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Between Ambition and Uncertainty: What Drives Young Women to Consider Social Freezing?

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Abstract

Social egg freezing has increasingly become a topic of public discussion in recent years. It means the cryopreservation (freezing) of human unfertilized egg cells, which enables women to postpone pregnancy to a later age. The discussion has often focused on the normative implications of this technological innovation in reproductive medicine and on the reasons that motivate women to use it. Our study analyzes the covariates of the desire to use social freezing. We model this desire based on a broad rational choice model of decision making. In this theoretical framework, we consider the specific constraints and costs that determine this consideration, but also the benefits that drive the desire to use social freezing in the future. We particularly focus on career ambitions, gender roles, specific benefits and constraints, as well as social norms concerning social freezing. We test this broad rational choice model based on a survey among university students (N = 805) at the University of Zurich conducted in 2023, focusing on a population segment that is especially inclined to consider the utilization of social freezing. Our empirical results show that the desire to use social freezing is driven by both tangible benefits, such as enhanced career prospects and more time to find a suitable partner, and normative benefits, like increased reproductive autonomy. However, the high financial costs of the procedure significantly inhibit potential uptake. Broader attitudes toward gender roles and career orientation also influence these desires, though more immediate cost–benefit considerations largely mediate their effects.

Keywords

assisted reproductive technologies; cryopreservation; fertility; rational choice; social freezing; social norms

1. Introduction

Human fertility and family formation are drastically changing in Western societies: Family planning is affected by increasing uncertainties about how to combine work and family, changing gender norms, and partnership instability (Cooper et al., 2011; Gregory et al., 2013; Sherman, 2009). In many high-income countries, including Switzerland, the age at first childbirth has steadily risen (Bundesamt für Statistik, 2023; Sobotka, 2011) as higher education, career progression, and longer life expectancy have shifted major life events to later stages, yet the biological constraints of fertility remain unchanged (European Society of Human Reproduction and Embryology Capri Workshop Group, 2005). At the same time, the opportunities for postponing parenthood are improving as an increasing number of individuals turn to the cryopreservation of unfertilized egg cells (known as "egg freezing" or "oocyte freezing") as a means of fertility preservation (Human Fertilisation and Embryology Authority, 2024). While the freezing of unfertilized egg or sperm cells was initially developed as a medical intervention for patients undergoing chemotherapy, it is increasingly being used for non-medical reasons, allowing women to postpone motherhood despite the natural decline in fertility with age. This development led to the term "social (egg) freezing" (SEF).

The debate on SEF is intertwined with feminist and ethical considerations. De Proost and Coene (2019) argue that SEF reinforces neoliberal gender norms, portraying fertility as an individual responsibility and self-optimization rather than addressing broader structural inequalities (see also Bozzaro, 2018; Myers & Martin, 2021; Wunder, 2013), which make balancing career and family challenging. Mertes and Pennings (2011) adopt a more balanced stance, acknowledging that while SEF offers reproductive autonomy, clinics should be cautious about marketing the procedure as a guaranteed solution. Van de Wiel (2020) similarly critiques the increasing commodification of fertility, arguing that SEF perpetuates gendered reproductive norms and reinforces inequalities in reproductive access.

The increase in usage, improving success rates, and political changes in access to medically assisted reproduction in general raise several sociological questions. Our study aims to shed light on the specific motivations and benefits, social norms, and constraints shaping the desire to use SEF among young women. Previous empirical research on the motivations to use SEF is mainly qualitative. While highlighting the diverse motives of young women considering SEF, it leaves open the question of generalizability. Furthermore, most quantitative empirical research has focused on women who have already used SEF (Jones et al., 2019; but see also Schmid et al., 2025). Therefore, our study is one of the first to examine the determinants of considering SEF using a quantitative methodology and a prospective design, focusing on young women primarily before their family-formation phase. Our approach is based on a broad rational choice model of decision making to consider both motivations and benefits, social norms, and specific constraints that could influence the decision to consider SEF in the future. By using a comprehensive survey conducted among students, specifically female and non-binary students at a BA, MA, and PhD level (N = 805) at the University of Zurich (UZH) in 2023, we investigate how these specific determinants are interwoven with broader background attitudes regarding career and gender roles, prevailing social norms, and patterns of social stratification. This approach ultimately aims at answering the research question (RQ): Considering particular benefits, specific constraints, social norms, and background attitudes, which are the most important motivations and constraints relating to the desire to use SEF in the future among young and educated women? This broad perspective enables us to disentangle the direct and indirect impact of more specific benefits, general attitudes, and socio-demographic variables capturing structures of social inequality.

The present study must be contextualized by taking the rather restrictive legal situation for reproductive medicine in Switzerland into account. Focusing on the most important technologies, in-vitro fertilization, insemination, sperm donation, and SEF are allowed in Switzerland, whereas egg cell donation and surrogacy are illegal. Only married couples are permitted to use these legal technologies. Since 2022, this has also been true for same-sex female couples. However, health insurance covers only the use of insemination for couples diagnosed with infertility. Concerning SEF, eggs can only be stored for five years, which is extendable to ten years. To use the frozen eggs, in-vitro fertilization is necessary, but single parenthood is not possible. In addition, in-vitro fertilization is only lawful in the case of infertility, meaning that the frozen eggs will only be relevant if, by the time of use, the mother (or father) is diagnosed with infertility, and the couple is married (The Federal Assembly of the Swiss Confederation, 1998).

