



Ten pathways to elective egg freezing: a binational analysis

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Abstract

Purpose What are the specific pathways that lead women to freeze their eggs? In this binational study, women were asked directly about the life circumstances that led them on the path to elective egg freezing (EEF).

Methods From June 2014 to August 2016, 150 women (114 in the USA, 36 in Israel) who had completed at least 1 cycle of EEF were interviewed by two medical anthropologists. Study participants were recruited through four American IVF clinics (two academic, two private) and three in Israel (one academic, two private). Interviews were audio-recorded, transcribed verbatim, and entered into a qualitative data management program (Dedoose) for analysis.

Results The majority (85%) of women in the study were without partners, while 15% had partners at the time of EEF. Six pathways to EEF were found among women without partners (being single, divorced, broken up, deployed overseas, single mother, career planner), with career planning being the least common pathway to EEF. Among women with partners, four pathways to EEF were found (relationship too new or uncertain, partner not ready to have children, partner refusing to have children, or partner having multiple partners). With only one exception, the pathways and their frequencies were similar in both countries.

Conclusions Partnership problems, not career planning, lead most women on pathways to EEF. These pathways should be studied in a variety of national settings, and fertility clinics should offer patient-centered care for single women pursuing EEF in the couples-oriented world of IVF.

Keywords Fertility preservation · Oocyte cryopreservation · Pathways · Partners · USA · Israel

Introduction

Over the past 5 years, oocyte cryopreservation via vitrification has gained increasing acceptance for healthy women who are hoping to preserve their reproductive potential [1, 2]. Oocyte cryopreservation in healthy women has been called “social

egg freezing,” “non-medical egg freezing,” “elective oocyte cryopreservation,” “elective fertility preservation,” and “oocyte banking for anticipated gamete exhaustion.” Given the ongoing lack of agreement on the best nomenclature [3], we suggest that “elective egg freezing” (EEF) be added to the glossary of accepted terms [4], because it may most closely

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mirror women's preferred usage, per the study results described below.

Many recent clinical reviews of oocyte cryopreservation have shown that EEF is being used by women to “postpone,” “defer,” or “delay” childbearing for the purposes of (1) education and career; (2) prevention of age-related fertility decline; (3) maintenance of reproductive autonomy; or (4) lack of an appropriate partner [3, 5–9]. However, these reviews do not clarify whether women are intentionally postponing their fertility, or attempting to preserve their reproductive potential for reasons beyond their individual control.

As early as 2013, Belgian ethicist Heidi Mertes [10] worried that common media and medical portrayals of EEF might “oversimplify” women's motivations and circumstances. She pointed to three distinct ways in which EEF users were commonly portrayed: (1) as “selfish career-pursuing women,” (2) “victims of a male-oriented society that makes it difficult for women to combine motherhood with a good education or professional responsibilities,” or (3) “wise, proactive women who will not have to depend on oocyte donors should they suffer from age-related infertility” [10, p. 141]. Mertes questioned whether these portrayals were accurate and suggested that the absence of a male partner might, in fact, be the most common reason for women's adoption of EEF as a form of fertility preservation.

Several anonymous surveys have begun to provide evidence regarding women's EEF motivations. In New York City, a survey of 183 women who had completed at least 1 cycle of EEF during the 2005–2011 “experimental” period showed that 84% were age 35 or older, and 88% had completed at least 1 cycle of EEF because they lacked a partner with whom to have children [11]. Soon thereafter, a survey of 86 women in Brussels, Belgium, who had undertaken at least one EEF cycle between 2009 and 2011, found that women were 36.7 years of age on average, and 81% lacked partners [12]. Similarly, in Melbourne, Australia, a survey of 96 women who had completed EEF between 1999 and 2014 found that 48% were 38 years or older, and 90% were single. These Australian women were also described as “socio-economically advantaged”: highly educated (89%), professionals (88%), and who owned private health insurance (93%) [12, p. 578]. Although 34% had been pregnant at some point in their lives, none were currently mothers. Of the total group, 94% had not returned for their stored oocytes, because they could not foresee a future as single mothers [13, 14]. Most recently, researchers in San Francisco, California, employed a validated decision-regret scale and visual analog scales of anxiety and depression among more than 200 women, age 36.4 on average, who had completed EEF between 2012 and 2016. Averaging 2 years post-EEF, women tended to report high levels of satisfaction with their EEF decision, but also significant levels of anxiety, depression, loneliness, and hopelessness about “reproductive futures,” with one in six women reporting EEF “regret” for reasons that were unclear [15].

