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## **Frosties: Feminist cultural analysis of frozen cells and seeds documentaries**

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### **Abstract**

Developments within cryobiology have turned the freezing of biological parts into standard clinical procedure. This article turns to the cryopolitics of egg freezing and seed conservation to focus on the cultural imaginaries of (frozen) cells and seeds revealed in the two documentaries: *Motherhood on Ice* (2014) and *Seeds of Time* (2014). The cultural imaginaries of frozen cells and seeds reiterate an understanding of reproduction as kinship-through-genes, extending the reproductive temporality of the body and the affective temporalities associated with climate change, turning cells and seeds into desirable insurance objects and objects of human manipulation. The article concludes that while *Seeds of Time* upholds a masculinist and scientific imaginary of humans as gods over seeds, in *Motherhood on Ice*, the cultural imaginary cements a gendered and straight temporality in which ice synchronizes straight, white women's middle-class femininity and reproductive potential with ideals of romantic time.

### **Keywords**

Cryopolitics, cryopreservation, feminist cultural analysis, *Motherhood on Ice*, reproduction, *Seeds of Time*, time and temporality

### **Introduction**

Liquid nitrogen tanks operating at  $-196^{\circ}\text{C}$  have become standard storage facilities for women's egg cells, while plant seeds from all over the world are sent to remote Svalbard in Norway to be stored in the Global Seed Vault at a permanent  $-20^{\circ}\text{C}$ . Cells and seeds are frozen at subzero temperatures in the hope of securing their (re)productive futures.

This article discusses the cultural imaginaries of the (frozen) egg cell, as they appear in *Motherhood on Ice*, a film portraying documentary filmmaker Amanda Burrell's individual egg freezing journey, and the imaginaries associated with (frozen) plant seeds in *Seeds of Time* in which agriculturalist Cary Fowler travels around a warming world to ensure future plant diversity.

The ability to freeze biological material, such as cells, embryos, organs, tissues, seeds, whole bodies or simply heads, is not new. Cryopreservation (the prefix *cryo* means icy cold from the Greek word *crystallos*) can be traced to the emergence of cooling technologies and techniques undertaken, following the Cold War period, within the general field of cryobiology (Luyet and Gehenio, 1940). In this article, I pursue a cultural analytical approach to the ways that the two ‘frosties’ – the human egg cell and the plant seed – engage different cultural imaginaries, when they get extracted, collected and put on ice. To do this, the article has been developed into four separate sections. In the first section, I turn to the theoretical frameworks of cryopolitics and feminist cultural analytical perspectives on time and temperature. In the second section, I discuss how the notion of cultural imaginaries can be used as an analytical lens through which the frozen seed and the egg cell can be understood. I then situate the methodological choice to focus upon *Motherhood on Ice* and *Seeds of Time*, including the benefits gained from reading these two films together and their wider media context. In the analytical section, I highlight how different cultural imaginaries and trajectories related to putting cells and seeds on ice, in the two documentaries, are enacted as heroic journeys in which cells, seeds and ice entangle with tales of prognosis; turn into genetic, cultural and economic resources, as well as kinship makers.

### **Background: the cultural politics of frosties**

The concept of cryopolitics emerges out of debates on the geopolitical importance of the Arctic and climate change politics (Bravo, 2017; Bravo and Rees, 2006; Radin and Kowal, 2017). It refers to the politics of low temperatures (Radin and Kowal, 2017) and the cooling efforts undertaken in the field of cryobiology (Kowal and Radin, 2015; Landecker, 2005). Within the context of cryopreservation, the ability to put biological material on ice has come to be seen as the biopolitical tool of the 21st century (Radin and Kowal, 2017). Initially used in the industry of animal breeding (Clarke, 2007), cryopreservation is today common practice, involving freezers, shipping companies, laboratories, biological banks contributing to a ‘fast, industrial-scale distribution’ (Landecker, 2005: 7) and transnational exchanges in biological material (Kroløkke, 2014). While low temperatures are central in transplant surgery, reproductive medicine and cryonics (Friese, 2013; Parry, 2004), the concern about warming temperatures of the planet underlie conservation efforts (Bravo, 2017; Van Dooren, 2009). Accordingly, cryopolitics constitutes both an overall theoretical framework for climate change and the melting ice in the Arctic, and an umbrella term for understanding the cultural imperative to put reproduction *on ice*. As noted by Thompson (2017), we live paradoxically in a world in which we are ‘chronically short of ice in nature’, but ‘not in culture’ (p. 339).