Before we introduce our data and statistical methods of analysis in Section 3, we explain the state of research on the use of SEF and our theoretical approach in Section 2. The empirical results are presented in Section 4. We discuss the conclusions from our research and its limitations in Section 5. Overall, our empirical results show that the desire to use SEF is driven by both tangible benefits and constraints, as well as normative attitudes and benefits.

2. State of Research

The process of egg freezing involves stimulating the ovaries with hormones to produce multiple eggs, retrieving these eggs from the ovaries, and then freezing them using a technique called vitrification, which prevents ice crystal formation and thus preserves egg quality (Nawroth, 2015). Over the past decade, advances in vitrification have significantly improved the success rates of egg freezing, which, however, vary considerably depending on the cited source. For younger women under the age of 38, the American Society for Reproductive Medicine (2023) estimates that the chance of a baby being born from a frozen egg is between 2 and 12%. In contrast, Lockwood (2011) quotes a success rate of up to 50%—a figure that depends heavily on the age at which the eggs are retrieved. Mertes and Pennings (2011) argue that the lower success rates are largely due to many women undergoing treatment in their late 30s when their eggs are already considered "suboptimal." They argue that SEF should ideally be offered to women in their mid to late 20s. It should also be noted that the use of frozen eggs requires in vitro procedures, which themselves have relatively low success rates (Milman et al., 2017). Since Apple and Facebook announced in 2014 that they would cover the cost of SEF for their employees, the technology has attracted increasing media attention (Mertes, 2015). With this, the number of egg freezing cycles performed has increased by around 25–30% annually (Baldwin et al., 2019).

With the growing societal interest in the use of SEF, scientific interest in the topic has also increased. Publications from various specialist areas shed light on the procedure from social, ethical, legal, and medical perspectives. Social scientific literature has mainly focused on the socio-demographic composition of (potential) users, their motivations, and opportunities to use SEF. Regarding socio-demographic variables, women who opt into SEF tend to be single, highly educated, and actively engaged in the workforce, with a strong emphasis on genetic motherhood (Inhorn et al., 2018; Osaah et al., 2024; Schmid et al., 2025). Moreover, research shows that both age and identifying as a sexual minority are significantly correlated with the intended use of SEF. According to a study by Lewis et al. (2016), younger age, being single, and being bi- or homosexual (as compared to heterosexual) are all associated with personally considering SEF. A recent

study by Chehimi et al. (2025) also confirms that in France, where SEF is fully covered by public health insurance, the women who make use of SEF are single, childless, have a high educational level, and a high socioprofessional status.

Notably, a study in the UK found that participants undergoing oocyte cryopreservation were, on average, 36.7 years old (Baldwin et al., 2015). From a medical point of view, this is rather old as the age-related decline in ovarian reserve has started by this point. Knowing that women tend to freeze their eggs this late makes interviewing young women who are in their prime reproductive years especially important (see Osaah et al., 2024; Tozzo et al., 2019, for examples from Ghana and Italy).

2.1. Benefits and Constraints of Social Egg Freezing

One of the most widely discussed drivers of SEF is the fear of age-related fertility decline. Research consistently shows that women freeze their eggs due to concerns about diminishing ovarian reserve and the biological limitations of fertility. A qualitative study of 31 participants in the UK by Baldwin et al. (2019) found that women primarily opt for SEF because they feel that they are running out of time to start a "conventional" family. The desire not to regret it later and not to be ashamed of not having done SEF played a central role here, but also the desire to take the pressure off new partnerships was cited as a motivation. In addition, difficulties in finding a suitable partner and concerns about "panic partnering" were named as key motivations. Similarly, Kanters et al. (2022) found that Dutch women who engaged in SEF were primarily motivated by the fear of not finding a suitable partner and concerns about reproductive timing. This aligns with findings from Inhorn (2023), who explores how SEF is driven by the "mating gap," where women are unable to find suitable partners during their peak reproductive years. Inhorn (2023) emphasizes how SEF provides emotional and social reassurance but also highlights systemic gender and relationship dynamics. Beyond biological concerns, career considerations also play a significant role in SEF decision-making. While some scholars question whether career aspirations are a primary driver of SEF (Inhorn, 2023), others find that women who pursue SEF are often highly educated and career-oriented, highlighting the role of professional ambitions in shaping reproductive planning (Baldwin et al., 2015; Schmid et al., 2025). Studies that primarily address ethical aspects of the procedure highlight how SEF is often framed as a tool for career planning, allowing women to prioritize education and professional aspirations before transitioning into motherhood (De Proost & Coene, 2019; Rottenberg, 2017).

Concerning limitations in the use of SEF, the most prominent aspects are the costs, uncertainty of success, and potential medical side effects. Platts et al. (2021) conducted a systematic review on women's attitudes towards SEF and found that financial constraints were a significant deterrent, even for women who expressed interest in the procedure. This was confirmed in a study of female students at a private university in Ghana, where interest in SEF was notable but the costs were a clear barrier (Osaah et al., 2024). SEF is often prohibitively expensive and rarely covered by insurance, making it accessible primarily to wealthier individuals (Baldwin, 2018; van de Wiel, 2020). Moreover, as Mertes and Pennings (2011) point out, the chances of achieving a live birth from frozen eggs remain uncertain and depend heavily on the woman's age at freezing. According to qualitative interviews with women who had decided on SEF, this uncertainty of success changed significantly with a transition in the freezing method—from the traditional slow freeze method to the more promising vitrification—yet the uncertainty remains relevant in their decision (Baldwin, 2019). The potential medical downsides (and especially their relevance to women considering SEF) have so

