

**ANTICIPATING INFERTILITY:
Egg Freezing, Genetic Preservation, and Risk**

LAUREN JADE MARTIN

City University of New York Graduate Center

[Current affiliation: Penn State University, Berks]

ABSTRACT: This article discusses the new reproductive technology of egg freezing in the context of existing literature on gender, medicalization, and infertility. What is unique about this technology is its use by women who are not currently infertile but who may anticipate a future diagnosis. This circumstance gives rise to a new ontological category of “anticipated infertility.” The author draws on participant observation and a qualitative analysis of scientific, mainstream, and marketing literature to identify and compare the representation of two different candidates for egg freezing: women with cancer and healthy young women. Although both populations experience anticipated infertility, their dichotomous portrayals as appropriate candidates are demonstrative of gender norms linking women to motherhood. Egg freezing is a concise illustration of how the medicalization of women’s bodies and bodily processes masks a host of cultural anxieties about aging, illness, reproduction, and risk.

Keywords: *aging; family; health/medical; knowledge/science; reproduction*

ANTICIPATING INFERTILITY: Egg Freezing, Genetic Preservation, and Risk

LAUREN JADE MARTIN

Feminist scholars and writers have been analyzing and debating the social, political, and economic implications of new reproductive technologies (NRTs) for decades (Corea 1985; Firestone 1970; Ginsburg and Rapp 1991; Rothman 1993). As technologies grow more sophisticated, there is a continued need to study their impacts. Egg freezing (or more technically, “oocyte cryopreservation”) has recently emerged as a technology meriting such analysis. Similar to other NRTs, egg freezing is not a “neutral” technology (Rothman 2000). Its development has been influenced as much by politics and ethics as it has by the pursuit of technical achievement.

In Italy, for example, researchers worked to perfect oocyte cryopreservation to bypass legal restrictions against egg donation and embryo freezing (Boggio 2005; Parmegiani et al. 2009). Elsewhere, egg freezing sidesteps controversies about the disposition of embryos, including custody battles after couples separate, restrictions on embryonic research, and “orphan” embryos resulting from unpaid storage payments (Bankowski et al. 2005). Autologous egg freezing may also potentially counter some of the exploitative dynamics of egg donation, where young women sell their ova for thousands of dollars (Steinbock 2004; Waldby and Cooper 2008).

No registry exists to keep track of how many women have frozen their eggs. Secondary research, however, provides us with some information about its growing prevalence. By 2008, at least 936 babies had been born worldwide using frozen oocytes (Noyes, Porcu, and Borini 2009). In the United States, more than 50 percent of clinics surveyed offer egg freezing services (Rudick et al. 2009). The process is expensive—the estimated cost of the procedure itself is approximately \$9,000 to \$15,000, with additional annual storage fees. As many experts consider egg freezing “experimental,” insurance plans generally do not cover it. Similar to sperm banking, egg freezing enables women to harvest, preserve, and store their eggs for future use; a woman’s body can age while microscopic parts of her self exist frozen in an ageless, timeless state of being. Those microscopic body parts can then be brought back to the future. They are thawed, fertilized with sperm in vitro, and transferred back into her body. She is split in two: Her younger self is the egg donor, her older self is the recipient, the two selves separated by time and experience.

Sperm banks have existed since the middle of last century, enabling a time lag between gamete extraction and the eventual birth of a child (Moore 2007); this article explores how a functionally similar technology is now applied to women. I begin with a review of existing scholarly discourses about medicalization and infertility, arguing for the introduction of “anticipated infertility” as an ontological category to explore the time lag and its gendered implications. I then use an ethnographic mixed method consisting of a review of scientific, mainstream, and marketing literature and participant observation at fertility seminars to identify the primary populations described in these sources as potential candidates for egg freezing. The construction of their representation is demonstrative of gender norms linking women to motherhood. Egg

freezing is a concise illustration of how the medicalization of women's bodies and bodily processes masks a host of cultural anxieties about aging, illness, reproduction, and risk.

MEDICALIZATION AND ANTICIPATED INFERTILITY

Underlying the development of egg freezing is the medicalization of infertility. Once a condition or problem is medicalized, its boundaries are not static; rather, the category itself is subject to expansion (Conrad 1992). The expansion of infertility treatment demonstrates this phenomenon: Technologies developed to assist one group of people with particular biomedical needs are applied to other populations with different needs and situations. With this expansion, the very meanings of fertility and infertility become redefined.

Scholars have noted the link between gender and medicalization, such that, as Lock and Kaufert (1998, 1) write, women's bodies are the "cornerstone of the medicalization of life," easily appropriated for medical practice. From depression (Blum and Stracuzzi 2004) to HPV vaccination (Carpenter and Casper 2009) to "female sexual dysfunction" (Cacchioni 2007), this gendered link is also evident in the medicalization of pregnancy, childbirth, and infertility (e.g., Brubaker 2007; Franklin and Ragoné 1998; Ginsburg and Rapp 1991; Rothman 2000). The advent of new reproductive technologies and practices such as IVF, egg donation, and genetic testing shifts the ways that medical authorities treat women's bodies as potential mothers, medical subjects, and valuable resources for the production of babies at the same time it transforms cultural ideas about conception and parenting.

