POST-INTERNET QUEER REPRODUCTIVE WORK AND THE FIXED CAPITAL OF FERTILITY

The interface, the network and the viral
as themes and modes of artistic response

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ABSTRACT

This research considers the digital infrastructures and interfaces of the Assisted Reproductive Technologies (ARTs) industry as a depository for human memory and a powerful translation zone where beliefs regarding social and biological reproduction are fashioned today. Offering an innovative take on the dynamic interaction between sexuality and digital technologies, this thesis sets out how queer reproduction struggles, as evidenced in the long history of pathologizing queer parenting structures and the networks of care forged during the HIV/AIDS crisis, are not just a glimmer haunting the IVF-centred heteronormative fertility clinic but structurally linked across the systems of accumulation that order capitalist expansion.

The concept of "post-internet queer reproductive work" fuses three scholarly traditions: the study of *queer work*, theorizations of *reproductive labor* and the concept of *fixed capital*. Chapters 1-4 define and mobilise these concepts, suggesting how they interact and inform each other in the context of the financialized fertility market, with a focus on the facial-matching algorithm boom in Spain and European clinic and bank websites. Post-internet queer reproductive work is further elaborated on through close readings of 1970s UK lesbian magazine *Sappho*, who published poetry and operated as a network for resource sharing across disability, sexuality, race and class struggles, and *Gay Gamete* (2000), a work of Net Art by U.S artist Clover Leary that protested an FDA protocol regulating gamete donation according to sexuality and sexual practices. Beyond historical examples, the concept of post-internet queer reproductive work attends analytically to the processes through which the social knowledge accumulated in queer reproduction struggles is incorporated as the fixed capital and "digital machines" of the global fertility market.

Chapters 5-6 contextualise the artistic dimension of this thesis as it is constituted by an animation film, a Net Art work, a poetry book and ongoing editorial project *Them, All Magazine*, which brings together poetry, critical writing and Net/Code/Software Art on the subject of reproductive politics and sexuality. Broadly, this research proposes a reclaiming of the interface, network and viral as themes and modes of artistic response to reproductive control. While the interface, network and viral are staple topics in the fields of Software Studies and Visual Studies of the Internet, they have not been a main

concern for Feminist Social Reproduction Theory or related studies of assisted reproduction. On the other hand, social reproduction struggles and sexuality have not always been at the center of studies of the interface, the network and the viral. This thesis is an original contribution to the interdisciplinary field of reproduction studies by developing a Queer Marxist perspective on assisted reproduction, fixed capital and reproductive labor –and their intersections– and by presenting post-internet art works and practices as modes of response to reproductive control. Layering critical, sociological, historical, audiovisual, editorial, auto- and poetic gazes, this thesis develops an interdisciplinary mode of "gestural writing" as a method and *way of knowing* that centres bodily feeling and political becomings.

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Chapter 1
INTRODUCTION

QUEER REPRODUCTION AFTER THE INTERNET,
THE POST-INTERNET AND
THE REPRODUCTIVE IMAGINARY

While the convergence of Assisted Reproductive Technologies (ARTs)[1] and the Internet in the 1990s promised to connect people in "queer" ways –recoding normative gender roles and de-biologizing kinship– today as users advance through online-offline fertility systems, they may find themselves submitting to the compulsive racial and sexual identification that now characterizes much of our online-offline activity. In other words, in order to pursue the liberal promise of reproductive rights and access, the "user" is also required to "play" race, gender and class games at the level of the Internet interface, in which unequal working conditions, racial privileges and conservative kinship structures are normalized. The poetic and aesthetic forms of address of the contemporary fertility website –with their animated marketing banners, drop-down lists, multiple data entry points, baskets and endless streams of heteronormative gamete donor profiles– can trigger bad feelings. I move beyond, though, a straightforward dismissal of particular representations as somehow missing the mark where another image or narrative could get it right. Following debates around the politics of infrastructure (Bowker and Star, 1999; Galloway, 2004; Mackenzie 2006), I approach 21st century assisted reproduction as a complex of reception areas, laboratories, microscopes, micromanipulator tools (etc.,) as well as,

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> visual-spatial structuring devices such as a window and its subcomponents, timelines and buttons; sounds, such as system event sounds; animated representations of running data-processes such as a loading bar, throbbers used in web browsers, spinning cursors; widgets; menus, which describe available functions (Cramer & Fuller, 2008, p. 230).

[1]   According to the International Committee for Monitoring Assisted Reproductive Technology and the World Health Organization, ART 'includes the in vitro handling of both human oocytes and sperm, or embryos for the purpose of establishing pregnancy' (Zegers-Hochschild et al., 2009, p. 2685). Following scholarship on queer and trans reproduction (Leibetseder, 2018b; Mamo, 2018), I define ARTs more broadly as processes involving the in vitro handling of gametes, artificial insemination as well as home or DIY inseminations.

Where media infrastructures scholar Lisa Parks (2015) helpfully defines "infrastructure" as the hard "stuff you can kick", according to a Software Studies perspective the difference between "hard-" and "soft-" ware is not actually between materiality and immateriality, or even visibility and invisibility (Fuller, 2008; Chun, 2011). This troubling of the binary distinction between material and immaterial, and between hard and soft, coincides with a trans*feminist[2] politics that conceives of the human body not as a preexisting "natural" entity awaiting "technological" modification, but as the already hard-soft material-immaterial effect of vertically stacked and networked medical, social and political technologies of the body (Preciado, 2017). This thesis brings together perspectives on reproduction from across the fields of Science and Technology Studies (STS), Software Studies, trans*feminism and Queer Marxism to approach the digital interfaces

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[2]   I use "transfeminism" interchangeably throughout the thesis with trans*feminism and trans*, following the adoption of the asterisk in English speaking contexts by many activists and scholars since the early 2010s in recognition of the way in which both the terms "transsexual" and "transgender" have been resignified in opposition to their deployment within colonial Western medicine (Cardenas, 2022; Raha, 2018). The addition of the asterisk in particular registers the "post-internet" condition of sexual and gender politics today, and the ways in which transfeminism with and after the Internet might be seen to pursue networked interdependencies. Sevan Bussell (2012) explains, "The asterisk came from internet search structure. When you add an asterisk to the end of the search term, you're telling your computer to search for whatever you typed plus any characters after" (as cited in Tompkins, 2014). Micha Cárdenas (2022) adds, "using a digital command line syntax indicates trans-anything: transgender, transexual, nonbinary and more" (p.11). The term "transfeminism" has distinct political genealogies in different geolocations. In Spain, the term is used interchangeably and often in replacement of "queer". This is on one hand because in a *Castellano* and *Catalan* speaking context, *transfeminismo* "is more meaningful" than the Anglo-American "queer" and also because transfeminist politics has historically, since the mid-2000s, centered experiences of gender non-conformity "that traditional feminism hasn't fully addressed as political subjects, such as transsexual or transgender people, dykes, butches, sex workers, fags, and people with functional diversity" (Egaña & Sola, 2016, p.75). In Barcelona there is a rich precedent of intersections between transfeminism, anarchism, feminism, artistic experimentation, post-porn practices, DIY and the free and open software movement. Though these intersections are not the subject of this research, this thesis is informed by these political and aesthetic cultures of experimentation in Spain, which I have participated in since 2013.

and infrastructures of assisted reproduction as *a depository for human memory and a powerful translation zone where the reproductive imaginary is fashioned today.*

This thesis elaborates on the structural link between the lesbian-led artificial insemination networks of the 1970s and the heteronormative IVF centered global commercial fertility business of today; between the demands to obtain access to medical technologies compounded by HIV/AIDS related queer activism and the liberal eugenic discourses on access and choice promoted by contemporary fertility discourses. At first glance I use the concept of "queer reproduction" as it may be linked to experiences and histories of LGBTQIA++[3] engagement with the changing landscape of fertility and reproductive technologies, taking lead from sociological scholarship on "queering reproduction". Queering reproduction was a concept developed through empirical studies of LGBTQIA++ people using assisted reproductive technologies in clinical settings to create families (Mamo, 2007; 2010). While this research recognizes how queer "chosen families" (Weston, 1991) take on many forms and may result from both medicalized reproductive technologies and DIY inseminations, the general fastening of queer reproduction to state or commercial biomedicine[4] potentially limits the reproductive imaginary constructed by the research itself. In the first place, such a strong link between queer reproduction and the fertility clinic overlooks the fact that queer and queer of color communities have long been engaged in reproductive and care work, though this has gone undervalued and under-theorized by dominant theories of reproductive labor and the

3   The practice of naming sexualities, and their acronymization, are sites of historical tension and contestation. I use the acronym LGBTQIA++ (Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual and more) interchangeably with LGBTQ+ (Lesbian, Gay, Bisexual, Queer and more) to refer to these intersecting political struggles around sexuality and gender nonconformity. I use the shorter acronym LGBT without the "+" where I want to, sometimes unconsciously, suggest a narrower or more conservative understanding of sexual dissidence, such as in the context of lesbian and gay revisionist history (Chapter 3) or commercial companies that seem to target only lesbian or gay consumers (Chapters 2 and 4).

4   Evidenced in, for example, this definition of "lesbian reproduction" as "enabled through the meeting of assisted reproductive technologies with vibrant women's and lesbian health movements organized around issues of reproductive rights" (Mamo, 2013, p. 229).

household (Raha, 2018). While a focus of this thesis is assisted reproduction "after" the Internet, I resist defining "queer reproduction" only in relation to biomedical infrastructure and the commercial Internet. By rooting the thesis in the question of reproductive work and elaborating on the aesthetic and poetic dimensions of queer reproductive biologies, this research expands the definition of queer reproduction towards the social and dispels misleading narratives around the queer family as somehow new.

It is in this sense that I deploy post-internet art's anarchic traversing of online and offline spaces and its characteristically ambivalent use of analogue and digital technologies. The term "post-internet" is credited to the U.S artist Marisa Olson, who used it to describe artworks that "address the impacts of the internet on culture at large, and this can be done well on networks but can and should also exist offline" (Regine, 2008). The "post-" in post-internet is understood to signify not "after" the Internet but (as in post-feminism, post-colonial and post-human) the revision or critique of a fundamental force that is so embedded in the culture that it constitutes rather a "condition" (Gronlund, 2014, p. 214; Quaranta, 2017). Post-Internet is sometimes used interchangeably with "post-digital", which Florian Cramer (2014) recognizes is "a term that sucks but is quite useful" for the way it describes both "a contemporary disenchantment with digital information systems and media gadgets, and a period in which our fascination with these systems and gadgets has become historical" (p. 12). The terms post-internet and post-digital both express the ambivalence of the Internet itself as something to be embraced *and* critiqued, rejected but also transformed, intervened and also in the best case ignored. Even though "post-internet" may seem "awkwardly passé [...] as at least in the art world the post-internet already happened" (Kolb et al., 2021, p.4), I use the term for its enduring critique of the discourses of progress and innovation that pervade the framing of "technologies" as "new", as well as its characterization of the relationship between "online" and "offline" as fundamentally a dynamic one. The "post-internet" framing holds space for paradoxical readings: I locate the changing landscape of queer reproduction in relation to specific digital technologies –like Internet interfaces and facial-matching algorithms– but I also consider what about queer reproductive lives after the Internet is actually just the same as "pre-Internet" times.

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Discussion around social and biological reproduction across Western media has been dominated in recent years by questions of access to reproductive resources, especially in light of the 2022 overturning of *Roe v. Wade*. As well as the legal effects of the U.S. Supreme Court decision, the communication leading up to the legislation change, including the supposed unintentional leak, was a jolt to the global public imagination regarding reproductive rights. One outcome of the ruling was the eclipse of one reproductive "topic" over others: many responded to the streamlining effect of the global spotlight on abortion by creating solidarity across struggles and connecting, for example, the criticism of the conservative attacks on bodily autonomy through restricted access to abortion to transfeminist, queer, crip and reproductive justice discussions of bodily autonomy (Price, 2023; Faye, 2022).[5] Other scholars connected the renewed focus on access to abortion as a vital *resource* to wider social reproduction resource struggles, such as the need to secure "decent wages, worker protections, unions, freedom for queer and trans people, immigration policies not rooted in terrorizing and exploiting migrants, ending police violence, safe housing, food security and addressing the climate crisis" (Briggs, 2022). The fallout from *Roe v. Wade* demonstrates how reproduction is tied up not only in legal permissions and prohibitions but in questions of visibility, public cultures of memory and information: "reproductive politics is in large part about language and the contestation of meanings" (Pollack Petchesky, as cited in Franklin, 2018 p. 638). Following theorists of social reproduction (Sears, 2016; Federici & Jones, 2020; Ferguson, 2016; Gimenez, 2019; Vogel, 1983), reproductive politics (Briggs, 2018; Price, 2021; Roberts, 1997) and the imaginary (Jasanoff & Kim, 2015), we might think about this field of

5   As Shon Faye commented in August, 2022, "If you look globally there is an attack on trans people's bodily autonomy and if we look at the U.S there is an attack on all women by the right. All women have a big storm coming" (Faye, 2022). These arguments have been the focus of the reproductive justice movement over the last three decades. The term "Reproductive Justice" was coined in 1994 by a network of Black women in Chicago, USA, in the context of the Cairo International Conference on Population and Development. Reproductive Justice activists and intellectuals highlighted the limits of the middle-classness and whiteness of the "women's movement" and have focused on questions of race, class, commercial toxicity and the environment where these had been overlooked by a liberal feminist politics and discourse of reproductive rights (L. Ross et al., 2017; L. J. Ross & Solinger, 2017; Price, 2021, 2022).

contestation as the "reproductive imaginary": those ideas and feelings about reproduction that are collectively held and performed at the level of governance.

The "reproductive imaginary" is populated by racial and gender stereotypes which directly impact reproductive health through policy (Hill Collins, 2006) and stratify labor in hierarchies of value and visibility across national contexts and within the household (Ginsburg & Rapp, 1995). Cedric Robinson (2000) coined the term "racial capital" in the early 1980s to refer to the way in which "the development, organization, and expansion of capitalist society pursued essentially racial directions" (p.2). Robinson provides an extensive history of the "racial sensibility of Western civilization", which he writes is "a material force", both an "ideology and actuality that affects the class consciousness of workers" (p.3). Debates around who can be recognized legally or normatively as a "worker", "national" and "parent" are, from this perspective, material struggles to the extent that these identities not only enable access to legal protections and material resources (housing, food, energy and land) but are powerful subjective identities that promise a sense of racialised self- and collective belonging. Robinson explains, "racialism permeates the social structures emergent from capitalism and the term 'racial capitalism' refers to this development and subsequent structure as a historical agency" (p.3). As Robinson reminds us, however, "capitalists never achieved the coherence of structure and organization that had been the promise of capitalism as an objective system" (p.9). This thesis affirms the ways in which reproductive imaginaries and racial sensibilities are being re-organized all the time and how reproductive resources are appropriated and self-managed in disobedient ways.

QUEER REPRODUCTIVE WORK:
QUEER WORK, REPRODUCTIVE LABOR
AND FIXED CAPITAL

The concept "queer reproductive work" builds on and fuses three scholarly traditions: the study of *queer work*, defined in the mid-1990s as "work, which is performed by, or has the reputation of being performed by homosexual men or women" where "queer is used to

emphasize the stigma that was attached to it" (Bérubé, 2011, p. 261)[6]; theorizations of *reproductive labor*, which bridge multiple strands of Marxist Feminist, Black Feminist and Queer Marxist thought, from the mid-1970s to the present, on how capitalist production relies on unwaged domestic labor (Costa, 1988; Dalla Costa & James, 2017; Federici & Jones, 2020), the maintenance of genders and sexualities (Federici, 2012, 1975; Rubin, 1975) and practices of consumption (Floyd, 2009) either directly or indirectly (Vogel, 1983); and *fixed capital*, which is Marxist lexicon for the physical infrastructures of communication and transport without which capital could not "flow and expand" (Harvey, 2001).

Marx's concept of fixed capital figures in contemporary scholarship on one hand as the "immoveable" built environment of the city (Harvey, 1975; 1982; 1985; 2001; Jessop, 2004; Eckers & Prudham, 2017) and on the other hand as what Antonio Negri has called the "digital machines" (2019), which span the software-hardware of algorithms, cables, computers and servers (Greene & Joseph, 2015). In other words, and following both strands, fixed capital "has left the factory and moved into smartphones, homes, and cities" (Hui, 2018). David Harvey (2001) explains how "capitalism could not survive without being geographically expansionary and perpetually seeking out 'spatial fixes' for its problems" and that in turn "major innovations in transport and communication technologies are necessary for that expansion to occur" (p.25). The global fertility industry is exemplary in this respect as it not only depends on spatialized fixed capital arrangements to function (the clustering of fertility clinics and banks in the highest rent paying areas of capital cities; the fashioning of entire countries as reproductive tourism destinations; the development of transport networks necessary to safely move tissue across borders; and the design of baroque fertility and donor catalog websites to capture and manage consumers' attention) but the creation of new fixed capital technologies (new pharma, new diagnostics and technosolution add-ons) is central to the business model of competing

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6   The term 'queer work' was coined by Allan Bérubé in a 1996 keynote lecture at the 22nd Annual Southwest Labor Studies Conference, San Francisco State University, in reference to what he called the 'homosexualising' of steward work on cruise ships in the 1930s, which he analyzed in relation to the racializing of work in the hospitality, service and leisure sectors (Bérubé, 2011).

fertility clinics and firms. In this thesis I consider the fixed capital of the ART market as it "plays a vital role not only in facilitating economic function but also in helping to secure the legitimacy of particular social orderings" (Ekers & Prudham, 2017, p.13). I look at how these ideological social orderings may be structurally linked to and partially determined by past experiences and histories of queer reproductive work.

Melinda Cooper and Catherine Waldby (2014) have already analyzed how the invisibilized reproductive labor of tissue donors and experimental test subjects produces surplus-value in the context of stem cell research and assisted reproduction, which they frame as markets within the wider "bioeconomy".[7] Focusing on bioeconomic clinical labor is "novel" they note, "because generally speaking, tissue donation and research participation are not understood or analyzed as a form of work" (p. 7). Further ethnographic research on the experiences of bioeconomic workers has revealed how, in the context of the European market, the majority of eggs used in IVF procedures are donated by young working-class people (Lafuente-Funes & Pérez Orozco, 2020; Vertommen et al., 2021), many with experiences of migration (Nahman, 2018) and/or are LGBTQIA++ identifying (Leibetseder, 2018b). That the heteronormative IVF-centered market is paradoxically reliant on unending supplies of donated "queer egg cells"[8] (Leibetseder, 2018a) has led to key insights regarding the politics

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7   The term "Bioeconomy" was popularized by the 2009 report The Bioeconomy to 2030, an initiative of the Organization for Economic Co-operation and Development (OECD). The report "invites the reader to think about the global challenges of the future and how the biological sciences may contribute to solving these complex problems" (p.21), proposing a range of technologies, industries, practices, and services –including genetically modified plants and microorganisms, bio- and synthetic fuels and advanced knowledge of genes and complex cell processes– as "valuable solutions". The report does not mention assisted reproductive technologies such as IVF nor are fertility questions addressed explicitly. However, I follow Cooper and Waldby (2014) in including the fertility industry within the domain of the "bio-economic", based on their idea that today the "in vivo biology of human subjects is enrolled into post-Fordist labour processes" (p. 7), the post-Fordist challenges that the report promises to resolve.

8   The egg cells are "queer" because they are donated by people who identify as LGBTQIA++. Doris Leibetseder (2018) builds on the concept of "queer egg cells" in reference to the fact that LGBTQIA++ people often approximate fertility clinics, and freeze and share

of sexuality and sex that lies at the center of value-production in assisted reproduction, and which this thesis elaborates on.

Yet my main focus is not on surrogacy providers or egg donors all of whom have figured as reproductive workers in recent scholarship on the political economy of global fertility services (Vertommen & Barbagallo, 2022). As mentioned, this thesis pursues an understanding of queer reproduction in relation to, but also beyond, biomedical infrastructure, and so I make an argument for widening the frame through which the figure of the queer (bioeconomic) reproductive worker is recognized in scholarship. I ask not only who the queer reproductive worker is, what activities they are undertaking and under what conditions, but also *when* this re/productive work happened. Chapter 3 is key in this respect as it proposes the 1970s magazine *Sappho* as a historical example of a collective of queer reproductive workers who not only transformed their own reproductive imaginaries through actions across the fields of art, research, poetry, editorial, reproductive medicine and politics, but also that of the nation and the commercial fertility industry, well into the present.

The precarious and risk-laden conditions of bioeconomic workers today, as detailed by the above-mentioned scholarship on reproductive labor in the bioeconomy, has highlighted the urgency of considering ethical questions around LGBTQ complicity when using, or not using, surrogacy and donated eggs to create families (Smietana, 2018). Scholarship on the ethics of LGBTQ+ fertility consumer practices has unfolded alongside research on the particular affective activities that, though not specific to, tend to structure the LGBTQ+ experience of the fertility clinic. Such activities include waiting for and/or travelling across borders to access affordable and/or legal treatment and managing discriminatory behavior in clinical settings designed to cater to heteronormative family-making norms (Close, 2022; Dahl, 2020; Lafuente-Funes, 2019; Mamo, 2013). As the ethics of LGBT people using surrogacy and donated eggs, and the experience of discrimination against LGBT people in fertility clinics, has figured centrally in scholarship on queer reproduction (Sudenkaarne & Blell, 2022; Tam, 2021), this research rather zooms in on the forms of queer complicity and resistance stimulated *at the level of the Internet*

programs, not because they are "biologically infertile" but to access donors, or for legal reasons such as the need to protect LGBT co-parenting rights.

interface. This project is not entirely silent though on the experiences of queer bioeconomic workers and ART consumers in the present: *The Queer Reproduction Papers* (Chapter 6) and the film *The Wife of Them All* (2022) reconstruct the voices of fertility industry egg donors, artists, precarious workers, domestic workers and prospective, or existing, parents who identify as LGBTQIA++ today. I foreground the networked connections between these queer reproductive workers, taking care to detail the different material conditions that structure their individual interactions as consumers or workers, while also affirming their capacity to act in networked ways.

Cooper and Waldby (2014) contend that it is not only *the bioeconomic worker* who generates surplus-value for the fertility capitalist, but today *the biological cell itself* performs "regenerative labor" that also produces surplus-value. Cooper and Waldby imbue biology with the innate capacity to generate surplus value to further underline their innovative proposal: to analyze aspects of fertility and reproduction as direct sites of capital accumulation and recognize tissue donors as workers in need of protections, if not already organized in class struggles. Yet this latter concern does not require a theoretical commitment to biology as a site of surplus, and analyzing microorganic and reproductive cellular processes as innately generative of surplus-value is to look at "biology" through the lens of the commercial bioeconomy itself (see ft. 7.). As the critical literature on the bioeconomy contends, the bioeconomy is a "political project" and "an act of the imagination" (Goven and Pavone, 2014). The term itself is actively engaged in redrawing the distinctions between the economic and non-economic; natural and manmade, technological and biological: "the bioeconomy attempts a double movement, by claiming that only these neoliberally embedded technological solutions can successfully address such ecological and social crisis" (Goven & Pavone, 2014, p.19). This critique of the bioeconomy as a faux-solution underlies my development of the concept of the "fertility fix" (Chapters 2 and 4). The "fertility fix" encourages a shift in analytical focus from prescriptive definitions of reproductive labor to the dynamic interactions between reproduction and production as they play out across the city and manifest in "fixed" aspects of bioeconomic infrastructure or particular pieces of software.

The theories of labor and value in the bioeconomy mentioned above are rooted in multiple lineages of Marxist Feminist and Black

Feminist thought on the nature of reproductive labor as it differs from its productive counterpart. Cooper and Waldby's (2014) understanding of unwaged bioeconomic reproductive labor as "productive" for the fertility capitalist, for example, is inspired by an argument made by Wages for Housework, a 1970s international feminist movement (Dalla Costa & James, 1975; Federici, 2020).[9] Wages for Housework called for a wage for unpaid domestic labor based on the idea that reproducing the waged worker's labor-power in the household upholds capitalist production, and thus should be considered "productive" of surplus-value for the capitalist. Angela Davis (1977, 1983), also writing in the 1970s, argued alternatively that unpaid domestic labor "generates only the value of utility, and is not related to the productive apparatus" (1977, p.176). Davis stressed the limits of calling non-productive labor "productive" and argued against demanding wages when historically wages have not offered sufficient protection for Black women domestic workers (1983, p. 237). The debate about where exactly the distinction can be drawn between productive and reproductive labor continues into the present. Yet there is a shared appreciation across Black Feminist, Marxist Feminist and classical Marxism regarding the "dual-character" of reproductive labor as both necessary to capitalist production while also a site of political struggle: as Patricia Hill-Collins stated in 1990, "reproductive work is a site of both confinement and empowerment" (p.46). These intellectual and political lineages are key to this thesis' development of the concept of "post-internet queer reproductive work" and have fundamentally influenced the Queer Marxist theories of reproductive work that I mention in Chapter 3. My decision to introduce more centrally the question of fixed capital is, though, weighted towards the Marxian Social Reproduction Framework (Davis, 1983; Doyle Griffiths, 2020), which takes up an orthodox reading of Marx's Labor Theory of Value.