far received comparatively little attention in academic discourse. The procedure involves hormonal stimulation, egg retrieval under sedation, and potential side effects such as ovarian hyperstimulation syndrome, infection, and emotional distress (Baldwin, 2019; Nawroth, 2015). Mertes and Pennings (2011) caution that SEF is often promoted without sufficient awareness of its medical risks, particularly when performed at later reproductive ages when success rates decline. Similarly, De Proost and Coene (2019) criticize the discourse for the fact that the medical risks and burden are sometimes downplayed in favor of an emphasis on autonomy. Baldwin (2019) found in her interviews with SEF users that the physical side effects came as quite a shock to many, yet in retrospect, they were seen as a "short-term sacrifice in the pursuit of a longer-term goal" (p. 101).

While these previous studies offer intriguing insights into women's motivations to freeze their eggs, our study addresses some shortcomings that they face. First of all, most interview studies that focused on motivations and constraints only interviewed women who had already used SEF (e.g., Baldwin et al., 2019; Inhorn, 2023). While approaching women who have already used SEF is straightforward when analyzing motivations, it overlooks the opinions and reasoning of women who would not use it or have not put any thought into it. In addition, asking for motivations and constraints after use is also methodologically susceptible to forms of post-hoc justification (see Winchester & Green, 2019). Therefore, our study covers young women mainly before they have started the phase of family formation. Further, many studies on SEF are qualitative and focus on two major issues in the decision to choose SEF: Compatibility of work and family, and the availability of suitable partners for family formation. Our study aims at a quantitative assessment of the main determinants of the willingness to use SEF among young women at the university, which also means they can be assumed to have certain career aspirations. We see a strength in our sample because previous research has shown that especially women with tertiary education remain childless (Lockwood, 2011; Sobotka, 2011). This is especially true for Switzerland, where the wish to have children does not diverge strongly between women with different levels of education. However, the realized number of children is comparatively low for women with tertiary education in Switzerland (Beaujouan & Berghammer, 2019). Reconciling employment and family is rather difficult since parental leave regulations are comparatively restrictive and daycare is rather expensive in Switzerland (Bundesamt für Statistik, 2021). The question of fertility preservation is therefore most relevant to highly educated women in this country. Because of the rather young age of university students, we decided not to focus on the topic of age-related fertility decline.

2.2. Rational Choice Model of Decision Making

To model the interplay of motivations for SEF and its constraints, we turn to a broad version of rational choice theory (RCT), a frequently used explanatory perspective in the social sciences. However, it has received little attention in the explanation of reproductive decision-making. To our knowledge, only one other study has used this approach to SEF so far. Kılıç and Göçmen (2018) analyzed women's motivations to freeze their eggs using an RCT perspective in semi-structured interviews with 21 women in Turkey who were either in the process of SEF or had used it in the previous year. They found that women "engage in rational calculations to find a solution to their reproductive concerns" and that they "turn to their own belief systems when dealing with future uncertainty; and they negotiate social norms…while trying to conform to traditional reproductive roles" (p. 19).

RCT is based on three main assumptions concerning preferences, constraints, and outcomes like decisions, intentions, or desires (Becker, 1976; Coleman, 1990; Opp, 1999; Schenk et al., 2018):

1. Preferences and goals: Individuals are motivated by well-ordered, consistent preferences for certain outcomes. In other words, behavior and other outcomes are driven by specific goals, and people can rank different alternatives, like benefits or costs, according to these goals.
2. Constraints: Individuals face various constraints—whether opportunities or restrictions—that affect their ability to realize these goals. These constraints shape the set of available alternatives and influence the costs and benefits associated with each choice.
3. Decision rule: Given their preferences and the constraints they face, individuals choose between alternatives by applying a decision rule. Most rational choice models assume that people select the action, attitude, or intention that best satisfies their goals (maximization of utility) by weighing all available costs and benefits.

RCT has been used to explain different types of outcome variables, like decisions, behaviors, intentions, desires, or attitudes (Becker, 1976; Coleman, 1990; Opp, 1999; Schenk et al., 2018). Our dependent variable focuses on the question of whether young women would consider the use of SEF in the future. Based on the widely used traits-desires-intentions-behaviors framework to explain fertility by Miller (1994), this represents a desire and not an intention, since it represents feelings towards a possible goal, not a specific plan to put this goal into action. Miller (1994, p. 228) assumes that desires are mainly shaped by factors internal to the individual, like motivations, attitudes, and beliefs. Beliefs usually focus on external conditions like satisfaction with work, career opportunities, or the chance to find a suitable partner.

Therefore, based on this model, the impact of particular motivations and benefits can only be determined if constraints are empirically taken into account. What specific benefits and constraints have to be considered to explain the desire to use SEF? To develop an explanatory model including a broader set of constraints and motives, we systematize motivations and constraints previously discussed in the literature on SEF and related research on fertility and family decisions.

Concerning preferences and goals, as shown above in the literature review on the main motivations for SEF, the main goals and benefits which are mentioned in research are related to the fear of running out of time (Baldwin et al., 2019): This is, on the one hand, the goal of developing a career before starting a family, and, on the other hand, the search for a suitable partner to raise a family with (Inhorn, 2023; Kanters et al., 2022). Therefore, we will focus on the relative importance of these two motivations in our analysis. In addition, we will also include the increase in autonomy as an additional benefit, which is often mentioned as a liberating moment in the literature on SEF (Bernstein & Wiesemann, 2014; Dondorp & De Wert, 2009; Mertes & Pennings, 2011).