Only two small-scale, interview-based studies published so far explore women's EEF motivations and experiences directly. A study by Baldwin and colleagues, focusing primarily on 23 British women who had completed EEF, found women to be highly educated professionals (68% with postgraduate degrees or other professional qualifications), who were mostly working in managerial roles (74%) [16–19]. Although all the women hoped to be in a committed heterosexual relationship, 84% were single at the time of EEF, despite their “readiness” for motherhood. As the authors stated, “For most women, this ‘readiness’ consisted primarily of being in a stable relationship with a partner who they felt was committed to having a child” [2016, p. 243]. Similarly, a recent interview-based study of 21 Turkish women who were in the process of EEF or had completed an EEF cycle within the previous year found these women to be highly educated professionals, with a median age of 40, all of whom were unmarried and six of whom had never had sexual intercourse.

Given the emerging evidence that highly educated professional women may be preserving their fertility due to lack of suitable partners—rather than intentionally postponing their fertility due to educational or career planning—additional qualitative assessments of women's specific life circumstances and pathways to EEF are needed. The goal of this study then was to identify these pathways, based on women's own assessments of their life circumstances and primary motivations. Additionally, through qualitative analysis, we aimed to categorize and rank these various EEF pathways in order of frequency, thereby providing some sense of which pathways to EEF are most common. Finally, through a binational study design, we aimed to compare these various pathways among women in the USA and Israel, countries where EEF was approved for clinical use relatively early (January 2011 in Israel, October 2012 in the US), but with different levels of state support for women's childbearing, fertility rates, and assisted reproduction [20].

Methods

This study took place from June 2014 to August 2016, and was designed to assess the motivations and experiences of women who had completed at least one EEF cycle. Women were recruited from seven IVF clinics, four in the USA (two academic, two private) and three in Israel (one academic, two private). In the USA, recruitment occurred primarily by email flyers sent out by the four participating clinics, or by study flyers given directly by their clinicians during appointments. In Israel, recruitment occurred by phone, with IVF clinicians and their assistants inviting women to participate in the study.

In total, 150 women who had undertaken at least one EEF cycle volunteered to participate, 114 in the US and 36 in Israel. All women who volunteered for the study signed written

informed consent forms, agreeing to a confidential, audio-recorded interview in a private setting. The semi-structured interviews were conducted by the first and second authors, who are medical anthropologists with years of experience interviewing assisted reproduction patients in a variety of research settings. The American anthropologist interviewed all the American participants in the study (in English), while the Israeli anthropologist interviewed all the Israeli participants (in Hebrew). Conversations usually lasted about 1 h but ranged in length from one half to more than 2 h.

In both the USA and Israel, an identical semi-structured interview schedule was used to conduct interviews, although the schedule was translated into Hebrew for the Israeli participants. In the semi-structured portion, all women were asked a brief series of socio-demographic questions (i.e., age, place of birth, current residence, education completed, current employment, marital status, ethnicity, religion), as well as relevant details of reproductive history (i.e., age at menarche, contraceptive use, any known reproductive problems). Following these semi-structured questions, women were asked to describe their life circumstances at the time of EEF, and their primary motivations for pursuing fertility preservation. Because the qualitative interview process was open-ended, women often “led” the interviews, describing their egg-freezing “stories” and their decision-making processes in detail. The theoretical framework of this study was thus largely person-centered and experiential [21].