The ability to freeze biological material draws on the promise of immortality and the allure of future reanimation (Doyle, 1997; Parry and Gere, 2006). As noted by Radin and Kowal (2017), it has become a type of insurance policy – a protection of life against death (p. 9). Consequently, the concept of cryopolitics replaces the biopolitical notion of to ‘make live and let die’ with a newer

scientific discourse noting the centrality of to ‘make live and *not let die*’ (Kowal and Radin, 2015: 68). In adding the deferral of death and the promises of reanimation, cryopolitics sets out to explore the transgressed ‘boundaries of accepted bioethical practice, interpreted as life *without* death’ (Kowal and Radin, 2015: 69). Freezing becomes a form of affective biological time machine, producing new forms of ‘latent life’ (Luyet and Gehenio, 1940; Radin, 2013). Consequently, cryopolitics turns the promises of low temperatures into ‘cold optimism, a belief that death – or the acceptance of its finality – can be postponed indefinitely through practices of preservation’ (Radin and Kowal, 2017: 9). Moreover, freezing produces a new form of *latent* biological matter and becomes life or matter ‘in a state of suspended animation’ (Radin, 2013: 8). In this manner, latency seeks to ensure both the past and keeping biological material available for future use. When frosties turn into latent biological matter, they simultaneously become future informational resources granting the scientist access to ‘knowledge about biological variation as novel analytical techniques were developed’ (Radin, 2013: 488).

Today’s cooling technologies halt decay and modify what it means to be biological (Hoeyer, 2017; Landecker, 2005; Radin and Kowal, 2017). As noted by Landecker (2005), freezing has become an ‘infrastructural element of contemporary biotechnology’ (p. 4). It has led to an understanding that to be biological means to be ‘suspendable, interruptible, storable, freezable in parts’ (Landecker, 2005: 4). The ability to freeze biological material allows the synchronization of parts of different generational and time development ages (Landecker, 2005). It enables biological parts to seemingly be paused, while other parts paradoxically continue living (Landecker, 2005). This is also illustrative of what Landecker (2005) calls the ‘plasticity of living matter’ (p. 4) and what Radin and Kowal (2017) refer to as ‘temporal prosthesis’ (p. 12). For example, egg freezing promises reproductive plasticity or prosthesis when younger eggs hold the promise of a higher chance of fertility. Once ‘on ice’, women’s future reproductive abilities have the appearance of being secured. Moreover, because cold temperatures enable mobility, biological matter becomes capable of being transported across national and temporal borders. For example, Danish sperm becomes a global export commodity (Kroløkke, 2009), while sperm from a deceased man can be shipped elsewhere and used years later in the making of (grand)children (Hashiloni-Dolev, 2015; Van de Wiel, 2015).

Clearly, freezing is a future-oriented strategy. To Shoffstall (2010), freezing is conceptualized as a ‘shuttle through time’ (p. 294) or the ‘what could be’ of a given future (p. 287). Time and temperature are in this manner interrelated. Notably, in the case of human reproductive cells, freezing entangles the somatic temporality of the body (growing old/becoming infertile) with institutional temporalities (how society structures procreation in women’s lives), normative temporalities (when a woman is viewed as too young or too old to procreate) and affective temporalities (hoping to become a parent or fearing it is too late). Such temporalities are embedded within temporal techniques (calendars and watches; Zeruvabel, 1981). They form a temporal

experience that appears natural and feels like an ‘inner clock’ (Freeman, 2007), while simultaneously orienting people in specific ways (Adams et al., 2009). This is also the case when it comes to frozen plant seeds. As noted by Van Dooren (2009), freezing entangles with globalized temporalities (the image of the warming globe) and affective temporalities (the fear of future starvation and extinction). In these entanglements, today’s citizens must reflect about future scenarios and freezing is, in this manner, enacted as a type of prognosis time (Jain, 2007; Puar, 2009). According to Jain (2007), the prognostic subject is confronted by the fear of a likely future: ‘Living in prognosis serves the idea of a timeline and all the usual ways one orients oneself in time: one’s age, generation and stage in the assumed lifespan’ (pp. 80–81).

Theorizing time within a queer feminist framework, Freeman (2010) discusses the concept of chrononormativity to critically address the ways that ‘institutional forces come to seem like somatic facts’ (p. 3), as well as the theoretical construct of chronobiopolitics providing a framework for understanding how women discipline themselves – and become disciplined – through temporal bodily enactments that achieve the appearance of a natural time of sorts:

In a chronobiological society, the state and other institutions, including representational apparatuses, link properly temporalized bodies to narratives of movement and change. These are teleological schemes of events or strategies for living such as marriage, accumulation of health and wealth for the future, reproduction, childrearing, and death and its attendant rituals. (p. 4)

Taken together, temperature and time are clearly interrelated. Freezing biological matter defers and disentangles elements or parts from particular bodies and environments. Its allure lies exactly in its promise to re-animate and re-entangle biological matter into future new or (old) enhanced bodies, landscapes or emergent transnational market exchanges. As echoed by Hoeyer (2017), freezing buys time (p. 207). As an act of postponement or what Hoeyer (2017) refers to as suspension, freezing enables cells and seeds to travel in more ways than one: Cells and seeds literally become mobile and travel across the globe, yet they simultaneously mobilize heated public debates. So, as a theoretical framework, cryopolitics takes the temperature on the cultural politics of frosties, including how cells and seeds become located in particular normative temporalities and cultural imaginaries.