In regard to constraints, a decision for SEF is not made in a vacuum; women must weigh the potential benefits of preserving fertility and their motivations to use SEF against the financial and medical constraints inherent to the procedure (Platts et al., 2021). Furthermore, SEF is not covered by medical insurance and is comparatively expensive in Switzerland, which makes the financial burdens especially salient. As described in the literature review, because of its costs, the decision for or against SEF is embedded within the broader structure of social inequality (van de Wiel, 2020). Beyond the financial and medical burden, the uncertainty about the

overall chances of success could be another constraint on the desire to use SEF (Mertes & Pennings, 2011; Milman et al., 2017).

We assume that, in addition to the direct benefits and constraints of the desire to use SEF, motivations for such decisions are also shaped by broader social and personal norms (Bazzani et al., 2025; Beham-Rabanser et al., 2024; Bujard et al., 2023; Nauck, 2007). First of all, we take the impact of normative considerations into account (Opp, 1999; Sunderer & Rössel, 2012). Social pressure, especially by other household members, family, and friends, is generally seen as an important influence on fertility. Two types of social norms can be distinguished: injunctive and descriptive (Nolan et al., 2008). Injunctive social norms represent beliefs about what other people think one should do (Ajzen, 2012). They can motivate behavior due to expected approval by others. They can also be constraining, because they prohibit certain behaviors. Previous research on the influence of injunctive social norms on fertility and assisted reproduction indicates their relevance (Balbo et al., 2013; Bujard et al., 2023). Descriptive social norms are defined as beliefs about how other people behave in a certain situation (Nolan et al., 2008). These beliefs provide information about appropriate behavior and therefore function as a behavioral constraint. At the societal level, a strong descriptive norm exists, since approximately 80% of women give birth to at least one child (Sobotka, 2011). However, there is also research showing the social contagiousness of fertility in different societal contexts, underlining the importance of descriptive norms for fertility decisions (Balbo & Barban, 2014; Buyukkececi et al., 2020).

Beyond the direct benefits, constraints, and the individual perception of descriptive and injunctive norms, there is evidence that reproductive decisions and desires are shaped by more general background attitudes (Balbo et al., 2013; Bazzani et al., 2025; Lesthaeghe, 2015; Miller, 1994). We focus especially on gender role attitudes and career orientations, because they have been shown to be especially important for attitudes and desires toward reproductive decisions, and also touch upon the motivations that were discussed in the empirical research on SEF.

In sum, the RCT model proposed here considers the following variables as possible explanatory factors for the desire to use SEF: (a) benefits in autonomy and gender equality in reproductive decisions, benefits concerning career opportunities and benefits concerning having more time to find a suitable partner; (b) economic and medical burdens of SEF as specific constraints as well as perceptions of success of SEF; (c) individually perceived injunctive as well as descriptive social norms; and (d) background attitudes on gender norms and careers. Based on this broad theoretical approach, we could specify more clearly which of the aforementioned motivations and constraints are of higher or lesser relevance for the explanation of the desire to use SEF in the young and educated population we study. Concerning the relationship between the different predictors studied, we assume a funnel of causality according to the empirically well-established compatibility principle in social psychology. It assumes that the covariation between the independent and the dependent variable is higher if the specificity of the measured attitude, desire, or behavior is on a corresponding level. Therefore, the more specific costs and benefits directly related to SEF should have a stronger impact on the desire for SEF compared to the more general background attitudes that shape the more specific beliefs about costs and benefits (Ajzen & Fishbein, 1977). This assumption will be tested in a mediation analysis.

We thus formulated the following RQ:

RQ: Considering particular benefits, specific constraints, social norms, and background attitudes, which are the most important motivations and constraints relating to the desire to use SEF in the future among young and educated women?

3. Empirical Data

The data used for our analyses are based on an online survey conducted among female and non-binary university students at a BA, MA, and PhD level at the UZH in 2023. We consider this specific sample highly interesting with regard to the topic because (a) respondents are pursuing tertiary education, which statistically makes them particularly prone to late or absent motherhood and to considering SEF (Lockwood, 2011; Schmid et al., 2025; Sobotka, 2011), and (b) at the time of the survey they are largely still in an age group that is ideal for egg freezing from a medical point of view. Using the university's mailing list, 11,939 students were invited to fill out the questionnaire, of which 1,100 students participated, and 805 filled out the survey entirely. It is important to note that the respondents read a description of SEF, including information on the procedure and costs, before answering the questions we use to operationalize our main variables (see Appendix A in the Supplementary File).

A comparison with official university statistics (UZH, 2024) indicates a high degree of alignment in terms of level of study between the respondents and the overall student population: 48% of our participants were BA students (UZH: 52%), 30% MA students (UZH: 27%), and 22% PhD students (UZH: 19%). However, the distribution by study program deviates from the overall student population: While law and medicine are among the largest faculties at UZH, students from social sciences are overrepresented in our sample and form the largest group. This suggests a disciplinary bias, possibly reflecting differing levels of interest or awareness regarding the topic. Students with a stronger interest in fertility or future family planning may have been more inclined to take part, which could lead to an overestimation of the level of the desire to use SEF. Nevertheless, the sample remains highly relevant for understanding the motivations and constraints of those most likely to engage with the topic.