Completed interviews were then transcribed verbatim by research assistants at Yale University and the University of Haifa. At the University of Haifa, interview transcripts were then translated from Hebrew into English by a professional bilingual translator. All interview transcripts were uploaded into a qualitative data analysis software program (Dedoose) for thematic content analysis, and detailed interview synopses were written, summarized, shared, and reviewed by the two medical anthropologists responsible for the qualitative data analysis. Socio-demographic information was transferred into Excel files for descriptive statistical analysis. The research protocol was approved by academic Institutional Review Boards and by the ethics committees of all the collaborating IVF clinic sites.

Results

As shown in Table 1, women’s socio-demographic characteristics were quite similar in the USA and Israel. The average age for EEF was 36 (36.4 in the US, 36.2 in Israel), with about three-quarters of women in both countries pursuing EEF in their late 30s. Almost all women in the study identified as heterosexual, with only two American women noting that they were bisexual and one Israeli woman a lesbian. As seen in Table 1, women who froze their eggs in both countries were

Table 1 Elective egg freezing in the USA and Israel: sociodemographic characteristics of study participants

Characteristics	USA		Israel		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Age at EEF						
25–29	1	<1	0	0	1	1
30–34	19	17	7	19	26	17
35–39	83	73	27	75	110	73
>40	11	10	2	6	13	9
Total	114	100	36	100	150	100
Highest degree						
High school	0	.0	1	3	1	1
Associates degree (2-year)	1	1	0	0	1	1
Professional arts performance	2	2	0	0	2	1
Bachelors	23	20	14	39	37	25
Masters	52	45	13	36	65	43
MD	16	14	7	19	23	15
PhD	11	10	1	3	12	8
JD	8	7	0	0	8	5
MD-PhD	1	1	0	0	1	1
Total	114	100	36	100	150	100
Ethnicity						
American women						
Caucasian American	79	69	–	–	79	53
Asian-American	20	18	–	–	20	13
African-American	5	4	–	–	5	3.5
Latinx American	4	3.5	–	–	4	2.5
Mixed race	4	3.5	–	–	4	2.5
Middle Eastern Heritage	2	2	–	–	2	1.5
Israeli women						
Ashkenazi	–	–	26	72	26	17
Mizrahi	–	–	3	8	3	2
Mixed	–	–	7	20	7	5
Total	114	100	36	100	150	100

highly educated. Only four women had not graduated from university, primarily because of alternative careers in the performing arts or military. One quarter of women had completed their bachelors’ degrees and gone onto find meaningful employment. But, nearly three-quarters had also pursued postgraduate education. More than a dozen women, all American, had completed dual postgraduate degrees (e.g., MD-PhD, MD-MPH, PhD-MPP, and so on). Furthermore, more than half of the American women had attended Ivy League or other “elite” academic institutions.

As also shown in Table 1, women in both countries who had pursued EEF were ethnically and racially diverse. In the USA, more than three-quarters of women were Caucasian, but Asian-American (South, East, and Southeast Asian), African-American, Latinx, mixed race, and Middle Eastern-origin

women were also represented. In Israel, nearly three-quarters of women were of Ashkenazi (European) Jewish origin, with the rest being of Mizrahi (Middle Eastern origin) or mixed Ashkenazi-Mizrahi backgrounds.

Table 2 examines the pathways to EEF among women in the study. As seen in Table 2, most women (85%) were without partners at the time of EEF, with a slightly higher percentage of un-partnered women in Israel than in the USA. Only 15% of women in the study had a partner at the time of EEF, with slightly more American women partnered than Israelis. Given that partnership status significantly affected women's pathways to EEF, Table 2 is divided into two major sections, "Women without Partners" and "Women with Partners." However, being "partnered" or "un-partnered" are not monolithic categories, especially in terms of motivation to pursue EEF. Women in both categories faced a variety of different life circumstances that led them on the path to EEF. Here, we attempt to provide a brief but nuanced description of women's ten pathways to EEF, and these pathways' frequency among the study population.