### **Imaginaries: a cultural analytical concept**

In this article, I rely on the concept of sociotechnical imaginaries developed by Jasanoff and Kim (2009) and Franklin et al.’s (2000) feminist approach, in order to discuss the cultural imaginaries on frozen cells and seeds. Briefly, the construct of imaginaries serves as an analytical tool in

anthropology, cultural studies and feminist scholarship (Franklin et al., 2000; Haraway, 1989; Marcus, 1995; Strauss, 2006). It frequently refers to collectively held ideas, or as noted by Jasanoff (2015), imaginaries are ‘publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology’ (p. 322). Imaginaries come to reveal both normative fantasies associated with the body (such as its reproductive capacities), for example, and utopian ideas of what could happen in the future (such as the postponement of death through freezing technologies). In this manner, imaginaries (re)inscribe how social life should be ordered and categorized (Appadurai, 1996; Valaskivi and Sumiala, 2014) and how particular scientific accomplishments and geographical locations can be understood (Jensen and Huggan, 2016; Reijnders, 2016). Accordingly, in the work of Jasanoff and Kim (2009), sociotechnical imaginaries turn into a vital ‘cultural resource that enables new forms of life’ (p. 122) while simultaneously being embedded in a ‘reservoir of norms and discourses, metaphors and cultural meanings’ (p. 123). As an analytical concept, then, cultural imaginaries entail assemblages of technological progress, are rooted in particular institutional settings (law and politics), entangle with commercial opportunities (egg and seed banking) and frequently very normative constructions of how life should be lived.

Cultural imaginaries are analytically productive to work with. For example, in their analysis of President Eisenhower’s 1956 ‘Atoms for Peace’ speech, Jasanoff and Kim (2009) show how the speech reframed the atom from a sociotechnical imaginary of ‘destruction’ to an imaginary of the atom bomb as a ‘life sustainer’, in the process positioning the United States as a peaceful, constructive nation. Similarly, Hvenegård-Lassen (2016), in her discussion of cultural imaginaries in the Danish-produced series of videos *Secrets of the Ice*, notes how the five videos draw upon a colonial imaginary in which the ice sheets become constructed akin to ‘virgin’ landscapes. In the videos, ice core drillings become cultural imaginaries of ‘phallic vehicles of conquest’ (p. 6) opening up the Greenlandic landscape to the ‘rightful’ scientific, Danish (male) gaze. Meanwhile, in Franklin’s (2000) analysis of the film and the theme park *Jurassic Park*, she notes how life itself becomes reconstructed as a commercial and playful genetic imaginary enabling the ‘bio-tourist’ (p. 206) to enjoy extinct forms of nature, now remade into consumable and global nature commodities. A characteristic of these examples is the way that the concept of cultural imaginaries works to combine the theoretical insights of postcolonial and feminist scholarship with that of mediated material, such as speeches and films. In the remaining part of this article, the notion of cultural imaginaries will be used as an analytical approach to critically understand the intersections between icy temperature, cells and seeds. Before I turn to the analysis, however, a brief discussion of my choice to focus upon two documentaries is in order.

### **Method: documentaries on ice, cells and seeds**

Documentaries constitute important sites for negotiating imaginaries on technological progress (Bryld and Lykke, 2002). In this article, I focus on two documentaries: *Motherhood on Ice* produced in 2014 by Al Jazeera and *Seeds of Time* similarly released in 2014 produced by Sandy McLeod and HUNGRY in association with Isotope Films. When *Motherhood on Ice* was first aired in November of 2014, the response was, according to Amanda Burrell, the main protagonist and an experienced filmmaker from the United Kingdom, overwhelmingly positive (personal email consultation with Burrell, 2017). While no detailed viewing figures are available, *Motherhood on Ice* is still accessible on YouTube and appears to appeal to a predominantly educated, western, white female audience (<https://www.youtube.com/watch?v=ibYdky9dyZo> retrieved November 2017).

Meanwhile, *Seeds of Time* has been screened more than 90 times and has won several awards including the Audience Award at the San Francisco Film Festival in 2014 and the Best Cinematography Award at the Costa Rica Film Festival in 2014 (<http://www.seedsoftimemovie.com/> retrieved November 2017).

Television and film have, as Wheatley (2016) argues, given viewers' access to the spectacular at home. Akin to the spectacularization of exterior and interior landscapes (arctic landscapes and mature follicles, for example), the documentaries included in this article engage edutainment practices in being educational and entertaining (spectacular) to watch. Yet, they also differ in significant ways. Whereas *Motherhood on Ice* is a first-person documentary (Kilborn and Izon, 1997) directed and shot by Burrell producing a personal reproductive portrait of sorts, *Seeds of Time* uses a more expository documentary mode (Kilborn and Izon, 1997) including Fowler's voice-over seeking to persuasively communicate a doomsday narrative of climate change. *Motherhood on Ice* is animated through Burrell's inner monolog, yet when combined with her transnational travel including her fertility consultations in Turkey (where she lives), the United Kingdom (where she is from) and Cyprus (where she eventually freezes her eggs), egg freezing gets repositioned in a more globalized context. In contrast to the personal tone prevalent in *Motherhood on Ice*, in *Seeds of Time*, the commentary is constructed as 'objective'. Although the narrative structure is rhetorically connected with Fowler's own personal battle with cancer, in *Seeds of Time* the urgency of climate change is mobilized as a global concern through Fowler's transnational travels (New York, Svalbard, Rome and Copenhagen) along with the strategic employment of 'Google Earth' esthetics (Wheatley, 2011: 237) in which satellite images of the globe are followed by spectacular endangered landscapes, rare shots of extraordinarily colorful seeds and string background music. Meanwhile, both documentaries are positioned in international milieus weaving in and out of different geopolitical settings simultaneously cementing Burrell and Fowler as global citizens having the privileges of whiteness and cultural capital, as they freely move throughout the world.