The dependent variable in all of our analyses is the desire to use SEF ("Can you imagine using social freezing personally in the future?"). The desire could be indicated on a 5-point Likert scale ranging from *no, absolutely not* (1) to *yes, in any case* (5) with steps of *rather no* (2), *maybe* (3), and *rather yes* (4).

In conceptualizing the underlying questionnaire, we aimed to cover the different benefits, constraints, norms, and background attitudes discussed in the literature review that might influence the decision for or against SEF. Background attitudes include being career-oriented as well as gender role attitudes. The index for career orientation draws on concepts from existing work on career commitment and work values (e.g., Greenhaus, 1971, 1973). It is based on both subjective career orientation (5-point scale from not being career-oriented to being career-oriented) and the importance of job and career, professional activity, promotion opportunities, and a high income (Cronbach's $\alpha = 0.81$). Higher values always correspond to being more career-oriented (scale range 1 to 5).

The index measuring gender role attitudes consists of a series of established items relating to the parent-child relationship and the division of care work. They were largely adapted from established surveys such as the International Social Survey Programmme (see Braun, 1999), with additional items on same-sex

and single-parent families developed by the authors to reflect contemporary family diversity. We used principal components analysis and Cronbach's α to assess different aspects of our indices. Principal components analysis was applied to explore the underlying structure of the items and to ensure that they load onto a single component, indicating unidimensionality. Cronbach's α was then used to assess the internal consistency of the items within each index. Since unidimensionality is a prerequisite for meaningful interpretation of Cronbach's α, using both methods in conjunction is a well-established practice (see, e.g., Tavakol & Dennick, 2011). After conducting principal components analysis, one item was removed since it did not yield consistent results in any constellations, and the remaining items were combined into an index (Cronbach's $\alpha = 0.78$). Higher values correspond to non-traditional and lower values to traditional gender norms (scale range 1 to 5). Descriptive statistics of the indices are shown in Table 1; the corresponding items for each index are in Table B of the Supplementary File.

In operationalizing injunctive and descriptive norms, we follow the standard procedures which are usually used in research (Nolan et al., 2008): With respect to injunctive norms, we asked respondents for their individual perceptions of the normative expectations of different reference groups in their environment. The internal reliability is acceptable, with a Cronbach's α of 0.6—this value could not be increased despite checking the item-total correlations. To operationalize descriptive norms, we asked respondents if people in their environment have already used SEF. This is in line with research on the contagiousness of reproductive decisions (Buyukkececi et al., 2020).

Table 1. Descriptive statistics of indices used.

Index	No. of items	Mean (*SD*)	Min	Max	Valid *N*	Cronbach's α
Career orientation	5	4.05 (0.64)	1	5	856	0.81
Gender roles	7	4.26 (0.60)	1	5	819	0.78
Autonomy benefits	5	4.17 (0.65)	1	5	1,000	0.74
Economic benefits	2	3.06 (1.27)	1	5	918	0.77
Partner benefits	1	3.26 (1.48)	1	5	917	—
Financial constraints	1	2.57 (1.16)	1	5	835	—
Medical constraints	1	2.29 (1.00)	1	5	773	—
Success rate constraint	1	2.76 (1.02)	1	5	787	—
Injunctive norm	6	3.23 (0.59)	1	5	829	0.60
Descriptive norm	1	% Yes (1–2) 10.81	1	3	1,024	—

The most specific level operationalized in our study is the level of specific benefits and constraints that women could associate with SEF. Benefits include reproductive autonomy and gender equality, economic benefits in the form of career opportunities, and more time to find a suitable partner. Benefits concerning autonomy and gender equality in reproductive decisions were operationalized with five items (see Table B in the Supplementary File; Cronbach's $\alpha = 0.74$), economic benefits with two items (Cronbach's $\alpha = 0.77$), and time to wait for a suitable partner with one item.

The specific constraints were all operationalized by a single-item measurement of economic and medical burdens and the importance of the success rate of SEF. In addition to the theoretical variables in the broad rational choice model, we also included several control variables to account for the socio-demographic

composition of the sample, which was mentioned as a correlate of using SEF in previous literature (see Section 2). We include the study level (BA, MA, PhD), age in years, relationship status (single, in a relationship), and sexual orientation (heterosexual, lesbian, asexual/aromantic, bisexual). Control variables were selected based on theoretical and empirical considerations related to reproductive decision making. Age and level of study were included as they are closely tied to life course timing and family planning. Relationship status was controlled for because, as previously discussed, one of the main drivers for considering SEF is the absence of a suitable partner. Sexual orientation was included due to existing legal restrictions on access to assisted reproductive technologies in Switzerland, where treatments are often limited to married (heterosexual) couples. Additionally, prior research has shown that non-heterosexual individuals face more complex family planning decisions, which may influence their reproductive intentions and consideration of SEF (e.g., Mamo, 2007).

The respondent's mean age is 26 years, with the youngest respondent being 18 and the oldest 67 years old (descriptive statistics of the sample are in Table C in the Supplementary File). The vast majority identify as female (99%), and only a few respondents identify as non-binary (1%). Concerning their relationship status, 60% are in a relationship and 40% are single. Of those who indicate being single, 65% are (currently) not looking for a partner, while the remaining 35% are. Respondents who could not imagine using SEF were 48% (scale points 1 or 2), 27% could maybe imagine it, and the remaining 25% of respondents could imagine using it (scale points 4 or 5). Therefore, a sizable share of the respondents is willing to consider SEF in the future, highlighting the current salience of the topic. This is also confirmed by the fact that more than 10% of the respondents know a person who has already used SEF. The items on career orientation and gender norms exhibit a skewed distribution, as in most cases the mean value is above the midpoint of the scale, indicating that the studied young women are generally career-oriented and have non-traditional conceptions of gender roles. Examining the specific benefits, this skewed distribution is also true for the specific benefits of reproductive autonomy and finding a suitable partner. Notably, the different specific constraints exhibit relatively low average values, centered around the midpoint of the scale.