According to Marx's Labour Theory of Value set out in Capital. Volume 1 (1976) reproductive labor does not produce surplus-value, but

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9   The first articulation of the Wages for Housework movement took place in Italy through the work of Mariarosa Dalla Costa, Selma James, Silvia Federici and Brigitte Galtier, who formed part of the International Feminist Collective. Wages for Housework groups were later established across France, Germany, Switzerland, England, the U.S, Mexico, Argentina and Canada (Toupin, 2018).

that is not to say that social reproduction does not become incorporated into the productive circuit at all. Marx's (1973) theory of fixed capital, first elaborated in The Grundrisse (1857), rests precisely on the idea that machines and technical infrastructures are not only the direct product of the waged laborers who built them in factories and warehouses but are also the indirect "organs of the human brain, created by the human hand, the power of knowledge objectified" (Marx, 1973, p. 606). Marx goes on to say that once manufactured by workers, fixed capital "steps in and out" of the productive circuit: "materials are fixed capital not because of their specific mode of being but because of their use" (p. 681). Marx's concept of fixed capital thus describes how aspects of social reproduction –social knowledge and experience– can be later incorporated into the productive circuit through the creation and use of infrastructure; and his theory highlights the particular significance of spatial and temporal orderings to value production at large (Marx, 1973, p.606). The idea that social reproduction at some point enters the circuit to produce value has been central to both Marxist Feminist thinking on the productive dimension of reproductive labor, and the Italian Autonomist Marxist theories of the "General Intellect" (Hardt & Negri, 2001; Marazzi & Mecchia, 2011; Virno, 2003). I suggest it is also highly relevant to the present analysis of the structural link between queer reproduction struggles and the digital fixed capital of the fertility industry.[10] Marx's theorization of fixed capital as the objectification of human knowledge and social practices over time is conducive to a broader reading of the built environment (urban, rural and post-internet) as the effect of interactions between reproductive and productive work and shows how "socioecologies, as forms of dead labor embodied in fixed capital, help to drive or impede the production and flow of value through physical infrastructure and landscapes of production" (Ekers and Prudham, 2017, p. 7). Queer reproductive work in this sense might be seen to haunt[11] the

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10   Discussions of the "General Intellect" in Marx's writings within the Italian Operaismo movement have been traced back to Antoni Negri's 1978 lecture on the 'chapter on machines' in Marx's *Grundrisse* (1857) (Pasquinelli, 2019).

11   I use the term "haunt" only twice in this thesis in reference to the way in which queer reproductive work might be seen to be 'present' even where it is most absent, just as a ghost is an absent person who

reproductive imaginary of the contemporary fertility clinic.

Recent theorization of Queer and Black trans social reproduction (Raha, 2017, 2018, 2021; Ellison, 2017) have focused precisely on the *materially transformative* dimension of reproductive labor as a process that modifies human knowledge, biology, technology and the built environment. The concept of "post-internet queer reproductive work" relies centrally on Kate Doyle Griffiths (2019, 2020) and Nat Raha's (2018, 2021) theories of queer social reproduction, and this thesis builds from Raha's thorough reconstruction of the genealogy of the concept of reproductive labor/work across Feminist Social Reproduction Theory and Women of Color Feminism throughout the 20th and 21st centuries. Raha's genealogy traces, for example, the connections between John D'Emilio's (1983) early work situating the emergence of gay identities in relation to changes in industrial capitalism to Miranda Joseph's (2002) insights on the "productive" dimension of gay sex; between Patricia Hill Collins (1990) perspective on reproductive work in the context of the maintenance of Black family life and Leah Lakshmi Piepzna-Samarasinha's (2018) more recent analysis of the labor dimension of "care work" in the context of Disability Justice organizing and daily life. Raha also situates Meg Wesling's (2015) influential concept of "Queer value" in relation to Rosemary Hennessey's (2006) study of the "feminized labor" of Queer maquila workers on the U.S-Mexican border, whose forms of sex-gender non-conformity were instrumentalized by capitalist employers to lower the cost of labor-power, while also becoming central to the queer workers'

makes themselves known through a haunting. The notion of haunting is also linked to this project's analysis of how queer reproduction struggles are orientated around the creation of alternative futures which in turn transform the present. The idea that the future, not the past, "haunts" the present is most famously distilled in the first line of the communist manifesto: "A specter is haunting Europe — the specter of communism". I chose not to take up haunting too centrally however, in light of the rich work on haunting– from Jacques Derrida's *Spectres of Marx* (1993) to Mark Fisher's (2012, 2016) writing on hauntology. While resonant, this latter post-Marxist lineage is structured around a certain nostalgia for the linear time of modernity and focuses too normatively on how past imaginings of an alternative future have failed. On the contrary, I study the queer reproductive imaginary as it was fundamentally realized: though fragmented and extracted, queer reproductive work has resulted in the radical transformation of the global reproductive imaginary, even and especially, where this memory is erased or suppressed.

"activation of critical consciousness" (p. 394). In Chapter 3 I return to some of these, and more, queer theoretical perspectives on reproductive labor in my analysis of *Sappho* magazine as a hub for (post-internet) queer reproductive work. As Raha (2021) observes, the social reproduction of LGBTQIA++ life remains marginalized within Marxist Feminism (p.105). That is not to say however that the Queer Marxist perspective on social reproduction differs theoretically from Feminist Social Reproduction Theory. On the contrary, as Kate Doyle Griffiths (2018) explains in her defense of Social Reproduction Theory (SRT) (a response to Melinda Cooper's critique of SRT), she writes:

> SRT does not attempt to substitute reproductive labor for productive labor as the source of a "new" revolutionary subject, or argue that women's strikes, riots, or social movements against police violence and the devaluation of black life replace organizing and consciousness at the point of production in Marxist theory. Instead, we suggest that exactly as the atomized work of individuals at the point of production can and should be seen as collective product of the working class, so, too should the work of social reproduction, and that both are spaces of radicalization and development of class consciousness. Rather than viewing movements of women, queer, and racialized subjects as Reinscriptions of the divisions of the capitalist labor market, or worse, diversions from the class project, they are seen to precede and create the necessary social conditions for broad class action, both activating and potentiating class struggle at "choke points" of logistics and manufacture.

Doyle Griffiths' observation that reproduction struggles bear on, if not fundamentally determine, the realm of production is central to this thesis and its focus on the dynamic interactions between production and reproduction; waged and unwaged reproductive work. Queer and trans* social reproduction theory does much to bridge the gap between early Marxist Feminist concerns with reproductive labor as a concrete set of domestic activities that produce value in independent ways, and the "unitary" perspective (Davis, 1983; Edholm, Harris and Young 1977; Vogel, 1983; Ferguson & McNally, 2013; Doyle Griffiths, 2020) that rather observes the great number of dynamic labor processes, institutions,

borders and material infrastructures and industrial complexes implicated in upholding, and transforming, the capitalist class relation. Following SRT, this thesis avoids approaching biology or reproduction as inherent sites of surplus-value and takes up an orthodox and unitary reading of Marx's Labor Theory of Value to analyze how biology, technology, gender, sexuality and the city are all *worked on* in ways that are productive, reproductive, waged and unwaged.

I take up a Queer perspective on social reproduction theory to focus on the *materially transformative* dimension of queer reproductive labor as a process that modifies human knowledge, biology, technology and the built environment over time. Yet the materially transformative dimension of reproductive work, queer or otherwise, has not been fully addressed in relation to the digital infrastructures of the bioeconomy. It is to fill this gap that I focus on the structural links between queerness and the digital infrastructures and interfaces of the fertility industry, proposing that today's heteronormative fertility fixed capital is one such "choke point of logistics and manufacture" (Doyle Griffiths, 2018) where class struggle plays out according to a politics of sex and sexuality.

A classical reading of Marx's Labor Theory of Value, as taken up within Social Reproduction Theory (SRT), is arguably more important today as many "bio" and "reproductive" processes –from aspects of reproduction to energy, utilities, science, knowledge etc.– are being, or are already, subsumed entirely as direct sites of accumulation. Yet the corresponding systems of waged labor have obviously not materialized. Kevin Floyd (2016) suggests, by way of explanation, that "what is expanding is not value-producing labor, but capital relative to value-producing labor, and the global reserve of surplus labor – a form of life radically disassociated from the valorization process" (p.66). Biology and technology under the present regime of accumulation, from this perspective, is not generative of *surplus-value* but generative of *surplus labor*. In other words, it is perhaps truer today than ever before that, as Marx (1976) said, "capital has acquired the occult ability to add value to itself" (p. 255). Treating the question of social reproduction as central to fixed capital creation after the Internet, enables me to argue that if technology and biology (and their many intersections) *appear* to generate surplus-value in and of themselves, it is because they have been made, fashioned, manufactured and maintained by workers, over time.

By connecting these lineages of Marxist Feminist and Queer Marxist Social Reproduction Theory to recent discussions of the digital machine and fixed capital, it is possible to consider how, on one hand, LGBTQIA++ communities reproduce ourselves through activities of self- and collective re/production, and also how, over time, queer reproduction gets extracted and objectified as specific technologies or aspects of the built environment. A focus on fixed capital pursues a wider spatial lens through which to observe, as Ferguson and McNally write (2013), "the world as significantly the product of people's reproductive labor" (p. xxxvii). By ushering in discussions of fixed capital and its dynamic relationship to both production and reproduction over time, it is possible to approach work beyond labor studies definitions as a set of concrete activities or professions. As Fergurson and McNally (2013) comment, "too often [social reproduction feminists] conceptualized labor as a thing, operating within another thing or structure (eg. the economy, the household or community)" (p. xxxvii). Queer reproductive work is mobilized in this thesis as an analytic for studying the dynamic and temporally complex process of transforming subjectivities, digital technologies and the built environment.

RESEARCH QUESTIONS

The questions that guide this artistic research are:

- To what extent are past cycles of queer reproductive work incorporated as the fertility industry's fixed capital?
- How might the interface-page be reclaimed by the reader-writer as a space to fashion queer and trans*feminist reproductive imaginaries and biologies?

WRITING GESTURALLY AS CRITICAL ARTISTIC RESEARCH METHOD: DETOUR, EROTIC KNOWLEDGE AND HISTORICAL MATERIALISM AT THE LEVEL OF THE INTERNET INTERFACE

The proliferation of materialities of writing –across interface, page and video– that constitute this thesis is not random methodological opulence but a critical response to the reproductive politics of the Internet interface. The Internet interface is fundamentally "interdisciplinary" as it "draws on the materiality of other media (e.g. text, pages, photography, cinematic language, control panels)" (Pold & Bertelson, 2004, p. 26). Many scholars and artists have refined creative practices at specific interdisciplinary junctures, such as the rich traditions of code poetry (Betran et al., 2018; Raley, 2012), electronic literature (Hayles, 2008) and software art (Soon & Cox, 2021). Other practitioners have followed certain orthodoxies rooted in the medium specificity of aesthetic programming (Fazi & Fuller, 2019), such as the idea that to critique a control and feedback system, like the Internet interface, the critique must be performed as that system (Moll, 2016; Parikka, 2021; Pold, 2019). Inspired by these practices, this thesis advances an interdisciplinary art practice that writes within, but also across, mediums: I conflate page and interface, html and lyric, animation and sculptural inscription because these switches characterize the subjective experience of the everyday Internet interface. The art and poetry works introduced in Chapter 5 and contextualized in Chapter 6 privilege the experience of a general interface "reader-writer", a term I use throughout in the place of "user" or "consumer" to emphasize the political and creative dimension of everyday reading practices on- and off- line (Castillo, 2022).

Instead of defining this writing practice as "interdisciplinary" or "expanded", I use the term "writing gesturally". This is with the explicit aim of directing the critical and creative force of the Feminist and Queer theoretical and artistic lineages of gesture towards the study of the Internet interface. Writing gesturally is attuned to the Internet interface as it pressures, captures and manages at the intersection of the linguistic and bodily: the gestural. The gestural, as it relates to a critique of the politics of the body and political imagination, has two main lineages (Close, 2022). Firstly, a theoretical lineage

rooted in Black Feminist Thought, Social Reproduction Feminism, Queer Theory and Queer Marxism, which have all considered how patterns of bodily movement relate to power structures in work, communication and politics.[12] The second is a plastic lineage rooted in contemporary art that involves the artistic displacement of daily bodily gestures through dance, performance, video and new media art.[13]

[12]   I highlight in particular social reproduction feminism's attention to the assignment of particular gestures – "cooking, smiling, fucking"– to women so that their unpaid and domesticated "feminine work" may be easier to "extract." (Federici, 2012, p.19). Key to the theoretical lineage is Black Feminist scholarship, which has pointed out how the gestures associated with domestic labor do not always mean the same thing when taking into account the racialization of work. Patricia Hill Collins (1990) notes that many Marxist feminist theories of women's reproductive labor fall short of explaining, and indeed invisibilize, Black women's work experiences, which include the long history of Black women undertaking paid domestic work as well as the unpaid work that Black women do to care for black family life. Also relevant are Queer Theory conceptualizations of gender as "performative" to the extent that all genders require repetitive daily "corporeal enactments" (Butler, 1993, p. 234). Queer Marxism deepens the insight with a discussion of "regimes of sexual knowledge" that are "historically specific" and that have "complex social effects" that include the regulation of how bodies connect, touch and share affection in public space (Floyd, 2009, p. 25). Bodily gestures associated with the "masculine" or "feminine", as well as the "policing of intimacy" between the sexes in public space, is, according to this perspective, historically specific to the beginning of the 20th century when particular transformations in production, consumption, popular culture and psychoanalysis were underway. For a Critical Artistic Research method, this lineage of gesture is important as it reminds us that the body always moves in relation to regimes of knowledge about bodily difference; and that such epistemologies of difference are always in dispute, at the level of "the everyday."

[13]   Think of the mobilizing of the repetition of walking in Lucinda Childs' 1979 work *Dance*; Lorraine O'Grady crashing a New York art gallery –one of the only gallery's at the time dedicated to avant-garde black arts – in 1980 wearing a white gown and cracking a whip shouting "No more boot-licking! No more ass-kissing! No more buttering-up! No more posturing of super-assimilates!" (it was the artist's guerrilla performance work *Mlle Bourgeoise Noire*); Pedro Lemebel and Francisco Casas naked atop a mare in the Yeguas del apocalipsis protest against censorship *Refundacion de la Universidad de Chile* (1988); Pipilotti Rist walking down the street in a blue gown holding a baseball bat and turning suddenly to smash a car in the video work *Ever Is Over All* (1997); Lesbian artist Sharon Hayes reading a pledge to be the next president at the 2008 Republican National Convention in

While one might be tempted to say that the plastic lineage is the practical dimension of the gesture, whereas the first lineage is the theory, it is precisely the self-reflective and critical import of artistic displacements of bodily gestures that affirm the theoretical reach of working plastically. My term *writing gesturally* conflates the theoretical and plastic and sees this "interdisciplinarity" as a key dimension of a Critical Artistic Research method, as the discipline pursues a knowledge project of *commoning*.[14]

Audre Lorde's 1978 essay *The Uses of the Erotic: the Erotic as Power* profoundly grounds the idea of "interdisciplinarity" and "the commons" in a Queer and Black Lesbian Feminist politics and practice of knowing. Audre Lorde proposes the term "erotic knowledge" and defines this as the "sharing deeply [of] any pursuit with another person" (2007, p. 53). Lorde explains how erotic knowledge can be transmitted while "dancing, building a bookcase, writing a poem or

Revolutionary Love 2: I am Your Best Fantasy; the combination of ambient music, counting and gestures associated with different kinds of office and factory work in the opera *Einstein on the Beach* (1976); Pratibha Parmar's video work *Sari Red* (1988) that centers the gesture of dressing at her family home and was made in protest at the racist murder of a teenager in London; Faith Wilding's 1974 poem and performance *Waiting*, in which the speaker, rocking back and forth, summarizes a woman's life as a series of waiting scenes; "Waiting for someone to feed me, Waiting for someone to change my diaper…Waiting to go to a party, to be asked to dance, to dance close…Waiting for my children to come home from school Waiting for them to grow up, to leave home…Waiting for my flesh to sag"; Shu Lea Cheang's 1994 Net Art work *Brandon*, which consisted of a system of interfaces grounding the gestures of virtual navigation in a dissident memory practice and celebration of trans* life. These examples are insufficient but they suggest the long tradition of research into the plasticity of the gesture across dance, performance, video and new media and Net Art.

14   The concept of the commons has been taken up by multiple theorists and practitioners in reference to struggles over land, education, communication, knowledge, energy and resources. This is the broad application I use here, which connects to feminist, queer and decolonial critiques of scarcity, and particularly Audre Lorde's (2007) theory of erotic knowledge as a reminder of "what is shared and not shared" (p. 78). Marxist and Marxist feminist thinking on the commons often departs from the historical English common law concept of "the commons" (Federici, 2014; Linebaugh, 2009). Since the 2008 financial crisis, the commons has been widely embraced as a method in contemporary art and critical artistic research practice (Balkind, 2018; Baldauf, 2016; Kirkkopelto, 2022; Moten and Stefano, 2004).

examining an idea" (p. 57); adding that "there is a difference between painting a back fence and writing a poem, but only one of quantity" (p. 56). In these passages Audre Lorde conflates a wide range of artistic, theoretical, poetic and daily life practices, emphasizing what is most important to any or either: sharing. This "sharing of joy, whether physical, emotional, psychic, or intellectual, forms a bridge between the sharers" which in turn provides "the basis for understanding what is not shared between them" (p. 56). Lorde here explicitly connects a notion of the commons (the sharing that "forms a bridge between the sharers") with a critique of scarcity ("what is not shared between them") and the fact that this knowledge can be shared through a wide range of disciplinary practices: while the transmission or "charge" of erotic knowledge often occurs in language ("a poem or examining an idea") sometimes it is non-linguistic or a material practice ("painting a back fence"). These reflections on creativity, sexuality, materiality and knowledge make this 1978 essay a key text for considering the body politics of "interdisciplinarity", and for developing a queer and anti-racist practice of knowing within the interdisciplinary field of Critical Artistic Research.

Writing gesturally as a method is also based on what Walter Benjamin (1928) termed "method as detour"[15]: a form of criticism that "looks beyond the geographical and temporal limits of the object under investigation in order to construct a 'constellation' that traverses multiple heterogeneous times and places" (Billings, 2015). Benjamin's detouring opposes linearity and immediacy and opens the research to connections across the realms of art, politics, language, history and personal experience. Detour, as it implies the idea of moving and turning, resonates with the forms of "associative argumentation" that characterize Queer of Color Critique (Esteban Muñoz, 2019, p. 4) and what Chela Sandoval (2000) termed the "differential mode", which "functions like the clutch of an automobile, the mechanism that permits the driver to select, engage and disengage gears [...] the differential represents the variant; its presence emerges out of correlations, intensities, junctures, crisis" (p.57). I use the term "writing gesturally"

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[15]   Walter Benjamin mentions 'Methode ist Umweg' ('Method is detour') in his PhD thesis, entitled *The Origin of German Tragic Drama* (1928), submitted at the University of Frankfurt. I am grateful to Tjasa Kancler, whose PhD thesis, cited below, uses "detour" and who first drew my attention to it as a method.

to underscore what is present in the Bejaminian detour, Muñozian associative argumentation and the Sandovalian differential mode: *the body* as it turns (detours), connects (associates) and moves (differentially) between ways of knowing, doing and making.

Writing gesturally resists the "method first" approach too, because from a feminist and antiracist research perspective *all* research "does not just produce a particular account of an object but in fact produces the object itself" (M'Charek, 2005, p.171). This linking of *accounts* to *objects* manifests in this thesis as each chapter, artwork or stage of the research taking on a distinct materiality, voice or style as the object of study shifts and contaminates the research method. Writing gesturally contextualizes the "methodological pluralism" that characterizes many artistic research processes (Borgdorff, 2012; Hannula, Suoranta, & Vadén, 2014) not as multiplicity for multiplicity's sake but as the "intentional tactics" (Sandoval, 2000) of a project rooted in these feminist critiques of method. Following an established tradition of feminist and antiracist science studies (R. Benjamin, 2019a; Haraway, 1996; M'charek, 2005) and Queer Theory (Butler, 2006, 2011; De Lauretis, 1987; Foucault, 1990; Preciado, 2017; Sedgwick, 2008), this research pursues a constellation-style analysis of the reproductive imaginary that links social reproduction to the Internet interface; facial-matching algorithms to European racial science; the human face to the poetic form of the sonnet; clay animation film to the racialized discourses of biological plasticity; cryopreservation to heterosexuality; bio-markets to climate emergency; and reproductive biology to work.

Queer historical materialism explicitly combines this constellation-style analysis of "capitalist culture in its dynamic, geographically diverse, and contradictory articulations" (Rosenberg and Villarejo, 2012, p.4) with what Rosenberg & Villarejo (2012) call "recovery work" (p. 5), exemplified in the practice of re-reading the documents of past artistic, literary and political movements in ways that self-consciously sustain struggles in the present. For Walter Benjamin (2003), historical materialism lies precisely in the idea that the past is incomplete and discontinuous; a string of "interruptions", "flashes", "storms" and "moments of danger" (p. 390). Following this approach to history as a struggle between presence and absence, silence and ubiquity, I search for queer reproductive work where it is most amply documented (across the pages of a lesbian arts and culture magazine

from the 1970s) but also where it has been repressed, forgotten or erased: across the ableist websites of the global fertility industry.

Writing gesturally as a Critical Artistic Research method emboldens the layering of sociological, historical, auto-theoretical, poetic and plastic work to structure the research project, where the whole pursues not absolute objectivity but a totality of constellations, interruptions, polyphony and montage. A number of PhD theses in the field of Artistic Research do just this: combine critical writing, essay, auto-theory, historical and sociological research with plastic practices in art, performance, film and poetry as a means of analyzing capitalist culture. Examples include the use of Benjaminian detour as a method in Tjasa Kancler's *Arte, política y resistencia en la era post-media* (2013); the combination of political economy, queer hi[r]storical materialist[16] methods and poetry writing in Nat Raha's *Queer Capital: Marxism in Queer Theory and Post-1950s Poetics* (2018); Emma Balkind's *Estovers: Practice based research on the concept of the commons within contemporary art* (2018), which combines a study of the concept of the commons in law and history with a diary-like account of art as a practice of commoning; and Eliana Otta's use of the chronicle to document performance-based research into mental health and depression in the context of economic crisis in Athens and Lima in *Lost and Shared: A laboratory for collective mourning, towards affective and transformative politics* (2023). I mention these PhD theses with the idea of locating this Doctoral thesis in relation to the interdisciplinary and international project of Critical Artistic Research (Godin et al., 2021; Bäckman et al., 2021). Furthermore, these theses, each in their own way, account for the experience of the researcher as they detour through academic departments and art disciplines, between institutions, cities and across geopolitical borders, in a way that is not dissimilar to the wandering protagonists of the German idealist *Bildungsroman* literature and drama traditions that

16 Following the adaptation of history to "herstory", Nat Raha (2018) modifies the term "historical materialism" to "hi[r]storical materialism", which she defines as a "radical queer and trans methodology" that "elucidates challenges to structural hierarchies, right-wing politics and capitalist dispossession rooted in the lives, sociality, politics and sexual practices of queer and trans people" (p.27). The term herstory was used widely across the radical feminist and lesbian feminist movements of the 1970s, exemplified in the work of the Lesbian Herstory Archive Project in the U.S.

Walter Benjamin was studying when he coined the term "method as detour" in 1925. As Allan Bérubé (2011), the working-class gay community historian who coined the term "queer work" in 1996 writes,

> most of what I know and how I think has grown out of the situations I have been in. Moving around. Checking out what's going on and trying to understand how it got to be that way with me in it. (p. 233)[17]

Writing gesturally approaches the location and movement of the artist researcher as an integral part of the research. The processual character of detour means the artist researcher can, "offer [themselves] to the research project as an instrument. The subjective knowledge constructed through individual and artistic experience transforms into critical research knowledge through critical and reflective analysis" (Kallio-Tavin, 2017, p. 2). I write about histories of reproductive control and queer reproduction in the UK, where I was born, Spain, where I have lived for a decade, and Finland, where I have been partially based during this doctoral research project. These countries figure in this research through the reconstruction of incidental life choices and turnings, but also because they play specific roles in the flow of fertility capital in Europe and are host to different racialized and gendered hierarchies of access to social reproduction resources and reproductive technologies. Finland is a progressive social democracy that has supported lesbian access to ARTs through private healthcare since the early 2000s, yet the requirement that trans* and non-binary people undergo forced sterilization as part of gender affirmation processes was only lifted in 2023. The UK is the self-proclaimed birthplace of IVF, and where the first IVF baby was born in 1978. Yet, similarly, access to repro-technologies is restricted, and "technologies of non-reproduction" (Chapter 6) continue to condition the possibility for many people to create, maintain or even live with the families they already form a part of. Lastly, Spain has been a reproductive tourism hub since the mid-2000s, with many people travelling from across the globe to access affordable treatment there.