In what follows, I use the concept of cultural imaginaries to discuss how (frozen) cells and seeds, throughout the two documentaries, are temporally, technologically and culturally situated.

While the documentaries differ with regard to their narrative structure, visual appeal and strategic employment of sound, they both position ice as a rescue technology of sorts. Similar to Bull's (2014) compelling analysis of how forensic practices and DNA entangle with normative understandings of reproduction, kinship and bioethical debates in the *Crime Scene Investigation* (CSI), in the two aforementioned documentaries, I pay attention to the way that cells and seeds become semi-autonomous, yet when put *on ice*, imagined future promises of hope reappearing in the global imaginary as informational and genetic forms of kinship. In the documentaries, ice is naturalized as a necessary kind of doing, while the ability to hope – whether for future pregnancy (potential) or globally available food supply – becomes characteristic of the good and responsible bio-citizen, as also reflected in the work of Duggan and Munoz (2009). Consequently, in the analysis, I turn first to the ways in which prognosis time, kinship and reproductive temporality are negotiated.

### **Tales of prognosis: naturalizing ice and frosties**

In *Motherhood on Ice*, Amanda Burrell is the film's protagonist and narrator. As she walks through the market, the viewer gets a glimpse of what appears to be outdoor living, comfortable weather along with Amanda living in Istanbul, noting 'so I have it all – well, almost. I'm 42, single, and I am childless'. Her post-feminist discourse is called into question through her sleepless nights going in and out of anxiety, however, wondering: 'I can't have children, it is too late'. The prognosis of childlessness is accentuated due to Burrell's age of 42, the clinical estimations of her rapidly declining 'pregnancy potential' and various meetings with fertility experts in Istanbul and London, and interviews with other women who have already confronted the decision to freeze – or not. In the film, the prospect of remaining childless turns into a fear of becoming a 'sad smelly old lady living alone with her cats', visibly present during one of Amanda's interviews. The film intimately shares Amanda's thought processes, her international travels, her leisure activity of belly dancing reframed as a fertility ritual, and her desire to become a mother, albeit not at any cost: 'I have a particular dream of motherhood, which is meeting a partner and creating a family together'. Although she still hopes to meet the 'man of her dreams' and conceive naturally, due to her age and the cost of freezing, she travels to Cyprus to have her eggs extracted and stored.

Not only is Amanda, at the macro-level and as a single woman, positioned in a state of prognosis, but also at the micro-level, her egg cells are displayed as facing an imminent prognosis of death and destruction. In reference to Jain (2007), living in prognosis embodies loss and death, and hoping for a certain futurity. This involves Amanda's status as a single woman, her aging body, along with her failing reproductive potential. 'My fertility is running out', Amanda notes in preparation for her fertility doctor's visit, wondering: 'But have I left it too late?' With her 43rd birthday quickly approaching (her self-imposed deadline for the decision to freeze), she recognizes that swift decision making is in order: 'I need to act quickly'. Her fertility is pulling her, we learn,



‘off a cliff’ and the majority of her eggs are, she notes, likely to be abnormal. In what appears as a big calculus game involving egg quantity and quality, Amanda fears that it ‘may already be game over’, or as noted by her Istanbul doctor: ‘I am telling you: after the age of 45, getting pregnant is going down to 1% ... that low’. However, the UK doctor estimates her future chance at pregnancy (should she decide not to freeze her eggs) to fall to between 2 and 4 percent in 2 years time.

Amanda reckons that her fertility ‘nosedives’ and in this manner, she debates statistical calculations, egg quality (the chance of a healthy baby) and cost, together with her desire for motherhood. As noted by Haimés and Taylor (2009), the ‘calculus of conception’ involves ‘endless mental arithmetic’ (2143), in which, in this case, Amanda is intensely calculating her chances of future conception.