4. Empirical Results

We model the desire to use SEF by applying linear OLS regressions. Our analysis is structured to examine how different layers of factors influence a woman's consideration of SEF within a funnel of causality. We begin by including basic socio-demographic variables that inform us about the respondent's social position, such as age, level of studies, relationship status, and sexual orientation, in our first regression model. In the second model, we add variables capturing broader attitudes related to career orientation and gender roles. In the third model, we introduce more specific factors: the benefits and constraints that respondents associate with SEF. We assume that these specific perceptions not only directly affect the decision but also mediate the influence of the broader attitudes. In our fourth model, we further enrich the analysis by including descriptive and injunctive norm variables, which we expect will directly affect the outcome. To further explore the mediating role of the benefits and constraints, we use the Baron and Kenny (1986) approach. This step-by-step approach enables us to disentangle the direct and indirect effects of various factors on the consideration of SEF. The regression analyses are based on 619 respondents who provided complete data on all included variables, ensuring the observations remain constant across all models.

4.1. Regression Results

The results of our regression models are presented in Table 2. In our interpretation of the results, we follow the stepwise procedure of the statistical analysis outlined earlier. Model 1 shows the results with respect to socio-demographic variables. As the adjusted R^2 shows, the included socio-demographic variables do not contribute to the explanation of the desire to use SEF in an important way. Most of the coefficients are very small, while the responding p-values tend to be high and hint at a lack of significant results, except for the study level. PhD students, in contrast to BA or MA students, have a higher probability of considering SEF.

Table 2. OLS regressions with consideration of SEF as the dependent variable.

	Model 1	Model 2	Model 3	Model 4
Injunctive norm				0.363*** (0.063)
Descriptive norm				
Yes, one person				0.246 (0.128)
Yes, several people				−0.252 (0.204)
Benefits				
Autonomy			0.214** (0.074)	0.202** (0.072)
Economic			0.346*** (0.039)	0.320*** (0.038)
Partner			0.131*** (0.028)	0.120*** (0.027)
Costs/constraints				
Financial burden			−0.137*** (0.032)	−0.114*** (0.031)
Medical burden			−0.062 (0.038)	−0.067 (0.037)
Success rate			0.140*** (0.037)	0.126** (0.037)
Background attitudes				
Gender norms		0.160* (0.075)	0.039 (0.060)	0.029 (0.058)
Career oriented		0.427*** (0.075)	0.129* (0.061)	0.153** (0.059)
Study level (0 = BA)				
MA	0.092 (0.116)	0.037 (0.113)	0.053 (0.089)	0.008 (0.086)
PhD	0.287* (0.142)	0.169 (0.139)	0.107 (0.109)	0.032 (0.106)
Age	−0.003 (0.011)	0.004 (0.011)	0.001 (0.008)	0.010 (0.008)
Relationship status (0 = single)				
In a relationship	−0.067 (0.102)	−0.094 (0.099)	0.100 (0.079)	0.075 (0.077)
Sexual orientation (0 = heterosexual)				
Lesbian	−0.466 (0.254)	−0.413 (0.247)	−0.302 (0.196)	−0.225 (0.191)
Asexual/Aromantic	−0.102 (0.480)	−0.009 (0.466)	0.086 (0.367)	0.177 (0.357)
Bisexual	0.063 (0.129)	0.113 (0.126)	0.053 (0.099)	0.110 (0.097)
Adj. R-squared	0.003	0.063	0.425	0.458
Observations (N)	619	619	619	619

Notes: Standard deviations in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

They are typically in a different stage of life; in Switzerland, they are usually gainfully employed and age-wise closer to the mean age of family formation. Of the socio-demographics, the effect size is the biggest for lesbian respondents, which seems to reduce the desire to use SEF. Both the study level and sexual orientation tend to decrease in effect size when the background attitudes are entered in Model 2.

In Model 2, we integrate the background attitudes on career orientation and gender roles. These two variables are more consequential for the desire to use SEF compared to the socio-demographic variables, as the increased adjusted R^2 of 0.063 indicates. Career orientations are particularly important for the formation of this desire. Gender roles seem to be less important, considering the smaller effect size, especially after we enter the specific benefits and constraints in Model 3.

In Model 3, we add the specific benefits and constraints to our statistical explanation. Since they are, according to the compatibility principle, theoretically much closer to the formation of the desire to use SEF, the explanatory power of the model jumps to an adjusted R^2 of 0.425, indicating a very strong relationship. All three variables capturing the specific benefits of SEF are highly statistically significant.

For instance, tangible benefits like enhanced career prospects and finding a suitable partner have robust positive effects, while the perceived benefits of greater autonomy and the promotion of gender equality also add to women's willingness to consider SEF. Thus, not only do tangible benefits matter to young women, but also the perspective of increased normative benefits coming with SEF. In addition to the specific benefits, the specific constraints also matter for the consideration of SEF. Financial considerations are a critical determinant: The financial burden substantially decreases the likelihood of using SEF, while the uncertainty around the probability of success in the treatment contributes positively to the decision. In contrast, the medical burden appears to have only a modest negative impact, if at all, not reaching any significance in Model 3 and in Model 4. This is a noteworthy result, given the particularly burdensome nature of the medical process of extracting egg cells.