Women without partners

No. 1: being single

Women are undertaking EEF primarily because they are single. In this study, 42% of women were not in a current relationship, had never been married, and were looking for a partner. Most of these women had serious relationships in the past, often in their 20s and early 30s, sometimes describing themselves as "serial monogamists." However, a few had not had a serious relationship (five Americans and nine Israelis), for

reasons they could not easily explain. A small number of religious women—four in the USA (Jewish, Christian, and Muslim) and two in Israel (Jewish)—had never been in a serious relationship, sometimes explaining that they were "saving themselves" for marriage.

Women who had never married often expressed regret and puzzlement over how they had "ended up" this way. Most women lamented the shortage of eligible men, especially men of equal educational and professional backgrounds. In some cases, women had tried "dating down" to widen their partnership possibilities; however, they reported that less educated or less successful men had often acted as though they were "intimidated." Without a partner, these highly educated professional women had turned to EEF, usually in their late 30s, to "buy time," while continuing to search for a partner with the hope of future marriage and motherhood.

No. 2: divorced or divorcing

Among the women without partners, 17% had been previously married, but were now divorced or in the process of divorcing. Among the Israeli women, divorces were largely described as "friendly" or "painless." However, the majority of American divorcees described the process as "very complicated," "soap opera-ish," "particularly acrimonious," "crazy," or "vindictive." Ex-husbands were variously described by women as being unfaithful, over-controlling, narcissistic, alcoholic, asexual, or, as one woman put it, "a big jerk." Within this divorced/divorcing category, two husbands had adamantly refused to have children, while another had impregnated a woman outside of his marriage.

Table 2 Ten pathways to elective egg freezing: a typology with frequencies (%)

Order	Pathways	USA		Israel		Total No.	Frequency (%)
		No.	%	No.	%		
Women without partners							
1	Being single	42	37	21	58	63	42
2	Divorced or divorcing	19	17	7	19	26	17
3	Broken up	16	14	2	6	18	12
4	Deployed overseas	12	11	0	0	12	8
5	Single mother	3	3	3	8	6	4
6	Career planner	2	2	0	0	2	2
	Total single	94	84	33	91	127	85
Women with partners							
1	Partner not ready to have children	10	9	2	6	12	8
2	Relationship too new or uncertain	6	5	1	3	7	5
3	Partner refuses to have children	2	1	0	0	2	1
4	Partner has multiple partners	2	1	0	0	2	1
	Total	20	16	3	9	23	15
	Total	114	100	36	100	150	100

In all 26 cases of divorce in this study, EEF was seen as preserving reproductive potential and relieving anxiety in the aftermath of divorce, especially for women who had already reached their mid- to late-30s. In fact, two American women in this study were successful in obtaining EEF cycles as part of their divorce settlements. For divorced and divorcing women, EEF was described as a way to heal and move forward with their lives in the aftermath of painful marital dissolutions.

No. 3: broken up

In addition to divorce, relationship “break ups” are leading women to EEF. In this study, 12% of never-married women had recently “broken up” from long-term relationships, which then led them on the path to EEF. Women described five main reasons for their breakups: (1) their partners did not want children, (2) their partners changed their minds about having children, (3) their partners already had children and did not want more, (4) their partners were significantly younger and not ready to have children, or (5) they or their partners were expressing doubts about the relationship as a whole.

As with divorces, these breakups were often described as “traumatic,” especially when a woman had committed many years to a relationship (e.g., “most of my 30s”), or had been “dumped” by a man whom she had hoped to marry. Sometimes, breakups were not acrimonious, but still very painful for the women involved. For example, a woman whose loving relationship ended when her partner was posted overseas asked: “What else am I going to do other than freeze my eggs?” As with divorce, relationship dissolution was one of the pathways to EEF, especially among women in their mid- to late 30s who were attempting to preserve their remaining fertility.