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[17] These words were spoken in a keynote Address for "Constructing Queer Cultures," a conference sponsored by the Program in Lesbian, Bisexual, and Gay Studies at Cornell University, February 1995 (Berube, 2011).

Writing gesturally as a method allows for the poetic-political and plastic-theoretical critique of the tensions between the constructed "open nowhere" of the global fertility industry's online portals and the closed national jurisdictions that mark out Finland, the UK and Spain as specific disciplinary nodes within the European and global fertility market network.

QUEER MARXISM
AND ARTISTIC RESEARCH

Contemporary debates around Artistic Research often crystallize in anxieties over the status of the artwork in the research process: to what extent can the artwork be considered a knowledge output (Borgdorff, 2012)? Further worries stem from the interdisciplinary nature of many artistic research practices: how can Artistic Research practices be evaluated if they are always between disciplines and therefore between disciplinary mechanisms of evaluation (Biggs & Karlsson, 2012; Hellström, 2010)?

The meeting of art and research has unfolded over the last few decades in relation to neoliberal transformations in higher education that have increasingly placed practices of learning, teaching and research under the pressures of the market. Neoliberalism as a political ideology calls for the end to state intervention into educational institutions, and an opening up of institutional educational protocols and practices to the supposedly free interests of the individual as a self-determined and autonomous economic participant. While this might sound like a democratizing approach to higher education, the reality is one of complex and even contradictory partnerships between state governance of education leading to at least the partial privatization of many services and the commodification of all aspects of the commons (Olssen & Peters, 2005). In this sense, art is no different to other subjects, as all forms of knowledge making are subordinated to the laws of supply and demand, often at the expense of the pursuit of science, social science and art for social justice (Nauha, 2022). The chronology of neoliberalism is tied to financial deregulation and policies of privatization in Chile led by Chicago school theorists in the 1970s (Harvey, 2005). While this has involved the accelerated commodification of the commons across the world, this plays

out differently in different contexts and according to North-South geopolitical relations and histories of colonialism (Al-Haija & Mahamid, 2021). Any understanding of the emergence of Artistic Research in tandem with neoliberal educational policies in Europe thus also must take into account the colonial hold over academia and notions of scholarship, which long predates neoliberalism. Defining what science, social science and art *is* and what it is *for* continues to be a site of struggle against colonial imposition.

Part of this imposition is expressed as educational policies and institutional practices organized around the idea of "research excellence" and the creation of "quality knowledge products" fit for exchange on an international market. In this competitive landscape, many art education professionals have mounted their defenses of art with recourse to arguments heavily influenced by modernity-coloniality or the contemporary art market. There is the tendency to defend art as research by emphasizing the technical and conceptual accomplishments of "excellent artworks" (Kirkkopelto, 2022), a definition that derives rather from structures of value formation in the contemporary art market. Alternatively, there is the tendency to defend art as science with recourse to enlightenment notions of "aesthetic experiences" linked to general "theories of color" and sciences of "perception" that presuppose a universal human body, divorced from history, and that supposedly experiences all visual and aural forms in the same way. Such ableist approaches to the aesthetic experience is often said to unfold within a particular medium, whether this medium be a traditional fine art medium, such as painting or performance, or socially engaged art. More critically comes the defense of art as knowledge about art institutions. This defense, as Kathrin Busch (2009) details, ties Artistic Research to the legacy of 1990s Institutional Critique, whose object of critique was the art market and whose tactics are therefore not always adapted for considering today's increasingly baroque chains of commodification of the commons.[18] Bringing Artistic Research and Queer

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[18] Numerous efforts have, however, questioned the art historical confinement of Institutional Critique to practices that *only* comment on art institutions and markets. Collective curatorial and research projects such as Red conceptualismos del sur, the "Re.act feminism archive" and "Conceptualism: Intersectional Readings, International Framings (part of the Black Artists & Modernism" project) –to name just three– have helped write an alternative account of Institutional Critique, populated by actions and research that addressed not only

Marxism together works against the appraisal of "excellent artworks", "aesthetic experiences" and "knowledge production" as the only possible output of an artistic research project, and contests the knowledge economy as the only historical genealogy of Artistic Research as a field. As Audre Lorde (2007) writes: "to encourage excellence is to go beyond the encouraged mediocrity of our society" (p. 54).

Critical Artistic Research may be seen to align with the disciplinary research goals of Queer Marxism, as these were articulated at the intersections of Black Feminism, Queer Theory and HIV/AIDS-related activism: that of transforming, as Audre Lorde says, *silence into language and action,* and as Heather Love (2007) writes, "the base materials of social abjection into the gold of political agency" (p.18). In the U.S academic context of the late-2000s, several foundational Queer Marxist texts dialogued with early 20th century Marxist and Soviet Marxist thinkers and questioned the ontological exteriority of queerness as constructed by early Queer Theory (Edelman, 2004). Jose Esteban Muñoz (2009) wrote about Ernst Bloch; Kevin Floyd (2009) used the work of Georg Lukács; and Meg Wesling (2012) re-read the work of Hannah Arendt. These works all challenged the idea of "a queer" who is "outside the norm" by detailing accounts of collectives of workers who fashioned their sexualities, gender identities and sexual practices in relation to structures of consumption and in tension with the pressures of racialized labor markets. In the U.S academy of the 2010s, Queer Marxism cemented through the work of Petrus Liu (2015); in the U.K through monographic creative and critical research by Nat Raha (2018), Bogdan Popa (2021) and the recent publication of *Transgender Marxism* (Gleeson & O'Rourke, 2021); and in Spain through the work of Rosa Maria Garcia (2021, forthcoming) and Tjasa Kancler (2013). These projects similarly challenge the fallacy of exteriority that pervades early Queer Theory and reclaim queer and trans*ness as a transformative dynamic between workers and their surroundings. These founding theoretical texts of Queer Marxism demonstrated how Queer Theory itself was elaborated precisely in dialogue with many global resistance movements and intellectual traditions –from HIV/AIDS-related direct action to Black Radicalism, Black Feminism and Chinese and Eastern European Marxism. Queer Marxism as a discipline resists not so much Queer Theory but

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the art market but also authoritarian states, political institutions, colonialism, coloniality and the politics of the body.

the neoliberal and academic enclosure of something called queerness to a North American or Western center to which movements from the Global South are to be added subsequently. According to a Queer Marxist perspective, words that circulate to name sexualities and movements should not be understood as versions of an Anglo-American queer. Rather, *cuir* in the Andean territories in Latin America (Falconi, 2020), *tongzhi* and *lala* in "the two Chinas" (Liu, 2015), *khush* in India (Parmar, 1989) and *kuchu* in Uganda (Rao, 2020), for example, hold both local and global histories of pathologization and change their meanings as they are used in resistance movements or alternatively co-opted by state and neocolonial forces. Change and transformation is centered in Queer Marxist studies of the social relations and sexualities that emerge in tension with and in tandem to capitalist production.

It is this challenge to the fixity of queerness as an exteriority or negativity that makes Queer Marxism an appropriate lens for an Artistic Research project on queer reproduction, as the term encompasses both social and biological reproduction; the using and the not using of ARTs; the having and not having of kids; the simultaneous incorporation and exclusion of LGBTQIA++ people from consumer and labor markets globally; and the queer critique of capitalist social forms as they are also potentially strategically embraced. As the focus of Queer Marxism has been the dynamic historical and material relations between people's desires, identities and sexual practices and capitalist production (D'Emilio, 1983; Floyd, 2009; Hennessy, 2002; Raha, 2018; Wesling, 2015), and a major focus of this thesis is precisely the relationship between queer social reproduction struggles and the creation of commodities and fixed capital in the commercial fertility industry, I explicitly use a Queer Marxist theoretical lens. This Queer Marxist approach to reproduction as fundamentally traversed by economic, environmental, technological and social forces is also much informed by the U.S Reproductive Justice (RJ) movement (see ft. 5), whose research and action is organized around a necessarily expansive definition of reproductive rights as, "the human right to maintain personal bodily autonomy, have children, not have children, and parent the children we have in safe and sustainable communities" (Sistersong, 1997). The Reproductive Justice framework is first and foremost a framework for organizing that centers the reproductive experiences and desires of women and people of color, historically overlooked by the mainstream reproductive rights framework.

There is an important analytical and theoretical dimension to the RJ movement that coincides with Marxist Feminist approaches to the household as inherently structured by environmental, food security, housing and labor concerns. While there is come contention about the displacement and abstraction of the RJ framework from the U.S, where the movement originated between 1994-1997, the present research project is palpably inspired by the strategic anti-moralism and capacious definitions of reproduction proposed by the RJ movement and its explicit critique of the racialized politics of reproduction globally. At least at an analytical level, Queer Marxism, Marxist Feminism and Reproductive Justice all emphasize the fact that human beings create, and therefore can change, the social organization of reproduction and in this sense guide this research theoretically.

Beyond the story of Artistic Research as an effect of the neoliberalizing of higher education, and the coming together of "science" and "art" in different lab and tech settings, is a genealogy of Artistic Research already grounded in the Feminist, Queer, Marxist and Decolonial intellectual traditions and their many intersections throughout the 20th and 21st centuries. Particularly, to the extent that these traditions have critiqued colonial science, troubled the extractive methods of anthropological and social science research, and aligned the pursuit of knowledge with social and ecological justice goals. As Ecuadorian writer and theorist Diego Falconi (2017) has said, "it is impossible to separate queer, feminist and decolonial theories from their respective political struggles."[19] Nor would one want to separate the "academic" from the "political" in this way: it is precisely this self-reflexiveness and situatedness that makes these valid research practices. Bringing together a Reproductive Justice and Marxist Feminist informed Queer Marxist lens with an Artistic Research practice enables one to conceive of the use (value) of the research beyond the knowledge economy or art market and in dialogue with these critiques of the politics of the body and the question of *how, why and where to know*. Intersecting Queer Marxism and Artistic Research seeks not the production of knowledge objects nor the study of research subjects, but the sharing of knowledge about social and biological reproduction, which in turn acts as a reminder of the *shared* capacity to know (Lorde, 2007).

[19]   Diego Falconi, talk given in the context of the Máster oficial en Literatura Comparada: Estudios Literarios y Culturales, Universidad de Barcelona Autonoma, 2017.

ETHICAL CONSIDERATIONS

Many factors influenced my decision to study queer reproduction. Working as an archivist for filmmaker Pratibha Parmar and curating an exhibition of her early video and film work attuned me to the visual politics of the popular authoritarian discourses on race and sex that emerged under neoliberalism. Any critical reconstruction of the UK context of intervention for queer video and film practices under Thatcherism inevitably involved attending to the introduction of Section 28, the 1984 Police and Criminal Evidence Act and the 1989 Prevention of Terrorism Act, and thus considering the lasting impact of the HIV/AIDS crisis on potentializing sexuality and race as discourses managed by the conservative media and governed through national censorship and state surveillance and border laws. Involved in the arts and cultural scene in Barcelona from the mid-2010s through my participation in the performance and pedagogy collective *diásporas críticas,* I listened when Paul B. Preciado, my then master's thesis advisor, mentioned in passing how, *someone should do a study of the fertility neighborhood in Barcelona*. This did not mean much at the time, and the many reproduction scholars I cite throughout this thesis were already at work. The words returned later as I became interested in the political organization of reproduction and family as my partner, her daughter, her mother and I found ourselves crossing social, bureaucratic and geopolitical borders in search of interdependency and stability. These previous curatorial and artistic research focuses have shaped the present study of queer reproduction as much as any autobiographical link.

This project draws on personal experiences though and, with their permission, the experiences of those around me. In Chapter 6 I register questions around the ethics of disclosure as they emerge, which enables a faithful documentation of the spontaneous and processual character of this, and any, research, perhaps more than is available when adhering to "method first". I also reference commercial entities who have been informed of their being under study. The web continues to be a grey area for copyright law, as well as for researchers using big data, digital data or informational material sourced online. The question of what counts as public versus private (Lester, 2013) and related concerns regarding the discursive power of framing information as "data" (Ciston, 2023), remain at the center of contemporary

discussions around researching ethically after and on the Internet. Not making the assumption that websites belong to the public because they are in the public realm, I make sketches (see Chapter 4 and Chapter 6) and also "info sketches", which use larger quantities of anonymized information sourced online (see Chapter 6). This provides what I think is a necessary concretization of the context of intervention for the artistic projects (Chapter 5), without compromising copyright or referring to information available online that is generated by human subjects.

Throughout the thesis I intentionally avoid using terms like "knowledge production" and am guided by formulations and ideas about knowing deriving from poets, researchers and artists engaged in Queer, Women of Color and Black Feminist research, in particular Audre Lorde's (1978) theory of "erotic knowledge" detailed above. I am wary of the fact that my positionality as a white researcher might limit the impact of these citations, precisely in the context of a knowledge economy that has long co-opted the intellectual work of women of color. That Marxism, Feminism, Artistic Research and Queer and Crip Theory are often perceived to be predominantly white intellectual or political traditions is a consequence of the omission of the work of Black scholars and scholars of color who have contributed to and led these movements. I cite recognizing that a tactic of many white scholars has been to not read, not cite, not mention and not reference certain theories and theorists, even in the case where this intellectual labor has evidently influenced their own.

THE REPRODUCTIVE POLITICS
OF THE INTERNET

The next three chapters (2, 3 and 4) detail the interface, network and viral as they are wrapped up in shifting sciences of the body and ideas regarding biological and genetic difference. These three chapters broadly consider the reproductive politics of the Internet by detailing the role of the interface, network and viral in fashioning a dominant reproductive imaginary in and across national contexts. Chapter 2 addresses the ubiquity of the human face across ART industry Internet interfaces since the 1990s. I contextualize the recent incorporation of facial-matching algorithms by fertility clinics and banks in

Spain both in relation to the political economy of "reproductive tourism" in Europe and scholarly discussions that "problematize the phenotype in relation to race" (M'Charek & Schamm, 2020). This chapter develops the concept of the "fertility fix": add-on technologies that promise to temporarily resolve capital flow issues in the financialized fertility sector, and that simultaneously ideologically "fix" consumption practices rooted in the "liberal eugenics" ideas of "personal reproductive choices" (Russell, 2018). Chapter 3 offers an alternative genealogy of "reproductive choice": I contextualize UK 1970s lesbian magazine *Sappho* as they participated in wider networks of cultural activism and elaborate the concept of "post-internet queer reproductive work" in relation to theories of the network across computer science, kinship studies and Crip and Disability Justice theory and practice. Chapter 4 performs a close reading of the Net Art work *Gay Gamete* (2000) by U.S artist Clover Leary and connects the viral as it cuts not only *metaphorically* but also *methodologically* across the study of communication technologies, histories of science and medicine and arts and criticism practices. I address the direct impact that the HIV/AIDS crisis had on the digital infrastructures and interfaces of contemporary assisted reproduction, suggesting the processes through which knowledge forged in the context of queer reproduction struggles is incorporated as the fertility industry's fixed capital. Chapter 5 introduces the poetry collection, film, Net Art works and editorial project, demonstrating how these stages of the research synthesize the Internet interface, network and viral as themes and modes of artistic response. Chapter 6 uses the tactics of auto-writing to document the making and sharing of these works. According to the method of writing gesturally, as detailed above, the critical writing, artworks, poetry, film and auto-writing sections, far from being separate works or mediums, may be considered different stages of the same gesture, whereby what is valued is not a particular aesthetic form or production technique but the affirmation of social knowledges and experiences of reproduction and a shared capacity to know.

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Chapter 2
THE INTERFACE AND THE FACE

What you see here is colorful illusion,
an art boasting of beauty and its skill,
which in false reasoning of color will,
pervert the mind in delicate delusion.

Here were the flatteries of paint engage
to vitiate the horrors of the years,
where softening the rust of time appears
to triumph over oblivion and age,

all is a vain, careful disguise of clothing,
it is a slender blossom in the gale,
it is a futile port for doom reserved,

it is a foolish labor that can only fail:
it is a wasting zeal and, well observed,
is corpse, is dust, is shadow, and is nothing.

Sor Juana Inés de la Cruz, SONNET (1689)

FIGURE 1. Anonymized "staff impression" text from a commercial sperm bank in Europe, while using developer tool (2020). Screenshot. Image courtesy the author.

FORGETTING IS A DEFINING
FEATURE OF THE INTERFACE

This chapter situates the enthusiastic uptake of facial-matching algorithms by fertility clinics in Spain in relation to local experimental cultures of biomedical innovation and the political economy of reproductive tourism in Europe. I also contextualize the rise of the facial-matching algorithm in assisted reproduction in relation to the racial politics and sciences of the face, reading the ubiquity of the human face across the global fertility industry's Internet interfaces since the 1990s through scholarly discussions regarding the "return of the phenotype" (M'Charek & Schamm, 2020). While I observe that lesbian and gay consumers are often explicitly addressed by fertility add-on companies[20], something that perhaps signals a progressive shift in the value and visibility of queer reproduction, the racial politics of facial-matching underscores that any promise of equality or inclusivity coincides with an obligatory forgetting of Queer and Crip politics (see Chapter 3).[21]

Forgetting, though, is a defining feature of the interface (Galloway, 2012; Old & Bertelson, 2004; Chun, 2011) and the "return of the phenotype" approximates the return of software "as an axiomatic, [that] comes to embody the logic of the already there" (Chun, 2011, p. 10). Yet "rather than condemning interfaces as a form of deception, designed to induce false consciousness", the task is to investigate their "paradoxical combination of visibility and invisibility, rational causation and profound ignorance" (Chun, 2011, p.59). I zoom out from the facial-matching algorithm to the Internet interface, where the algorithms are strategically visualized and advertised, and then

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20 The terms "fertility add-on" and "IVF add-on" are being deployed broadly in current sociology of assisted reproduction scholarship to name a wide range of products and services, from alternative medicine and wellness products to algorithmic embryo selection in the IVF lab (Armstrong et al., 2019; Galiano et al., 2021). I approach the facial-matching algorithm as an "add-on" technology as it fits into the "porous" definition of an "add-on technology" that "crafts hope" in a fertility context (Perrotta & Hamper, 2021).

21 These intellectual and political traditions have critiqued and opposed the politics and policies of reproductive liberalism, eugenics and their intersections (Kafer, 2013; McRuer, 2018; D. Roberts, 2015; D. E. Roberts, 2006)

out further, to the human face: tracing, in this way, the relationship between "the functional control interface and the cultural interface" (Pold and Bertelsen, 2004, p.26). This chapter accounts for the Internet interface as "not a representational display of a world 'out there' but a translation zone aimed at inducing new modes of thought" (Halpern, 2014, p. 73).

A number of recent studies of assisted reproduction have attended to the racial politics of donor selection. While noting that historically race has *always* played a role in people's personal decisions regarding family-making, philosopher Camisha A. Russell (2018) suggests that the online serializing of the racialized "biogenetic menu" marks a new era in which race is both reproduced and depoliticized through assisted reproduction procedures. Russell concludes that:

> the existence of drop-down menus for race and ethnicity on sperm bank web pages are on the one-hand a stark reminder of the deep social practices that have divided and continue to organize people in terms of race. The fact that the existence of such drop-down menus is not seen as strange or regressive, on the other hand, reveals how race is still fundamentally viewed as the outcome of reproduction (p. 160).

Similarly, cyberfeminist scholar Radhika Gajjala has detailed "the process of identity production at the computer interface" (Gajjala et al., 2008, p. 1112) and Media theorist Lisa Nakamura has addressed the "menu-driven sense of personal identity" online and how "race happens on the web in ways that are unique to the medium of hypertext and web menus" (Nakamura, 2002, p.111). This chapter contributes to these studies of the racial politics of the Internet interface by focusing on a case where racial classifications are precisely *not* mentioned or serialized, but where the racial politics of reproductive control nevertheless fundamentally determines aspects of commercial interface design and its forms of visual and lyrical address.

"DEAR LGBT CONSUMER"

Around 2019, and increasingly throughout 2020, many fertility clinics in Spain began promoting their use of facial-matching algorithms on

their website homepages. While facial-matching algorithms have also appeared in the U.S context (Fairfax Inc. has developed its own trade-marked "Fairfax Facematch®" algorithm), in Spain the facial-matching algorithm is currently experiencing a commercial boom. In a context in which only anonymous donation is permitted[22], and all donor selection is performed by the clinics, the facial-matching algorithm allows the clinics to make claims regarding the accuracy of their choices, beyond the typical evaluation of physical characteristics, doctor-patient communication, blood type and genetic matching.

Fenomatch, registered in 2019 by the Spanish trade office, describes how their algorithm "scans more than 12,000 data points in order to help find the donor with the greatest biometric similarity" (Fenomatch Website, 2021a). The machine-learning algorithm works by analyzing a scanned passport size photograph, which is translated into data-points that are mapped and then compared with other "datafied" photographs. The company's website is populated by images of women covered in shining white lines that segment their faces into the geometric contours of their facial features. In one image, a woman looks down at her phone as white lines pour out of her eyes, cheeks and nose onto the phone's screen, connecting them. In another, a woman is looking at a child: both their faces are mapped and connected through a constellation of white lines and dots. The Fenomatch logo bears the twisted braid of the double helix structure of deoxyribonucleic acid (DNA), which was discovered in the 1950s giving rise to modern molecular biology. DNA is composed of four bases (known as A, C, G and T) whose unique sequence determines the production of different molecules in the body. About 99% of DNA bases are the same in every person, and the remaining 1% is what makes us unique. In the post-DNA imaginary of the hereditary, the gene is understood to be a section of DNA that controls the production of specific proteins in the cell responsible for "phenotypical" traits, such as our eye colour or blood type ("pheno" means "observe"). DNA constitutes the chromosomes present in the nucleus of every cell, including the reproductive egg and sperm cells, and so is fundamental for prescribing what "phenotypical" traits are passed on to the

22   Spanish law (14/2006 on Assisted Human Reproduction Techniques, Chapter II, Article 5) requires that clinics and donor banks keep the confidentiality of donor identity. This means patients and children can obtain only general information about the donors.

next generation. This link between DNA and phenotype is both logical and vague: logical because different phenotypes may be the expression of differences at the level of DNA sequencing, but vague because it is widely accepted that phenotypes are equally, if not more greatly, influenced by environmental and social conditions. As DNA is understood to constitute genetic, and thus inherited, material, it is not surprising it appears symbolized as part of the logo of this company, which promises to align the DNA-related phenotypical expressions of donors with that of prospective parents. At the same time, the fact that phenotype can rarely be directly related *only* to DNA, makes any promise to be able to control or select these expressions unreliable if not entirely unrealistic. The extent to which DNA actively makes the face, and the extent to which the face can be considered a reliable aspect of phenotypical expression, as eye color is thought to be, is a site of considerable scientific speculation and experimentation well into the present.

In the age of DNA, the scientific and popular reproductive imaginary of the hereditary rests on stabilizing the genotype and phenotype as, paradoxically, both independent objects of knowable biology and a highly unpredictable set of relations. As many scientists and critics have pointed out, however, such stability surrounding both the gene and the genotype/phenotype distinction/relation has not yet been achieved (Griffiths, 2016; Keller, 2000). In the context of scientific research and the development of commercial bio-products and repro-technologies, these words are often used not to name, describe or explain but to gesture: "like biology, the word 'gene' is used to analyze, [and] the term itself retains a plasticity" (Franklin, 2013, p.158). Fenomatch (2021) recognize the scientific ambiguities of linking DNA to face. Their marketing material correctly situates the phenotype in relation to extra-genetic social conditioning and epigenetics, which are the heritable changes in gene expression that do not respond to the information "coded" in the DNA sequence. The DNA-phenotype link that the marketing visuals and logo establish is then not so much unscientific as a particular exploitation of the flexibility of the post-DNA reproductive imaginary of the gene. It is through this supposed stability, which is also a flexibility, of the relations between face and DNA, genotype and phenotype, that the family too is imagined to be *biological* and thus *controllable* through practices of selection.

