

Egg freezing, genetic relatedness, and motherhood:

A binational empirical bioethical investigation of women's views

ABSTRACT

Genetic relatedness figures heavily in contemporary ethical debates on egg freezing, although the arguments lack empirical-based evidence. Rather than adding another theoretical view on the moral relevance of genetic connections, this paper instead proposes an empirically grounded perspective based on two independent qualitative interview-based studies conducted in Belgium and France. Three themes emerge from our empirical data: (1) prioritizing family building; (2) centering the gestational experience of motherhood; and (3) identifying the complexities and limitations of adoption. Those themes suggest that the relationship between egg freezing, genetics, biological motherhood, and adoption is highly complex and less straightforward than what is often assumed in the egg freezing debate. Our study provides more detailed insights into women's ambivalent experiences regarding those reproductive options. We discuss the ethical implications of our empirical findings and hold that pursuing genetic desire is not necessarily the main moral reason why women freeze their eggs.

KEYWORDS: Egg freezing, genetic relatedness, motherhood, France, Belgium, qualitative research

INTRODUCTION

Since the early 2010s, oocyte vitrification, also known as egg freezing, is no longer considered experimental, according to the European Society of Human Reproduction and Embryology and the American Society for Reproductive Medicine.¹ Egg freezing can be used to prevent future infertility in several medical contexts: oncological diseases, gynecological disorders (e.g., endometriosis or ovarian surgery), and genetic conditions with a known impact on ovarian reserve (e.g., Fragile-X or Turner Syndrome). Healthy women who want to mitigate the risk of age-related infertility can also freeze their eggs, which has been described as “elective” or “social” egg freezing (SEF).² SEF has been frequently contrasted against egg freezing for medical reasons (medical egg freezing, MEF). Still, given women's overlapping SEF and MEF experiences, the sharp distinction between both types of egg freezing is subjected to criticism and called into question.³

In recent years, SEF has instigated an interdisciplinary academic debate, with some scholars advocating for the revolutionary character of social egg freezing, suggesting that it enhances reproductive autonomy and gender equality.⁴ Egg freezing could support equal participation in

¹ Dondorp, W., De Wert, G., Pennings, G., Shenfield, F., Devroey, P., Tarlatzis, B., ... Diedrich, K. (2012). Oocyte cryopreservation for age-related fertility loss. *Human Reproduction*, 27(5), 1231–1237. <https://doi.org/10.1093/humrep/des029>; The Practice Committees of the American Society for Reproductive Medicine and the Society and the Society for Assisted Reproductive Technology. (2013). Mature oocyte cryopreservation: a guideline. *Fertility and Sterility*, 99(1), 37–43. <https://doi.org/10.1016/j.fertnstert.2012.09.028>

² This article will maintain the phrase “social egg freezing,” a pragmatic choice based on the term having become the most common signifier of the ethical practice in question. We follow several other authors who have put forth similar thoughts on using this terminology, namely the following. Baldwin, K. (2019). *Egg Freezing, Fertility and Reproductive Choice*. Emerald Publishing Limited; Miner, S.A., Miller, W.K., Grady, C., & Berkman, B.E. (2021). “It’s Just Another Added Benefit”: Women’s Experiences with Employment-Based Egg Freezing Programs. *AJOB Empirical Bioethics*, 12(1), 41–52. <https://doi.org/10.1080/23294515.2020.1823908>

³ Petropanagos, A. (2010). Reproductive ‘Choice’ and Egg Freezing. In T. Woodruff, L. Zoloth, L. Campo-Engelstein, & S. Rodriguez (Eds.), *Oncofertility. Ethical, Legal, Social, and Medical Perspectives* (pp. 223–235). Springer; Mertes, H., & Pennings, G. (2022). Ethical Considerations of Fertility Preservation. In M. Grynberg & P. Patrizio (Eds.), *Female and Male Fertility Preservation* (pp. 627–640). Springer International Publishing. https://doi.org/10.1007/978-3-030-47767-7_46; De Proost, M., & Paton, A. (2022). Medical versus social egg freezing: the importance of future choice for women’s decision-making. *Monash Bioethics Review*. <https://doi.org/10.1007/s40592-022-00153-9>