In Model 4, we enter, in addition to the specific benefits and constraints, also the subjectively perceived injunctive and descriptive social norms. They clearly contribute to the explanation as the adjusted R^2 rises from 0.425 to 0.458, which is mainly explained by the injunctive norm. Therefore, the acceptance of SEF in one's social environment plays a role in considering the freezing of egg cells. The effect of descriptive norms is overall somewhat lower, but it still highlights the importance of exemplary behavior and role models in one's social context for fertility considerations.

4.2. Mediation Analysis

Since some of the coefficients in Model 2 lost significance (e.g., gender roles) when adding the specific benefits and constraints in Model 3, we additionally looked for mediating effects of these benefits and constraints. In doing so, we used the classic Baron and Kenny (1986) approach by testing the effects of the independent variables (gender role attitudes and career orientation) on the specific benefits (reproductive autonomy and career benefits) first and then including both in a regression considering SEF as the dependent variable. In this framework, mediation is present when: (a) the independent variable significantly influences the mediator; (b) the independent variable significantly affects the dependent variable when the mediator is not included; (c) the mediator itself has a significant impact on the dependent variable; and

(f) the influence of the independent variable on the dependent variable decreases once the mediator is added to the model. Although this method is well-established in sociological research, some, such as Zhao et al. (2010), now argue that the only requirement is that the independent variable's effect on the dependent variable lessens with the inclusion of the mediator. This is already given with the results of Models 2 and 3.

Because the specific benefits and constraints are theoretically much closer to the formation of the desire to use SEF, we expect the effect of gender role attitudes (independent variable) to be mediated via the benefits relating to reproductive autonomy (mediator) and the background attitudes on career orientation (independent variable) to be mediated via the economic benefits (mediator). A causal diagram visualizing these potential effects can be taken from Graph D in the Supplementary File.

For the effect of gender role attitudes, the assumption of the reproductive autonomy benefit as a mediator can be confirmed: (a) Having less traditional gender role attitudes has a significant positive effect on seeing SEF as a way to increase reproductive autonomy, (b) while gender role attitudes have a significant effect on considering SEF itself and (c) the reproductive autonomy benefit affects considering SEF, (d) this significance vanishes entirely, and the effect size is strongly diminished when adding the specific benefit of reproductive autonomy into the equation (as seen in Table 1).

For career orientation and economic benefits as a potential mediator, the step-by-step analysis also confirms mediation, though less strongly: (a) Being career-oriented clearly has a positive and highly significant effect on perceiving career benefits in SEF; (b) career orientation also influences SEF decisions, with individuals who are more career-oriented considering using it more strongly at a statistically highly significant level; (c) economic benefits have a significant impact on considering SEF; (d) when adding the specific economic benefits to the model, the coefficient of career orientation decreases by approximately 0.30 scale points, however, it remains statistically significant throughout all models (as opposed to gender role attitudes).

4.3. Robustness Checks

With the regression models including a large number of variables, we were confronted with a number of robustness concerns that we would like to point out in this section and further explain how we handled these situations. While we included women of all ages and those who already have children in all of our analyses, as they may still have individual desires relating to SEF, we suspected them to have generally lower desires. When removing women over the age of 35 and those who already have children from the regression, age has a weak (0.051) but significant positive effect ($p = 0.002$). We therefore looked at age in groups as categorical variables, but no consistent picture emerged, and p-values dropped immensely. We then checked for a potential curvilinear effect of age, as SEF might be of most interest to those who are old enough to be thinking about their reproductive future but have not yet reached an age where the issue has become obsolete. When included as a quadratic term, age shows a very weak (−0.009) but significant ($p = 0.004$) inverted U-shape (concave) effect. Furthermore, whether or not respondents already have children is not considered separately in the analyses because the number of respondents with children is very low (less than 5%). We calculated models with and without this group, and it did not influence our overall results in an important way.

Mediation is often tested by conducting a Sobel test to further evaluate whether the indirect (mediated) effect is statistically significant. The fact that our independent variables are not normally distributed at all made this step redundant because the test assumes normal distribution. Instead, we used bootstrapping to obtain standard errors, *p*-values, and confidence intervals. We used 1,000 bootstrapped samples as recommended by Preacher and Hayes (2008). For Model A, bootstrapping produced an indirect effect with a 95% confidence interval that did not include zero, indicating that the effect of gender role attitudes on considering SEF is significantly mediated by the perceived benefit of increased reproductive autonomy. Similarly, for Model B, the bootstrapped confidence interval for the indirect effect of career orientation (via the benefit of being able to focus on one's career) did not include zero. This provides robust evidence that the mediation effects are statistically significant in our sample of female university students.

5. Discussion and Conclusion

5.1. Discussion

This study enhances our understanding of the decision-making process surrounding social egg freezing by integrating different drivers of this process within a broad rational choice framework. This framework incorporates background attitudes—such as career orientation and gender role attitudes—normative influences like injunctive and descriptive norms, and specific benefits and constraints, including increased reproductive autonomy, economic advantages in the form of improved career prospects, and a longer period to find a suitable partner on one side, against financial and medical insecurities on the other. This approach allowed us to investigate how these specific determinants interweave with broader attitudes, prevailing social norms, and patterns of social stratification, thereby clarifying which motivations and constraints are most relevant in explaining the desire to use SEF. This is among the first studies to employ a standardized design, enabling us to quantify the strength of various factors shaping the desire to use SEF in the future. In addition, we were able to study this in a prospective design because our study population consisted of young women mainly before their age of family formation.