In the film, egg freezing is positioned as the technology that offers hope. In a conversation with another elective egg freezer, Sarah, who went through several cycles to freeze a stunning 70 eggs, the prognosis of childlessness is turned into a cultural imaginary of motherhood by egg-freezing technology: ‘You are changing the “if” I have kids to “when” I have kids’, Sarah, now deep into her 40s, says. In this account, egg freezing is positioned as ‘stopping the sadness’, reframing your own cells into ‘eggs sitting somewhere, waiting for you’. In this imaginary of reproduction as choice, technology and consumption, ice prolongs reproductive futurity in which eggs become genetic material readily available (on the shelf) for your own later usage. Meanwhile, as noted by Puar (2009), prognosis is also a form of ‘affective futurity’ (p. 163), as it involves the manipulation of ‘statistical probability’ (p. 163). In fact, Puar (2009) argues that being able to produce hope distinguishes the good from the bad neoliberal subjects. Within neoliberal ideology, empowerment and reproductive choice are, as noted by Chen (2014), turned into the ability to consume. Similarly, Amanda remains optimistic and as a prognostic subject, she becomes a future patient, invariably hailed as a ‘consumer-in-waiting’ (Rajan, 2007: 167). In her case, egg freezing and the subsequent thawing necessitate later in vitro fertilization (IVF) treatments if the frozen cells are to result in a successful pregnancy. Rajan (2007) pinpoints this relationship between value generation and consumption, when he says: ‘At the contemporary discursive terrain of knowledge production is also inevitably the capitalist terrain of value generation, each probabilistically interpellated polymorphic subject becomes not just a target of possible intervention but also a consumer-in-waiting’ (p. 167).

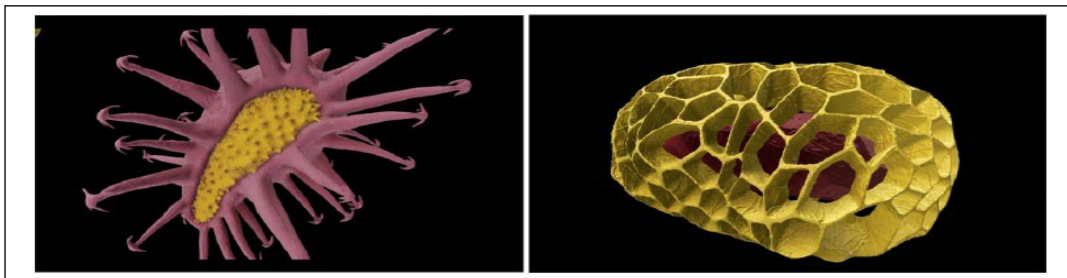
Meanwhile, in *Seeds of Time*, we follow agricultural activist Cary Fowler’s determination to collect and freeze crop seeds for future use. Mostly using a first-person narrative account, Cary situates the ‘fate of human kind’ as resting with the (frequently in the film portrayed as ‘his’) ability to secure future plant seeds. As a result, seeds are, throughout the film, transformed into valuable genetic resources while the global magnitude of climate change is metaphorically reinforced through the image of the globe, and literally, when the film moves through different geopolitical locations: from Memphis, Tennessee (where Cary lives) to New York, Oxford, Svalbard (the location of the

Global Seed Vault), Rome (the location of The Global Crop Diversity Trust), Saint Petersburg, Copenhagen and the Sacred Valley in Peru. In his transnational travel, Cary enters in and out of different conversations cementing his credibility as a seed conservationist and positioning him as a rescuer of sorts. Cary's determination and battle to secure plant seeds are moreover strengthened through his own personal narrative battling cancer, stressing that time is precious and short. At one point in the documentary, darkening clouds and rain form the visual background, followed by stories of seed collection in Saint Petersburg undertaken during World War II and the affective outbursts of tears and sadness by locals, when crop diversity is destroyed, seemingly due to climate change. Meanwhile, the Global Seed Vault, built into the mountain in remote and arctic Svalbard, becomes a 'Garden of Eden', visually depicted as a virginal (and vaginal) ice cage – a 'big insurance company for the world', and a space where Cary desires his own ashes to be placed.

In this film, prognosis engages both the apocalypse of a melting world and also the accompanying fear of starvation and food shortages, combined with Cary's own cancer diagnosis. Thus, whereas loss and death, in the case of Amanda, concerns her failing reproductive potential, in which egg freezing becomes a form of prosthesis, extending her ability to mother, in *Seeds of Time*, prognosis is stratified along geopolitical North–South locations. Cary notes that food scarcity produces diseases, creating a global 'epidemic' in which 'people at the bottom of the food chain starve to death'. In the film, Cary's globalized travels are in sharp contrast to localized subjects in the High Andes of Peru, whose crops and naturalized forms of togetherness are simultaneously aligned with newsflashes of drought, higher food prices and war. The need for plant diversity is made to appear natural in the film when Cary notes that: 'we have low stockpiles of food' and combines this with a recognizable image of climate change (visually portrayed by small icebergs passing by), setting the stage for urgent action. Freezing is justified, however, as plant seeds are positioned as 'some of the most valuable resources on earth', making swift action not only desirable, but necessary.

In the films, cells and seeds come to personify life and global futurity (Lie, 2012; Martin, 1992). Similar to Lie's analysis of the visual representation of reproductive cells, in *Seeds of Time*, plant seeds are put on display as fantastic, physical and manageable entities (Lie, 2012), as well as cultural icons (Nelkin and Lindee, 1995). Notably, the scale with which we see plant seeds makes each of them appear unique: colorful, autonomous, alone and distinguishable, displaying a new type of potentiality, and that of an extraordinary future plant (Figure 1). Meanwhile, the egg cells in *Motherhood on Ice* appear surprisingly mundane. Displayed in gray shades, Amanda's egg cells are recognizable future reproductive potential, narrated as promises of hope and consequently important enough to print. Jointly, the visual depictions work to position seeds and cells as stand-ins for particular hosts (particular plants and persons, and also humanity at large, see also Parry, 2004), or as noted by Amanda, in reference to her egg cells, they become: 'My five tiny hopes for the future'.