⁴ Homburg, R., van der Veen, F., & Silber, S.J. (2009). Oocyte vitrification—Women’s emancipation set in stone. *Fertility and Sterility*, 91(4), 1319–1320. <https://doi.org/10.1016/j.fertnstert.2008.02.127>; Gil-Arribas, E.,

employment and give women time to become emotionally and psychologically ready to have children. However, this lies in contrast with concerns that weave through the ethics of reproductive technology, such as the exploitation and commodification of women's bodies and related unnecessary health risks. Feminist scholars emphasize how a woman's reproductive autonomy must always be contemplated within larger cultural contexts of social inequalities.⁵ Moreover, according to some authors, the uptake and promotion of egg freezing could reinforce "selective pronatalism" by urging the most privileged women to preserve their fertility and discourage less privileged ones from having children.⁶ SEF is often associated with neoliberal tendencies that put women in a double bind: They are applauded for their individual risk-management against older motherhood while potentially blamed for any adverse outcomes and not having done enough to secure biogenetic future motherhood.⁷

The possibility of having genetically related children (i.e., becoming a genetic mother) lies at the center of scholars' reflections. In the context of medical egg freezing, Asch and McLeod argue that overvaluing the genetic basis of family is problematic and that counseling practices for patients should encourage non-biologic parenting options to offset genetic biases.⁸ In the context of social egg freezing, Martin holds that a "genetic imperative" (i.e., privileging genetic

Blockeel, C., Pennings, G., Nekkebroeck, J., Velasco, J.A.G., Serna, J., & De Vos, M. (2022). Oocyte vitrification for elective fertility preservation: a SWOT analysis. *Reproductive BioMedicine Online*. <https://doi.org/10.1016/j.rbmo.2022.02.001>

⁵ Cattapan, A., Hammond, K., Haw, J., & Tarasoff, L. (2014). Breaking the Ice: Young Feminist Scholars of Reproductive Politics Reflect on Egg Freezing. *International Journal of Feminist Approaches to Bioethics*. 7(2), 236-247.

⁶ Thompson, C. (2005). *Making Parents: The Ontological Choreography of Reproductive Technologies*. MIT Press.

⁷ Baldwin, op. cit. n. 2; Van de Wiel, L. (2020). The speculative turn in IVF: egg freezing and the financialization of fertility. *New Genetics and Society*. 39(3), 306–326. <https://doi.org/10.1080/14636778.2019.1709430>; Myers, K. (2017). "If I'm Going to Do It, I'm Going to Do It Right": Intensive Mothering Ideologies among Childless Women Who Elect Egg Freezing. *Gender & Society*. 31(6), 777–803. <https://doi.org/10.1177/0891243217732329>

⁸ McLeod, C. (2010). Morally Justifying Oncofertility Research. In T. Woodruff, L. Zoloth, L. Campo-Engelstein, & S. Rodriguez (Eds.), *Oncofertility. Ethical, Legal, Social, and Medical Perspectives* (pp. 187–194). Springer; Asch, A. (2010). The Lessons of Oncofertility for Assisted Reproduction. In T. Woodruff, L. Zoloth, L. Campo-Engelstein, & S. Rodriguez (Eds.), *Oncofertility. Ethical, Legal, Social, and Medical Perspectives* (pp. 181–186). Springer.

children over other ways of building families) has been enforced by this technology.⁹ In a similar vein, several scholars emphasize the centrality of the genetic tie for women undertaking egg freezing.¹⁰ Waldby argues that one's reasoning for freezing eggs can be interpreted as "a refusal of more pragmatic, efficient reproductive options" such as egg donation and adoption, due to the prioritization of genetic connection.¹¹ Furthermore, the historical invisibility of eggs as passive agents in the procreative process is redefined as women become theoretically empowered to choose their own conditions for motherhood without having to rely on either a man or egg donation.¹² However, by ostensibly empowering women, egg freezing reinforces heteronormative and traditional life course expectations with notions of "finding the right guy," doing motherhood "properly," and "finding the right moment" to start a family.¹³ As Stephens argues "its application often comes with [...] conservative assumptions about parenthood and family forms."¹⁴

⁹ Martin, L.J. (2010). Anticipating Infertility: Egg Freezing, Genetic Preservation, and Risk. *Gender & Society*. 24(4), 526–545. <https://doi.org/10.1177/0891243210377172>

¹⁰ Carroll, K., & Kroløkke, C. (2018). Freezing for love: enacting 'responsible' reproductive citizenship through egg freezing. *Culture, Health & Sexuality*. 20(9), 992–1005. <https://doi.org/10.1080/13691058.2017.1404643>; Kılıç, A., & Göçmen, İ. (2018). Fate, morals and rational calculations: Freezing eggs for non-medical reasons in Turkey. *Social Science & Medicine*. 203, 19–27; Kanters, N.T.J., Brokke, K.E., Bos, A.M.E., Benneheij, S.H., Kostenzer, J., & Ockhuijsen, H.D.L. (2022). An unconventional path to conventional motherhood: A qualitative study of women's motivations and experiences regarding social egg freezing in the Netherlands. *Journal of Gynecology Obstetrics and Human Reproduction*. 51(2), 102268. <https://doi.org/10.1016/j.jogoh.2021.102268>.