Gender also shapes the medicalization of infertility. Greil, Leitko, and Porter (1988) find that gender plays a crucial role in how men and women experience infertility. The women they interviewed tended to view infertility as a greater tragedy than their male partners. Women felt that their inability to have children was stigmatizing and spoiled their identities as women; as a consequence, they took on more responsibility for managing infertility treatment. Similarly, Becker (2000) describes how an inability to have children disrupts women's gender identities. She argues that gender is "enacted" through new reproductive technologies, reproducing such cultural ideologies as the importance of continuing the male line (cf. Lorber and Bandlamudi 1993; Rothman 2000). L. H. Clarke, Martin-Matthews, and Matthews (2006) likewise claim that the stigma of infertility is embodied differently by women, who are more likely to use words such as "failure" and "broken" to describe their bodies, than men, who often indicate that their infertility feels emasculating.

While the link between stigma and infertility informs the use of NRTs, not all of those who use NRTs can be categorically described as "the infertile," since not every person accessing them necessarily has an infertility diagnosis (that is, fits the criteria of being unable to achieve pregnancy after one year of frequent unprotected heterosexual intercourse). For example, an infertility diagnosis may apply to a heterosexual couple as a single unit even if only one individual in that couple is infertile. Unpartnered individuals or lesbian or gay couples may technically be fertile but require assisted technology to achieve pregnancy (Johnson 2009; Mamo 2007). Nor is an infertility diagnosis necessarily relevant for those who use IVF paired with preimplantation genetic diagnosis (PGD) to select for or against particular genetic traits (Rothschild 2005). In all of these cases, medical techniques created to aid the infertile in achieving pregnancy have expanded to allow other categories of people have biologically related

children. At the same time, this expansion multiplies the types of bodies and pregnancies that are subjected to medicalization.

Discourse about infertility, including the stigma of childlessness, also affects the range of technologies and services available and marketed to those who do not currently plan to have biological children but may want children at some point in the future. The medicalization of infertility has expanded to such an extent that its effects reverberate throughout the fertile population—even those whose resources do not allow them to access these methods (Bell 2009). This is perhaps most evident with egg freezing technology, which contributes to the medicalization of the reproduction of those who may only anticipate infertility. The ontological category I call “anticipated infertility” may be used to describe this phenomenon. It is not a medical diagnosis, but rather a sociological descriptor for the condition in which one believes one may be infertile in the future. Although the focus here is on women with ovaries capable of producing viable ova, this new category goes beyond that demographic to encompass all reproductive bodies. Through the process of aging, all reproductive bodies will eventually be rendered incapable of having biological children without medical assistance.

The trajectory from fertile to infertile is reminiscent of Sontag’s (1990, 3) famous description of states of illness and health:

Everyone who is born holds dual citizenship, in the kingdom of the well and in the kingdom of the sick. Although we all prefer to use only the good passport, sooner or later each of us is obliged, at least for a spell, to identify ourselves as citizens of that other place.

This dual citizenship can also be applied to fertility: Throughout our lifetimes, we hold passports in the two kingdoms of the fertile and the nonfertile.

The medicalization of reproduction requires a new description of stages of the life cycle, in which the “normal” stage disappears and we are left only with pathologies: anticipated infertility and infertility. NRTs such as egg freezing may serve as the passport (or perhaps the border smugglers) back to the kingdom of the fertile after cancer treatments, sexually transmitted infections, environmental toxins, or mere aging have placed individuals in the kingdom of the infertile.

This has particular resonance for women, whose bodies are socially and culturally linked to reproduction (Firestone 1970; Lorber 1994; McQuillan et al. 2008; Rich 1986) and may experience infertility and childlessness as especially stigmatizing. Anticipated infertility may have similarly gendered effects, creating a range of expectations or inducements to seek medical intervention. This can be extrapolated from the common practice of treating *male*-factor infertility with treatments such as IVF that require a high degree of medical intervention on the *female* partner’s body (Becker 2000; Greil, Leitko, and Porter 1998; Lorber and Bandlamudi 1993; Rothman 2000). With respect to gender ideologies that link mothering with womanhood, there may be a greater expectation for women to orient themselves to their reproductive futures, anticipating their future biological livelihoods and capacities.

Anticipated infertility relates to arguments by sociologists and anthropologists about the

transformation of medicine into a science of risk analysis (A. E. Clarke et al. 2005; Conrad 2007; Rabinow 1996; Rose and Novas 2005). Contemporary biomedicalization has replaced “illness” with “health,” turning it into an individual project of social responsibility wherein technologies of risk and surveillance are used to manage and achieve an ideal state of being (A. E. Clarke et al. 2005; Rose 2006). Becker describes risk-taking in infertility treatment as a gendered phenomenon, with women taking on most of the risks of treatment; they may “experiment with their bodies out of a sense of responsibility to produce a pregnancy and their sense of entitlement to one” (2000, 101). With egg freezing, the risk analysis that leads to bodily experimentation has shifted back in time to incorporate those who are still fertile.

As an ontological category, anticipated infertility is expansive, applicable to large swaths of the population who are not diagnostically infertile. And as a medicalized condition, the power to define its parameters rests in the hands of medical authorities (Conrad 1992). Once it is defined as an “illness” (or even a “pre-illness” or “pre-condition”), treating it as a problem becomes an imperative—not a matter of whether, but of how and when (Zola 2005). If anticipated infertility is understood to be an untenable condition, then it becomes the duty of clinicians to enable a way to “preserve” women’s ability to have biological children. It also becomes an obligation of those experiencing anticipated infertility to ensure their future reproductive capacity. Discourse about egg freezing renders certain bodies “treatable” for this condition, at the same time those bodies are hierarchized in terms of who are most in need or deserving of treatment.