To answer our RQ, we employed linear OLS regressions alongside the Baron and Kenny (1986) step-by-step approach to disentangle the direct and indirect effects of various factors on SEF consideration, with additional bootstrapping providing robust estimates and confidence intervals for the mediator effects.

Our analysis of female and non-binary students at the UZH indicates that while basic demographic factors (such as age, study level, or relationship status) have only a modest influence, likely due to our relatively homogeneous sample, only lesbian students show a lower desire to use SEF in the future. This is in line with results that show that lesbian persons usually have a lower inclination to raise a family (Baiocco & Laghi, 2013; Riskind & Patterson, 2010). In addition, this could also be attributed to the rather restrictive legal context for same-sex parents in Switzerland (see Chautems & Roca i Escoda, 2025). In contrast, the desire to use SEF is strongly driven by a balance between costs and benefits. In particular, perceived benefits related to reproductive autonomy, enhanced career opportunities, and an extended window to find a partner strongly motivate SEF consideration, whereas the financial burden acts as a significant deterrent. Given that SEF is comparatively expensive in Switzerland and not covered by medical insurance, the salience of financial constraints in our sample is understandable. Interestingly, the medical burden did not significantly affect SEF consideration, a finding that may reflect both the limited information provided about the

procedure in our questionnaire and Baldwin's (2019) observation that users view SEF as a short-term sacrifice in pursuit of long-term family goals. Additionally, it was unexpected that uncertainty about the chances of success of SEF had a positive effect on consideration.

Moreover, while background attitudes regarding gender roles and career orientation are important, their effects are (partially) mediated through specific cost–benefit evaluations. Gender roles play a smaller role, which may be due to the rather low variation of gender role attitudes among female university students. Essentially, the decision to use SEF is less about demographic characteristics and broader attitudes and more about how women weigh practical and normative incentives against financial risks and perceived probabilities of success embedded within a broader framework of attitudes on gender roles and career orientation.

Our findings align with and expand upon earlier research discussed in the literature review. The primary motivations noted in previous studies—fear of running out of time (Baldwin et al., 2019), difficulties in finding a suitable partner (Inhorn, 2023), and career and financial considerations (Kanters et al., 2022)—were confirmed as important drivers of SEF consideration. Prior research has also underscored the dual influence of personal aspirations and external pressures (Ajzen, 2012; De Proost & Coene, 2019; Nolan et al., 2008; Rottenberg, 2017) in shaping reproductive decisions. Our research not only reaffirms these factors but also demonstrates the mediating role of specific benefits, such as reproductive autonomy, finding a suitable partner, and career opportunities, thereby offering a more nuanced understanding of SEF decisions among young, educated women. Especially the normative benefit of increased reproductive autonomy, which goes beyond tangible benefits, was of substantial importance for the desire to use SEF.

Despite its contributions, this research is not without limitations. The relatively homogeneous sample of university students limits the generalizability of the findings, and future studies would benefit from examining a more diverse population. Furthermore, while the proposed statistical relationships between socio-demographic variables, background attitudes, specific benefits and constraints, and the desire to use SEF are theoretically coherent and plausible, we are not able to demonstrate the causal direction of these relations. In contrast to our cross-sectional sample, this would necessitate a longitudinal perspective on the process of decision making. In the overall interpretation of the findings, it is important to consider the rather restrictive legal context in Switzerland, which also limits the actual utility of SEF, as the preserved eggs can only be used within married couples in cases of infertility. Therefore, the overall attractiveness of SEF for young women might be comparatively low in Switzerland. With SEF use on the rise, time will reveal whether the procedure can effectively counteract age-related fertility decline. Currently, few women return to their frozen eggs, with many eventually disposing of them (Fuscaldo et al., 2025). However, with the impending legalization of egg donation in Switzerland (The Federal Council, 2025), the needs of infertile women and the surplus of frozen eggs might, depending on the final legislation, align more closely. Decisions regarding egg freezing and medically assisted reproduction remain highly relevant amid increasing infertility rates, and our study provides a foundation for further research in this field.

5.2. Conclusion

Overall, by shedding light on the multifaceted determinants of SEF intentions, this study deepens our understanding of contemporary reproductive choices and invites further discussion on how social and economic policies can better support women's autonomy and career aspirations in modern family formation.

With a standardized and prospective research design focusing on young women before family formation, we were able to show that specific benefits—such as career perspectives, finding a suitable partner, and increasing reproductive autonomy—strongly shape the desire to use SEF. On the other hand, specific costs, especially the financial costs of the procedure, also play a significant role. Socio-demographic variables are of lesser importance, and more general background attitudes on gender roles and career orientations are mainly mediated by the more specific benefits and costs.

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Conflict of Interests

The authors declare no conflict of interest. In this article, editorial decisions were undertaken by Ulf R. Hedetoft (University of Copenhagen, Denmark).

Data Availability

The data used in this study were collected as part of Nadja Colombini's MA thesis. While the thesis is available via the Supplementary File, the underlying dataset is not publicly available due to privacy and ethical considerations. Interested researchers may request access to the data by contacting the corresponding author.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

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