¹¹ Waldby, C. (2019). *The Oocyte Economy: The Changing Meaning of Human Eggs*. Duke University Press.

¹² Bühler, N. (2015). Imagining the Future of Motherhood: the Medically Assisted Extension of Fertility and the Production of Genealogical Continuity. *Sociologus*. 65(1), 79–100.

¹³ Van de Wiel, L. (2014). For Whom the Clock Ticks: Reproductive Ageing and Egg Freezing in Dutch and British News Media. *Studies in the Maternal*. 6. <https://doi.org/10.16995/SIM.4>; Baldwin, K. (2017). 'I Suppose I Think to Myself, That's the Best Way to Be a Mother': How Ideologies of Parenthood Shape Women's Use of Social Egg Freezing Technology. *Sociological Research Online*. 22(2), 20–34. <https://doi.org/10.5153/sro.4187>; De Proost, M., & Coene, G. (2019). Emancipation on thin ice: Women's autonomy, reproductive justice, and social egg freezing. *Tijdschrift Voor Genderstudies*. 22(4), 357–371. <https://doi.org/10.5117/TVGN2019.4.003.DEPR>

¹⁴ Stephens, J. (2022). Fertility and Fragility: Social Egg Freezing and the 'Potentially Maternal' Subject. In R.M. Shaw (Ed.), *Reproductive Citizenship. Health, Technology and Society* (pp. 101–123). Palgrave Macmillan.

Genetic relatedness figures heavily in contemporary ethical debates on egg freezing, but the arguments are lacking empirical evidence. From a woman's perspective,¹⁵ the normative tensions related to egg freezing and the desire for genetic motherhood remain underexplored. Because considering women's experiences in bioethical debates is essential for understanding the associated ethical implications and providing sound arguments, this paper will abstain from adding another theoretical view to the normative discussion of the moral relevance of genetic connections. Instead, it proposes an empirically grounded, bottom-up perspective based on two independent qualitative interview studies conducted in Belgium and France.

In pursuing this objective, three themes emerged from our empirical data: (1) prioritizing family building; (2) centering the gestational experience of motherhood; and (3) identifying the complexities and limitations of adoption. Those themes suggest that the relationship between egg freezing, genetics, biological motherhood, and adoption is highly complex and less straightforward than often assumed in scholarly literature. We hold that genetic desire is not necessarily the main reason why women freeze their eggs and further show how women's ideas around genetic, biological, and adoptive motherhood combine, overlap, and change over time. Thus, in order to go beyond the conventional questions raised by ethicists and social scientists, this paper provides a comprehensive moral understanding of the substantive issue of genetics and shows a more diverse and complex picture of the relationship between egg freezing and genetic motherhood.

METHODS

¹⁵ Although this article often refers to "women," we acknowledge that not all persons with wombs and egg cells identify as women.

This paper is based on the findings of two qualitative studies conducted independently by a social anthropologist in France and a moral philosopher in Belgium. These studies, comprising the Ph.D. research of the authors, assess the experiences of women interested in freezing their eggs, regardless of the procedure's status, meaning that we interviewed women who: were considering egg freezing; had already undertaken one or several cycles of it; and, in the case of France, had abandoned the procedure.

The French study interviewed 43 women between March 2018 and December 2019. At this time, SEF was still prohibited but MEF and egg sharing were allowed and fully reimbursed by French Health Insurance (*l'assurance maladie*).¹⁶ In this context, we have defined social egg freezing as a cryopreserving procedure undertaken abroad. The Belgium study interviewed 21 women between February 2019 and February 2021. Since 2017, public funding in Belgium partially covers egg freezing for patients with cancer, borderline ovarian tumors, and undergoing hematopoietic stem cell transplantation. Public health insurance still does not cover egg freezing for non-medical or social reasons.¹⁷

Thus, this binational analysis includes a total of 64 women concerned with egg freezing: 43 in France and 21 in Belgium. As shown in Table 1, 58% of them (n= 37) undertook so-called social egg freezing; 26% medical egg freezing (n= 17); and 16% egg sharing (n= 10). The median age of these women was 34.5 years old. At the time of the interviews, 53% (n= 34) were single, 45% (n= 29) were in a couple, and one did not report her relationship status. Their

¹⁶ From 2021, the Bioethics Laws authorized open access to ova cryopreservation for all healthy women between 29 and 37 years of age (*Décret n° 2021-1243 du 28 septembre 2021*). Nowadays, France is the only country worldwide that reimburses SEF.