METHOD

I use an ethnographic mixed methods approach, combining a qualitative review of textual materials with participant observation. The texts consist of scientific (including medical and bioethics) journal articles, newspaper reports, and marketing materials. For science articles, I searched academic databases with the keyword “oocyte cryopreservation,” limiting the results to human populations. I searched LexisNexis using the lay term “egg freezing” to find newspaper articles. To further limit this sample, I focused on United States and British newspapers. I collected marketing materials including brochures, newsletters, direct e-mails, and Web sites from fertility clinics and nonprofit organizations in the course of participant observation and Internet research.

I employed grounded theory methods and ethnographic content analysis to review these texts, extrapolating themes inductively from the data (Altheide 1987; Straus and Corbin 1990). Once the theme of appropriate candidates for egg freezing emerged from an initial scan of the materials, I then selected those texts that addressed this theme. I coded to identify patterns in how candidates for this technology are framed when egg freezing is discussed as a scientific discourse, as a topic of general human interest, and as a direct-to-consumer service.

Included in this content analysis were field notes from unobtrusive participant observation at public events in New York City and the San Francisco Bay area sponsored by fertility clinics, programs, and a non-profit advocacy group. These were publicized as educational events in newspapers, magazines, radio, direct e-mails, and organization Web sites. The events fell in three categories: “open house” seminars, special topic seminars, and conferences. At open house seminars ($n = 5$), fertility clinic staff members (usually physicians and other medical staff) presented educational information about infertility and infertility treatments, informed potential

clients about their services, and often gave tours of the facilities. The special topic seminars ($n = 3$) were narrower in scope than the open houses, featuring formal presentations (also by physicians and other professionals) and moderated discussion about egg freezing, fertility preservation, and infertility prevention. Two of these seminars occurred onsite at clinics, but the third, took place at a nail salon. Both the open house and special topic seminars typically lasted 1.5 to 2 hours, whereas the conferences ($n = 2$) were daylong events. The latter, both organized by the same nonprofit organization but cosponsored by fertility clinics, pharmaceutical companies, and other corporate and nonprofit entities, took place at conference centers and consisted of series of panels and workshops led by physicians, attorneys, and social workers on a variety of topics, including fertility preservation.

As a participant observer, I registered for and attended the events as a member of the public interested in learning more about the organizations and topics being presented. All of the events were free, except for the conferences sponsored by the nonprofit organization, at which I volunteered in exchange for admission. I took brief notes during the seminars and typed up longer field notes of my observations afterwards. Because I wanted my presence to be as unobtrusive as possible, for the most part I did not disclose my role as a researcher. For this reason, I have chosen to keep the names of all organizations and seminar presenters that I observed anonymous.

My role as participant observer was twofold. As a participant, my goal was to experience the seminars in the same way as the strangers sitting beside me: Was it a warm, welcoming environment? Did the sessions start on time? Were our questions answered thoughtfully? As an observer, however, my experiences were one step removed, as I aimed to take note of how the seminar organizers attempted to appeal to the participants. This entailed taking detailed notes about what kinds of information and materials were distributed to participants (e.g., pens, key chains, brochures, press clippings, egg- or sperm-shaped toys), what the space physically looked and felt like, the content of the presentations, and how presenters engaged with their audience. Although my observations focused on the speakers, I made notes about the composition of the audience in terms of age, race, gender distribution, and whether people were attending by themselves or with presumed friends and/or partners.¹ I did not record any identifying information about participants or their infertility status if they disclosed it.

REPRESENTATIONS OF EGG FREEZING CANDIDATES

Clinicians and to a lesser extent journalists and marketing executives often employ a curious phrase to describe egg freezing and related procedures: “fertility preservation.” In 2009 alone, 299 articles with the term “fertility preservation” were indexed in the ScienceDirect database, including 102 from *Fertility and Sterility*, the publication of the American Society for Reproductive Medicine (ASRM). The mainstream media is less likely to use this phrase (only seven articles containing this phrase were published in 2009 in major world newspapers indexed by LexisNexis), more often referring to the process only as “egg freezing.”

“Fertility preservation” is, however, a misnomer. Women who use their own thawed eggs because they cannot conceive on their own are no more fertile than those women who use donated eggs for the same reason. What *has* been preserved is not their fertility, but the *genetic connection*. “Fertility” is here being redefined as not the ability to spontaneously conceive and

carry a pregnancy, but the ability to transmit one's genetic material to future generations.² This is a remarkable redefinition that has so far received little, if any, attention among medical, bioethics, or social science communities. The genetic continuity enabled by egg freezing has racial and class dimensions. Those who use donated eggs often use an extensive "matching" process to ensure that egg donors share similar racial ethnic backgrounds with the intended parents, as well as markers of cultural capital such as college degrees and high SAT scores (Almeling 2007; Roberts 2009; Tuller 2010). This matching process reifies race- ethnicity, cultural capital, and even personality as genetically transmissible traits. Egg freezing takes this reification a step further by providing the perfectly matched egg donor: oneself. And just as potential egg donors are evaluated and ranked by agencies and clinics, so too are potential egg freezing candidates placed in a hierarchy of whose fertility is most in need of preservation.