Perhaps this desire to control phenotype is to be expected: the fact that children should look like their parents is widely appreciated

and "looking alike" is an understandable site of emotional investment for families. On the other hand, today, as ever, societies are upheld by familial networks whose members may look nothing like each other. The queer and antiracist promise of autonomy and interdependency in social reproduction consists precisely in the possibility of affirming and nurturing reproductive practices that may include, but do not depend on, biologized kinship. The double helix as it combines with the datafied faces of mother and child in this company's logo promises the phenotype as *biological security* in a context in which this biological understanding of family is under threat precisely through the use of donated reproductive cells. The facial-matching algorithm is interesting in this sense because it expresses this promise, which far predates machine learning, to *reproduce* a particular sexual and social politics of the family, in a context in which the development of reproductive technologies of all kinds –imaginative and material– might otherwise make a break with it (Strathern, 1992; Franklin, 2013).

In a webinar talk on facial recognition given on May 11, 2021, by representatives of Fenomatch for an IVF patient support project organized by the European Fertility Society (EFS), the company's product owner explains to the audience what Fenomatch is:

> The idea is that the donor assisted child will look more like the other members of the family. It works with egg or sperm donation; heterosexual and homosexual couples, so we can use photographs of men or women to find egg or sperm donors so even if it is a lesbian or gay couple the technology still works (My IVF answers, 2021).

Lesbian and gay couples are mentioned explicitly here, suggesting the ways in which queer access to reproductive technologies and fertility add-ons has shifted: where once LGBTQIA++ people were cast as a threat to biology, society and family, they now emerge as key subjects of the reproductive imaginary of biologized kinship.

THE FACIAL-MATCHING ALGORITHM
IN THE REPRODUCTIVE
TOURISM CONTEXT OF SPAIN

While Europe constitutes the global fertility sector's biggest continental market, the legislation, affordability and norms surrounding childbearing and assisted conception vary widely across the continent. This "patchwork of permissivity and prohibition" has resulted in Spain becoming the "most active country in assisted reproduction" (De Geyter et al. 2018). In 2018 the global fertility services market was valued at 20 billion US dollars (Statista, 2022), with Spain's national fertility services market valued at around 498 million USD (Registro Nacional de Actividad, Ministerio de sanidad, 2019). While significant, the profits generated in Spain were less than in the UK, where in the same year the ART market was valued at 514 million USD, despite the fact that the UK has a third of the clinics and banks: in 2019 the Human Fertilisation and Embryology Authority (HFEA) registered 106 licensed clinics in the UK (HFEA, 2019) while in Spain 311 clinics were registered by the Ministry of Health (2019). In the last two decades Spain's assisted reproduction market has come to be associated with cheap rounds of IVF and a commercial landscape populated by experimental techno-solution add-ons. This cultural, geopolitical and political economic context is key for situating the facial-matching boom in fertility in Spain. Assisted reproduction is regulated in Spain by the 2005 law, which allows single women and LGBTQIA++ people to access ARTs either privately or through the state funded public health system. Spain is also a priority destination for individuals or couples seeking fertility treatments that require donated eggs, because over 50% of all eggs used in ART procedures in Europe are donated in Spain (Ferraretti et al., 2017). While the language used by the law is keen to link egg donation to "altruism" –with clinic marketing material also asserting "the special empathy of Spanish women" (IVI Fertility Clinic, 2021)– sociological studies have rather explained the high numbers of egg donation as a result of the 2008 financial crisis, when many people turned to gamete donation as an "informal service labor, recruited from young, marginalized segments of the population" (Alkorta, 2021, p. 223). Many of the ART procedures performed in Spanish clinics are thus performed on patients who travel to Spain for treatment, which explains why the majority of Spanish

fertility websites are in English and cater to multilingual clientele. While many organizations and scholars prefer to use the term "cross border care" (Pennings, 2005) to describe these journeys because it is both more "descriptive and neutral" (Präg & Mills, 2017; Shenfield et al., 2010), or "reproductive exile" as this highlights "the numerous difficulties and constraints faced by infertile patients who are forced to travel globally for assisted reproduction" (Inhorn & Patrizio, 2009), the term "reproductive tourism" more accurately portrays the way in which these journeys map atop an already existing structure of production that orders North-South relations in Europe.[23] Countries like Spain and Greece were encouraged to replace their manufacturing centered economy with construction and services, such as tourism, as part of their entry requirements into the European Union in the mid 1980s. In the context of the European ART market, these North-South and North-East relations within the European Union have contributed to cementing Spain and Ukraine as gamete and surrogacy "provider countries". The term "reproductive tourism" better visibilizes, in this sense, the continental market dynamics that have favored the fashioning of certain countries as sites of production and manufacturing and others as sites of leisure and consumption.

These are conditions that lie behind Spain as a reproductive tourism hub, and that help explain why Spain has come to host a number of fertility add-on start-ups, such as Fenomatch. Clinics such as Instituto Marquez, in Barcelona, exemplify this experimental culture. Their website displays adverts for add-on fertility technologies they themselves have developed, including a smart-phone accessible live embryo surveillance (a tool called Embryoscope), options for algorithmic embryo selection, a "baby pod" (an ipod like speaker that plays music into the womb) and a multimedia high-definition screen in a masturbation booth for sperm donors (Instituto Marquez, 2021a). The Director of the clinic, Dr. Marisa López-Teijón, was awarded the Ig Nobel Prize for Medicine presented in 2017 at MIT, for experiments

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23   In a position paper on Good Clinical Treatment in Assisted Reproduction (2008), the European Society of Human Reproduction and Embryology (ESHRE) adopt the term "cross border reproductive care" to describe the phenomena of people traveling across borders to pursue fertility treatment. The reasons given are that people travel in order to circumvent legal restrictions in their own countries, to gain access where it is prohibited, or to save on treatment costs and not tourism.

FIGURE 2. "Isle's trip to the clinic" from *The Wife of Them All* (2022). Dir. Rebecca Close. Film still screenshot. Image courtesy the author.

in "discovering how fetal hearing works" and for organizing "live concerts for embryos," including a recent visit to the lab by pop-rock band The Corrs (Instituto Marquez, 2021b).

In the competitive reproductive tourism context of Spain, the facial-matching algorithm forms part of what Swanson (2014) calls "donor-differentiation": a set of "key marketing tools" through which a product accrues value "for its unique qualities, although available in standardized units [...] like a fine wine" (p.157). The facial-matching algorithm can also be situated within what sociologist Lucy van de Wiel (2019) has called the "datafication of reproduction" through the patenting of software and the drive towards the generation of data, which permits "different organizations to become data-rich in new ways" (pp.197-200). It is also necessary however to explain the facial-matching algorithm phenomenon with reference to the longer history of the racial politics of the face, and the position that the

human face already holds in the reproductive imaginary as a site of racialized kinship verification and affective encounter.

COMPUTER-VISION AND HUMAN-VISION: THE RACIAL POLITICS OF MATCHING FACES

In conversation with me in March 2022, an embryologist turned software developer at Fenomatch was keen to distinguish his company's algorithm from others on the Spanish market, such as Ovo clinic's ovomatch or IVI Fertility Group's PerfectMatch360º, both of which are based on the Amazon Rekognition API. Facial-matching technology, as opposed to recognition technology, emerged through the fusing of facial recognition and image similarity practices and research within the field of computer vision. Face recognition dates back to the 1960s (Bledsoe, 1966) and consists of two main tasks: face identification (locating the identity of a person using a photograph of their face) and face verification (checking if two images of faces refer to the same person). By the 1990s researchers began to approach the face less as a geometric entity defined by isolated features –the nose, mouth and eyes– and more as a two-dimensional *surface*. Facial-recognition algorithms were designed to perform identification and verification tasks by reading the face as its dimensionality had been radically reduced and projected onto a feature space, itself previously constructed by the "eigenvalues" of a set of training faces called the EigenFaces (Turk & Pentland, 1991). The arrival of neural networks and deep learning combined with the availability of big data sets towards the late-2000s marked a new age for facial recognition research and practice. Image similarity research, rooted in image retrieval practices, also dates back to the 1960s, but grew in scale with the release of the Mosaic Internet-browser and the availability of digital vision sensors. With Internet users suddenly being able to access a huge number of images, creating tools for indexing the Web and digital archives became more important. The arrival of neural networks and big data sets similarly brought a new age for image similarity research.

Algorithms like Fenomatch's emerge at this intersection of image similarity and facial recognition methods. In general, all machine learning based facial recognition algorithms require a low-dimensional space into which high-dimensional vectors are

translated, called an embedding space (Koehrsen, 2018). Facial recognition plots a face's data points into the embedding space in such a way that the distance between different faces is great. Matching algorithms, on the other hand, plot into an embedding space in such a way that the space between similar pairs is small. Fenomatch (Meléndez et al., 2021) explain this in a recent article: "facial recognition will optimize characteristics that differentiate one from another, for example a birthmark or tattoo, giving a high weight to these traits in order to differentiate" (p.2). The optimization process of the Fenomatch algorithm is supposedly weighted towards matching traits in order to achieve, as they say, "maximum similarity" (p.3).

Yet in order to create a set of statistical calculations to measure similarity, required for a facial-matching algorithm trial and error optimization process, one must be able to define the rules of similarity. As many researchers have noted, the geometry of face is far from straightforward and the human-specific neural processing for faces differs from that of other objects (Hadders-Algra, 2022; Hoehl & Peykarjou, 2012; Karaaslan, 2017). Furthermore, any matches would be impossible to verify as they are based on highly subjective markers. Today, the algorithms used for facial recognition tasks are mostly trained with normative identity as categories, for example gender, race and even sexuality. This paradox is visibilized when Fenomatch state proudly, despite the constant appraisal of the accuracy and efficiency of their algorithm, that the final selection of the donor is "still made by a human" (Fenomatch Website, 2021b). In the end, it turns out; evaluating facial similarity is a problem not for computer-vision but for human-vision.

The "human-vision" of the face was constructed over successive traditions of philosophy, science and art unfolding in the context of European modernity-coloniality. The field of physiognomy, as advanced by proponents such as Johann Lavater (1741–1801), already approached the face as a kind of readable surface. The idea that the face might be broken down into classifiable entities was also central to 18th century European painting, which was greatly informed by Charles Le Brun's (1751) finite list of "the passions" as they manifest on the surface of the face. The epistemic status of the face was central to the theology of Augustine (AD.354 – 430), who believed that true knowledge of the world was only accessible on encountering God "face-to-face" (*Letter* 120.3–4). The human face in this sense has long

been *a portal* through which knowledge about the human and human society is accessed and organized. The face has long been an interface.

Fenomatch are not alone in bringing up the genotype/phenotype distinction/relation and re-affirming the genetic determinism that structures early 20th century studies of heredity, embryology and developmental biology (Lock, 2005). A flurry of papers on the use of AI tools that link gene to face have been published in the last decade. These articles include studies of the use of 3D facial phenotyping to biometrically match siblings (Hoskens et al., 2021); studies of "the genetics of the human face" in an article that quotes Francis Galton as a "pioneer" (Crouch et al., 2018), p.676); algorithms that "identify genetic syndromes using deep learning such as DeepGesalt", presented as a "next generation phenotyping technology" (Gurovich et al., 2018, 2019) and experiments that claim to be able to predict people's sexuality by algorithmic evaluation of photographs of their faces (González-Álvarez, 2017; Skorska et al., 2015).

Many of these studies result from problematic practices of data gathering: from the use of racialized data cohorts to train machine-learning algorithms to the possible lack of informed consent from participants (Nieves Delgado, 2020). In the aforementioned study of the face and sexuality, the authors used a "facial modeling program trained on photographs of white faces", which they gathered by "approaching people at pride events" (Skorska et al., 2015, p.1377). The results of this experiment include the "findings" that "lesbian women had noses that were more turned up, mouths that were more puckered, and [...]" (p.1378). Another experiment conducted at Stanford University in 2018 used deep learning neural networks to "predict sexual orientation" using a data cohort of 35,326 facial images (Wang & Kosinski, 2018). The researchers write that:

> Consistent with the prenatal hormone theory of sexual orientation, gay men and women tended to have gender-atypical facial morphology, expression, and grooming styles… Given a single facial image, a classifier could correctly distinguish between gay and heterosexual men in 81% of cases, and in 74% of cases for women (p. 246).

Across these studies the face is constructed as a portal through which to flow a mix of antiquated and contemporary theories

of racial and sexual difference: here hormonal, there genetic, here neurological, there phenotypical etc. This discursive mixing and matching is a defining feature of European and Western science: it is what Cedric Robinson (2000) termed the "racial sensibility" that determines, in the context of scientific research and technological innovation, the "problems" that algorithms and machine learning technologies are set up to solve today (Benjamin, 2018, 2019b, 2019c). Achille Mmembe (2017) calls the persistence of racial thinking since the 18th century the "codified madness" of Euro-American science, which repeatedly, "reduces the body and the living being to matters of appearance, skin, and color, by granting skin and color the status of fiction based on biology" (p.2). By exploiting the elastic relations between phenotype, genotype, face and gene, the facial-matching algorithm relies on the same philosophical and scientific research framework that drives the homophobic, racist and ablest "studies" mentioned above.

It is in the context of the current *facial-racial delirium* of historical and contemporary scientific research practices that M'Charek and Schramm (2020) call for context-specific studies of "practices of face-making". The point is not to reject all sciences of the face, gene, phenotype or DNA, but to investigate how such practices of knowledge are inevitably "entangled with the fabric of European or Western societies [and] as they produce and are the product of race and racism" (p.322). M'Charek and Schramm (2020) note that while,

> scholarship on the body—for example, in anthropology, science and technology studies (STS), or feminist and postcolonial studies—has taken firm shape [...] the critical turn to the face has not yet been made (p.321).

Citing Deleuze and Guattari's (2007) theory of the "absolute machine of faciality", the authors argue for more analysis of the "work the face does, including the relations it generates" (p.321). Critical studies of the face and racial science have so far focused on forensic DNA phenotyping (M'charek, 2020; Queirós, 2021); archaeological reconstructions of the face using DNA (Nieves Delgado, 2020); early ethnological "racial clustering" based on appearance (M'Charek, 2020); racial science infused colonial taxonomies of the face across 19th century police and psychiatry practices, when photographs of

people's faces were presented as evidence of madness, sexual deviance and criminality (Didi-Huberman & Charcot, 2003; Sekula, 1986); and contemporary art practices that have reappropriated the portrait form as a site of "dissident physiognomy" (Preciado, 2014). The central role that the face plays in the reproductive imaginary, and more concretely in assisted reproduction, remains under studied. As well as a means of differentiating between commodities (Swanson, 2014) and signaling the exposure of reproduction to financial institutions and instruments (van de Wiel, 2019; 2020), the adoption of facial matching algorithms by fertility clinics, this section suggests, should be situated in relation to discussions that problematize "the return of the phenotype" (M'charek & Schramm, 2020) in relation to race.

THE SONNETIZATION OF THE DONOR CATALOG: POETRY, SOFTWARE AND THE FACE AS AN INTERFACE

In the context of assisted reproduction the phenotype never exactly went away. A quick look at 1990s donor catalog websites and one observes that the promise to match faces –the use of photos to select donors based on facial features– is neither new nor specific to the big data age: California Cryobank stated on their website as early as 1997 that they offered a "photographic donor matching consultation to help with donor selection."[24] By the mid-2000s many donor catalogs offered childhood photos of the faces of their donors. The incorporation of facial-matching algorithms by clinics and banks therefore provides a moment of visibility for the processes through which the face was perhaps already at work in assisted reproduction.

The face is *made* too in textual form: it is common across online sperm donor catalogs to encounter a piece of writing called "staff impressions" or "clinic description" in which the clinic or bank staff describe the donor's appearance and demeanor in their own words. This is a technique through which the clinics are able to "sell the cells" (Almeling, 2011) with the "failure to display desired donors may impede the bank's business success" (Bokek-Cohen, 2015). The

[24]   See entry for 8th Feb 1997 for 'Our Services and Programs' page at www.cryobank.com via: https://web.archive.org/

formulaic nature of these descriptions is evident: the repetition of phrases like "loves to travel", "sportsman", "engineering student", demonstrate the use of proxies that commodify ability, sexuality and class, despite the non-heritability of many of these traits. Zooming out from these short textual descriptions and an analogy can be drawn between the staff impression text and the historical poetic form of the sonnet. Firstly, the texts feature descriptions of the face prominently (see Chapter 6). Secondly, the size of the texts is consistently around fourteen lines. The sonnet form in poetry is similarly known for featuring descriptions of the human face and having fourteen lines (Paterson, 2012). Literary theorist Peter Sacks (2002) suggests these aspects are structurally linked: the sonnet not only often features descriptions of the human face, but its dimensions (the fourteen lines) *mimic* the dimensions of the face, but scaled down in such a way that the reader may hold the face in their imagination. The prominence of the face to the sonnet as a content *and* form have been linked to the act of gazing in the Elizabethan court: the sonnet is characterized by a "showiness" that expresses the performative forms of individuality emerging in the Elizabethan age (Hass, 2017, p. 123). Above all, the sonnet form enables the reader to have the powerful subjective experience of *facing* somebody. This affective encounter is a key to the sonnet's popularity in poetry since the 16th century. Critic Elaine Scarry (1997) notes how recalling the face of an absent friend is more difficult than evoking a yellow tulip in the mind's eye. Unlike the human face, blossoming flowers, she argues, "flash up in a moment" (p. 92). In the context of the donor catalog, the staff impression text does what a sonnet does: facilitates the difficult imaginative act required of the reader of calling up a human face in the imagination. The incorporation of facial-matching algorithms thus elaborates on and amplifies what could be called the *sonnetization of donor selection* already at work in assisted reproduction since the 1990s. While the transformation of photos of the donor's face into 12,000 data points clearly marks a new and specific moment of datafication, it is the previous processes of *sonnetizing* that accounts for the always already there of the face and phenotype to assisted reproduction.

The point of considering this poetry-software coupling is to assess the face not only as a content across sperm and egg donor catalogues but also as a form that determines the Internet interface's readability at large: streams of sonnet-sized texts that maximize affective

encounter. Drawing a parallel between the text size of staff impressions and the sonnet helps to better define the kind of work the face is doing in the context of assisted reproduction. In particular, it enables one to think about the face *as an interface*: a powerful zone where social experiences and knowledge is translated into the contemporary precept of readability, which I contextualize in relation to interface design in the next section.

DIRECT MANIPULATION AND BIOLOGICAL CONTROL: THE LIBERAL EUGENICS OF THE ART INTERFACE

The facial-matching algorithm promises to distribute the subjective experience of control over some aspect of reproductive biology and biological process to the individual fertility patient. Control over biology has had many historical chapters but the 20th century has been characterized by just this kind of "supplementary, additional, additive biology of standardized biological control" (Franklin, 2013, p.237). Camisha A. Russell (2018) coined the term "liberal eugenics" to name the many assisted reproduction procedures and protocols that feature the racial matching or selection of donors or that promote the individualized "investment" in the biogenetic health of the future child through genetic selection. The "liberal or neoliberal eugenics era" is defined, Russell explains, on one hand by the availability of genetic information and technologies for selecting or deselecting particular genes in a child, also known as "reprogenetics" (Silver, 2007), and on the other hand by the "belief that the use of reprogenetics [...] should be understood as a matter of personal choice" (p.134).[25] It is the discourse of personal choice that is radically agitated at the level of the

[25] The framing of diagnostics such as prenatal testing and other forms of deselection as personal choices, as Alison Kafer (2013) comments, "casts women as responsible for their future children's able-bodiedness/able-mindedness; prospective parents are urged to take advantage of these services so as to avoid burdening their future children with any disabilities. This notion of "burdening" children finds an echo in the debate over same-sex marriage, with LGBT couples cast as selfish parents, placing their own desires over the physical and mental health of their children (and, by extension, of all children)." (p. 69).

Internet interface, where the supplementary logic of 21st century biological control meets the computational logic of direct manipulation, with powerful subjective and economic effects.

The term "direct manipulation" was coined in the early 1980s to refer to the interaction style for graphical user interfaces (GUIs) exemplified in the desktop metaphor: one organizes digital files as one organizes one's desk, by directly touching and moving things around (Chun, 2011; Shneiderman, 1983). The visual-based interaction replaced the previous instruction based command line, which had consisted of long and complex syntax. The interface reader gets "direct personal manipulation of the screen, and thus, by extension, of the system it indexes or represents" (Chun, 2011, p. 62). Direct manipulation is one way to explain the astounding subjective effects of the most motion-restricted activities when surfing the web, shopping online or playing a video game: finger tapping and thumb wriggling are extended in heroic narratives that are very much "real" to those buying, playing, zooming in and clicking (Chun, 2011; Manovich, 2002).

While the facial-matching algorithm is not a tool of genetic selection or deselection (though the Fenomatch company also offer genetic diagnostic add-ons), its marketing language takes for granted some of the most unstable entities in the biological life sciences (the gene and the phenotype/genotype relation/distinction) and establishes anarchic links between them. The framing of the facial-matching algorithm as a technosolution rooted in the plasticity of these biological entities as objects of knowledge mitigates the cynical process of substitution actually occurring: the promise of control over some aspect of reproductive biology replaces a shared human memory of the concrete activities actually involved in establishing emotional connections and maintaining kinship ties. As suggested above, the principle of direct manipulation serves to naturalize such substitutions as they are framed at the level of the Internet interface, as personal choices and presented visually as buttons, spinning cursors, widgets or drop-down menus. The decision to opt in for the facial-matching algorithm is, like many experiences of the Internet interface, "on the face of it all about choice but in fact it offers no other choice" (Nakamura, 2002, p. 104), thus cementing the liberal eugenics idea that parents should be held accountable for selecting and deselecting aspects of their children's genetic and phenotypic profiles

(Russell, 2018). More expansive and abundant understandings of reproductive choice, family resemblance and kinship connections are suppressed, if not deleted, at the level of the interface.

Across the computer-vision, European painting, philosophy and scientific research traditions discussed above, the human face is conceived to be simultaneously a transparent site of affective encounter and a complex multi-layered epistemic object of scientific research and invention (M'Charek, 2020). Fenomatch (2021) are aware of this contradiction when they describe the face as "the most important point of contact for human interaction" while at the same time noting how "the question of the inheritance of facial features has been of interest for science for many centuries" (p.4). The two-faced nature of the face as a simple and complex object enables its flexible mobilization towards affirming a wide range of claims in the context of assisted reproduction and family-making at large: from framing the face as a unique site of human emotional connection to suggesting that the face is a formal site of kinship verification.

THE FERTILITY FIX: THE INCORPORATION OF QUEER REPRODUCTIVE WORK AS FERTILITY INDUSTRY FIXED CAPITAL

The face as an interface and the Internet interface governed by the logic of the face fashions a reproductive imaginary rooted in the legacies of biological control and direct manipulation, radically animating a paranoid "racial sensibility" that underpins racial capitalist production (Robinson, 1983). Especially in contexts such as Spain, where patients do not choose the donor, add-on technologies like the facial-matching algorithm excite this racial sensibility: "the focus on matching physical (racial) appearance participates in the personalizing and depoliticizing or racial identity [...] naturalizing the existence of racial categories and severing contemporary decisions from their historical contexts" (Russell, 2018, p.154). This disconnection of contemporary fertility decisions from historical contexts might also be seen as an explicit biomedical market strategy. Following scholarship on fixed capital, spatial fixes and the financializing of fertility, I consider this "disconnection of contemporary

decisions from their historical contexts" through the lens of *the fertility fix*: a techno-solution to what is both a crisis in social reproduction and a crisis in overaccumulation.

The growth of the global ART market over the last few decades has been situated in contemporary scholarship in relation to a structural shift in the dynamic between reproduction and production brought about by the move from a Fordist to a post-Fordist economy (Waldby, 2015; Waldby & Cooper, 2008, 2010). In the U.S and some European countries, this has meant a "shift in time and energies once devoted to reproduction to 'productive' (i.e. paid) work" (Fraser, 2018, p. 87 as cited in van de Wiel, 2020), as gendered sectors of the population entered the productive sphere at exactly the same time that many aspects of social reproduction –education, healthcare, energy etc.– were being commodified under neoliberalism. In many different national contexts today, fertility technologies –from endless rounds of IVF to egg freezing programs– "not only function as a resolution to this scarcity dynamic between production and reproduction, but also bring fertility itself into the realm of accumulation" (van de Wiel, 2020). In other words, fertility technologies are proposed as a "fix" to what is essentially a crisis in social reproduction.