¹⁷ De Proost, M., Coene, G., Nekkebroeck, J., & Provoost, V. (2022). 'I feel that injustice is being done to me': a qualitative study of women's viewpoints on the (lack of) reimbursement for social egg freezing. *BMC Medical Ethics*. 23(1), 35. <https://doi.org/10.1186/s12910-022-00774-z>

overall level of education is very high: 46% (n= 30) had a bachelor's degree; 42% (n= 27) a master's; and, notably, 8% (n= 5) had a doctorate. They also reported working in professions requiring highly advanced or specialized training (e.g., social worker, journalist, psychologist, and researcher). Finally, they were almost exclusively white and, at 92% (n= 59), heterosexual.

The interviews in both countries used open-ended questions that focused on the women's primary motivations for undertaking the procedure and their experiences of egg freezing itself (some exemplifying questions that we used are reported in Table 2). Completed interviews were transcribed verbatim and translated from French and Dutch into English. Both studies obtained written or verbal consent from all participants beforehand. Pseudonyms are used throughout the paper to maintain anonymity. Likewise, other personal information has been edited out. Presented quotations provide information about the country of the interview (France or Belgium) and the age of the interviewee.

To analyze and compare the two studies' interview data, we combined a thematic analysis with interdisciplinary collaborative auditing for empirical ethics projects.¹⁸ Both authors drafted an inductive coding structure from the raw data. Consecutive auditing cycles were organized to deliberate on how to structure the themes and arrive at final analytical decisions. To structure these auditing meetings, we implemented Provoost's method for disciplinary heterogeneity and discussion to improve trustworthiness while combining our empirical findings with our ethical and anthropological theories, which greatly aided our interdisciplinary endeavor to explore the ethics of egg freezing in relation to genetic motherhood. In the Discussion section, we highlight

¹⁸ Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*. 11(4), 589–597; Provoost, V. (2020). Interdisciplinary Collaborative Auditing as a Method to Facilitate Teamwork/Teams in Empirical Ethics Projects. *AJOB Empirical Bioethics*. 11(1), 14–16. <https://doi.org/10.1080/23294515.2019.170543>

normative issues arising from our data, although the scope of this article precludes forming any final normative judgments on the practice under study.

RESULTS

Our French and Belgian fieldwork revealed three major themes regarding egg freezing and genetic motherhood. First, we were surprised to find that interviewees hesitated when asked directly about whether egg freezing would enable a genetic bond with their children-to-be. Indeed, few women spontaneously declared wanting to undertake egg freezing in order to pass on their genes or have a “genetic child.” Our second theme emerged when women’s responses shifted the emphasis in our questions from genetics to the biological experience of pregnancy. Finally, the theme of adoption consistently and somewhat unexpectedly arose during our interviews. Women indeed contemplated adoption and often highlighted the ethical implications of discarding or privileging it as a path to motherhood. The following sections explore these three themes.

Prioritizing family building

Most of the women interviewed in both France and Belgium expressed wanting to have a child and build a family with a male partner—ideally without the aid of reproductive technology.¹⁹ None of our participants spontaneously mentioned undertaking egg freezing to maintain a genetic connection with their children-to-be. Instead, they placed paramount importance on the possibility of conceiving a child with their current or future partner: “My preference is for a child from the two of us” (Martine, Belgium, 33); and “With my husband, we are civilly and religiously married, and, for us, family life is inseparable from the fact of having children” (Amparo, France, 33). They described wishing to go from conjugality (i.e., finding a suitable

¹⁹ Very few women declared not wanting children or having a sexual orientation other than heterosexual.

partner) to genetic motherhood (i.e., conceiving with this partner).²⁰ This progression was qualified as “natural” (Maud, Belgium, 38), “the traditional family pattern” (Isla, Belgium, 38), or “the proper setup” (Elmira, Belgium, 38) to becoming a mother and building a family. However, the mentioned causes for not attaining this path were being single, (potentially) age-related infertility, and (potentially) illness-related infertility, among other conditions. Within these possible contexts, egg freezing was described as a “plan B” for motherhood if they are unable to achieve the ideal circumstances (i.e., pregnancy via sexual intercourse with the “right” partner).

Curiously, when asked directly if egg freezing is a way to assure the genetic connection with their children-to-be, few replied affirmatively. Martine (Belgium, 33) described herself as “a pleasant person that should be continued. [...] I would like to take that opportunity to first pass on my own blood and genes”; and Julia (Belgium, 37) replied that the genetic connection “is very important.” For them, “good” motherhood is a synonym for genetic motherhood: “I would never want someone else's child [...] it needs to come from my own egg, from my own genetic material [...] I want to recognize myself in the child and bring it up with my own standards and values” (Maud, Belgium, 38). Knowing one’s genetic origins was given importance. Moreover, they frequently attached the significance of this genetic connection to a kinship resemblance between their children-to-be and not only themselves but also other genetically related family members:

I: Do you find the genetic connection important [between you and your future children]?