But what do these images of cells and seeds do? In *Seeds of Time*, the fate of humankind is seen as ‘resting on these genetic resources’, while the beauty and vulnerability of the planet is displayed through camera shots of icy, white Svalbard, and the hilly, lush green landscapes of the High Andes in Peru. The icy, cold north becomes a safe, hopeful and virginal environment of genetic suspension, similar to the cold liquid nitrogen tanks. The Global Seed Vault is constructed as a spectacular ‘environmentally controlled, long term and secure repository for exploitable molecular resources’ (Parry, 2004: 403). The masculine narrative is visually reiterated when the camera follows Cary entering the vault’s long hallway, symbolically representing a birth canal, to later arrive at the epicenter (the uterus) of the storage facility. Along with the frozen bucket that Amanda’s egg cells are put into, the vault constitutes a feminized sociotechnical imaginary – a uterine environment of future (re)productive immortality and hope. In *Motherhood on Ice*, this imaginary is, moreover, produced in a manner that resembles a more intimate home-like environment. During her visit to the UK clinic, Amanda is told that the technology matches her internal environment with the ‘same concentration of gases that you have inside your womb’, having the effect that ‘the eggs don’t think that they have ever left your body’. To Amanda, ice re-entangles her reproductive future with a normative future, as her frozen egg cells are positioned as offering her ‘a slim hope, but at least it gives me some hope of starting a family in the future’. Eggs on ice reclaim her desire for a particular straight reproductive temporality reiterated in the closing moments of the film as: ‘I still hold on to the dream of meeting a man and starting a family naturally’.



**Figure 1.** Screenshots of plant seeds from *Seeds of Time*.

Having presented and discussed the main frameworks of the two films, including the ways that they each illustrate prognosis time, I now turn to a discussion of the ways that frozen cells and seeds produce particular understandings of globalized kinship.

### **Imagining natures: genetic kinship on ice**

Through images of metropolises such as London, Istanbul, Rome and New York, both films draw on the idea of frozen cells and seeds as mobile and globalized cultural imaginaries. In the case of

*Seeds of Time*, the image of the blue planet combined with the use of suspenseful music cement the global magnitude and doomsday narrative of climate change. To Franklin et al. (2000), the blue planet is one of the most widely used iconic images. A symbol of ‘global unity, international collaboration, shared planetary interdependence’ (Franklin et al., 2000: 28), the blue planet signifies widespread risks and vulnerabilities. In what Franklin et al. (2000) refer to as a space of panhumanity, seed collection and freezing frame the planetary risks as shared. This is reiterated in *Seeds of Time*, where globalized accounts of climate change are combined with localized Peruvian communities in which, for example, the potato crop seemingly unites members across intergenerational lines. Here, the image of the blue planet and the Peruvian highlands stand in contrast to images of a bountiful produce section in a North American supermarket, along with an elderly white woman putting food in her mouth.

Both films fuse the desire for ‘own’ cells with an alarmist rhetoric of aging (understood as irrevocable decay) in *Motherhood on Ice*, or climate change (a permanent loss of biodiversity leading to civil disruption and war) in *Seeds of Time*. This cultural imaginary works to produce an understanding of genetic kinship as not only preferable but also necessary. In *Motherhood on Ice*, Amanda’s egg cell gets constructed as a ‘mini-me’, when she compares her egg extraction to ‘a bit like giving birth, seeing part of me on that screen’. Amanda’s ability to mother is, in the movie, in fact, reduced to her ability to put her egg cells on ice. As noted by Rothman (1989), this type of genetic thinking reinforces a type of patriarchal value in which the ‘seed’ replaces the maternal–child relationship. Because Amanda wishes a particular straight temporality including that of a potential male partner, her decision to freeze is naturalized in light of an alarming rhetoric of reproductive aging and decline. As Franklin et al. (2000) elegantly put it, seeds become ‘at once personal, political, ancient, natural and manufactured: icons of both global nature and global culture’ (p. 81). Whereas in *Motherhood on Ice* this includes genetic motherhood, in *Seeds of Time*, activists and scientists similarly stress the genetic relationship, as they search for ‘a wild relative’, making genealogy appear at the very core of not only the ability for this seed to survive, but also global human survival. In this cultural imaginary, values associated with biodiversity coincide with naturalized ideas of kinship-through-genes. As echoed by Franklin et al. (2000), it is a particular appeal associated with the accumulation of biowealth in which ‘progress, enterprise, consumption, green activism and public health’ come together (p. 84).