Much of the literature regarding oocyte cryopreservation qualifies it as an experimental, yet promising, treatment. As a sociologist interested in the narrative constructions of users of reproductive technologies, I am less concerned with its relative effectiveness than I am with its representation. Based on my textual review and participant observation, I have identified two primary populations most often named as potential candidates for egg freezing: women cancer patients about to undergo chemo- or radiation therapy and healthy young women who wish to pause their "biological clocks."

A Matter of Sympathy: The Worthy Cancer Patient

Journal articles about oocyte cryopreservation often include similar elements: citations of increasing incidences of cancer among young women, discussions of the negative effects of cancer treatment on fertility, descriptions of various techniques of fertility preservation, and reports of results (Bromer and Patrizio 2008; Chang and Suh 2008; Grifo and Noyes 2010; Practice Committee of the ASRM and Practice Committee of the Society for Assisted Reproductive Technology [SART] 2008). Others may not include all of the aforementioned elements, but still maintain the same thread: Cancer patients face infertility issues after receiving treatment, and therefore assisted reproductive technologies should be developed to help them (De Ziegler et al. 2010; Lockwood 2002; Tao and Del Valle 2008).

The clinical literature paints a common portrait of the young woman with cancer as a sympathetic subject. Not only is she faced with a cancer diagnosis and the specter of harrowing treatment, she must also contend with the fact that if she survives, she may not be able to conceive and carry to term her own genetically related child. Given the stigma of infertility and childlessness, particularly for women, an inability to bear one's own child is seen as a tragic consequence of cancer treatment that may be ameliorated by fertility preservation. Egg freezing, which involves hormone injections, surgery, and possibly delaying cancer treatment, becomes an embodied sacrifice for the sake of a future family. Clinicians describe infertility as a "loss," such that "survivors and clinicians need to consider quality-of-life issues, such as reproduction, in the course of a patient's therapy" (Grifo and Noyes 2010, 391; cf. de Ziegler et al. 2010). Chang and Suh (2008, 105) lament, "In general, young female cancer patients are poorly counseled on their options for fertility preservation. Treatment of the cancer is of utmost importance, but several assisted reproductive technologies can provide relief from the uncertainty of future without compromising cancer treatments."

A sympathetic portrayal of young women with cancer emerges more clearly when contrasted with another group of egg freezing candidates: healthy young women wishing to delay childbearing for nonmedical or “elective” reasons. This dichotomous portrayal is highlighted in the guidelines published by reproductive medicine’s primary professional organization, which state that oocyte cryopreservation may be considered for women with medical conditions, but, because clinical data are insufficient, “should not be offered or marketed as a means to defer reproductive aging” (Practice Committee of the SART and Practice Committee of the ASRM 2008, S134). By limiting access to egg freezing technologies to a particular population, professional organizations enact a gatekeeping function. This gatekeeping marks cancer patients as more deserving of treatment than healthy young women and exposes the socially constructed nature of egg freezing, the elusive parameters of what constitutes necessary treatment, and the power of clinicians to judge which patients are deserving of their services.

The dichotomous portrayal is, to a certain extent, also present in mainstream reportage about egg freezing. For example, a *New York Times* article reports that, “Until very recently, egg freezing . . . was carried out only in carefully controlled research settings and was available only to young women facing chemotherapy or suffering from illnesses that might make them infertile,” and contrasts this with a company now “offering egg freezing to any woman with healthy ovaries and approximately \$15,000 to spend” (Wadyka 2004). A pair of articles in the *Salt Lake Tribune* also illustrates this dichotomy. The first begins “Geeta Shah no longer has her left breast. She will have chemotherapy for the next four months, which could lead to early menopause for the 30-year-old, who does not have children but wants to be a mother” (May 2008b). This sympathetic portrayal of a cancer patient who decides to freeze eggs and embryos is in stark contrast with the second, much shorter article about elective egg freezing, which presents no anecdotes or quotes from any healthy young women with whom the reader could identify (May 2008a).

Exploitation or Emancipation? The Healthy Young Woman as Subject

Although the cancer patient is almost universally portrayed in a sympathetic light in medical and popular literature, the healthy young woman who is also the target of fertility preservation efforts is a much more ambivalent figure. A 2004 *Philadelphia Inquirer* article about egg freezing contrasts excited statements by physicians such as, “The days of the biological clock are over,” with others stating that the practice is “misleading and unethical” or “absolute nonsense” (McCullough 2004). More recently, at the ASRM 2009 annual meeting, a session titled “Should We Preserve Oocytes for Young Women to Delay Childbearing?” boasted a “standing-room-only crowd” with “rousing deliberation” (ASRM 2009). In this and other forums, critics of extending the practice oppose those who argue that oocyte cryopreservation has been so successful that it should no longer be regarded as “experimental” and should be offered to any woman who requests it (Noyes, Boldt, and Nagy 2010; cf. Richards 2010).

There are three primary narratives about this group of egg freezing candidates in the medical literature, marketing materials of clinics, presentations of physicians at symposia, and the mainstream media: (1) They are vulnerable to exploitation, (2) they are putting their own selfish needs ahead of more important priorities, and (3) they are liberated and forward-thinking.

The first narrative is one that is subtly expressed by some clinicians and is also implied in the professional guidelines advising against social applications of egg freezing. For example, at two

open house seminars, one on each coast, physicians stated that this technique—due to its potential complications, costs, and experimental status—should only be indicated for patients prior to undergoing treatment for cancer or gynecological diseases. Even more firmly, a physician at the New York clinic derided the marketing of egg freezing to healthy young women as a cynical commercial venture and raised concerns about the social consequences of possibly coercing young women to freeze their eggs for the sake of their careers.