²⁰ Franklin, S. (1997). *Embodied Progress: A Cultural Account of Assisted Conception*. Routledge.

R: Yeah, sure. I would like to recognize my kids. It is like genetic heritage. If they can have my father's nose or, I don't know, hair or [...] I don't know. I feel like it is actually a family signature (Lan, Belgium, 35).

Only a few participants indicated spontaneously any desire to have genetic children when asked, maintain “genetic heritage,” or continue the family line.

Centering the gestational experience of motherhood

Interestingly, when inquiring further into the importance of the genetic bond when egg freezing, the responses changed entirely as interviewees shifted the focus from genetic motherhood to a desire to experience pregnancy: “I want to experience the feeling that the child comes from me. I think that [this process] is very special, not necessarily because he looks like me. That doesn't interest me, not at all” (Annemie, Belgium, 36); and “Carrying a child myself, raising a child myself, is important to me” (Emma, Belgium, 35). Their responses frequently describe biological details of the pregnancy process as well as being able to care for a newborn baby. For example, they mention wanting to see their bellies growing, to “feel the baby moving,” (Mary, France, 39), and to give birth. Elmira (Belgium, 38) stated that she “wants to experience the nine-month pregnancy, the breastfeeding, the whole natural process of being a mom”; and Mary (France, 39) believed that “everything that happens in the belly will influence the personality of the baby and who this little being will be.” These descriptions of the biological connection with their children-to-be highlight the centrality of the embodied experience of motherhood. Thus, when asked about their reasons for undertaking egg freezing and the importance of genetic connection, it is not surprising that they downplay genetics in favor of pregnancy as a long-term process:

I: Have you considered alternatives to egg freezing?

R: Uh, yes, but I would like to experience the process of pregnancy and that's why freezing my own eggs comes to the fore compared to the other options. I want to feel a child growing inside me. I can hardly rationalize that, actually.

I: Do you think it is important to have a genetic connection with this child?

R: Not necessarily a genetic connection, more the process of being pregnant. If I do not freeze now but at forty still desire to have children, I would also have no problem implanting another woman's egg cell (Laura, Belgium, 31).

Laura's answer asserts that egg freezing is not about keeping the genetic connection, but about enabling the biological bond. It is a visceral desire to reproduce that she cannot rationalize and what is crucial for her is to experience the "process of being pregnant." In emphasizing the biological process of pregnancy in order to become a biological mother, she expressed her openness to receiving donated oocytes. This resonated with the voices of other interviewees:

I: Have you thought about other ways of becoming a mother, like egg donation or adoption, for example?

R: Yes, yes, yes, of course. I think that adoption is great. If I cannot have a child naturally, I would really like to carry a child, so I could even accept an egg donation. And, then, I would consider adoption (Karen, France, 27).

For most women, their future experience of motherhood hinged on the embodied experience of pregnancy with either their own frozen eggs or an egg donation.

Identifying the complexities and limitations of adoption

When asked whether adoption would be a possible path towards motherhood, women who froze their eggs gave multiple and complex reasons for either considering or refusing it. Some participants clearly did not take this option into account: “It is not on my priority list” (Martine, Belgium, 33); “I discarded adoption” (Remedios, France, 30); and “I would never adopt a child. The furthest step I would take is a sperm donor” (Emma, Belgium, 35). Reasons for discarding adoption were not always related to lacking a biogenetic connection (i.e., a lack of genetic and biological bonds). Some of the reasons advanced were: fears concerning the child’s physical and mental health; ethical concerns; long waiting lists; the cost of the procedure; and possible discrimination against women during adoption procedures because of singlehood, homosexuality, and a health problem; just to name a few.

For some participants, the reasons for disregarding adoption are associated with the adoptee's past story: “I'm terrified that the child would not be healthy, and that they had problems during their childhood. There are examples around me of people experiencing difficulties with adoptees. So, I prefer to avoid adoption” (Leonora, France, 44). In this case, the predominant argument is not necessarily the genetic connection but the child's health. Lan (Belgium, 35) argued that “adopted children are more likely to develop an identity crisis during their teenage years”; and Martine (Belgium, 33) said, “I work as a psychologist, so I can see that it is not easy to adopt or become a foster parent. These are always vulnerable children.”