No. 4: deployed overseas

Careers can involve partnership sacrifices, as seen in the case of the woman whose partner was posted overseas. In this study, 8% of women, all American, had themselves been deployed overseas, either in the Foreign Service, foreign aid and humanitarian organizations, or the US military. These women’s postings were often in difficult and dangerous locations, including war zones and refugee camps. Long-term deployments, sometimes lasting up to 3 years and with multiple recurrences, made finding and maintaining lasting relationships difficult. This was especially true for high-ranking military women, who had difficulties finding partners, given the dangers of their jobs, the military’s anti-fraternization policies, and the fact that most military men are already married.

It is important to point out that overseas deployment as a pathway to EEF was found only in the US portion of the study. In Israel, women enter the military at young ages but tend to leave after their 2- or 3-year period of mandatory service ends.

Furthermore, Israeli women’s military service usually takes place within the country’s boundaries and does not entail substantial travel. In the USA, on the other hand, women’s military service is voluntary and often involves substantial movement between postings. Thus, single US military women in this study had undertaken EEF to preserve their fertility during deployment.

No. 5: single mother

Six women, three in each country, had undertaken EEF on the eventual path to single motherhood. Five of these women froze their eggs first, then decided to become “single mothers by choice” (SMCs)—a term initially put forward in the late 1980s to describe middle-class, “mid-life,” educated women, who decided to parent on their own, either by adoption or donor insemination [22, 23]. Two of the American women, both physicians, had undertaken EEF after their relationships with male partners had ended (as in pathway 3 above). But, because they were financially stable, they ultimately decided to become single mothers using donor sperm. At the time of the interview, both had become mothers of infant children. In addition, one American woman in the study was already a single mother (from a prior failed relationship), but undertook EEF in the hope of second child. Among the three Israeli women in this category, all were single at the time of EEF and had decided to become single mothers by choice using donor sperm after they had already frozen their eggs. At the time of the interview, one woman had given birth, and two were pregnant, one with twins. These Israeli women mentioned that EEF was an emotional “stepping stone” in the process of coming to terms with single motherhood.

Many women in the study had contemplated this pathway to single motherhood. Most considered single motherhood a very difficult choice—a “last resort” or “plan B.” Women often cited the high financial costs of raising a child alone, especially in expensive cities such as New York, San Francisco, or Tel Aviv. For others, single motherhood suggested “desperation” or “failure,” and they rejected it out of hand. Whether this EEF-assisted pathway to single motherhood will continue to grow is uncertain. In this study, it comprised a small but significant category of single women who became mothers on their own.

No. 6: career planner

Most recent review articles suggest that EEF is being used by “career women” for fertility postponement. However, in this study, career planning was the least common pathway to EEF among women without partners. Only one woman, an American, explicitly described her path to EEF as a career strategy. At age 30, she was significantly younger than most women in the study, had attended two Ivy League universities

on the way to an advanced degree, and was using EEF en route to becoming a high-tech entrepreneur. Another American woman, age 33, turned to EEF when her career finally “took off.” She had passed the difficult Foreign Service exam and had saved enough money to freeze her eggs before her deployment to Latin America. She was clear in her interview that her decision to freeze her eggs had allowed her to focus on her new career. None of the Israeli women in the study mentioned career considerations as grounds for EEF, as most were already in their late 30s when they pursued this reproductive option.

Most women were clear that they were not intentionally delaying their fertility for the sake of their careers. Although their careers had kept them busy—sometimes impinging upon free time and energy for dating—most had always hoped to meet a partner along the way. By their mid- to late 30s, however, 85% of women in this study remained “partner-less” for the reasons described above. Partnership problems, rather than career planning, led single women in this study on the various pathways to EEF. This was true even among women *with* partners, as described in the next section.

Women with partners

No. 1: partner not ready to have children

Fifteen percent of the women in this study, mostly Americans, were partnered at the time of EEF. About half of these partnered women were in secure, stable relationships with men who wanted to have children. But, in most cases, male partners were not yet “ready” to become fathers, usually because they were completing their educations, making significant career moves, or were significantly younger (e.g., 5–18 years) than their female partners. In addition, some men simply did not feel prepared to become fathers, and were asking their partners to wait.