De Melo-Martin and Cholst (2008, 523) echo these worries about the social consequences of egg freezing, arguing:

Vulnerable patients and healthy young women are being offered oocyte cryopreservation commercially with critical information still lacking. This is ethically questionable: lack of data about safety and effectiveness puts patients and their offspring at risk, precludes women from making really autonomous decisions, wastes scarce resources, and undermines public trust in the medical profession.

Similarly, in a packet of materials handed out at another open house, an article cowritten by its medical director states, “Presently, given the status of current technology, any representation that egg freezing provides any assurance that women can presently preserve their fertility by banking their eggs for future use is both empty and misleading and will ultimately lead to major disappointments with an inevitable public backlash” (Sher and Keskinetepe 2005, 1). Bioethicist Harwood (2009, 39) argues that the marketing of egg freezing to healthy young women may be “commercially exploitative,” especially when they are led to believe that banking their eggs can serve as a form of insurance against future infertility.

This narrative frames egg freezing by healthy young women as exploitation; encouraging young women to pay large sums of money to freeze their eggs when the technique is still largely experimental is cast as exploitative, and the consumers portrayed as naive. Underlying this particular narrative, however, is the willingness of many assisted fertility providers—as indicated in the professional guidelines and the call to amend them—to offer elective egg freezing to healthy young women once the technology is no longer classified as experimental.

In the second narrative, which appears in the popular—though not the medical—literature, the healthy young woman’s decision to freeze eggs is portrayed as a selfish move, unlike the altruism of the cancer patient who is willing to subject her body to invasive treatments to fulfill future family obligations. The selfish/altruistic dichotomy represents two sides of the same gender ideology of motherhood as role fulfillment. In the first instance, freezing eggs is selfish because it delays motherhood, whereas in the second, freezing eggs is altruistic because it enables it.

Anxieties around social applications of egg freezing resonate with conservative views that blame education- and career-oriented young women for the breakdown of the family. In a newspaper article published in the United Kingdom, for example, the author writes, “In the next few years, hundreds—perhaps thousands—of perfectly healthy women could soon be regarding egg freezing as their ‘safety net.’ [Is] it really something we should be applauding? Should we really be encouraging a generation of women to put off motherhood for another decade?” (Johnston 2004). These are merely rhetorical questions, however, and the author does not advance this

particular narrative in the rest of her article. In fact, this narrative is primarily used as a rhetorical device, easily torn down to justify egg freezing for social reasons. For example, a British woman who has decided to freeze her eggs tells a reporter:

Tabloid newspapers talk about selfish Bridget Jones types putting their eggs on ice so they can carry on partying until the last gasp before the menopause. My own circumstances are nothing like that; nor are those of the other single women I know who are in their thirties and yearning for babies. We are not selfish, we are not out partying at the expense of our personal lives—we are out, not at home, looking for an adorable husband and potential father. (Chaudhuri 2005)

As a rhetorical device, this narrative links delayed marriage and childbearing for the sake of education, careers, and the search for “Mister Right” with the reproductive consequence of declining fertility.

The third narrative articulates egg freezing as an empowering answer to anticipated infertility. Some physicians and bioethicists argue that egg freezing will “emancipate” women by enabling them to achieve reproductive parity with men (Homburg, van der Veen, and Silber 2008). By using technology to delay childbearing, women gain equal participation in employment, time to find a partner and become psychologically ready for children, and “insurance” against future egg failure (Goold and Savulescu 2009).

This narrative is most common in materials marketing egg freezing. A session at an egg-freezing seminar advertised in a direct marketing e-mail message as “The Biological Clock: Take Control of Your Dating Life” featured a panel composed of a fertility doctor, a clinical psychologist, and a self-described “dating expert.” The theme of empowerment was especially promoted by the latter two panelists, most explicitly by the dating expert who began her talk with the words “Knowledge is power.” The psychologist and the dating expert framed egg freezing as a way to give women a sense of control over their bodies, their lives, and their fertility. Presumably secure in their knowledge that they have eggs banked, women can concentrate on their careers and finding a partner instead of panicking about being single and getting older. At the same time the audience was meant to be flattered by being described as high-achieving, take-charge kind of women, they were also shamed with the words, “Men can see your desperation.” The take-away message was that freezing eggs makes women feel more confident and appear less desperate, which will make them more attractive to men. The heteronormativity of the event was all too palpable.

EGG FREEZING, FEAR, AND THE MANAGEMENT OF RISK

As the last narrative suggests, the framing of egg freezing as empowerment may be coupled with fear—in this case the twin anxieties of aging and singlehood. At the beginning of the seminar previously described, I quietly sat and observed my surroundings as I waited for the panel to begin. On every chair was a folder from the egg freezing company with information sheets about the process, an “Egg Freezing Quiz,” biographies of the evening’s speakers, press clips, and an oversized postcard. Seated together across from me were two women who looked to be in their 30s. One woman pulled out the postcard and pointed it out to her friend who, in reply, shook her head and audibly groaned. On one side of the card was a smiling young white woman giving a

bath to a baby, and to the left were the words “Set your own biological clock,” with the name of the company below. The flip side of the card read: “DID YOU KNOW . . . Egg quality begins to decline at 27 and significantly deteriorates every year past 35. But, now you have options!”