One of the ways crisis has manifested historically is "overaccumulation", which Harvey (2001) defines as, "in its most virulent form, a surplus of labor and capital side by side" (p.26). Building on Marx's observation that capital relies on investment and innovation in transport and communication infrastructures for expansion, Harvey coins the term "the spatial fix", arguing that this spatial fixing of capital accelerates in the age of financial capital. Financial logics of production have created evermore "surpluses of capital" (Harvey, 2003, p. 149), creating an "overaccumulation" that capitalists respond to by commodifying and devaluing social reproduction assets –from land to labor-power– that are "thrown out of circulation" and then "lie fallow and dormant until surplus capital seizes upon them to breathe new life into capital accumulation" (Harvey 2003, p.151). The tension between overaccumulation and devaluation is evident in the fertility industry, which is especially vulnerable to capital flow blockages and value realization issues. Between the unfounded pretensions of "future-orientated marketing claims of biomedicine" (Rajan, 2006) and the increasing reliance of biomedical firms on volatile financial instruments and private equity (Hogarth, 2017; Rajan, 2006; van de

Wiel, 2020), the bioeconomy has proved far less profitable than initially projected. Innovating in fixed capital, such as communication technologies, transport and add-ons, effectively "buys time", as this fixed capital is able to temporarily "absorb current surplus capital and increase future productivity and profitability" (Jessop, 2006, p.4).

The fertility techno-solution, of which the facial-matching algorithm is one example, can be situated at this juncture of symbolic and material "fixes". On one hand, the algorithm is an ideological "fix" to what is framed as a crisis in social and biological infertility and kinship relations. On the other hand, such techno-solutions "fix" the problems of overaccumulation and capital mobility in the financialized fertility market. The spatial and material dimension of the "fertility fix" can also be observed in the emergence of entire countries, like Spain, as reproductive tourism destinations and the development of parts of the city, like Sarrià in Barcelona, as fertility neighborhoods where clinics and banks cluster.

Recent scholarship on digital and networked technologies as fixed capital also build, like Harvey's theory traced above, on Marx's writings on fixed capital, which were first introduced in the *Grundrisse: Foundations of the critique of political economy* (1858, 1973) and elaborated on across Chapters 7–11 of *Capital, Volume II* (1885, 1978). There Marx amends what he considers to be the major flaw of Adam Smith's political economy, building a theory of fixed and circulating capital by distinguishing constant from variable capital: variable capital is the purchase of labor-power and thus can create value, but fixed and circulating capital, as an investment in infrastructure, cannot. While fixed capital is not central to production, it does contribute value either by being activated by living labor or through its capacity to "step in and out of the production process" (p. 681). The investment in fixed capital does not immediately generate profits, which is why the ideological fixing of "portions of the total social capital" into the infrastructure is key to securing profits, as it shortens turnover time by "qualitatively altering the relations of production, distribution and consumption" (Ekers & Prudham, 2018, p. 7). At this point in Marx's argument, as it has been skillfully reconstructed in this scholarship on the built environment and the digital machine as fixed capital, it is possible to appreciate the looping temporalities that determine the process through which human knowledge is transformed into aspects of infrastructure *over time*. For, "what is an algorithm?" asks Antonio

Negri (2019), if not "fixed capital, being a machine born of cooperative social intelligence" (p. 209). In the context of the fertility industry, the forms of "cooperative social intelligence" that give rise to algorithmic donor selection are, I suggest, not only informed by liberal eugenics but the forms of reproductive choice forged in the context of queer reproduction struggles.

The idea that experiences and knowledge of queer reproductive choice are incorporated as the fertility industry's fixed capital might be appreciated by looking at the way in which LGBTQIA++ reproductive lives are invoked by the companies themselves. Towards the end of the webinar mentioned above, the facial-matching algorithm company representatives mention the imaginary lesbian family, but again only as an example to *explain* the "science" of the algorithm. In answer to an audience member's question, "Can you compare the similarity between two women and find one same donor for both?" the Fenomatch representatives comment,

> If, for example, we have a lesbian couple that's looking for a sperm donor, then we would have the egg from one of the women. On the other woman, we would perform the Fenomatch, so in that case, the donor assisted child will get the genetic mother's DNA from the egg and the phenotype matched genetic material from the donor with the facial resemblance to the recipient's partner. We can use a photograph of women to look for men, and we can use a photograph of men to look for women without any problems. (My IVF Answers, 2021)

It is not quite that LGBTQIA++ people are being addressed as prospective fertility patients, or incorporated as equal consumers, rather that they are mentioned as an example to prove the *efficiency* of the technology and to *explain* how it works ("without any problems"). The invoking of the queer family in order to *explain and promote* a techno-solution evidences what is otherwise difficult to observe due to the delayed turn-over times and looping temporalities that structure the creation and use of fixed capital: how the knowledge forged in the context of queer reproduction struggles is re-directed towards the assisted reproduction of heteronormative biologized kinship.

In the next chapter I provide an example of just such a "queer reproduction struggle" and I detail the way in which it may offer an alternative genealogy of "reproductive choice" against the liberal eugenic model. The next chapter's post-internet framing emphasizes the networked and poetic dimension of queer biological reproduction, as well as the dynamic dimension of reproductive work as it actively fashions the reproductive imaginary beyond "the return" of the phenotype and face.

THE NETWORK AND REPRODUCTIVE WORK

Someone will remember us / I say / even in another time
–Sappho (2002)

PRINT MEDIA AND
THE REPRODUCTIVE IMAGINARY

In 1977 the *London Evening News* sent an undercover journalist to pose as a "fake lesbian" at a meeting held by *Sappho,* one of the UK's first lesbian organizations and magazines. In the meeting *Sappho* workers shared information on Artificial Insemination by Donor (A.I.D) processes and offered to help connect prospective parents with donors and doctors willing to perform the procedures through private clinics. When the *Evening News* published their exposé *Sappho* ceased to work with the same doctor, and the doctor named in the article went into hiding for a few months. *Sappho* has figured in recent scholarship in the fields of feminist psychology as an example of "the key strategies deployed by lesbian activists to challenge the psycho-pathologization of homosexuality" (Spandler & Carr, 2021, p. 121); in an anthology of 20th century women's periodicals and print culture in Britain (Forster & Hollows, 2020); and in a historical account of post-war lesbian culture and motherhood in the UK (Jennings, 2017). This chapter reads *Sappho* through queer theoretical perspectives on the intersections of reproductive work, creative practice and self-conscious decision making (Wesling, 2012; Lorde, 2007) and contextualizes the magazine as a node for "post-internet queer reproductive work". Although evidently before the Internet, and before the advent of HIV/AIDS-related queer activism and Queer Theory, this instance of the collective management of reproductive resources and labor evidenced forms of interdependency, self-consciousness and choice useful for thinking "post" (as in revising or thinking beyond) the current online-offline commercial worlds of assisted reproduction. I attempt to move beyond, in this sense, the idea of a "historical case study" and moral visions of the archive rooted in colonial dynamics of inclusion and collection, and pursue a reading of *Sappho* that anachronistically restores the Queer and Crip politics of the network against the ableist and transphobic organization of reproductive technologies today. Situating the techno-social-network before the advent of the Internet-as-network, I argue, is vital for resisting the always emergent esoteric discourse of the "network as progress" that today pervades our "network society" (Castells, 1996). By considering this example of a national media-led interruption of a lesbian-led assisted reproduction network in the UK beyond an exceptionalist logic of "phobic"

media and medicine, I approximate an analysis of the *structural* role of queer reproductive work in fashioning reproductive imaginaries and biologies in national contexts under racial capitalism. [26]

SAPPHO V. THE LONDON EVENING NEWS

On Thursday 5th January, 1978, *The Evening News* published a front page article with the headline: "Doctor Strange Love: the Belgravia Man who helps lesbians have babies." The article names a Dr. Sopher, responsible for the birth of ten babies to lesbian couples, for which he charged £12.50 for a consultation and £12 per insemination.[27] The exclusive continues with an article by investigative journalist Joanna Patyna relating how she "posed as a lesbian wanting a baby" and "with no examination or even questions about my background was offered A.I.D" (Patyna, 1978a, p. 24). After providing the details of the neighborhoods where the families live – Croydon, Gwent, Northumberland and North London – the article quotes Dr. Sopher

> I'm not doing anything illegal. A lesbian who wants a baby badly enough could achieve the same result by entering a casual heterosexual relationship. What I'm doing is preventing a situation that would be abhorrent to her and cutting down on the risks involved.

The article explains that the women were referred to Dr. Sopher through Sappho: "a London-based lesbian organization which runs women-only discos and social evenings in two central London

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26 This chapter is the result of archival research into the Sappho collections at Glasgow Women's Library, conducted while a Visiting Scholar at Cambridge University's ReproSoc. An earlier version of some of the sections were presented in June 2021 at the conference "Reproductive Futures: Emergent Injustices, Hopes and Paradoxes" (Tampere University, Finland) and in the workshop "Time, Temporality and Timing: Poetry and Reproduction through the lens of Sappho (1972-1981)", at the Glasgow Women's Library as part of Canal Press's tour in December 2022.

27 According to the current inflation rate, that would be £91.75 today, which would be just 2% of the fees charged for artificial insemination procedures by private clinics in the UK today.

pubs." Beside the article is a photograph of Sappho worker Nikki Henriques and editor Jackie Forster at their basement premises in Marylebone, London, where, as the article states "four Sappho babies are printed on the office noticeboard." Forster is quoted:

> Dr. Sopher was a guest speaker at one of our meetings...During discussions that followed we were amazed to discover that of the 80 women there, at least 75 admitted they would like to bear children of their own. Following the meeting, Dr. Sopher made inquiries among members of the BMA (The British Medical Association) about the possibilities of extending A.I.D to lesbians. Apparently they were horrified.

On Friday 6th January the expose continued with another front-page, whose headline was, this time, "Ban these babies" (Patyna, 1978b). The article quotes a number of MPs and representatives of

FIGURE 3. Patyna, J. (1978a, January 5) "How I posed as a Lesbian Wanting a Baby", London Evening News, pp. 24-25.

medical associations giving their opinions on A.I.D and Sappho and saying how they believed the activities of the doctors to be "unnatural and immoral". A feature story titled *The most remarkable family in Britain* (Patyna, 1978c) follows, telling of how three women came to be in a relationship with each other, moving in, and later deciding to co-parent. This article faithfully chronicles the discrimination experienced by the family at the hospital around the birth, yet the scandalized tone of the exposé fed a homophobic narrative around the abnormality of queer family structures. Over the subsequent days and weeks the Sappho editorial team responded to the articles, organizing a protest outside the *Evening News* offices and a *Lesbians Reply* article was published by the *Evening News* on the 10th January, which was written by the protestors, including the Sappho editors, who critiqued the ethics of the journalism practices of the newspaper. What was not mentioned at any point across the articles published by the *Evening News* was the fact that *Sappho* was itself a magazine.

SAPPHO (1972-1981) AND THE POST-INTERNET: THE QUEER AND CRIP POLITICS OF THE NETWORK

Sappho was established in 1972 by former-actress, reporter and editor Jackie Forster, who had previously worked for *Arena Three*, a magazine created by the Minorities Research Group, which was the first organization to openly advocate the interests of lesbians in the United Kingdom. Unlike *Arena Three*, Sappho was an independent and self-organized project. Their aims were, as stated in their first editorial letter, to:

> interchange information with homophile societies and heterosexual organizations to disperse the isolation of gay ghettos...Sappho will be subversive by questioning our conformist tenets, Sappho will be a radical race...Red Tory...Blue Labor...Liberal Life-Ladies...Marxist Mummies...homoemotional to the nth...by your contributions you and your letters you will fashion Sappho. (*Sappho*, 1972).

Sappho had been covering the topic of A.I.D long before the *Evening News* exposé. In 1972, in their first issue, they published a feature detailing the options available for prospective parents, whose subtitle asserted the "unalienable right to have children as homosexuals, whether by fostering, adoption or artificial insemination" (*Sappho*, 1972). By November 1973 they were celebrating "babies born to Sappho" in print, writing in an editorial letter how, "A certain pair are smiling experiencing nine months of pre-parent-hood (A.I.D)" (*Sappho,* 1973).

FIGURE 4. Bella Ashbey (1974) Happy Families column. *Sappho*, Vol. 1 Iss. 7.

A DAY IN THE LIFE OF....A FARMER

by Rosey

Thought you might be interested in an article about life on the farm. So here goes.

I'm up at five-thirty am, shivering when I see the frost on the windows, then have a cup of coffee before driving to the lambing field. Pairs of eyes twinkle in the lights of the landrover. Looks like four ewes have lambed in the night — three couples and a set of triplets. Hello — there's another ewe in labour — reckon she needs some assistance. So we catch her and lay her on her side, Bill keeps his knee on her kneck whilst I roll up my sleeve and insert my hand. Feels like two lambs; blindly sort out the jumble of front legs and ease out one lamb, clean its face up and place it in front of the ewe, who starts sniffing and licking it while I get the other one out. Then we stand back to make sure she will mother her lamb.

Start milking the two hundred cows, can milk twenty at a time in our herringbone parlour. It takes two of us about three hours to do the milking including cleaning down afterwards. We generally have a joke-telling session while we're milking, or else discuss TV programmes. Then we have to feed the cows their maize silage and barley — it's all mechanical nowadays — and then we let them self-feed the grass silage. Animals are all fed so now it's my breakfast time.

The slurry pit is full, so we're using the slurry tanker and tractor to pump it out and spread it on the fields. A smelly job.

After lunch check sheep again and move those that lambed last night into another field. The ewe with the triplets doesn't have enough milk, so take one lamb away and foster it on to a ewe who had dead lambs with the good old method of using the dead lamb's skin on the foster lamb. Afternoon milking comes round again, and I get asked if I'm "out on the razzle" with my girl friend to-night! Finish work at five-thirty pm — it's someone else's turn to check the sheep late tonight.

FIGURE 5. Rosey, (1977) A Day in the Life of A Farmer. *Sappho*, Vol. 5 Iss. 5.

Sappho also ran a column called "Happy Families" that shared experiences of queer domestic life. The "topics" of A.I.D, queer parenting and domesticity were consistently situated among a lively ecology of wider reproductive politics issues: Sappho ran "a day in the life of" column written by readers about their working days, offering a sparkling archive of experiences of labor activities undertaken by lesbians in the 1970s; they published original manifestos and documented activism on the intersection of lesbianism, sex worker and trans* identities, experiences and struggles[28]; *Sappho* were involved in the 1978 Child Benefit Lobby, which was a meeting attended by a coalition of British and migrant women of color at the House of Commons to protest the proposed withdrawal of child benefits from families who had experiences of migrating to Britain and *Sappho* later published the statements of the many lesbian mothers present at the meeting.[29] Over the decade Sappho established many activist groups, including, in 1975, supporting Sappho readers to set up a meeting space to discuss lesbianism and disability.[30] They also connected readers to arts, theater and poetry projects: in June 1975 they published a call from Gay Sweatshop Theatre looking for plays, and a year later Sappho and readers contributed research to *Care and Control* (1976), a play focusing on custody battles and legal discrimination experienced by lesbian mothers. Sappho published reviews, poetry, short stories and drawings, many of which were signed anonymously and collectively as "Member of Wages Due Lesbians", a prominent international network of collectives active in struggles related to sexuality, disability and race. It was these networks of art and activism that showed up outside the London Evening News offices on the 9th January 1978, to support *Sappho*'s protest against the homophobic exposé (Jennings, 2017).

As mentioned in Chapter 1, "post-internet" is a contentious term used by art critics and artists to refer to practices that reflect on the impact of the internet on society. Karen Archey and Robin Peckham (2014) define the post-internet as: "an internet state of mind – to

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28   See: Susan Lewis and Ben Foreman, 'Transexual Liberation Manifesto', *Sappho*, Vol. 3. Iss. 7. (1974); 'Lesbianism and Prostitution', *Sappho,* Vol.5. Iss. 8. (1977).

29   See: Child Benefit Lobby, *Sappho*, Vol. 6. Iss. 6. (1978).

30   See: E.B, K.B and J.C, 'Disabled Gay Women Group', *Sappho*, Vol. 4. Iss. 11. (1975).

FIGURE 6. Photo-documentation of the protest outside Evening News Offices from *Spray It Loud* (Posner, 1982) pp. 26-27. Image courtesy Jill Posner and Pandora Press.

think in the fashion of the network…an art object created with a consciousness of the networks within which it exists." *Sappho*, although existing before the Internet, might be considered "post-internet" to the extent that it had at the center of its politics the establishing and maintenance of networks: networks for disability and antiracist activism, networks for art and theater production and family networks. The term "network" began to be adopted by mid-20th century social anthropologists to describe the interdependent bonds between individuals and their extended family that are maintained beyond blood relations, marriage or formal adoption processes (Bott, 1957; Firth et al., 1956; Wellman and Wortley, 1989). "Networks" in this sense aptly names the familial configurations that *Sappho* helped to establish and maintain. Kinship studies today further accentuates the family as a "flexible network" adapted to deal with the displacement of members

across borders, in the contexts of migration (Francisco Menchavez, 2018) and the combating of structural racism and resource scarcity across households (Benjamin, 2018): what defines the familial dimension of a network is not legal or institutional arrangements but activities of mutual support. In reference to the networks of mutual aid established beyond, and often against, state and biological family dependencies, Disability Justice scholar, artist and activist Leah Lakshmi Piepzna-Samarasinha (2018) coins the term "care webs" and asks, "what does it mean to shift our ideas of access and care from an individual choice to a collective responsibility?" (p. 9). Piepzna-Samarasinha grounds the care web in the Disability Justice[31] principles of "cross-movement solidarity" and "interdependence" and connects present examples of "black and brown queer people creating networks of care by and for us" with "care webs that have existed through time, that I know of through queer legend and myth" (p. 4). By establishing a culture of self- and collective representation, and supporting lesbians, trans* people, people of color and women with and without disabilities to meet, publish and secure access to health care, reproductive technologies, work and benefits, *Sappho* might be considered one such node in the historical network of care. Significantly, *Sappho* was fundamentally maintained and supported by collectives of reader-writers and activists: the same collectives who turned up to support the organization, as mentioned, during the protests outside the London Evening News offices on the 9th January 1978.[32]

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[31] Disability Justice is often defined in contrast to the Disability Rights Movement, as distinguished by co-founder of U.S organization Sins Invalid, Patty Berne (2017): "While a concrete and radical move forward toward justice for disabled people, the Disability Rights Movement simultaneously invisibilized the lives of people who lived at intersecting structures of oppression– disabled people of color, immigrants with disabilities, queers with disabilities, trans and gender non-conforming people with disabilities who are houseless, people with disabilities who are incarcerated, people with disabilities who have had their ancestral lands stolen amongst others…Disability Justice activists organizers and cultural workers understand that able-bodied supremacy has been formed in relation to other systems of domination" (as cited in Piepzna-Samarasinha, 2018, p. 31)

[32] Rebecca Jennings (2017) notes that a number of collectives were present, including, Action for Lesbian Parents, Wages Due Lesbians, *Spare Rib* magazine and Gay Sweatshop Theatre Company.

Historically, *Sappho* typify the lesbian feminist tradition of health care activism that preceded HIV/AIDS activism and evidence how, as Crip Theory scholar Robert McRuer (2006) noted, "alternative ways of relating collectively and sexually always acknowledge interdependency and communal care" (p. 86). McRuer compares such historical "cultures of disability" to the "cults of ability" that would go on to influence the either/or logic of subsequent LGBT equality rights discourses in the U.S and Europe, where a strict distinction between public and private spheres led to *either* the radical "queer opposition to domesticity" or the queer assimilation into heteronormative social structures. The binary resistance/assimilation model of queer life, McRuer (2006) argues, "obscures the fact that we have already proliferated multiple queer alternatives to straight ways of relating" (p. 84). Cultures of disability problematize the strict distinction between queer opposition and assimilation and cut radically across public and private spheres, demonstrating how such distinctions are themselves "founded on principles of independence and ability, and is thus inimical both to the broader conception of access" (McRuer, 2006, p. 81). *Sappho*'s challenge to a host of institutions –of medicine, media, political economy and the home– exemplifies these public-private cultures of disability that profoundly disrupt not only the actual political economic organization of the productive/reproductive, waged/unwaged, and public/private spheres, but how this distinction has been theorized across traditional Marxism, Feminism and their intersections.

It would be "an error though to equate the absence of a center in the network with the absence of power relations" (Söderberg, 2008, p. 138), however, and any discussion of the critical potential of the network must today contend with the fact that networks can be centralized, decentralized or distributed and "it cannot be taken for granted that networks are democratic and politically radical" (Parikka, 2007, p. 293). This section has, however, presented *Sappho* as a node in a wider network of social reproduction struggles around access to health care, reproductive technologies, benefits, wages and housing that are grounded in "relations of social, material and prosthetic support" (Kim, p.85 as cited in Cartwright, 2020, p.15). The post-internet reading vitally grounds the *critical potential of the network* in the Disability Justice precepts of interdependency and cross-movement solidarity (Berne, 2017; Piepzna-Samarasinha, 2018).

QUEER REPRODUCTIVE WORK:
MEETINGS, MANIFESTOS, BABIES,
POEMS, COMPLAINTS, PROTESTS, LETTERS,
SEX, DOCTORS AND DISCOS

Sappho evidenced how both reproductive imaginaries and repro-
ductive biologies are *worked* on. The queer reproductive work activ-
ities documented across the pages of *Sappho* can be read, I suggest,
according to three categories: cultural activism, family and complaint,
all of which have occupied a prominent place in subsequent Queer
Theory and queer research practices.

FIGURE 7. Poem and march spread from *Sappho* Vol. 8. Iss. 10 (1980).

Firstly, as mentioned above, Sappho documented many of the protests and events they were involved in alongside poetry, short stories, drawings and plays: art and activism were inseparable. In 1987 Douglas Crimp defined "cultural activism" with reference to, firstly, the public interventions of the activist group ACT UP and, secondly, the work of video artists who created a "critical, theoretical, activist alternative to the personal, elegiac expressions that appeared to dominate the art-world response to AIDS" (p. 15). Like Audre Lorde in her essay on the erotic (Chapter 1), Douglas Crimp is not interested in whether the gesture, "is dancing, building a bookcase, writing a poem or examining an idea" (Lorde, 2007, p. 57). Cutting across art practices, daily life, activism, poetry and theory, Crimp mobilized an "expanded view of culture in relation to crisis", which is crystalized in his use of the word "response" that does not differentiate necessarily between an artwork, poem or protest. This "expanded" framework was necessary, Crimp argued, to address the HIV/AIDS crisis in all its dimensions: "AIDS intersects with and requires a critical rethinking of all of culture: of language and representation, of science and medicine, of health and illness, of sex and death, of the public and private realms." (p.15). Using the term "cultural activism" anachronistically here to describe the linked practices of art, theory, poetry, theater and protest documented by *Sappho* opens up interpretative possibilities that are key to the unfolding of this thesis: firstly, it enables an understanding of the global HIV/AIDS crisis as a reproductive politics issue and social reproduction crisis (Briggs, 2018; Bujra, 2004) and secondly it helps to emphasize the urgency of queer historical materialist "recovery work" that connects practices of art, poetry, protest, theater, critical writing (and software, Net Art, code art etc.) across times and spaces as "responses" to policies and politics of reproductive control.[33]

Another set of queer reproductive work activities documented across the pages of *Sappho* gather around the idea of family, as I have detailed above: from the birthing and raising of children to naming and supporting familial networks whose domestic conditions may not necessarily conform to the dominant configuration of a family – either because of collective living structures or because of displacement across borders. Lastly, a number of reproductive work

[33]   I elaborate on this in the next chapter's close reading of a work of Net Art as a response to a specific policy of reproductive control.

activities documented across the pages of Sappho might be gathered under the rubric of complaint. *Sappho* consistently documented – through reader's letters, essays, satirical pieces and editorial letters– people complaining: complaining about abusive partners, homophobic parents, financial problems and state violence or neglect. They also publicly disclosed the administrative work involved in filing official complaints regarding, for example, experiences of discrimination at work or at the hands of medical institutions or the council. The documentation of the *Evening News* exposé is exemplary: *Sappho* published a running commentary of the events as they unfolded, sharing articles critiquing the general homophobia of the national press; inviting and publishing readers' responses to the mediatized scandal; and calling out to supportive doctors and GPs so that the provision of AID might continue. They also shared the experiences of physical exhaustion and fear experienced as a result of the exposé and, perhaps the most mundane of all, published a detailed record of the year-long process of filing a complaint to the UK Press Council.[34] The complaint was ultimately rejected based on the Council's argument that "the discrimination you are complaining about is in any event justified." Forster writes:

> Most of us take this on innocent of the hours involved in the amount of dogged persistence needed to pursue it, when the whole matter has soured and we are contending with fresh crisis…Bone weary from the media onrush this year, Nikki and I consulted journalists…Their outraged response to the tactics employed by the Evening News reporters encouraged

[34] Sara Ahmed (2022) recently published an article titled *Complaint as a Queer Method* that builds on the insights of *Complaint!* (2021), a book that documents and analyzes the process of filing complaints in academic institutions. Ahmed writes, "Complaint seems to catch how those who challenge power become sites of negation, the complainer as container of negative affect, a leaky container, speaking out as spilling over. Negation can be quite a sensation. Think also of the word queer. We reclaim that word that has been used as an insult or as a smear not by trying to separate ourselves from the negativity, but by re-purposing it as tool". In an earlier version of the text, Ahmed (2019) proposes this "repurposing of negativity" as a form of "non-reproductive labor" to the extent that it is "the work you have to do not to reproduce an inheritance." Non-reproductive labor is perhaps another way to think about queer reproductive work.

the thought of approaches to the Press Council [...] So [...] In our non-existent spare time Niki and I drafted a blow-by-blow account of what had happened [...]