In these cases of “reproductive waitness” [24], EEF was employed to satisfy men’s desires, while preserving women’s fertility potential. Because men had instigated the delay, most were very supportive of their partners’ EEF decisions, accompanying them to appointments, administering hormonal injections, and sometimes paying for EEF cycles. These happily partnered, but “waiting” couples comprised an interesting pathway to EEF. Basically, these men were committing to marriage and child-rearing, but at some future date. They were also not committing their own sperm for the purposes of embryo freezing. Thus, their female partners were waiting for them to become ready for fatherhood.

No. 2: relationship too new or uncertain

Several women in the study were partnered at the time of EEF, but their relationships were too new or uncertain to be

considered stable. “New boyfriends” had often come into women’s lives around the time of EEF. Women often had amusing stories to tell about these circumstances—for example, explaining to their new boyfriends why they were injecting themselves with needles (“like a drug addict”), or telling their boyfriends that they were storing their eggs “in the freezer.” However, once informed, men were often supportive, viewing EEF as a “smart choice” for their girlfriends, and as a way to develop the relationship without “biological time” pressure.

Having said this, some women found themselves in uncertain relationships with partners who they found immature or unsupportive. It was unclear whether these couples would stay together, and EEF was undertaken in the midst of uncertainty. In both relationship types—the “new” and the “uncertain”—women had taken the path to EEF while seeing how their relationships unfolded.

No. 3: partner refuses to have children

In this study, two American husbands refused to have children. In one case, the woman agreed to marry her fiancé on the condition that he would have children with her. Thus, she experienced his post-marital refusal as a “huge betrayal.” At the time of the study, this woman, age 36, had undertaken 3 cycles of EEF and was seriously debating divorce. “I think I made a very bad choice,” she said. “What the hell was I doing?” In another case, a 38-year-old woman who had fallen in love and hastily eloped found herself in an unhappy marriage with a husband who insisted upon two abortions. At the time of the interview, this still-married woman lamented her relationship. “I feel very, very alone, actually. He’s not ready, not supportive whatsoever, and doesn’t grasp how much it means to me.” Not ready to give up on motherhood, the woman had turned to EEF and was thinking of becoming a single mother within her marital home, but “absolving him of his parental obligations.”

No. 4: partner has multiple partners

A final partnership problem leading women on the path to EEF involves the lack of male monogamy. Two women in this study, both Americans, had partners with multiple partners. In one case, a woman with an infant daughter discovered that her pilot husband had more than 40 paramours around the globe. Thus, she was using EEF to “buy myself a little bit of time,” while deciding how to end the relationship with her custodial rights intact. In another case from the San Francisco Bay Area, a woman was intentionally pursuing EEF with a “polyamorous” man who had open relationships with at least two other women. At the time of the interview, she was having a legal contract drawn up to obtain sole custody over her eggs, embryos, and future children. However, she was

keeping open the possibility of a custodial “upgrade,” if her polyamorous partner proved his future parental investment.

Discussion

Since the early 2000s, the “men as partners” problem has been clearly identified in international reproductive health circles [25]. Reproductive health scholars and policy makers have recognized that (1) reproduction is inherently relational, (2) both men and women are involved in reproduction, and hence (3) men must be included in reproductive health policies and programs, given their potential importance in enhancing women’s reproductive health and rights [25].

Although this men as partners problem has been well defined in public health scholarship, it has rarely been articulated in the assisted reproduction literature—even though it clearly emerged in our study as the key factor in women’s pathways to EEF. Through listening carefully to 150 women’s EEF stories, we were able to identify, categorize, compare, and rank the many ways that partnership problems lead to EEF.

Given these partnership problems, several issues must be discussed and analyzed in future scholarship. First, the popular notion that women are pursuing EEF primarily for career advancement is inaccurate, at least at the present time. Career planning comprises a minor pathway to EEF, although it may expand over time as younger women become familiarized with EEF [26]. In this study, women were already successful professionals, whose careers were well established. Most were clear that they loved their careers. But, they did not view their careers as a major reproductive obstacle, nor the reason that they had pursued EEF.