The link between anticipated infertility and anxiety is made even by well-intentioned physicians and patient advocacy organizations. A national nonprofit organization that bills itself as a resource for intended parents has recently been promoting a new infertility prevention campaign aimed at young women.³ Although they do not endorse egg freezing, per se, their literature and events raise rather than assuage fears related to anticipated infertility. For example, the cover of their pamphlet on infertility prevention features a young white woman wearing nothing but a black hat, black bra, and black lace-edged panties. Her face is in profile, and in her hands she holds an enormous clock, right over her pelvic area. This message, graphically emphasizing the ticking of a biological clock, is reiterated in this organization’s infertility prevention events held in nail salons in cities throughout the United States. At the event I attended, women in their 20s and 30s drank cocktails, had manicures, and ate cupcakes as the invited fertility doctor presented statistics about the rapid decline in egg quality and quantity after age 37.⁴ Unsurprisingly, the very first question he received from the audience was about egg freezing.

Anticipated infertility is as palpable for the cancer patient as it is for the healthy young woman not yet ready or able to have children. Autologous egg banking is a technology of risk management in anticipation of future infertility, enabling women to “bank” on having a frozen supply of ova when they are finally ready to procreate. As one doctor cogently explained to his audience of potential egg freezing clients, we must make a cost-benefit analysis: “What are the costs of doing it versus not doing it?” Egg freezing is thus marketed as a way to mitigate the risk of not being able to spontaneously conceive in the future, which relates to the risks of being childless, not experiencing pregnancy and childbirth, and not having a genetically related child. Implicit in this last notion is that having a child that is genetically related to its mother is less risky than to have one through egg donation or adoption, as if the genetic material a mother passes on to her child is a “known quantity,” giving the egg freezing consumer a modicum of control over her reproductive future. The risk of genetic discontinuity is not merely an individualized phenomenon, but is bound up within discourses of nationhood, race, and ethnicity, in which children are not blank slates but are born with cultural and racial histories embedded within their DNA.

CONCLUSION

Oocyte cryopreservation developed as a supplement to IVF for infertile couples, but the technique has since experienced mission creep, with its target market shifting from the infertile to women cancer patients and healthy young women planning for their reproductive futures. This shift exposes the need to formulate new ontological categories in discussions about new reproductive technologies and the fertility industry. As Mamo (2007, 30) succinctly argues, current biomedical definitions of infertility that require a year of regular, unprotected heterosexual intercourse “privileges the identity category of heterosexual, thereby creating a moral order around reproduction.” In addition to lesbians, gay men, and unpartnered individuals, there are many other categories of people who cannot be classified as “infertile” yet still access or desire access to NRTs.

To address one of these subpopulations, I have identified “anticipated infertility” as a state of being in which future infertility is predicted. This ontological category allows us to analyze the discourse surrounding the two primary candidates for egg freezing and their various portrayals as sympathetic, vulnerable, selfish, or liberated subjects. Their candidacy depends upon anxieties and fears of anticipated infertility and the stigma of childlessness and is informed by the reproductive imperative. The dichotomous response to the candidacy of women cancer patients versus healthy young women only underscores the expectation that women must sacrifice (their bodies, their careers) to become mothers and hence live up to gendered ideals.

On top of the reproductive imperative can now be laid the genetic imperative. “Fertility preservation” is a term often used within discourse about egg freezing to describe the solution to the problem of anticipated infertility. However, egg freezing merely preserves the ability to have a genetically related child. The very meaning of fertility (and, in turn, infertility) is redefined to emphasize the genetic connection. This genetic connection is reified as the gold standard of motherhood, circularly highlighting the necessity to address anticipated infertility by such measures as egg freezing.

As a tool of risk management, egg freezing is a technomedical remedy of displacement, ameliorating fears of childlessness and the reproductive and genetic unknown at the same time it puts women’s bodies and bank accounts at risk. Financial optimization has become another category to consider in the risk or cost-benefit analysis of biomedicine. Egg freezing, similar to other forms of autologous tissue banking, is future-oriented, becoming more valuable frozen and stored than left to age contained within the body (Waldby and Mitchell 2006). By reducing the inevitability of anticipated infertility, frozen eggs are not only an investment for a woman’s own future reproductive needs, but they may be a financial investment (at least for the healthy young woman), allowing her to spend her childbearing years acquiring education, skills, job promotions, and money. For both healthy women and cancer survivors, assuming that their stored ova are viable, having eggs banked may eliminate the need to financially compensate an egg donor in the future.

Egg freezing reflects, responds to, and reinforces contemporary demographic and social phenomena such as rising rates of cancer and infertility, delayed childbearing, and a persistent ideology that ranks the ability to have (genetic) children as the fulfillment of gender norms. It is, in the end, a technomedical fix. By analyzing brand new reproductive technologies, scholars are reminded of how trends of medicalization and risk analysis intertwine and interact with our bodies and our technologies.

NOTES

1. Participation at most events seemed to be evenly split between whites and people of color, including Asian, Latino/a, and Black individuals. Two of the special topic seminars were billed as “women only” events, but the other events had a mix of solitary women, heterosexual couples, and friend pairs. A wide range of ages were represented, with most participants appearing to be in their 30s.
2. If single women freeze ova unfertilized by donor sperm, this may enable future male partners to maintain their genetic connection to the child as well. I thank an anonymous reviewer for this

insight.

