prepare these parents for the additional strains that are specific to parenthood following gamete donation, such as the impact of a lack of genetic link and decisions about what, when and how to tell their children about their genetic origins.

General parenting stress levels among the donor-conceiving parents in this study are in line with parenting stress levels of randomly selected Swedish mothers with children in the same age group (22). Following donor conception, couples have reported stable levels of relationship satisfaction over time (28–30), which might balance parenting stress levels in general. Marital relationship has been considered "the principal support system for parents" (31), which is supported by the present results that relationship satisfaction consistently and significantly accounted for the variation in parenting stress levels and indicates that relationship satisfaction has a buffering impact on parenting stress.

One unexpected finding of this study was that parents who perceived they had complete agreement about the disclosure decision reported statistically significantly higher levels of parenting stress measured by the subscale Role Restriction. The concept of Role Restriction is mainly measured with items that explore how restricted parents feel by parenthood in their personal freedom. The originators of the Parenting Stress Index, Loyd & Abidin (21), proposed that extremely low levels of general parenting stress could indicate minimal involvement with children. In general, parents following donor conception are inclined to be overinvolved in parenting (32,33). Considering Loyd & Abidin's (1985) hypothesis, this unexpected result could be explained by assuming that parents who were very involved with and focused on their child's perspective, including coming to an agreement about the disclosure decision with their partner, felt more restricted in their personal freedom by parenthood compared with parents who did not actively strive to reach agreement about disclosure. However, this single result should be interpreted with caution taking the small coefficient into consideration.

Studies in the field of donor conception are often based on small sample sizes, particularly regarding parents who conceived through OD and samples of fathers. The present study is part of the longitudinal multicenter Swedish Study on Gamete Donation (SSGD), which maximized sample sizes through a population-based design and consecutive recruitment of participants over a period of three years. Nevertheless, it is important to emphasize that 22% of the parents reported incomplete agreement, reflecting imbalanced group sizes within the sample. This implies that the statistical power of the analysis of the subsample of parents with incomplete agreement about disclosure is reduced. As agreement about disclosure is our main predictor of interest, the interpretation of the presented results is therefore somewhat limited. Although the response rates in the present study are relatively high (70–77%), a previous publication focused on the SSGD using the same sample of parents (11) showed that non-responders at this follow-up assessment had a statistically significantly lower education level and statistically significantly less positive attitudes about disclosure to children compared to the participants. Thus, there is a risk that selection bias limited the external validity of the present results. In addition, in the present study a small number of parents were excluded because the couples had separated, as we wanted to control for relationship satisfaction in the regression models.

In the present study, agreement on the disclosure decision was assessed by asking parents about their individual perception of the level of agreement with their partner rather than their actual disclosure decision. The main

motivation for using this approach was that the individual's perception of couple agreement/disagreement was regarded as primarily relevant in relation to parenting stress. In addition, as the disclosure process is complex and includes decisions about when, what and how to disclose, interpretation of the couples' level of agreement based on individually reported decision details would involve a high risk for bias.

The present study is based on self-report measures on psychological wellbeing completed in the families' home. To overcome bias specifically associated with self-report within this setup, respondents were explicitly encouraged to complete the questionnaire individually, without talking to the other parent. One strength of the present study is that we used validated instruments to assess parenting stress and relationship satisfaction. Applying multivariate regression models enabled us to investigate the impact of perceived agreement about disclosure on parenting stress while controlling for other variables of importance. However, the cross-sectional design of the study limits conclusions about causal relationships between the variables. In view of the stated limitations, the present results may be partly generalizable to couples in early parenthood following treatment with oocytes and sperm from identifiable donors.

In conclusion, parenting stress in heterosexual donor-conceiving couples with young children does not appear to be negatively influenced by incomplete agreement about disclosure to children. As children grow older, reaching an agreement about what to tell the child about the donor conception might become more relevant for couples' stress related to parenthood. Further investigation of parents' well-being in relation to disclosure seems particularly relevant in the context of identity-release gamete donation.

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