Sappho magazine, and the social relations that emerge from these editorial practices, encouraged reader-writers to maintain and style their lives, artistic practices and families. The meticulous documentation of these moments of choice, desire, complaint and refusal constitute *Sappho* as a possible archive of "queer reproductive choice". Post-internet queer reproductive work as a concept is grounded, in this sense, in Queer Marxist scholarship on self-conscious decision-making at the intersections of work, communication and politics. In particular the work of Meg Wesling (2012), who takes up Hannah Arendt's (1959) distinction between "labor" and "work" to consider the forms of "self-conscious work" that "refuse the alienation of labor" (Wesling, 2012, p. 120) and Nat Raha (2018) who studies the ambivalent but no less radical "forms of cultural production that materialize when queer and trans people work for capital and for each other" (Raha, 2018, p. 8). Also key is the work of Audre Lorde (2007) (Chapter 1), who writes, "within the celebration of the erotic in all our endeavors, my work becomes a conscious decision" (p. 55). Queer reproductive work is characterized by this refusal of those environments that assert *the naturalness of heterosexual reproductive biology; the intrinsicness of heteronormative gendered reproductive roles and the givenness of biologized kinship*. The networked post-internet queer reproductive work activities of cultural activism, family maintenance and complaint are central to an understanding of reproductive work as the creative transformation of reproductive imaginaries and reproductive biologies.

Considering the political economy of *Sappho* might provide friction however for any idealization of the material conditions of post-internet queer reproductive work. At the time of the expose, the *Evening News* had a circulation of approximately 442,000 daily, and was published 6 times a week (Simms, 2006). In comparison, *Sappho* had a circulation of between 900 and 1000 readers, was donation and subscriber funded, was published just once a month and sold for between 15p, rising to 25p and then 50p towards the final issues. The magazine cost £356 to make per issue (£2,176 by today's standards) and was produced by a team of 8 women, 5 of

whom were unpaid volunteers, as the magazine could only fund 1 full time worker (Directory of Women's Liberation Newsletter, 1978). Most of its content was also contributed for free, being mainly reader and subscriber fabricated: "you fashion Sappho," the editorial letters affirmed every month. My intention is thus not to romanticize this *no* or *low-waged work* but to consider the ways in which the knowledge shared through the linked editorial, art, poetry and political practices successfully maintained LGBTQIA++ creative and familial lives.

QUEER REPRODUCTIVE WORK
AND NATIONAL REPRODUCTIVE IMAGINARIES:
A DYNAMIC

In the Chapter 1, I quoted Susan Ferguson & David McNally (2013) as saying, "too often [social reproduction feminists] conceptualized labor as a thing, operating within another thing or structure (eg. the economy, the household or community)" (p. xxxvii). Above, however, I have done just that: conceptualized queer reproductive work as a thing (a set of activities), operating within another thing (a magazine), operating within another thing (the nation state). To better support the conceptualization of queer reproductive work as a dynamic relationship between work and world, it is helpful to consider the concrete changes that *Sappho* and the *Sappho v. Evening News* case brought about to the reproductive imaginary in Britain. On one hand, the visibility led to *more* lesbians and women finding out about and pursuing access to artificial insemination. *Sappho* editor Jackie Forster (1978) documents, in her summary of the events surrounding the exposé published in *Sappho*, how the *Evening News* articles gathered attention from:

> journalists from Turn, Berlin, Australia, Brazil and feminists from France, magazines from Italy and Germany, Dutch radio and TV competed with British media to create an ordeal from which we are slowly recovering. (*Sappho*, Vol 6. Iss. 3, 1978)

Forster explains how, outside their premises, the "press, television, radio and magazine camped with cameras, while the telephone ran continuously." On the other hand, the article's representation of "lesbians as freaks with no right to bear children"[35] contributed to the efforts of conservative MPs and medical associations, such as the British Medical Association (BMA), who lobbied to ban queer access to ARTs. Twelve years later the same MPs and the BMA representatives quoted in the *Evening News* exposé had successfully pushed through the so-called "welfare clause" in the 1990 *Human Fertilisation and Embryology Act*, which stipulated that clinicians consider the "need for a father" of any potential child before offering a woman fertility treatment. This clause constitutes a major chapter in the history of reproductive control in Britain and effectively banned same-sex access to ARTs until 2008, when the clause was removed.

It is vital to contextualize these scandals not only as instances of homophobic media and medicine but as an integral part of the wider processes of racializing class-consciousness in relation to capitalist production. The reproductive imaginary is structured by mediatized debates around gender, parenting, housing, borders, land and reproductive technologies in order to police access not only to basic material resources but political imagination. Print media contributes in this sense to the racial management of the national imagination regarding what forms of social reproduction are possible.

WHY BRING UP SAPPHO TODAY?

One reason to bring up *Sappho* today is to strengthen a memory of the history of demands for queer access to reproductive technologies and to nurture similar struggles in the present, bearing in mind that LGBTQIA++ access to assisted reproductive technologies is by no means equal across Europe and globally. The years 2019-2023 that bracket this doctoral research project have been key in terms of changes to legislation affecting LGBTQIA++ access to ARTs in Finland and the UK. In July 2022 the UK Government published their "Women's Health Strategy", which promised to remove "the additional

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35 This is how the editors of Sappho characterized the representation in their *Lesbians Reply* article published in the *Evening News*.

barriers to IVF for female same-sex couples."[36] Previously, lesbian couples had to pay up to £25,000 for six cycles of artificial insemination privately in order to "prove infertility" and access IVF for free on the National Health Service (NHS). This evidently presents a major barrier for low-income households (Taylor et al., 2021) and creates differential treatment across the population bearing in mind that single women and heterosexual couples can access the same treatments immediately for free. LGBTQIA++ access to ARTs often coexists however with discriminatory reproductive rights policies. In 2013, LGBT marriage was granted legal protections in the UK, which was an important step for prospective LGBTQIA++ parents as marriage is required for co-parenting rights to be automatic. However, just a few months previously, the then prime minister Teresa May ushered in a new minimum income requirement for non-European Economic Area (EEA) spouses of nationals wishing to live in the UK, which was set at approximately £6,000 above the national minimum wage, an impossible feat for many. This policy reportedly separated tens of thousands of families and had an indiscriminate effect on women, LGBTQIA++ people, people of color and people with disabilities, who are less likely to earn enough to be able to sponsor their non-EEA partner (Sumptiom & Vargas-Silva, 2019).[37]

The Finnish government also recently changed the policy regulating LGBTQIA++ access to ARTs. In February 2023 the government removed the harmful requirement that trans* people endure not only invasive psychiatric evaluations but forced medical sterilization before they can have their gender affirmed. Beyond this, in Finland, *The Act on Assisted Fertility Treatments* (1237/2006) regulates all assisted reproduction procedures. While lesbians have been accessing ART treatments privately for many years, public clinics have been denying treatment to same-sex couples and single women based on the idea that these cases are not examples of "medical conditions" and so do not qualify for support on the national health system. In 2019, the Finnish administrative court ruled that the public health

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36   'First Women's Health Strategy', News article, UK Government, https://www.gov.uk/government/news/first-womens-health-strate-gy-for-england-to-tackle-gender-health-gap

37   *The Wife of Them All* (2022) film addresses personal and collective experiences of this minimum income requirement legislation.

system practice of denying treatment to single women and lesbian couples was discriminatory. The introduction of the *Maternity Act* in 2019 introduced further important changes for lesbian parents, as it stated that the female (married or unmarried) spouse of a person giving birth can claim to be the other mother of the child, either in clinics or at social services points. Finnish projects such "Monimuotoiset perheet – Diverse Families network" and "Sateenkaariperheet – Rainbow Families Finland" have been "tackling these gross injustices"[38] since the mid-2000s and recent scholarship on reproductive justice in Finland has linked these critiques of homophobic discrimination to the transphobic sterilization requirements (Honksaalo, 2018) and the longer histories of racialised reproductive control (Blell, 2022).

As much recent sociological scholarship has flagged, demands to *access* medical and reproductive technologies –from pharmaceuticals to reproductive technologies– has been rapidly co-opted since the 1990s by monopoly firms that use the language of "access" not to extend equal rights but to expand markets (Sismondo, 2020). With this in mind, I bring up *Sappho* also to nurture struggles that include but also *imagine* beyond questions of access. Across studies of reproduction and queer reproduction it is common to foreground *access to IVF*, with studies citing the first test-tube baby case, Louise Brown (coincidentally born the same year as the exposé in 1978), almost in a compulsory manner, as the birth of the fertility clinic. What if the Queer, Crip networks documented across the pages of *Sappho* are the real origin story of the "new reproductive technologies"? *What if Sappho had become the model for the contemporary fertility clinic?*

Returning to a lesbian zine from the 1970s –before the fertility clinic, before queer, before the Internet– brings up its own methodological and ethical questions too regarding the politics of "recovery". The line of poetry that opens this chapter is from (the original) Sappho (630 – c. 570 BC), translated by Canadian poet Anne Carson (2002) and quoted by Heather Love in her seminal reflections on the politics of queer history and queer methodologies. Entitled *Feeling Backward* (2007) Love writes how, "the longing for community across time is a crucial feature of queer historical experience, one produced by the historical isolation of individual queers as well as the damaged

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quality of the historical archive" (p. 37). While affirming the need to, as historian Elizabeth Freeman (2000) writes "'feel the tug backwards' as a potentially transformative part of [political] movements" (Freeman as cited in Love, 2008, p.30), Love warns against mobilizing romanticized notions of "community". "The Sapphic" is particularly suspect to this romance, which pervades revisionist lesbian and gay studies projects that seek a return to a pre-modern homosexuality. There is a geopolitics of "Sappho", as there is of the term "lesbian", which contains the name of a Greek island in its etymology (Parmar, 1994). The uptake of Greek words such as "Sappho" in the English language cannot be too far separated from the racialised reading of the Mediterranean region and the association of aspects of ancient Greek culture with whiteness (Robinson, 1984). As Queer Marxist scholar Petrus Liu (2015) writes,

> we cannot afford to keep assuming that queerness or homosexuality has a single origin in Greece or France. Nor can we assume that queer theory should begin with a description of how a certain 'we' evolved from a Greek cultural organization of gender and sexuality to the making of the modern French homosexual as a species and then to the twentieth-century homo- /heterosexual definitional crisis. (p.30)

The Eurocentric revisionist legacies that Liu refers to here have tended to block the occupation of the Sapphic as a site of anti-racist and class struggle. This was feminist scholar Cherrie Moraga's conclusion when the author commented to Amber Hollibaugh in 1981: "if you have enough money and privilege, you can separate yourself from heterosexist oppression, you can be Sapphic or something, but you don't have to be queer" (Hollibaugh & Moraga, 1981). Today, queer too has been "separated" from broader reproduction struggles. Against the aestheticizing tendencies of revisionist history, which abstracts identities or stories to reify socially "independent" "communities", this chapter emphasizes the connections between social struggles, and reconnects the socially reproductive dimensions of cultural activism, family and complaint.

RESTORING THE NETWORK
AFTER PACKET-SWITCHING AND
THE NETWORK SOCIETY

The loss of entire layers of complexity of "queer reproduction" is intensified in today's "networked society" (Castells, 1996) where abstraction occurs in less than a second. This is best elaborated on in relation to the Internet itself: a networked technology defined fundamentally by the drive towards the simplification and abstraction of data. Unlike the uninterrupted data streams of electronic communications or broadcast technology, the Internet uses packet-switched networking, which breaks a given message down into discrete parcels to be sent along different routes at different times (Chao et al., 2001). Only on arrival, and with the storage, routing, and processing power of a computer, is the data reassembled. Along the way, many technologies and protocols work on the information to break it up. Each successive, higher layer abstracts the raw data further, making it simpler to read for applications and users (Poulton, 2014). While networking is often discussed in topological terms, emphasizing horizontal exchange between hosts, actually its implementation is layered vertically too: as a technological form the networking activities of the Internet are both horizontal and vertical, centralized and decentralized. This has consequences for the reassembled message: sometimes layers of complexity or entire parcels get lost. The drive towards abstraction and simplicity is intensified socially and politically too: the tendency to streamline and hierarchize reproductive politics into "single issues" moves against the Queer and Crip politics of the network, as detailed above. This is the *reproductive politics of packet-switching* and the new sexual politics of the network, which increasingly self-legitimizes through parceling, enveloping and isolating as modes of technological, social and political response.

        This chapter has so far considered the network as a technological, social and political economic form that pre-dates the Internet. I have also considered the network as a reproductive imaginary and a mode of Queer and Crip action that cuts decisively across the public and private, productive and reproductive spheres, troubling these distinctions. It is the distributed and disruptive dimension of "the network" that precisely determines its functioning as a mode of

capitalist production: one that comes to dominate, according to the-
orists of the Network Society, in the post-Fordist and neoliberal era.
The rise of the network as a mode of capitalist production is exem-
plified in the rise of the *networked firm*, reliant on restructured pre-
carious labor, competition between small businesses, franchising and
networked communications technology (Söderberg, 2008). The "Net-
work Society" is constituted by globalized, communicative and pro-
ductive *networking* activities that come to constitute anything from
financial markets to politics and broadcasting (Castells, 1996). It is
in this context of *networked production*, that the network becomes
a self-legitimizing discourse. As mentioned in Chapter 1, central to
Marx's theory of fixed capital, and its deployment as a concept in con-
temporary studies of the built environment and digital technologies,
is the observation that the spatialization of capital –its fixing– legit-
imizes particular social and ideological forms. It is at this intersec-
tion of the network as a social, technological, political economic and
infrastructural force of legitimation that a powerful esoteric language
of the network emerges: Eran Fisher (2010) calls this "the spirit of
the network" that "with its specific critique of the pitfalls of Fordism,
legitimates the shift to post-Fordism first and foremost by depicting
this shift as progress" (p. 224). This has led many theorists, for exam-
ple Negri and Hardt (2001, 2005), to call on the network as a histori-
cally specific oppositional form of post-Fordist political action. Chris-
tian Fuchs (2008) similarly highlights the possibility of emphasizing
cooperation over competition when the networked technology of the
Internet facilitates and maximizes both. I have also explored *Sappho*
here as a mode of oppositional networked action orientated around
the reproductive work activities of cultural activism, family and com-
plaint and I have restored a memory of "reproductive choice" beyond
liberal eugenics precepts. In these approaches to the social, politi-
cal, economic and technological dimension of the network, there is
an ambivalence regarding the critical potential of the network that
recognizes how "asymmetries continue to be reproduced in the rela-
tive connectedness or isolation of a node, and, crucially, how power
resides in the protocol that enables communication between nodes"
(Söderberg, 2008, p. 139). In other words, political antagonisms are
explored as a question of proportion and scaling: power may be inten-
sified as nodes become hubs and as cooperation grows into com-
petition. The recasting of the network as the main organizational

structure for labor-capital struggles today (Castells, 1996; Hardt & Negri, 2001; Söderberg), far from affirming the irrelevance of class in the post-Fordist era, has revitalized anticapitalist critique in the networked tech, services and knowledge sectors. It has also significantly broadened the way that class struggle might be imagined and detailed historically in relation to *networked reproduction*, as this may be organized in both centralized and decentralized –horizontal and vertical– ways; yet this possibility has gone under theorized.

This chapter has detailed an instance of a queer reproduction struggle as "a question of networks against networks" (Terranova, 2022, p. 36) that fundamentally structures wider class struggles. The creation of homophobic exposes and the restricting of access to reproductive resources and technologies is key for racializing class-consciousness: debates around who can be considered a worker, parent and national are necessary in order to condition and police material resources and the political imagination. Highlighting how interdependence and cross-movement solidarity *pre-exist* the network society is also fundamental for countering the esotericism of the network as inherently progressive: the network has not only existed as a social, technological and political economic form before the networked firm and before packet-switching, but these networks perhaps haunt today's network society. For what is a network, if not fixed capital? And what is fixed capital, if not the accumulation of past cycles of re/productive work? In the next chapter, I elaborate further on the structural link between the fertility market and queer reproduction struggles; between fixed capital and reproductive work.

Chapter 4
THE VIRAL AND THE HIV/AIDS CRISIS

I'm calling you on this line /
which they have made for us /
love we could our perverse plan /
[…] we form gangs and infect

Francisco Casas,
"SODOMA EN ALGUNA PARTE", (1991, p.14)

REPRO-SEXUAL INTERSECTIONS
AT THE LEVEL OF THE INTERFACE

This chapter reaches beyond the commercial interfaces and algorithms of assisted reproduction to consider how a work of Net Art, entitled *Gay Gamete* (2000), responded to a specific U.S Food and Drug Administration (FDA) policy of reproductive control. I contextualize the FDA policy with reference to scholarship on the political management of the global HIV/AIDS crisis (Patton, 1991) as an "epidemic in signification" (Treichler, 1987) that fundamentally transformed popular and scientific thinking on genetics, sexuality, race, heritability, family and society. The role of the HIV/AIDS crisis in determining the clinical protocols for handling sperm has been well noted across studies of assisted reproduction (Swanson, 2014, Almeling, 2011). I deepen the observation though, often made in passing in these studies, that the heteronormative cultural coding of sperm donor profiles today is largely indebted to a racialised reproductive imaginary consolidated through the popular authoritarian management of the HIV/AIDS crisis. Following scholarship on "repro-sexual intersections" (Pralat, 2014), this chapter considers the structural link between the *viral* replication of fertility visuals across the ART interface –baby faces, doctors in white coats, pregnant women without heads and double helixes– and the political management of the human immunodeficiency *virus*.

GAY GAMETE (2000):
NET ART, CYBERFEMINISM AND
THE POLITICS OF INFECTION

Gay Gamete (2000) is a work of Net Art developed by the U.S contemporary artist and photographer Clover Leary. Throughout the late 1990s and early 2000s Clover Leary's interdisciplinary practice considered questions of sexuality and normalization. Together with artists Heather Cassils and Julia Steinmetz, she formed part of the Los Angeles based feminist collective Toxic Titties, whose performance and video works similarly investigated the domestication and privatization of LGBT identities and practices.[39] Clover Leary's

Gay Gamete (2000) emerges at the intersection of the 1990s Net Art movement and a wider pool of artistic and performative interventions that address the commercialization of biotechnologies. While works like Faith Wilding and Hyla Willis' *SmartMom* (1999) or Critical Art Ensemble's *Intelligent Sperm On-Line* (1999) combined tactical media disobedience with social intervention (Wilding & Willis, 2016), the performativity of *Gay Gamete* for the most part exists only online. Net Art[40] works often feature some modification of the browser experience to expose the social, political and technical functioning of particular web technologies. At the time of *Gay Gamete's* publication in 2000, many Net Art creators were experimenting with a range of coding languages and fusing programs to alter the online experience in psychedelic ways.[41] As a hyperlinked site with basic text and image content, *Gay Gamete* is quite straightforward: a normal web experience, which perhaps accounts for the artwork having been scarcely anthologized in art historical accounts of both the Net Art and cyberfeminist art movements. The project is mentioned in a footnote in Rachel Greene's (2004) compendium *Internet Art* (p. 96) but is absent from subsequent prominent Net Art anthologies (Bosma, 2011; Connor et al., 2019; Cornell & Halter; Daniels & Reisinger, 2009; Dekker, 2018; Respini, 2018; Tavin et al., 2021) and commentaries on the history of cyberfeminist art (Barnett, 2014; Seu, 2023; Sollfrank, 2002; Zafra & López Pellisa, 2019).

A defining characteristic of contemporaneous Net Art, cyberfeminist art and the tactical media movements is the parodying of corporate visuality. In *Intelligent Sperm On-line* (1999), U.S art collective Critical Art Ensemble intervene in a university campus to,

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39 Toxic Titties' work *Ikea Project* (2001), for example, critiques and parodies the sexual and gender politics of mainstream representations of domesticity through a combination of installation, interviews and video.

40 Art historians sometimes conflate 'net.art' with 'software art', 'Internet Art', 'Network Art', and 'post-internet art'. I follow US cataloging project Rhizome, who today uses the unpunctuated term Net Art to refer to any work of art in the past or present 'that acts on the network, or is acted on by it'. See: Rhizome, Retrieved Dec 3, 2021 from https://rhizome.org/editorial/2017/jun/13/what-is-net-art-a-definition.

41 For example, I.O.D's *Web Stalker* (1997); Jonah Bruker-Cohen's *Crank the Web* (2001); Cornelia Sollfrank's *Female Extension* (1997).

pose as the fertility clinic BioCom, allowing one of its customers at the home office to look over the audience and pick out a donor she likes. In the audience is a confederate, who is chosen, offered cash for his sperm, and agrees to donate. The rest of the performance is the audience reaction.

Intelligent Sperm On-line performs the liberal eugenics of assisted reproduction, as expressed in the pressures to choose the "most intelligent" donor, in order to critique the same liberal eugenics discourse. A similar tactic is deployed by the arts and technology collective Mongrel, who hacked a version of the image editing software Photoshop to create a modified version. The project used ResEdit (Resource Editor), which was a program used by developers to produce and modify the interface 'resources' in programs for MacOS at the time. Reader-users of the modified program, which they called *Heritage Gold* (1997), are invited to "edit their new family" via a series of drop-down menus where different categories for "social status" and "racialization" may be selected and where "immigration status" can be "configured". The program offers the opportunity to "flip historical relations on head" and click to "rotate world view": the new program copies, but also modifies, the literal interface between liberal eugenics and direct manipulation as it is normally organized at the level of the interface.

Gay Gamete (2000) does something similar to *Intelligent Sperm On-Line* (1999) and *Heritage Gold* (1997) as it parodies the ART industry's most banal visual and rhetorical tropes: micrographs of eggs and sperm; micromanipulator tools injecting oocytes; doctors clad in scrubs; images of reception areas; smiling baby faces; the twisting double helix of DNA and the discursive linking of fertility to "the future", "security", "investment" and "insurance". Yet *Gay Gamete* calls for what no commercial fertility clinic has ever advertised for: gay, and only gay, donors. Visitors to the site read that, "Thousands of us have already succeeded in donation. We have done our part to ensure a gay future, so must you, the very survival of our race depends upon your quick action" (Gay Gamete, 2000).

One of the main sites of *Gay Gamete's* parodic intervention is the "you" and "yours" of both dominant fertility discourse and the commercial Internet at large. The project performs a radical homosexualizing of the Internet's normalized lyrical address. The question

FIGURE 8. Homepage. Gay Gamete, (2000). Image courtesy Clover Leary.

of lyrical address is key in the context of personal computing. In a study of software as both a legal object governed by patents and financial instruments and as an accumulation of technical and social practices that constitute and transform the materiality of human memory, Wendy Hui Kyong Chun (2011) writes, "Computer programs shamelessly use shifters – pronouns like 'my' and 'you' – that address you, and everyone else, as a subject" (p. 67). The "you" of personal computing and the commercial Internet is intentionally both flexible and stratified: you are both an individual person and a target population. *Gay Gamete* though is more specific, and the homepage addresses the gay you: "Don't let *your* Gay DNA get left behind" (Gay Gamete, 2000). Clover Leary deploys parody via a logic of infection.

Scholarship on queer art has often invested the queer artwork with the capacity to "infect" the dominant culture (Halberstam, 2011; Lorenz, 2012). In her essay *Politics of Infection* (2014), Chilean critic Fernanda Carvajal details the performance and video interventions of Peruvian art collective Grupo Chaclacayo and Giuseppe Campuzano as they manifested transfeminist resistance to the forces of authoritarianism and terror in 1990s Lima. The essay refers to Queer Theory scholarship that draws on an intellectual tradition of critiquing the political and cultural management of the HIV/AIDS crisis across the globe (Meruane, 2012; Patton, 1991; Treichler, 1987).

FIGURE 9 & 10. Images: (Top) Eggs. Gay Gamete, (2000). Image courtesy Clover Leary; (Bottom) Sperm. Gay Gamete (2000). Image courtesy Clover Leary.