3. This group, which also organized the two conferences I attended, offers free services for intended parents online, in-person, and over the telephone, including coaching, resources, news, and public seminars. Their sponsors include clinics, government agencies, and pharmaceutical companies.

4. The age cited by this physician at which egg quality declines differed by 10 years from the marketing postcard described previously.

REFERENCES

Almeling, R. 2007. Selling genes, selling gender: Egg agencies, sperm banks, and the medical market in genetic material. *American Sociological Review* 72:319-40.

Altheide, D. L. 1987. Ethnographic content analysis. *Qualitative Sociology* 10:65-77.

American Society for Reproductive Medicine. 2009. *Oocyte freezing up for debate*. Birmingham, AL: American Society for Reproductive Medicine.

Bankowski, B. J., A. D. Lyerly, R. R. Faden, and E. E. Wallach. 2005. The social implications of embryo cryopreservation. *Fertility and Sterility* 84:823-32.

Becker, G. 2000. *The elusive embryo: How women and men approach new reproductive technologies*. Los Angeles: University of California Press.

Bell, A. V. 2009. "It's way out of my league": Low-income women's experiences of medicalized infertility. *Gender & Society* 23:688-709.

Blum, L. M. and N. F. Stracuzzi. 2004. Gender in the Prozac nation: Popular discourse and productive femininity. *Gender & Society* 18:269-86.

Boggio, A. 2005. Italy enacts new law on medically assisted reproduction. *Human Reproduction* 20:1153-157.

Bromer, J. G. and P. Patrizio. 2008. Preservation and postponement of female fertility. *Placenta* 29:S200-05.

Brubaker, S. J. 2007. Denied, embracing, and resisting medicalization: African American teen mothers' perceptions of formal pregnancy and childbirth care. *Gender & Society* 21:528-52.

Cacchioni, T. 2007. Heterosexuality and the "labour of love": A contribution to recent debates on female sexual dysfunction. *Sexualities* 10:299-320.

Carpenter, L. M. and M. J. Casper. 2009. A tale of two technologies: HPV vaccination, male circumcision, and sexual health. *Gender & Society* 23:790-816.

Chang, H. J. and C. S. Suh. 2008. Fertility preservation for women with malignancies: Current developments of cryopreservation. *Journal of Gynecological Oncology* 19:99-107.

- Chaudhuri, A. 2005. Why shouldn't I freeze my eggs? *Sunday Times* (London), 23 October.
- Clarke, A. E., J. K. Shim, L. Mamo, J. R. Fosket, and J. R. Fishman. 2005. Biomedicalization: Technoscientific transformations of health, illness, and U.S. biomedicine. In *The sociology of health and illness: Critical perspectives*, edited by P. Conrad. New York: Worth Publishers.
- Clarke, L. H., A. Martin-Matthews, and R. Matthews. 2006. The continuity and discontinuity of the embodied self in infertility. *Canadian Review of Sociology & Anthropology* 43:95-113.
- Conrad, P. 1992. Medicalization and social control. *Annual Review of Sociology* 18:209-32.
- Conrad, P. 2007. *The medicalization of society: On the transformation of human conditions into treatable disorders*. Baltimore, MD: Johns Hopkins University Press.
- Corea, G. 1985. *The mother machine: Reproductive technologies from artificial insemination to artificial wombs*. New York: Harper & Row.
- De Melo-Martin, I. and I. N. Cholst. 2008. Researching human oocyte cryopreservation: Ethical issues. *Fertility and Sterility* 89:523-28.
- De Ziegler, D., I. Streuli, I. Vasilopoulos, C. Decanter, P. This, and C. Chapron. 2010. Cancer and fecundity issues mandate a multidisciplinary approach. *Fertility and Sterility* 93:691-96.
- Firestone, S. 1970. *The dialectic of sex: The case for feminist revolution*. New York: Morrow.
- Franklin, S. and H. Ragoné. 1998. *Reproducing reproduction: Kinship, power, and technological innovation*. Philadelphia, PA: University of Pennsylvania Press.
- Ginsburg, F. and R. Rapp. 1991. The politics of reproduction. *Gender & Society* 20:311-43.
- Goold, I. and J. Savulescu. 2009. In favor of freezing eggs for non-medical reasons. *Bioethics* 23(1):47-58.
- Greil, A. L., T. A. Leitko, and K. L. Porter. 1988. Infertility: His and hers. *Gender & Society* 2:172-99.
- Grifo, J. A. and N. Noyes. 2010. Delivery rate using cryopreserved oocytes is comparable to conventional in vitro fertilization using fresh oocytes: Potential fertility preservation for cancer patients. *Fertility and Sterility* 93:391-96.
- Harwood, K. 2009. Egg freezing: A breakthrough for reproductive autonomy? *Bioethics* 23:39-46.
- Homburg, R., F. van der Veen, and S. J. Silber. 2009. Oocyte vitrification: Women's emancipation set in stone. *Fertility and Sterility* 91:1319-320.
- Johnson, Katherine M. 2009. The (single) woman question: Ideological barriers to accessing fertility treatment. Paper presented at Annual Meeting, Society for the Study of Social Problems, San Francisco.