For some other interviewees, not adopting is an ethical matter. Women in both studies mentioned the colonial history of adoption in Western countries and dismissed it as a legitimate path to motherhood. “I really have in mind the fact that Westerners have sought to benefit from children precisely through the inequalities and poverty of certain countries. I am pretty critical of adoption in France; thus, I will not consider adoption for myself!” (Remedios, France, 30).

Likewise, Maaïke (Belgium, 35) argued that international adoption is “very colonialist [...] like shopping for children.”

Most interviewees in both studies denied being opposed to adoption, but clearly established it as the “last option” to have a child: “That's five steps further” (Lotte, Belgium, 35); “It is the last solution” (Leonora, France, 44); and “I am not against it, but I would see it as a last resort” (Julie, Belgium, 34). Maaïke (Belgium, 35) described considering adoption if she “finds unity with a partner and we want a family, and it doesn't work out [otherwise].”

In contrast, a minority of the interviewees viewed the ethical implications from the opposite perspective, seeing adoption as not only a good option for becoming a mother, but also the most ethical way to do it: “Adoption is economical, ecological, and appeals to my feminist beliefs. Undergoing pregnancy for nine months and being removed from my social life while my partner continues going to the pub, it bothers me. [Adoption helps] avoid overpopulation” (Rita, France, 35). Kato (Belgium, 33) reflected similarly on the relationship between overpopulation and adoption: “The climate problem, we already have so many [people]. I can get so angry when I hear about people having four children. Do I actually have to have recourse to medicine to have a child?” Opinions similar to Rita and Kato's are rare, but their testimonial value is significant, as they show that undertaking egg freezing does not necessarily reject adoption. Both reproductive options are not mutually exclusive.

Remarkably, a few of the women we met were not only interested but had also actively inquired into adoption. Melissa (Belgium, 41) and Anna-María (France, 42) wished to become mothers via adoption but, as single women, the process was complicated. In the first case, Melissa remembers seeking information about adoption, but “it turned out that, as a single woman or

as a single person, you are not the most preferred foster family,” so she gave up immediately. In the second case, Anna-Maria wanted to follow in her sister’s footsteps and adopt. She even started the process, but “adoption is a very complicated process, especially for single women like me. Many waiting lists, an international process, etcetera. The chances of success are meager. So, I rely on ART to have a child.”

DISCUSSION AND ETHICAL IMPLICATIONS

This paper enriches and expands the ethical debate on the relationships between egg freezing, genetic relatedness, and motherhood by grounding it in the real world experiences of women undertaking oocyte cryopreservation. Empirical data from our two qualitative studies suggest that such relationships are complex and sometimes more contradictory than straightforward. We propose here that, although egg freezing enables women to have genetically related children, they do not necessarily undertake egg freezing *because* they want to have genetically related children. The former does not always lead to the latter. Our three themes highlight creativity, flexibility, and changes in how women define and pursue motherhood. Participants were reluctant to frame egg freezing as a means to forming a genetic bond with their children-to-be. Instead, they shifted the emphasis to the biological experience of pregnancy and the importance of their embodied experience. Likewise, logistical, health, and ethical reasons prevented them from pursuing adoptive motherhood. Participants showed recognition of the many paths to motherhood and less fixation on genetic connectivity.

Rather than explicitly ascribing egg freezing to a desired genetic connection with their future child, most interviewees instead described a desire to have a relationship with a partner. Our data reveals the existence of a robust discourse on the importance of a mother and father being equally genetically related to the child. In the egg freezing debate, several authors have argued

that because a secure and stable relationship is a precondition for women seeking motherhood, having a genetically related child with this partner is fundamental.²¹ What Nordqvist calls “genetic normativity” forms a part of their everyday interactions.²²

However, in contrast to previous work that places genetic continuity at the center of a woman’s rationale, we found that the definition of having your “own child” was fluid and malleable.²³ In unpacking what can be described as the “messy” reality of pursuing genetic desire through egg freezing, we find that women often take a pragmatic approach by both compromising and reformulating their ideals, moral reasoning, and choices along the way. Egg freezing gives more choices and agency to women trying to figure out their desired family formation over time, although these choices are still constrained by traditional kinship models.²⁴ Assisted reproductive technologies in general, and egg freezing in particular, have profoundly ambivalent and paradoxical effects on our understanding of how families can and should look. As the Swiss anthropologist Bühler argues “The biotechnological extension of fertility has therefore a transgressive potential with regard to gender, age, and kinship norms, but may, at the same time, reinforce them.”²⁵ Our study provides more detailed insights into women’s ambivalent experiences of these norms, which have been insufficiently addressed in the ethical debate and seldom highlighted in the social science literature.²⁶

²¹ Baldwin, op. cit. n. 13.