Similarly critiquing the limits of philosophical conceptualization of viruses as passive "products of globalization and conquest as well as computer security and digital control [and] dead ends for radical politics", U.S critic and artist Zach Blas (2012) reads the work of collectives like the Electronic Disturbance Theater and Queer Technologies

as they "use the virus as an anticapitalist tactic" (p. 30). The performance work *How to Write a Tropical Disease, How to Write a Manifesto* (2016) by feminist performance collective diásporas críticas, consisted of a reading of quotes of archival documents sourced from the Guayaquil Historical Archive pertaining to neocolonial hygiene campaigns in the city of Guayaquil between 1890-1919, as well as quotes from the work of various poets and activists from the 19th, 20th and 21st century, whose work has responded to the moral and social dimensions of early hygiene discourses. The work –as both archival research project and performative artistic response– considers the lasting impact of the scientific and social construction of narratives of contagion on present life in city centers and situates gentrification as part of a historical trajectory of social control and surveillance of public space that flourished particularly in the context of epidemics in the 19th century. Taking place in the city of Guayaquil, Ecuador, the work mobilized *transmission* as a mode of action via the *contagious* literary form of the *manifesto-poem*.[42] As the Cuban artist Felix Gonzalez Torres once said, "All the ideological apparatuses are replicating themselves, because that's the way culture works. So if I function as a virus, an imposter, an infiltrator, I will always replicate myself together with those institutions" (Gonzalez-Torres as cited in Chambers-Letson, 2010, p. 559).

While infection, transmission, contagion, the virus and the viral have distinct genealogies across the fields of medicine, psychoanalysis and computer science, they have all been reappropriated by artists and collectives globally, not only as metaphors but as modes of response. This viral tactic might also be called "No", as it was articulated by the poet Anne Boyer in her 2017 essay of the same title:

> take what is, and turn it upside down. Or take what is and make it what isn't. Or take what isn't and make it what is. Or take what is and shake it till change falls out of its pockets. Or take any hierarchy and plug the constituents of its bottom into the categories of its top. Or take any number of hierarchies and mix up their parts.

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[42] I was part of this collective between 2014-2016 and co-authored an article elaborating on the historical relationship between contagion and the manifesto text as a literary and political mode of action (Cisneros & Close, 2018)

It is by "taking what isn't and making what is" that Gay Gamete *infects* both dominant fertility discourses and "normal" lyrical address of the commercial Internet.

THE GAY GENE DEBATE
AND VIRAL HETERONORMATIVITY

Gay Gamete adopts a viral tactic of infection as a response to the virality of heteronormativity, radically intensified during the HIV/AIDS crisis. Concretely, the Net Art project responds to a specific Food and Drug Administration (FDA) policy that advised clinics against accepting gay donors. As *Gay Gamete* states:

> The FDA has been in the process of promulgating national regulations that would prohibit clinics from accepting sperm from homosexual applicants since 1999. (Gay Gamete, 2000).

In 2004 these guidelines were approved and despite various calls across the U.S to withdraw it over the last two decades, as of January 2020 the FDA and American Society for Reproductive Medicine (ASRM) still recommends that banks reject the applications of: "Males with a history of sex with another man, or females with a history of sex with a male who has had sex with another male in the preceding 5 years." (ASRM, 2020). By the early 2000s the combination of highly active antiretroviral therapy (HAART), in use from 1996 onwards, and cryopreservation techniques –which enables the sperm to be quarantined for 6 months at which point the donor would be tested again– already facilitated a person living with HIV to donate safely or to have children without a high risk of transmission (Kuji et al., 2007; Pralat, 2015). Furthermore, innovations in sperm washing were being developed all the time, and doctors in Italy had, as early as 1992, developed a sperm processing protocol that could isolate infected spermatozoa from the rest of the specimen enabling heterosexual couples where the male partner was HIV positive to get pregnant (Semprini et al., 1992). The FDA's decision to regulate donors must therefore be understood beyond the framework of disease prevention and in the context of the charged debates across scientific research and popular media regarding the existence

of the gay gene. Indeed, the gay gene debates would structure the reproductive imaginary for decades to come.

The idea that all the information about the human body and human behavior is biologically predetermined stems from the genotype/phenotype distinction first introduced by Swedish botanist Wilhelm Johannsen's (1911), who defined the genotype as "the sum total of all the 'genes' in a gamete or in a zygote" (p. 132-3). Johannsen (1911) also coined the word "gene", but remained intentionally ambiguous in his theories of the hereditary as to what exactly a gene is, stating that: "the nature of 'genes' is as yet of no value to propose any hypothesis" (p. 133). By the 1930s, however, the gene was enclosed as a "material entity: the biological analogue of molecules and atoms of physical science" (Fox Keller, 2000, p. 2). The discovery of DNA in the 1950s and its conceptualization as a program that switches on and off traits, seemed to further cement the entity of the gene as an object of study and in particular the material origin of the phenotype. The cold-war invention and medicalizing of gender through the clinical practices and experiments of physicians like John Money (Preciado, 2017; Popa, 2021) informed the legitimization of genetics as a science of difference: during the cytogenetic studies of the Y chromosome of the 1960s and 70s, "among U.S geneticists, the notion that genetics could explain individual behavior was professionally and institutionally on the rise" (Richardson, 2013, p. 89). This research into the genetic basis of gender pursued genetic evidence for character traits such as aggression or submissiveness, a line of thinking that would later condition the 1990s search for "the gay gene". Despite the fact the Human Genome Project had, on the contrary, disrupted early 20th century understandings of the gene as a reliable object of study (Fox Keller, 2000), geneticists in the 1990s began to seek evidence for a genetic basis to sexual orientation (Bailey & Pillard, 1991; Hamer et al., 1993), assuming once again "the gene to be a structural biological unit, a molecule that in some way determines behavior or identity" (Griffiths, 2016, p. 515). Heteronormativity, as a set of connected beliefs about gender, reproduction and sexual orientation, was radically agitated, in this sense, during the HIV/AIDS crisis. The presupposition that heterosexuality and a male-female gender binary is the "normal" human default found new political support from governmental administrations, scientific research and the media, cementing hierarchies of value and visibility that accelerated "pyramids of sexual oppression"

(Rubin, 1984) manifesting in legal prohibitions and protocols such as the FDA regulation that *Gay Gamete* protests. In the context of assisted reproduction, the legacies of heteronormative genetics research came to fundamentally fashion the reproductive imaginary: viral heteronormativity is an aspect of the racial politics of liberal eugenics that posit the human body as a site of both social experimentation and biological control to be managed through "personal choice".

SOCIAL REPRODUCTION AND FIXED CAPITAL: DESKILLING, VIRAL TRAVELS AND THE INTERFACE AS A SITE OF HISTORICAL AND MATERIAL STRUGGLE

There is one obvious way in which the HIV/AIDS crisis transformed the fixed capital infrastructure of the fertility industry: after the HIV/AIDS crisis cryopreservation was introduced globally as a disease prevention measure and clinical sperm donation practices were altered forever, leading to the development of the commercial banking infrastructure. As Robert Pralat (2014) writes, "HIV/AIDS *helped* to expand the industry by encouraging the use of cryopreservation" (p. 214) [emphasis added].

The idea of a sperm bank dates to the 19th century when Italian physician Montegazza discovered that human sperm could survive at temperatures below -15 degrees Celsius (Chian & Quinn, 2010). It wasn't until glycerol was discovered accidentally in the 1950s that experiments in cryobiology and cryopreservation became more widespread. As Kara Swanson writes (2014), "after years of medical indifference to frozen semen as a medical therapeutic, AIDS transformed semen into a body product that required a bank for safe exchange" (p. 227). It was as a result of the HIV/AIDS crisis that sperm donation developed as a *cryopreservation banking infrastructure*, with all of the forms of classification and cataloging that a bank, as an archive, generates. This is the most obvious way in which a queer reproduction struggle came to be incorporated as aspects of infrastructure, software and fixed capital of fertility.

Yet there is another way in which the HIV/AIDS crisis transformed the fixed capital infrastructures of fertility. The viral repetition

of heteronormativity might be seen as a key effect of the normalization of the Internet interface. Conversely the fertility industry's website –as fixed capital– can be seen as the material manifestation of viral heteronormativity. This dynamic relationship between the website and sexuality can be observed across the transformations to general interface design throughout the 2000s, as the Internet becomes increasingly a site of direct accumulation in, but also beyond, the context of assisted reproduction. In 2007 European Sperm Bank's donor catalog was a simple spreadsheet.[43] Today the use of filtered searches and drop-down lists tends to obscure the reader's understanding of the structures of classification, which in turn naturalizes the categories of identification used. The subjective experience is one of increasing immersion, intensified by the endless scrolling that characterizes the commercial Internet interface and social media today.

FIGURE 11. Sketch of "fictitious donor profile" from Cryos International Sperm Bank Ltd. (Denmark) 1998 website. See entry for January 22, 1998 for www.cryos.com via: https://web.archive.org/

43   See entry for June 8, 2007 for https://www.europeanspermbank.com via: https://web.archive.org/

OZ's personality graph
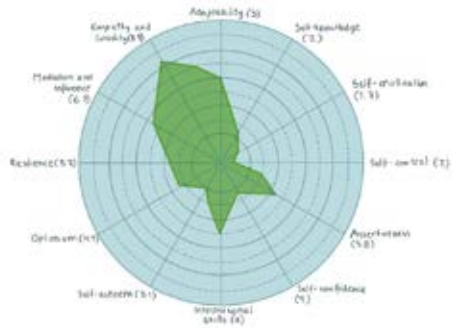
FIGURE 12. Sketch of (anonymized) "Oz's personality graph" from Cryos International (Denmark) 2022 website. See www.cryosinternational.com

The donor menu featured on the 1998 version of the site of Danish sperm bank Cryos International Sperm Bank Ltd. was a list of a few lines.[44] Today the company's donor catalogue is a topographic grid with project cards populated by buttons that take the viewer through to handwriting samples, audio files and data-visualizations of the results of Emotional Intelligence tests and personality evaluations. In 1997 California Cryobank Inc. presented its entire donor catalog as four spreadsheets, accessible through hyper-linked tabs differentiated by four racial classifications. The columns of each spreadsheet included an ID number, education and whether the donor had produced a successful pregnancy yet. Today, users enter the catalog via avatars: 'MAN OF MANY TALENTS'; 'MUSICAL ALADDIN'; 'COMPETITIVE SCIENTIST'; 'SIMPLY AMAZING'; HANDSOME HAITIAN AMERICAN'; 'OPERA SINGER'; 'BILINGUAL BRAINIAC'. The cultural scripts of heteronormativity collide with the visual and textual forms of address of the interface in ways that affirm "hegemonic masculinities"

44   See entry for August 19, 1998 for https://www.cryosinternational. com via: https://web.archive.org/

(Bokek-Cohen, 2016) and consolidate the fertility industry as an essentially "heteronormative business" (Lafuente-Funes, 2019). Or rather, these website features have developed in relation to the genetic determinism of the discourse on race and sex that characterizes post-HIV/AIDS assisted reproduction.

In *The Reification of Desire* (2009) Queer Marxist critic Kevin Floyd traces the processes through which epistemologies of difference and regimes of sexual knowledge can become "hegemonic" through market forces that facilitate "deskilling". Deskilling occurs when "access to sexual, temporal knowledge of the self is to be had only through commodity exchange" (p. 55). The viral heteronormativity of the nuclear family is a significant example of deskilling: a process through which social knowledge forged in the context of social reproduction struggles is transformed into products that can be accessed for a fee. California Cryobank today charge different fees to access different intensities of information regarding the social and medical backgrounds of their donors: Level 1 is free and includes a Genetic Test Summary, Donor Profile, Medical History, DNA Ancestry report, Donor Personal Essay and a Staff Impressions section. An extra payment of USD$145 grants access to Level 2, where the user can access an extended donor profile, childhood photos and a donor keepsake: a message written by the donor that the user can access but only when they are pregnant. Level 3 costs USD$250 and includes all the level 2 items plus a facial features report. The vials of sperm themselves cost $985 for anonymous donors and USD$1,130 for full ID disclosure. Danish bank Cryos International similarly offers four options to access donor info from between EU€ 828.00– 1,332.00; and Instituto de Reproducción CEFER in Barcelona offers a choice between "Classic Semen", which has undergone chromosome testing and basic analytics (karyotypic, Cystic Fibrosis, Beta Talasemia) and "Genetic Semen" which has been screened for 18 genetic disorders. They also offer "Compatibility Semen" that "assures genetic compatibility between you and your donor." "Premium Semen" furthermore promises to combine all three and includes an "extended profile of information about tastes and hobbies." What is most banal about any particular biogenetic profile is also what the companies think will attract clients, whose mechanisms of recognition are being worked on: racism, ableism, classism and heteronormativity emerge in this context as strategies of accumulation precisely because they

are easily reproducible as software fixed capital.[45] The predictable ways in which "bodily capacities assume the epistemological form of a complexly scientifically signifying system" (Floyd, 2009, p.44) is what makes liberal eugenics commercially viable. In this context of the viral repetition of "normalcy", equality demands to "access" ARTs are simply incorporated as a mechanism for the social reproduction of ableism, classism, racism and heteronormativity. As Jasbir Puar (2014) notes, this operates far beyond a single market context: the legal and territorial securing of LGBT "access" (to reproductive rights, private property transmission and consumer markets) in general almost always arrives concomitant with "the curtailing of welfare provisions, immigrant rights and the expansion of state power to engage in surveillance, detention and deportation." (p.25). Progressive equality discourse, including LGBT access rights, operates more than ever today as an optical stunt, a means of managing the visibility of differentiated reproductive politics struggles through the circulation of content –headlines, information, regimes of sexual knowledge, interface design, videos, images and even theory –that circulates virally. These "viral travels" end up "mutating" the impact of the contents (Puar, 2014, p.42), which makes the capacity for repetition, and the technical forms through which each iteration is achieved, as significant as the content's claims to criticality or scientific facticity. As donor profiles mutate increasingly from brief lists into immersive multimedia experiences, "folk beliefs, expressed as popular eugenics are not discouraged as unscientific [...] but encouraged" (Swanson, 2014, p.231). While *Gay Gamete's* proposal might be summarized as *it doesn't matter that there is no gay gene*, *this is political*, by con-

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45 The Marxist historian Marc Bloch (1967) provides ample reasons for why the banal should not be overlooked in studies and critiques of capitalism. Far from the resonances that the banal has with the non-descript today, in 13th century mediaeval France the *banalités* were small payments or "seigniorial rights" made to the *ban* –the ruling elite– in order to use technologies of subsistence such as baking ovens, horses and mills for grinding grain. Access to technologies of subsistence was restricted via the *ban*'s monopolies (p.152). The *banalités* are an example of the processes under capitalism through which people are dispossessed of knowledge and skills that are then sold back for a fee, which, read together with Floyd's notion of "deskilling" as implicating the commodification of "sexual, temporal knowledge of the self", facilitates a reading of the *banality* of fertility discourse.

trast, and from the perspective of the commercial entities that constitute the global assisted reproductive technology market, projected to reach $45.06 billion USD by 2026 (Fortune Business Insight, 2021), *it doesn't matter that there is no heteronormative gene, this is business.*

As detailed above, the reproductive imaginary of assisted reproduction is structured by *viral heteronormativity* and a genetic determinism accelerated during the HIV/AIDS crisis. The ART interface is characterized in this sense by its capacity to circulate outdated epistemologies of bodily difference, transforming self and collective social knowledge into commodities. The interface is a site of commodification, yet, over time, commodity production transforms infrastructure too: add-ons are quickly absorbed as structure and technical functions –biogenetic drop-down menus, live embryo surveillance, interactive personality graphs and facial-matching algorithms– become the "fixed" landscape of fertility.

NET ART HORIZONS BEYOND PARODY?

Clover Leary's *Gay Gamete* (2000), like Mongrel's *Heritage Gold* and Critical Art Ensemble's *Intelligent Sperm On-line* (1999), insert the liberal eugenics of contemporary biomedicine and assisted reproduction into a wider public forum. Both *Heritage Gold* and *Gay Gamete* valuably detail the combined performative, visual, poetic and *computational* dimension of liberal eugenics discourse, underscoring how computer programs and Internet interfaces are key sites of epistemic, historical and material struggle. This emphasis on the computer program and Internet interface as a theme and mode of artistic response within contemporary reproductive politics is a welcome and innovative contribution to both the sociology and history of reproductive technologies and Queer and Feminist theories of social reproduction after the Internet. The role of parody, as a politics of infection, is key to the structure of these critiques. In literary theory parody is distinguished from satire as the former is a mechanism of material appropriation and an *imitative* mode of inscription. Where satire mocks its target from a constructed outside, parody is said to depend on incorporating the original material into or as the new work. Parody, more than satire, productively blurs the boundaries between inside/outside, resistance/complicity, object/subject, past/present: parody "by

its very doubled structure, is very much an inscription of the past in the present" and therefore "brings to life actual historical tensions" (Hutcheon, 1985, p. 37). Particularly to the extent that *Gay Gamete* responds to, and informs the viewer directly about, the FDA protocol, the work not only *materializes* liberal eugenics but powerfully *historicizes* this discourse as it is sustained by specific medical institutions, legislation and epochs of scientific research. Against the virality of liberal eugenics and heteronormativity, these works replicate and transform; copy and hack; re-perform and critique.

In November 2011 an anonymous author posted to a thread labeled "infertility support and discussion" on U.S site *dcurbanmom. com* forum:

> I don't hate anyone but come on! I was doing a search about sperm banks or cryobanks and came across the following: (Note the part about keeping their gene and the agenda going.) I initially thought this was a joke website, but this is serious. People are being advised to be deceptive. (Dcurbunamom, 2011).

The link leads to Gay Gamete.com, whose welcome message reads:

> The Gay Gamete Project was developed as a means to ensure the genetic survival of homosexuality; to assure that the decline in homosexual procreation does not result in our eventual extinction.

The post received a number of anonymous replies: "This is just so wrong on so many levels"; "This is just sick?" "I hate to say it but I'm sure that at least some egg and sperm donors lie about previous mental illness, sexual orientation, cosmetic surgery, etc."; "I know anyone can lie at any time and for any reason, but this is an organized effort to target those folks who are the most vulnerable due to infertility." Another anonymous author clarifies: "this was an art project done by an artist called Clover Leary. Meant to stir just this type of response" (Dcurbanmom, 2011). The disclosure of *Gay Gamete* as an art project, far from quelling concerns invites further discussion: "parody or not, some nut jobs are doing exactly as they suggest. What's to stop them?"; "why is it so sick, you don't want a baby

whose sperm donor is gay? Lame."; "As a research biologist I can tell you there is no gay gene" (Dcurbanmom, 2011). Nearly a decade after *Gay Gamete's* publication, the work still has the power to infect. This is perhaps because the fertility tropes that *Gay Gamete* excerpted in the year 2000 have become *more*, not less, common across the fertility services industry today. This begs the question of whether the disobedient force of a Net Art work *as a parody* is somewhat capped by the general *parodic landscape* of racial capitalism's normalized liberal eugenics, which has only accelerated since 2000 and especially online. On one hand, *Gay Gamete's* call to lesbians and gays to "ensure a gay future" would still constitute a serious insurrection of those state and private institutions –clinics, banks, national regulating bodies, associations, the media– that compound contemporary reproductive control. The 2019 opening in New Zealand of the world's first HIV positive sperm bank called "Sperm Positive" is just one example of the non-parodic work necessary to destigmatize queer and/or HIV positive (assisted) reproduction.[46] On the other hand, *Gay Gamete's* joke call to "invest in genetic futures" strikes an uneasy resonance with what Lisa Duggan (2002) has since theorized as "the new homonormativity", which,

> comes equipped with a rhetorical recoding of key terms in the history of gay politics: 'equality' becomes narrow, formal access to a few conservatizing institutions, 'freedom' becomes impunity for bigotry […] 'the right to privacy' becomes domestic confinement. (p.186)

The Net Art works developed and introduced in the next chapter further elaborate on this question of the (im)possibility of Net Art horizons beyond parody.

In this chapter I have considered Clover Leary's Net Art work *Gay Gamete* (2000) as a response to the *viral heteronormativity* of fertility discourse and the normalized lyrical address of the commercial internet. I also historically and materially situated viral heteronormativity in relation to the pathologization of sexualities and sexual practices through scientific research and popular media

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[46]   Their website states how, "on January 27th, 2021, the first baby from an HIV positive sperm bank was born." (Sperm Positive Website, 2023).

representations which, during the HIV/AIDS crisis and the research context of the Human Genome Project, took on a genetic dimension. I also showed how epistemologies of difference profoundly structured the racial sensibility of the gay gene debates and impacted the material infrastructures of assisted reproduction for decades to come. This chapter thus considers the legacy of the ongoing HIV/AIDS crisis on the digital infrastructures and interfaces of the fertility industry and further details how social knowledge forged in the context of queer reproduction struggles accumulates over time as fixed capital. So far this thesis has affirmed one of 19th century Marxism's most innovative insights: that neither capital nor labor are "things" but processes involving connected circuits of production, reproduction and value, structured by overaccumulation, interruption, devaluation, delays and crisis (Marx, 1978, p. 181). This dynamic field of social and material struggle plays out, after the Internet this thesis argues, at the level of the interface. The next chapter presents works in poetry, video and Net Art that deepen this reclaiming of the interface, network and viral as themes and modes of artistic response.

Chapter 5
THE INTERFACE, THE NETWORK AND THE VIRAL

RÉPLICA, THE WIFE OF THEM ALL
AND THEM, ALL MAGAZINE

This section introduces the poetry collection *Réplica* (2022), the animation film *The Wife of Them All* (2022), and its Net Art website, and the ongoing editorial project *Them, All Magazine*. "Réplica" means copy, aftershock and an official reply or revision to the law. The replies presented in the book are psychedelic, satirical, sober, radical, post-internet, reformist, ancient, historical, human, animal and everyday. The collection of poems considers the commons as a series of familial connections that must be continually maintained and renewed: the commons as it is called into being. The book was published in December 2022 with Canal, a queer publishing co-operative and bilingual magazine, and presented as part of a UK tour, co-organized with Canal, consisting of readings and workshops at various venues, including at Glasgow Women's Library, Blunt Knife in Edinburgh, Eastside Projects in Birmingham and The Horse Hospital in London with invited guest readers, including Penny Goring, Alice Channer, Gizem Okulu, Rachel Pimm, Sasha A. Ahktar, Hannah Regel, Nat Raha and Camila Ospina Gaitan. Copies of the book in print have been deposited in the Aalto University Archives repository.

   The Wife of Them All (2022) is an animation film. The film lies at the intersection of documentary and science fiction, and features a network of characters based across continents who critique and move beyond borders, mad bureaucracy and precarious work in a heist plot that addresses the global fertility market in relation to the migratory control system. Aesthetically, the moving image project makes connections between histories of clay animation film, time-lapse microscopy and feminist and queer video art, which I elaborate on in Chapter 6. The characters in the film are voiced by artists and activists whose work in real life focuses on reproductive rights in an expanded sense: from securing fair wages for domestic and sex work to the question of trans* access to medical technologies and reproductive resources. The (non)actors of the film include Sabrina Michelle Rivera Sanchez (Coordinator at Sexwork Europe, Amsterdam, and member of Otras Sindicato de Trabajadoras Sexuales Spain); Alejandra Durga Ramos (Former member of Barcelona's Sindihogar Union of Domestic Workers) and Pratibha Parmar (UK/US artist and filmmaker). The film premiered at the 27th LesGaiCineMad film festival in

Madrid in November 2022 and travelled to the 69th Oberhausen International Short Film Festival, with the support of HAMACA moving image platform. Digital copies of the film have been deposited in the Aalto University Archives repository and are also available through the Aaltodoc dissertation page. The film can also be accessed via the project's Net Art site http://the-wife-of-them-all.glitch.me/ , which has also been archived by Aalto University Archives.
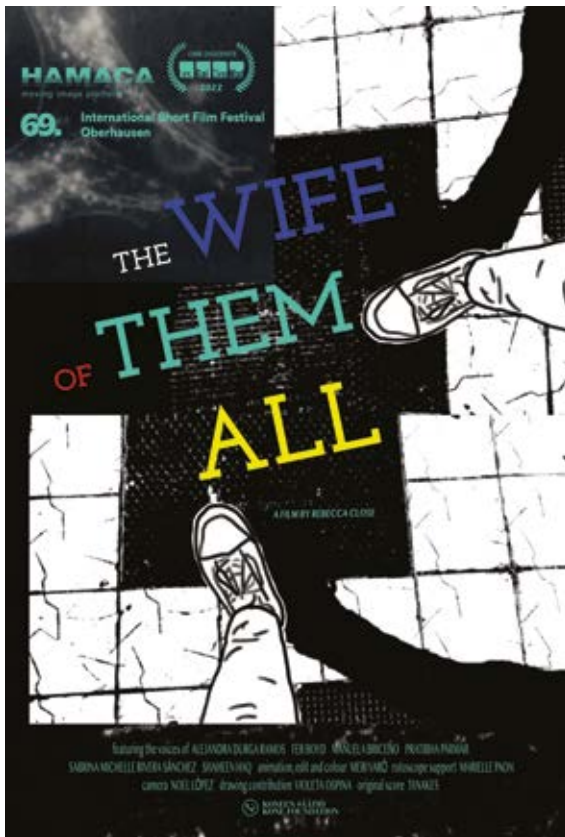
FIGURE 13. The Wife of Them All film poster. Image courtesy the author.