Second, it is important to recognize the magnitude and heterogeneity of partnership problems in professional women’s lives. In both the USA and Israel, otherwise successful women were experiencing their reproductive lives as being in jeopardy. EEF was their “technological concession”—a way of putting their reproduction “on hold” in the absence of stable relationships with men committed to marriage and family making.

Third, virtually, all women in this study were heterosexual, and most were explicit that they were looking for marriage to a man they loved. They hoped to achieve equal partnerships with men who would commit to parenthood within heteronormative family structures. However, in the absence of these conventional life circumstances, women in this study were pursuing less conventional pathway to EEF—thus holding out hope that their frozen eggs could be used to build their families in the future.

Fourth, although few women in this study were able to find reproductively committed partners, most were not willing to condemn all men as callous “jerks.” Indeed, the clear majority of women in this study were intent on dating, still hoping to find “Mr. Right.” But as we have argued elsewhere [27], educational disparities between men and women grow ever wider, making it more difficult for educated women to find partners. In the USA,

Israel, and nearly 70 other societies around the globe, more women are now entering and graduating from universities than men, leading to a significant “man deficit” among university-educated women who hope to marry [28]. In the USA at the present time, there are 3 million fewer university-educated men than educated women in the age group from 22 to 39—in other words, during women’s prime reproductive years.

Fifth, in struggling with what to do in the absence of equally educated men, some women in this study had “dated down,” entering relationships with men who were less educated, less successful, and often younger (or substantially older) than themselves. Others had given up on partnerships altogether, pursuing a new pathway to single motherhood by choice. Although so-called “mixed-collar” partnerships [28] and “single motherhood by choice” via EEF are still relatively uncommon, they appear to be emerging phenomena that require future investigation, including in other national settings.

Sixth, in terms of the US-Israel comparison, there were few clear differences in our study—a finding that was surprising, given Israel’s higher fertility rates and various supports for assisted reproduction [20]. Despite the Israeli state’s explicit encouragement of women’s childbearing and a culture of family centeredness, the men as partners problem was found in Israel as in the USA, making EEF pathways (and frequencies) similar between the two countries. The only difference involved overseas deployment. No Israeli woman had pursued EEF before deployment, whereas single American women were doing so in significant numbers.

Finally, as the first, large-scale interview-based study among women who had completed EEF, there are some inherent limitations that must be mentioned. The overall number of participants recruited in the two countries was unequal, reflecting the difference in population size and, hence, disparities in EEF uptake. Furthermore, women in both countries were recruited from a relatively small number of cities and states, limiting the generalizability of the findings. In addition, because this was a binational study, coordinated between researchers and clinics in the USA and Israel, the women who participated were recruited somewhat differently between the two countries and interviewed by different medical anthropologists in two different languages. Women in the two countries who chose not to participate in the study may have differed significantly from those women who volunteered, but the rates of non-response or lack of follow-up could not be elucidated or calculated, given non-random recruitment strategies and the nature of the qualitative study design. These sources of potential bias could not be eliminated and must be acknowledged in the assessment of study results.

Having said this, this study finds the men as partners problem to be extremely important in the lives of highly educated professional women in two countries. This problem, in turn, is sending women on many different pathways to EEF—pathways that need to be studied and confirmed in a variety of national settings.

For women themselves, this men as partners problem and the resultant “need” for EEF may be experienced as difficult, frustrating, and emotionally wrenching. Instead of achieving motherhood, well-educated, professionally successful, 30-something women are achieving what author Melanie Notkin [29, p. xxi] has called “otherhood”—being “single and approaching the end of our fertility.”

Given this scenario, IVF clinicians who are counseling and performing EEF should be aware of, and sensitive to, women’s many partnership issues—problems that are leading them on diverse pathways to EEF. Furthermore, it is important to realize that EEF patients are usually alone when they enter the couples-oriented world of IVF. Thus, IVF clinics must institute patient-centered care protocols for the growing numbers of single women seeking EEF around the globe.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflicts of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committees and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from all individual participants included in the study.

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