²² Nordqvist, P. (2017). Genetic thinking and everyday living: On family practices and family imaginaries. *Sociological Review*. 65(4), 865–881. <https://doi.org/10.1177/0038026117711645>

²³ Waldby, C. (2015). ‘Banking time’: egg freezing and the negotiation of future fertility. *Culture, Health and Sexuality*. 17(4), 470–482. <https://doi.org/10.1080/13691058.2014.951881>

²⁴ Freeman, T. (2014). Introduction. In T. Freeman, S. Graham, F. Ebtehaj, & M. Richards (Eds.), *Relatedness in Assisted Reproduction* (pp. 1–18). Cambridge University Press.

²⁵ Bühler, N. (2022). The ‘good’ of extending fertility: ontology and moral reasoning in a biotemporal regime of reproduction. *History and Philosophy of the Life Sciences*. 44, 21. <https://doi.org/https://doi.org/10.1007/s40656-022-00496-w>

²⁶ Gurbuz, A., Cil, A.P., Karakis, L.S., Abali, R., Ceyhan, M., Aksakal, E., ... Urman, B. (2021). Decision regret and associated factors following oocyte cryopreservation in patients with diminished ovarian reserve and/or age-related fertility decline. *Journal of Assisted Reproduction and Genetics*. <https://doi.org/10.1007/s10815-021-02164-7>; Riggs, D. (1992). An Examination of ‘Just in Case’ Arguments as they are Applied to Fertility

Likewise, our participants downplayed the significance of the genetic contribution to determining parenthood and emphasized the importance of gestation and their desire to experience pregnancy. This view seems to emphasize gestation as a highly valued role in their child's development for its contribution to bonding—a rationale that is also commonly found among egg donors in third-party reproduction and women using double gamete donation.²⁷ Our qualitative approach enables us to contextualize this attachment to biological motherhood and indicates that gestational and genetic motherhood are prioritized differently over time and under different circumstances.

Finally, our analysis casts new light on the relationship between egg freezing and adoption, finding that women's motivations for pursuing or rejecting adoption are not necessarily contingent upon a biogenetic bond. Instead, they either view it as a last option or outright exclude it due to personal, ethical, practical, financial, or social difficulties (e.g., the history of adoption in Western societies). More broadly, our findings contribute to a growing corpus of works concerned with the relationship between ART and adoption. Some scholars hold that choosing ART over adoption cannot be explained solely by the value ascribed to biogenetics in Western societies.²⁸ The choice is profoundly influenced by how one pursues the parental/maternal project, the rapidity of the process, and the costs, among other reasons. In

Preservation for Transgender People. In V. Mackie, N.J. Marks, & S. Ferber (Eds.), *The reproductive industry: Intimate experiences and global processes* (pp. 69–78). Rowman & Littlefield.

²⁷ Almeling, R. (2011). *Sex Cells: The Medical Market for Eggs and Sperm*. University of California Press; Landau, R., Weissenberg, R., & Madgar, I. (2008). A child of 'hers': older single mothers and their children conceived through IVF with both egg and sperm donation. *Fertility and Sterility*. 90(3), 576–583. <https://doi.org/10.1016/j.fertnstert.2007.07.1296>

²⁸ Châteauneuf, D. (2011). Désir d'enfant, procréation médicalement assistée et adoption: réflexion sur la définition des liens de parenté. Université de Montréal, Montréal. Retrieved from <https://papyrus.bib.umontreal.ca/xmlui/handle/1866/5034>; Marre, D. (2009). Los silencios de la adopción en España. *Revista de Antropología Social*. 18, 97–126; Pena, M. (2015). Los postulantes a adopción: biología, deseos y afectos para definir las fronteras de la familia. *Perifèria. Revista d'investigació i formació en Antropologia*. 20(1), 34–55. <https://doi.org/10.5565/rev/periferia.446>

this regard, some scholars have called for making adoption procedures less onerous and recognizing other non-genetic parenting opportunities as valuable alternatives.²⁹

One merit of our analysis is that it questions the centrality of whether an intense and fixed desire for genetically related motherhood exists in the context of egg freezing. By focusing on women's experiences, motivations, and trajectories when freezing their eggs, our findings allow us to detach the desire for genetic parenthood from their central moral considerations. Therefore, we challenge the idea that women undertake egg freezing *because* they want to have genetic children. When speaking discursively, most participants expressed openness to non-normative paths to motherhood should they find they could not have children via sexual intercourse with a “good” partner. Our inductively developed themes can offer moral philosophers more empirical tools for interpreting and legitimizing their theoretical arguments on reproductive decision-making and parental rights.³⁰ As use of this ART continues to grow, further investigation into the links between the ethics of egg freezing, motherhood, and genetic relatedness is needed.