Whereas the genetic tie is cemented in *Motherhood on Ice* as necessary in the making of motherhood, in *Seeds of Time*, examples of interspecies kinship unfold. To Van Dooren (2007), conservation efforts may indeed create a platform of what he calls interspecies forms of kinship (p. 72). For example, in *Seeds of Time*, the International Potato Center, located in Lima, Peru, grows long lost seeds, aiming to secure intergenerational human kinship ties. Here, seeds come to reestablish important rituals and traditions, or as noted in reference to the freezing of potato seeds in Svalbard: ‘The message that you are sending in sending all that seed to Svalbard is that all that

culture is kept'. Interspecies kinship ties are not restricted to the localized Indians in the High Andes, however. In the film, participants at a local plant festival in the United States echo this understanding when frozen seeds (here viewed as nature) and people (culture) come together to form warm communities of affection and intimacy. In this imaginary, ice produces intergenerational, interspecies and cross-cultural kinship ties, or as echoed in one participant account: 'My grandfather – he handed me this seed, and I just felt this connection – a living connection with people in a foreign country that I had never thought about before, and here I was linked to them through this seed'.

Consequently, in *Seeds of Time*, interspecies kinship is transformed into a form of 'dynamic conservation'. Nevertheless, Cary's dominant narrative is one in which the importance of the human project is never questioned. Quite the contrary, Cary stresses that seeds are informational resources that humans must learn to adapt to fit the environment. Notably, this is an environment in which humans 'manage', act as 'gods to those crops', in the process making humans the 'guardians' of seeds. Interestingly, this cultural imaginary is frequently gendered. For example, Roa-Rodriguez in Van Dooren (2007) notes:

When the seeds come to us they come as daughters-in-law, because if they get on well with us, the seeds will stay and then all will be happy. When we plant them and the little plant emerges from the soil, they become daughters. When the time of blossoming comes, the plants become sisters and it is the time to dance with them. This is the time of the carnivals. When the time of the harvest and seed storage comes, the seed becomes mother. (p. 84)

In contrast, in *Motherhood on Ice*, the eggs are already gendered when they are waiting in nitrogen suspension for Mr. Right (or the sperm from Mr. Right) to show up. Having discussed the ways that the cultural imaginaries of cells and seeds produce particular understandings of kinship as genetic and gendered, I turn now to a final discussion about time and temperature reframed as icy temporalities.

### **Icy temporalities**

In both films, time is depicted as 'short' and 'urgent', while ice is positioned as a rescue technology. In *Motherhood on Ice*, Amanda's time is restored once she puts her aging eggs on ice. As noted by Freeman (2007, 2010), routines and rituals produce the appearance of timelessness which, when disrupted, as in the case of Amanda's aging eggs, necessitates a readjustment of sorts. Technologies of freezing are used as a means of keeping 'her options open', as noted by Amanda's mom, including that of a 'ten-year window'. Amanda's discovery that mothering well into her 40s could be desirable extends her white, middle-class somatic reproductive temporality. What Amanda previously had set as an age limit of 45 is now reset to 50 – or early 50s. Meanwhile, in the film, the

image of the older, white, middle-class mother is revamped into a more relaxed, appreciative and attentive mother, epitomized through an image of a 53-year-old mom with her 2-year-old daughter running around on the playground. The reproductive work that Amanda – or any other older woman – has to undergo to freeze her eggs along with any pregnancy complications due to an aging body are entirely absent. Instead, images of healthy, energetic older mothers along with well-adjusted, happy and healthy children come together to normalize egg freezing as a technology that rightly rearranges the normative temporalities of when women should be able to mother.

This depiction of time and temporality aligns itself with Zerubavel's (1981) notion that normalcy is temporally located and synchrony is key: 'Temporal symmetry, which involves synchronizing the activities of different individuals, is actually one of the fundamental principles of social organization' (p. 65). Not only is Amanda's reproductive potential positioned as now being safeguarded in liquid nitrogen tanks, in this cultural imaginary, her femininity is resurrected. In the film, Amanda's doctor metaphorically puts Botox into her reproductive organs when referring to her ovaries as 'good-looking', noting how well they respond to the hormone treatments and saying: 'I like your ovaries. They respond very well'. In spite of her 42-year-old body, in the film, Amanda's eggs and ovaries come to appear spectacular – youthful, even feminized, through hormone treatments and the ultrasound scan in which the cultural imaginary of individualized, bountiful, fertile ovaries is revealed. In reference to the number of Amanda's follicles during her first examination, her Turkish male doctor notes: 'normally it does not look like this at 42'. As noted by Wheatley (2016), the inside of the body becomes a site of the spectacular turning, in the case of Amanda, her body into a landscape readily accessible and open for the medical and gendered gaze.

The considerable normative significance of time is displayed not only thematically, but also through the ways that 'fast' and 'slow' time operates in the films to secure and naturalize a particular narrative of time as 'precious' and 'running out'. In *Motherhood on Ice*, Amanda's reproductive time is reflected in the fact that, while in a rush to get to the infertility expert's office in Istanbul, she is stuck in traffic. Here, the traffic and the city's congestion act as metaphors for her internal reproductive rush. Moving through the busy city, Amanda's decision on her future reproductive potential is individualized, made on an island near Istanbul when a group of storks fly overhead. The storks symbolically represent fertility figures, bringing babies to parents and being migratory figures, because storks – like Amanda – migrate to warmer climates to secure a good breeding environment (or in the case of Amanda, to have eggs extracted). Meanwhile, the presence of 'fast time' is contrasted by the return to the 'slow time' characteristic of the final scenes of the film. Here, Amanda walks barefoot on a beach, sandals in hand, collecting shells and noting: 'It feels right to have frozen my eggs, but I hope I never have to use them'. Having put her reproductive time on hold, Amanda is visually depicted as relaxed, evidently now having time to maintain her hope for the future: 'I still hold on to the dream of meeting a man and starting a family naturally'. In this manner, egg freezing is framed as granting Amanda more time – freezing her biological time,

turning ice into a rescue technology of sorts, extending not only her reproductive time, but her romantic time as well.