- Johnston, J. 2004. Putting motherhood on ice. *Daily Mail* (London), 24 November.
- Lock, M. and P. A. Kaufert, eds. 1998. *Pragmatic women and body politics*. New York: Cambridge University Press.
- Lockwood, G. 2002. Politics, ethics and economics: Oocyte cryopreservation in the UK. *Reproductive Biomedicine Online* 6:151-53.
- Lorber, J. 1994. *Paradoxes of gender*. New Haven, CT: Yale University Press. Lorber, J. and L. Bandlamudi. 1993. The dynamics of marital bargaining in male infertility. *Gender & Society* 7:32-49.
- Mamo, L. 2007. *Queering reproduction: Achieving pregnancy in the age of technoscience*. Durham, NC: Duke University Press.
- May, H. 2008a. Some cancer-free women want to freeze eggs. *The Salt Lake Tribune*, 28 June.
- May, H. 2008b. Women undergoing chemo can freeze eggs for future. *The Salt Lake Tribune*, 28 June.
- McCullough, M. 2004. Egg-freezing for fertility offers hope—and hype. Entrepreneurs tout egg-freezing for fertility but some say it's too soon. *The Philadelphia Inquirer*, 1 August.
- McQuillan, J., A. L. Greil, K. M. Shreffler, and V. Tichenor. 2008. The importance of motherhood among women in the contemporary United States. *Gender & Society* 22:477-96.
- Moore, L. J. 2007. *Sperm counts: Overcome by man's most precious fluid*. New York: NYU Press.
- Noyes, N., J. Boldt, and Z. P. Nagy. 2010. Oocyte cryopreservation: Is it time to remove its experimental label? *Journal of Assisted Reproduction and Genetics* 27:69-74.
- Noyes, N., E. Porcu, and A. Borini. 2009. Over 900 oocyte cryopreservation babies born with no apparent increase in congenital anomalies. *Reproductive BioMedicine Online* 18:769-76.
- Parmegiani, L., F. Bertocci, C. Garello, M. C. Salvarani, G. Tambuscio, and R. Fabbri. 2009. Efficiency of human oocyte slow freezing: Results from five assisted reproduction centres. *Reproductive Biomedicine Online* 18:352-59.
- Practice Committee of the American Society for Reproductive Medicine and Practice Committee of the Society for Assisted Reproductive Technology. 2008. Ovarian tissue and oocyte cryopreservation. *Fertility and Sterility* 90:S241-46.
- Practice Committee of the Society for Assisted Reproductive Technology and Practice Committee of the American Society for Reproductive Medicine. 2008. Essential elements of informed consent for elective oocyte cryopreservation: A Practice Committee opinion. *Fertility and Sterility* 90:S134-35.

- Rabinow, P. 1996. *Essays on the anthropology of reason*. Princeton, NJ: Princeton University Press.
- Rich, A. 1986. *Of woman born: Motherhood as experience and institution*. New York: W. W. Norton.
- Richards, S. E. 2010. Is egg freezing unfairly marginalized? Why the experimental label should be removed from the procedure. *Slate*, 15 March. <http://www.slate.com/id/2247606> (accessed March 15, 2010).
- Roberts, D. E. 2009. Race, gender, and genetic technologies: A new reproductive dystopia? *Signs: Journal of Women in Culture and Society* 34:783-804.
- Rose, N. 2006. *The politics of life itself: Biomedicine, power, and subjectivity in the twenty-first century*. Princeton, NJ: Princeton University Press.
- Rose, N. and C. Novas. 2005. Biological citizenship. In *Global assemblages: Technology, politics, and ethics as anthropological problems*, edited by A. Ong and S. J. Collier. Malden, MA: Blackwell Publishing.
- Rothman, B. K. 1993. *The tentative pregnancy: How amniocentesis changes the experience of motherhood*. New York: W. W. Norton.
- Rothman, B. K. 2000. *Recreating motherhood*. New Brunswick, NJ: Rutgers University Press.
- Rothschild, J. 2005. *The dream of the perfect child*. Bloomington, IN: Indiana University Press.
- Rudick, B. J., R. Paulson, K. Bendikson, and K. Chung. 2009. The status of oocyte cryopreservation in the United States. *Fertility and Sterility* 92:S187.
- Sher, G. and L. Keskindepe. 2005. *Successfully freezing human eggs*. New York: Sher Institutes for Reproductive Medicine.
- Sontag, S. 1990. *Illness as metaphor and AIDS and its metaphors*. New York: Anchor Books.
- Steinbock, B. 2004. Payment for egg donation and surrogacy. *Mount Sinai Journal of Medicine* 71:255-65.
- Straus, A. and J. Corbin. 1990. *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.
- Tao, T. and A. Del Valle. 2008. Human oocyte and ovarian tissue cryopreservation and its application. *Journal of Assisted Reproduction and Genetics* 25:287-96.
- Tuller, D. 2010. Payment offers to egg donors prompt scrutiny. *The New York Times*, 10 May.
- Wadyka, S. 2004. For women worried about fertility, egg bank is a new option. *The New York Times*, 21 September.

Waldby, C. and M. Cooper. 2008. The biopolitics of reproduction: Post-Fordist biotechnology and women's clinical labour. *Australian Feminist Studies* 23:57-73.

Waldby, C. and R. Mitchell. 2006. *Tissue economies: Blood, organs, and cell lines in late capitalism*. Durham, NC: Duke University Press.

Zola, I. K. 2005. Medicine as an institution of social control. In *The sociology of health and illness: Critical perspectives*, edited by P. Conrad. New York: Worth Publishers.