LIMITATIONS

²⁹ De Wispelaere, J., & Weinstock, D. (2014). State Regulation and Assisted Reproduction. In F. Baylis & C. McLeod (Eds.), *Family-Making: Contemporary Ethical Challenges* (pp. 131–150). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199656066.003.0008>; Rulli, T. (2016). Preferring a Genetically-Related Child. *Journal of Moral Philosophy*. 13(6), 669–698. <https://doi.org/10.1163/17455243-4681062>; Maung, H. (2021). Parenthood and the concept of the biological tie. *DiGeSt - Journal of Diversity and Gender Studies*. 7(2), 7–19. <https://doi.org/10.21825/digest.v7i2.15950>

³⁰ Gheaus, A. (2018). Biological Parenthood: Gestational, Not Genetic. *Australasian Journal of Philosophy*. 96(2), 225–240. <https://doi.org/10.1080/00048402.2017.1354389>; Murphy, T.F., & Parks, J.A. (2020). Gestation as mothering. *Bioethics*. 34(9), 960–968. <https://doi.org/10.1111/bioe.12808>; Brighouse, H., & Swift, A. (2014). *Family Values: The Ethics of Parent-Child Relationships*. Princeton University Press; Groll, D. (2021). Naturalizing parenthood: Lessons from (some forms of) non-traditional family-making. *Journal of Social Philosophy*. <https://doi.org/10.1111/josp.12434>; Petropanagos, A. (2017). Pronatalism, Geneticism, and ART. *IJFAB: International Journal of Feminist Approaches to Bioethics*. 10(1), 119–147; Segers, S., Pennings, G., & Mertes, H. (2019). Getting what you desire: the normative significance of genetic relatedness in parent–child relationships. *Medicine, Health Care and Philosophy*. 22(3), 487–495. <https://doi.org/10.1007/s11019-019-09889-4>

Some limitations affect this paper, which is based on two independent qualitative interview-based studies conducted in Belgium and France. Firstly, our findings cannot be generalized to all women undergoing egg freezing across all countries. The particularities of both contexts demand establishing connections with other researchers by systematically comparing empirical data. Secondly, our results can show only women's self-reported attitudes toward genetics and family formation at the time of the interviews; we cannot thoroughly examine the extent to which their views are acted upon and how they evolve over time. Further follow-up work should investigate possible changes in reproductive trajectories after egg freezing. Finally, our sample is made up of cisgender women, mainly heterosexual. Our conclusions cannot comprehensively be applied to non-binary, transgender, and other gender-nonconforming individuals. We urge research on egg freezing and parenthood among gender-nonconforming populations.

Table 1.
 Characteristics of women interviewed in both studies.
 Information at the time of the interview.

<i>Women interviewed</i>	France		Belgium		Total	
	n	%	n	%	n	%
<i>Type of egg freezing</i>						
MEF	17	40	-	-	17	26
SEF	16	37	21	100	37	58
ESH	10	23	-	-	10	16
<i>Age</i>						
< 35	24	56	8	38	32	50
≥ 35	19	44	13	62	32	50
<i>Level of education</i>						
Doctorate	3	7	2	10	5	8
Master	9	21	18	86	27	42
Bachelor	29	67	1	4	30	46
High school or equivalent	2	5	/	0	2	4
<i>Relationship status</i>						
In a relationship	22	51	7	34	29	45
Single	20	47	14	66	34	53
Not mentioned	1	2	/	/	1	2
<i>Sexual orientation</i>						
Heterosexual	40	93	19	90	59	92
Homosexual	2	5	1	5	3	5
Other	1	2	1	5	2	3

MEF = Medical egg freezing

SEF = Social egg freezing

ESH = Egg sharing

- = Does not apply

/ = None

Table 2.
Interview topic guide

Exemplifying questions in the France study:

- How your story about egg freezing begins?
- Have you ever tried to have a child?
- Do you feel social pressure to have children?
- Is it important for you that your children are genetically related to you?
- Have you ever considered other alternatives for having a child (egg donation, sperm donation, adoption)?
- In what cases would you use your frozen eggs?

Exemplifying questions in the Belgium study:

- When did you begin to think about egg freezing and why?
- What was it about your situation which made you feel that becoming a mother was not yet something you felt able to pursue?
- What does parenthood mean to you?
- What do you think about single motherhood?
- Which conditions are important to you to become a mother? Income? Relationship? Stability?
- Which factors had an influence on your choice to undertake egg freezing?