Whereas time and temperature in *Motherhood on Ice* are repositioned as an individualized act of prosthesis, normalized as a ‘birthday present’, as well as affectively positioned as ‘hopes for the future’, in *Seeds of Time*, time and temperature fuse and are remade into Cary’s rightful ‘impatience about wasting time’. Here, Cary’s narrative concerning his own battle with cancer is transferred to the battle with climate change and the accompanying shortage in biodiversity. Moreover, this documentary’s musical choices – from the quiet piano introducing the viewer to the problem of seed conservation to the increasingly loud string instruments coupled with images of icebergs, drought and flooding – make time appear disturbingly fast. Music, as noted by Fink (2006), may produce affective responses of suspense and in the case of *Seeds of Time*, an understanding of time as short and precious.

In both films, viewers are taken through a series of suspenseful scenes, as conservation efforts are left unsecured. In the case of Amanda, the quality of her eggs is unknown, yet she remains hopeful for ‘double figures’. In the surgical theater, the count for the optimal number of egg cells begins when one staff member yells: ‘One oocyte’, and the viewer intensely follows the black and white image of Amanda’s egg cells disappearing from the screen, as they are extracted from her ovum, remade now into ‘two oocytes’ and more. Still resting in her hospital bed, suspense turns into disappointment when Amanda learns that of the 12 collected eggs, only five were mature enough to freeze, suggesting the need for another round of freezing for her to reach her desired double-digit number. In *Seeds of Time*, because of the fact that Cary has recovered from a second cancer, his health and also that of the globe are left in uncertainty and suspense. As the film comes to an end, his efforts at securing seed diversity, albeit clearly documented through the sizable Svalbard storage room, are left unresolved. At the macro-level, suspense is at the heart of both documentaries: What will happen to Amanda’s fertility? And when will the doomsday narrative of climate change destroy plant diversity? Thus, cold storage provides a safe environment for cells and seeds while overall uncertainty prevails: Amanda’s egg cells may be abnormal, she also may never meet the right guy, and she may choose never to use her eggs. The egg cells remain in what Amanda calls ‘the most banal-looking bucket’, turned discursively, in Amanda’s narration, into ‘their home for the next, however many years’. In the case of Cary, his cancer may ultimately kill him, before seed diversity has been completed and has safely reached the spectacular Arctic vault.

In combination, the cultural imaginary of ice works to alleviate somatic, normative and affective temporalities. Time and temperature intersect to produce an understanding of ice as putting Amanda’s reproductive potential in the ‘right order’, managing affective temporalities of fear of infertility (having left it too late), as well the normative temporalities of when to mother and the hopeful promises for the future (fertility). Similarly, in *Seeds of Time*, the somatic temporality of

Cary's cancer along with the affective temporality of climate change are resolved through ice and visually epitomized through a timeless, cold, virginal and icy Svalbard.

## Conclusion

I have analyzed the two documentaries *Seeds of Time* and *Motherhood on Ice* and discussed how ice turns cells and seeds into informational genetic resources, as well as frozen (future) assets. In this cultural imaginary, time and temperature work to synchronize (re)productive potential – whether in the securing of the future viability of plants, or in the future chances of genetic motherhood. In both films, freezing is enacted as individual, heroic rescue missions aimed at preserving life, undertaken in a fierce race against time and harsh bodily and geographical environments, characterized by emergent decay (aging), disease (infertility, cancer) and disaster (climate change).

As noted in the theoretical section, ice puts cells and seeds in a state of (permanent) suspension. In combining feminist cultural analysis with a cryopolitical framework, it becomes clear that these archived frosties draw upon very particular sociotechnical imaginaries of relatedness and gender. Whereas the frozen plant seed is stored in the epicenter of climate change, the far north of Svalbard in the Arctic, the film combines green activism with a white masculinist imaginary of human control and manipulation. Meanwhile, the liquid nitrogen freezers, located in the warm holiday island of Cyprus, position women's reproductive potential as residing within their egg cells, now permanently (re)stored at a temperature of  $-196^{\circ}\text{C}$ . This imaginary upholds a straight temporality of meeting Mr. Right, synchronizing white women's reproductive potential with their romantic time. The ways that Amanda and Cary interact, in both films, with this seemingly spectacular technology and virgin landscapes affirm the importance of ice and naturalize their decision to freeze. The promises that freezing technologies uphold with regard to the (re)productive temporality of egg cells and seeds draw on new, and fairly old, cultural imaginaries of (re)production, kinship and gender.

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