An earlier version of the film's website, titled *Classic Gold Premium,* was presented as part of talks and performances on reproductive technologies and queer reproduction between 2019-2021 and can be accessed here: https://classic-gold-premium.glitch.me/ . I reflect on these presentations in Chapter 6. *Classic Gold Premium* considers the role of the Internet interface in the production of value, and considers how, in the context of assisted reproduction, words deriving from colonial economies are put into viral circulation with commercial effects. *Classic Gold Premium* was developed broadly as a tool for thinking about the interface as a depository of human memory and a powerful translation zone where beliefs regarding social and biological reproduction are fashioned. An experiment in inserting the Internet interface into theories of social reproduction and the sociological analysis of assisted reproduction, it builds on a main strand of Queer Marxist study of the performative normalization of sexuality as "a certain kind of skilled labor located at the moment of consumption rather than production" (Floyd, 2009, p.155). It asks, what is reproduced through and by the Internet interface?

FIGURE 14. *Classic Gold Premium* Interface. Image courtesy the author.
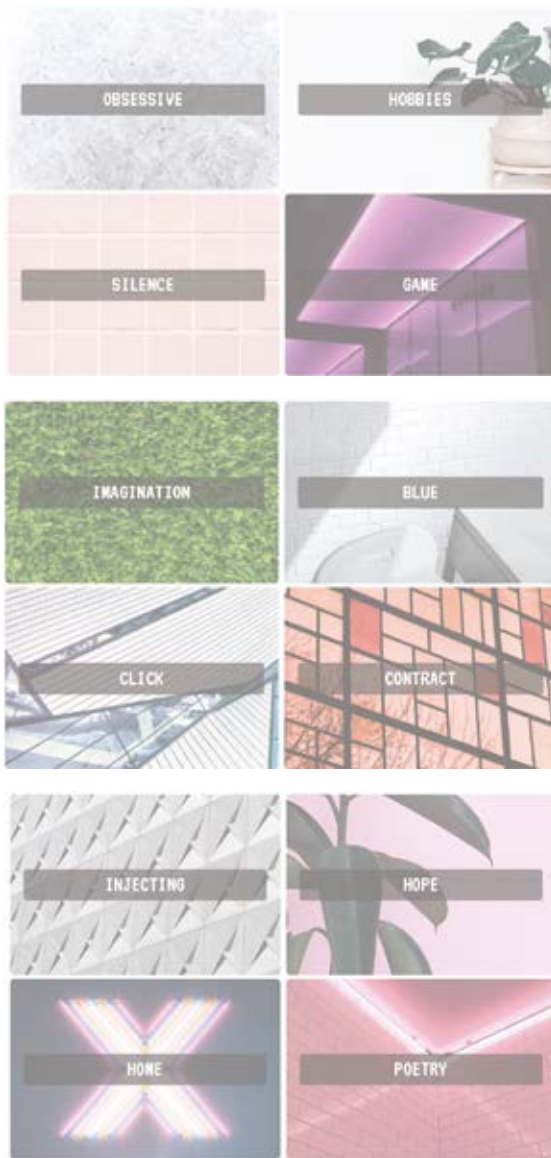
FIGURES 15, 16, 17. *Classic Gold Premium* Interface details. Image courtesy the author.

The question that guides this research is, though, *How might the interface-page be reclaimed by the reader-writer as a space to fashion queer and trans*feminist reproductive imaginaries?* With this in mind, I decided to create a different version of this work based on the experience of presenting the piece (Chapter 6) and the critical analysis of Net Art and parody (Chapter 4). In Chapter 4 I analyzed parody as a common Net Art tactic and suggested that, in the context of racial capitalism's already parodic landscapes of exchange, the repetition of a reproductive imaginary structured by the syntax of liberal eugenics fails to *reproduce* beyond a racial capitalist social formation. The words featured on the modified version of the film's website derive from descriptions of the film process, and the visuals are no longer stock images but the ceramic pieces used in the film. The work approximates more faithfully, in this respect, post-internet queer reproductive work, which, as detailed in Chapter 3, materializes in the often non-parodic commitment to complaint, network maintenance activities and the material and historical becoming of familial connections under and beyond capitalist re/production. In this sense, the poetry collection, film and film's website are a key part of the research as they fashion a dissident reproductive imaginary.
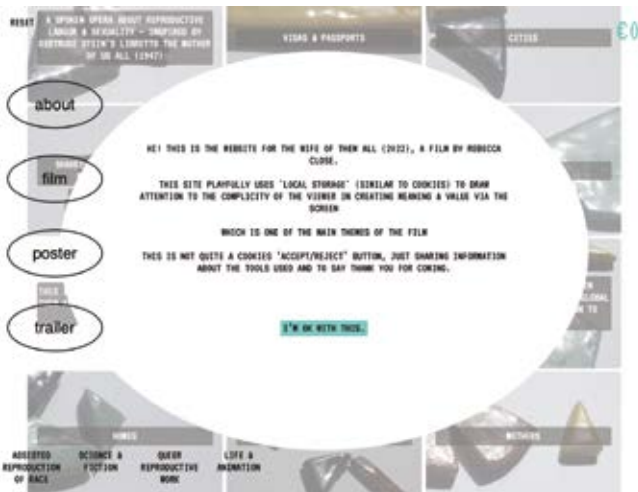
FIGURE 18. The Wife of Them All website index. Image courtesy the author.

FIGURE 19, 20, 21. *The Wife of Them All Website* Interface (details). Image courtesy the author.

This section also introduces *Them, All Magazine*, an ongoing editorial project that brings together poetry, Net/Software/Code art, critical writing and their intersections, with the aim of strengthening the interdisciplinary study of reproductive politics. The first issues feature work by reproductive justice scholar Kimala Price and software studies scholar and coder artist Winnie Soon. The magazine can be accessed here: http://www.them-all-magazine.com/ and is hosted by Systerserver, a server run by feminists, using free and open source software that acts as a place to learn system administration skills, host services and inspire others to do the same. A version of the site is archived by Aalto University Archives.

Them, All Magazine and *Réplica* were developed in parallel to my critical analysis of the digital infrastructures and interfaces of the ART industry and are deeply informed by the close readings I perform of the historical Queer Net Art and maga/zine projects (Chapters 3 and 4). In the preceding chapters I have analyzed these historical artistic and editorial interventions as modes of artistic response: ways of *responding* (Crimp, 1987) artistically, theoretically, politically and socially to specific policies of reproductive control as well as the

general landscapes of the reproductive imaginary. I focused on how these artistic responses foreground networked interdependencies and consider the Internet interface's visual, poetic and technological forms of address as they are formulated within protological fields beyond the question of access and choice that pervade reproductive rights discourse. The works introduced in this chapter similarly consider reproductive politics not only as a question of access and choice but as the daily negotiation of the body's value and legibility across communication, labor and political fields. The poetry collection, film and editorial project contribute to and strengthen an international contemporary queer and antiracist post-internet art and poetry scene, and was developed in dialogue with collectives such as Systerserver and coders, artists, poets and researchers such as Nat Raha, Anyely Marín Cisneros, Tjasa Kancler, Xeito Fole, Rosa Maria Garcia, Ali Akbar Mehta, Fran Lock, Camille Auer, Winnie Soon, Mara Karagianni, Fer Boyd and Madeleine Stack, all of whom work across page, sound, performance, poem and screen. Both the poetry collection and editorial project are grounded in Chapter 3's study of the role of print media cultures in fashioning reproductive imaginaries and respond to an urgent need to gather artistic, poetic and critical work on social, biological and

technological reproduction across disciplines. Traversing digital and analogue forms of address, *Réplica* (2022), *The Wife of Them All* (2022) and *Them, All Magazine* (on-going) construct a reader-writer attuned to the page and screen as sites of historical and material struggle.

THE INTERFACE, THE NETWORK AND THE VIRAL AS THEMES AND MODES OF ARTISTIC RESPONSE

A number of themes structure the worlds of the works introduced in this chapter. One is the human face and the Internet interface. Faces populate the donor catalogs and facial-matching algorithms I analyzed in Chapters 2 and 4. The human face, I concluded in Chapter 2, also informs more broadly the general design of the Internet interface, where easy-to-read face-sized graphics capture and manage the reader's attention. I use the sonnet form, historically and aesthetically linked to the face (Chapter 2) in *Réplica* to move through and beyond some of the binaries that structure the contemporary experience of the Internet as it is governed by the logic of the face: male/female; animal/human; world/underworld; resident/non-resident; family/non-family; past/future; freeze/heat; voice/surface. The face also informs the animation film through its absence: in a world dominated by visuals of the human face, the animation film pursues intimacy rather through texture and voice.

Another key theme is network. Chapter 3 reads artistic and editorial projects as they contribute to particular cultural scenes or activist movements as well as sustain aspects of broader familial and social life. The works presented here are similarly conscious of how they register and contribute to the networks of activism, art and social reproduction they were produced with and/or name.

A final theme is the viral: a viral logic pervades the works as they register the role of repetition in capitalist market expansion and social reproduction processes. The poetry collection uses the repetition of poem titles, the repetition of poetic forms or the repetition of sonic structures or turns of phrases to underscore the ambivalence of the viral: replication is key to the emptying forces of globalization (Puar, 2013) but it can also be used to reinscribe a dissident memory, a queer erotics and feminist economy of exchange.

The previous three chapters (2, 3 and 4) have detailed the interface, network and viral as social, political and technological forms that are fundamentally wrapped up in shifting sciences of the body and ideas regarding biological difference. These three chapters broadly considered the reproductive politics of the Internet, focusing on the role of the interface, network and viral in fashioning the reproductive imaginary across national contexts. The works introduced in this chapter reclaim the interface, network and viral as themes and modes of artistic intervention and thus mark a key moment of synthesis in this artistic research project. While the interface (Andersen, 2011; Andersen & Pold, 2018; Bertelsen & Pold, 2004; Chun, 2011; Cramer & Fuller, 2008; Galloway, 2012; Steven, 1999), the network and the viral (Chun, 2006; Parikka, 2007) are staple topics in the fields of software and Visual Studies of the Internet (Nakamura, 2002, 2007), they have not been so central to feminist and Queer and Marxist Feminist theories of social reproduction. On the other hand, sexuality and social reproduction struggles have not been a central concern of critical studies of the interface, the network and the viral.[47] Bringing these subjects together and into the domain of Artistic Research process is the main contribution of this thesis to the disciplines it touches and seeks to transform.

By thinking beyond the face, foregrounding interdependencies and mobilizing the replica, the artistic and poetic works explicitly assume their capitalist conditions of making even as they pursue socialist and queer alternatives. The artistic production occupies a central role in this research as an elaboration of an interdisciplinary post-internet Queer Marxist art and writing practice. In the next chapter I use auto-writing techniques to emphasize the social relations that this, and any, research process energizes.

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47   There is an abundance of theoretical and artistic work at the intersections of cyberfeminism, transfeminism and antiracism, which I have cited throughout. For example, the work of Wendy Hui Kyong Chun (2002, 2008), Lisa Nakamura (2002, 2008), Remedios Zafra (2005, 2013, 2018), Ruha Benjamin (2016; 2018; 2022; 2019) and Net and cyberfeminist artists and collectives such as Mongrel, Faith Wilding, subRosa, Shu Lea Cheang, Cornelia Sollfrank, VNS Matrix, Toxic Lesbian, Generatech and the TransHackfeminist communities in Spain (whose first meeting at Calafou in 2014 I happened to attend) have consistently attended to the racial and gender politics of the interface, network and viral and have fundamentally informed this project.

Chapter 6
THE QUEER REPRODUCTION PAPERS

THE EROTIC, DISCIPLINARY LABELS, PRIVACY, HOMONORMATIVITY, AND "I" AM AS "OPEN" AS THE DATA EXCHANGED ACCORDING TO A TCP/IP PROTOCOL

September 2019

I settle into the city of Espoo, take long walks, edge around frozen bodies of water, venture tentatively across the ice. Snow on the path. Snow on the leaves. Snow on the car. Grey sky. White white white. I am making audio recordings for a class called "Gender and Sound" led by Finnish sound artist Taina Riikonen. I bring my mic on walks to Nuuksio national park to record the silver birches creaking. I was struck in one of the classes by a sound work Taina shared with us: a recording she made of some PVC pants squeaking as she moved in them. She told us the piece was an "erotic artwork". I wondered if the work was erotic because of the PVC material, and the association of PVC or leather with images of sexualized bodies and body parts, or if it was erotic because the artist was sharing, through this sound piece, an experience of bodily pleasure, and that this sharing reminds the listener of their own capacity for pleasure. This is the difference between Herbert Marcuse's (1956) appraisal of "reeroticizing of the body through objectification" and Audre Lorde's reading of the erotic as the "shared pursuit of joy, whether intellectual, physical, psychological or emotional" (2007, p. 78). Often what we think of as erotic artworks are doing both: they might depart from a moment of "eroticization" through the objectification of the body in image or sound, but they may also connect with the reader-writer, viewer or listener through sharing a singular experience, a bodily feeling of pleasure.

I meet Einat for lunch. We talk about moving, research, break-ups and art. We'd gravitated towards each other in one of the welcome sessions, *oh I work with media but I don't say I'm like a "new media" artist, I mean I don't use that word.* I'd liked this sudden feeling of being with a sibling who dismisses –because they were already way beyond– the slang. The terms we use for describing disciplinary practices in the arts so often appear already outdated: *new media*, *post-internet*, *cyberfeminist*, *hacktivist*, *artist researcher...*One subscribes to disciplinary labels as part of an ongoing process of language learning, speaking languages to connect, share and know. In an article aptly subtitled "complicity and resistance in the cyberfield",

cyberfeminist scholar Radhika Gajjala (2002) notes how, "all these labels and categories are probably individual negotiations of disciplinarity, as many feminist scholars are required to situate their work and justify it within authorized disciplines" (p.183). Towards the end of our lunch Einat mentions their ex-partner has a daughter. *––So you are like a parent-person too?* I ask, waiting to say in the next breath something about my experience of, *intermittent parenting.* I might have said how, *it's mostly parenting the parent! What did they call you, or what did you call yourself?* But Einat says, *––a topic for another time!*

It occurs to me that maybe we don't talk about these experiences of forming part of family units because they are *private*. Or maybe because we do not see ourselves as forming part of *families*, because we or they are *queer*. The question of privacy hangs on me. What if by drawing on elements of my life I am losing my privacy, and the privacy of the people I love who I bring into this research text? Lisa Duggan (2002) defines homonormativity as the reduction of equality to "access to the institutions of domestic privacy, the 'free' market, and patriotism" (p.179). The new homonormativity implies the withdrawal of aspects of sexuality and social reproduction struggles behind closed doors, making it difficult to name and protect configurations of life and living that do not follow the legally and culturally protected nuclear model. Expressing equality rights in terms of access to private property and consumer privileges also fragments the public imagination regarding the forms of cooperative ownership and collective living arrangements that are humanly possible. Capitalism rests on privatization in this double sense: property creation and the withdrawal of certain topics from public discourse. The disclosure of personal experiences in auto-writing is a tool for de-privatizing social reproduction struggles, precisely in the context of the privatizing regimes of the new homonormativity. Works like Gloria Anzaldua's *Borderlands/La Frontera* (1987), Audre Lorde's *Zami: A New Spelling of My Name* (1982), Paul Preciado's *Testo Junkie* (2017), Anne Boyer's The Undying (2020), Lauren Fournier's *Autotheory as Feminist Practice in Art, Writing and Criticism* (2022), Bob Flannagan's *The Pain Journal* (2001) or Maggie Nelson's *The Argonauts* (2015)–and too many more to name here– all use auto-writing to know about the personal and political dimension of social and biological reproduction struggles. These projects

are associated with "autofiction"[48] and autotheory because of the way in which the act of writing is shown within the text to be transformative to the subject who is writing. The resulting books trace this dynamic between subjectivity and writing: self-fashioning happens through the process of remembering, which is a actually the re-organizing of experience in the present: "there occurs an assembling/putting together of the self [...] the autofictional has an effect on the real life of the author" (Wagner-Egelhaaf, 2022, p. 23). I am wary of listing the above books according to generic terms like autofiction or autotheory however, because each author developed their own terminology for what they were doing: Audre Lorde (1982) used *biomythography*; Gloria Anzaldua (1987) coined *Autohistoria-teoría* (Autohistory-theory); and Paul Preciado named writing as a *technology of auto-experimentation.* What links these projects is more an unruly interdisciplinarity, a kind of *gestural writing* as the plots are organized around the writer's movements and use of multiple body and knowledge practices at the intersection of the corporeal and linguistic: connecting performance, hormone taking, poetry, philosophy, activism, drugs, sex, sculpture and sickness. Autoethnographers also blend experience, story-telling, plastic practices and performance in interdisciplinary ways (Ellis & Adams, 2014; Ellis & Bochner, 2000) to move analytically from "biography to social structure" (Anderson, 2006). For the analytic auto-ethnography tradition there similarly must exist more than an autobiographical link between the researcher and the subject: for there to be a language of method there has to be "self-observation" and "self-visibility" in the text (Anderson, 2006, p. 376). This chapter affirms a re/productive relationship between "I" and context, "identity" and practice, and approximates a language of method through moments of self-visibility in the text.

Few critics would say, however, that in the age of social media that "sharing" elements of one's personal life is inherently disobedient. In the afterword to *Transgender Marxism* (2021), Jordy Rosenberg writes, "the fantasy of the perfect metabolism of settler bodies [...] haunts the contemporary self-reflexivity of literary form". (p. 312). Rosenberg situates the recent auto-writing trend within a long tradition of Western aesthetic practices through which a "white settler

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[48]   The term was coined in the 1970s by French writer Serge Doubrovsky, who is often credited as having written the first work of autofiction.

imaginary resolution of the real social contradictions of primitive accumulation constitutes the pre-history of the self-reflexive and the anti-aesthetic" (p.312). The construction of a character who is capable of making sense of themselves, according to Rosenberg's critique, ultimately affirms racial capitalism's self-image as a thermostatically regulating system. Autotheory and autofiction play out the racialized fantasy that the solution to the Euroamerican crisis of capital accumulation can be resolved on its own terms and within its own borders. It is an alarming reading of the auto-turn that coincides with adjacent critiques of the trend as "blindingly white" (Folarin, 2020). Recent critical revisions of the auto-fictive dimension of novels written by writers of color as early as the 1880s suggests, however, the long history of the deployment of the *auto-* as a tool for rather critiquing and moving beyond structures of marginalization and the colonial imaginaries of whiteness (Kazeem, 2019). Also preceding the current trend, is the field of Queer of Color critique and performance studies, where establishing links across the personal and the critical has a rich precedent. The work of Jose Esteban Muñoz (2009), "brings in [his] own personal experience as another way to ground historical queer sites with lived queer experience" (p. 4). The intention is "not simply to wax anecdotally but, instead, to reach for other modes of associative argumentation and evidencing" (Esteban Muñoz, 2009, p.4). In these examples the character-protagonists are not thermostatically self-stabilizing rational subjects but unstable "I's" that fail to cohere; discontinuous selves that open and close through their implication in precarious social, technological, familial and romantic networks.

In the age of the Internet, writing critically against the new homonormativity is not only about "de-privatizing" or making "public" the details of one's private life, because, as Wendy Hui Kyong Chun (2006) observes, since the development of the TCP/IP protocol[49] "the public/private binary has been supplanted by open/closed" (p. 28). Writing as a post-internet queer socially reproductive form rather practices openness in the same way that data is transmitted "openly" across the web: via the intense stacking of protocols that set strict rules of exchange. The openness of auto-writing and the openness of

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[49]   TCP/IP was developed in the 1970s and adopted as the protocol standard for ARPANET (the predecessor to the Internet) in 1983. TCP/IP specifies how data should be packaged, addressed, transmitted, routed and received.

data ushered through a TCP/IP protocol are the same to the extent they have been heavily worked on across multiple layers: "the openness –or to be more precise the readability– is constructed" (Chun, 2006, p. 65). The link between the material conditions of this transmission and this text is at first metaphorical, but it is also material and historical too: you are probably reading this on your laptop, with an assigned IP address and a local port that receives this communication as pre-ordered packets of data, because they have been standardized, tagged and sequenced so that your virtual machine knows how to read them. Or you are reading this in print, in the form of a book, whose final edit shot repeatedly across a network of servers. Similarly, if this text appears coherent, or "I" appear as a stable entity, it's because of the administrative work I have done at the header level to sequence out the parcels. This chapter is an experiment in writing freely after the Internet, where freedom means not a total lack of control but "a particular kind of self-conscious control" (Lessig, 2001, p. 4). This freedom, like control, is generated within the capitalist protological field.

FIGURE 22. "Mina's way" from *The Wife of Them All* (2022). Dir. Rebecca Close. Film still screenshot. Image courtesy the author.

ESPOO'S DATA CENTERS,
GASLIGHTING IN THE AGE OF CLIMATE CRISIS,
MAKING 'COLD WORK' AND
THE EUROPEAN GEOPOLITICS OF TEMPERATURE
September 2019

I send out emails to three data centers in the Helsinki region, one located not too far away from where I live. I want to do an audio recording of the sound generated from all the electricity required to keep them running. Espoo used to be a mining district and is now touted as a prime site for the global Hyperscale Data Center market, valued at $5 Billion in 2018 (Research and Markets, 2019). Such companies describe the natural environment in Finland as an "asset" to the data market. Google bought and converted an old paper factory in as early as 2012. Aware that consuming large amounts of energy in the middle of a climate crisis might not generate much support from governments and the public, the data center market has started to talk, misleadingly, of the "energy efficiency" of centers. The word "gaslighting" derives from the 1938 play *Gaslight* by Patrick Hamilton. The protagonist is a young woman whose husband tells her she's going mad. He eventually confines her to the house, explaining to her friends and family that she is sick. At night he knocks on the doors and walls and dims the lights a little everyday. When his wife asks him about the lights, he tells her she's imagining it. Gaslighting is used today to name a form of manipulation that occurs in abusive relationships: a subtle or indirect means of emotional abuse where the abuser deliberately creates a false narrative that makes the coerced person question their judgment. Microsoft recently announced a partnership with Finnish utility company Fortum, who are set to build a system of underground pipes stretching 900 kilometers under Helsinki that will recycle the heat created from the cooling of Microsoft computer servers. In their "Espoo Clean Heat" program the company promises to "recycle the waste of 'excess' heat from Microsoft's data centers" in order to heat buildings and homes in Espoo. It is in this context of commercial toxicity and climate emergency that the green data sector, fertility and wellness industries make promises they cannot possibly deliver on: sustainable, healthy futures. Perhaps one should not expect to see the mention of existential threats to humanity across the websites of commercial industries. They are businesses after all.

Denaturalize the false narrative for a second though and the fertility, wellness and green data center industry coincide in their corporate gaslighting.

The first talk I gave on reproduction was in 2018 with Anyely in the context of our fellowship with the Center for Arts, Design and Social Research (CAD+SR). We shared with the other fellows how our research process began with the personal experience of an online search across sperm bank websites. We'd closed the laptop almost immediately. The heteronormative framing of the donors was hilarious, but also shocking. When we decided to look again, it was not only as prospective "patients" but as researchers. In the talk we shared information regarding the different regulatory systems and national economies that had cemented Spain as a reproductive tourism destination since the mid-2000s (Chapter 2); we shared figures comparing the number of clinics in the UK, U.S, France, Spain, Mexico, India and Denmark to get a sense of the spatial dynamics of the fertility industry as they play out in different cities and across national contexts; we talked about the books that at this point had been the most influential to the project (Camisha A. Russell's *The Assisted Reproduction of Race* (2018) and Melinda Cooper and Catherine Waldby's *Clinical Labor* (2014)); and shared some images from real sperm donor catalogs in Spain, Denmark, US, and UK, comparing versions of the websites from the 1990s with those of today. In particular, we noted how the words used across the catalogs often derive directly from colonial economies: the mining of precious metals and the trade in goods such as tobacco, sugar and fruit. Not to mention the racial terms of classification that have their origin in the European racial sciences. We shared plans to make a counter-website called "Classic Gold Premium" that would critically and parodically consider this re-circulation and re-valuing of colonial terms in the context of the contemporary reproductive technology market.

One comment stood out from the audience's responses: a friend and colleague said to us that the work we were doing "offered such a cold perspective on family and motherhood." Cold seemed to signify something negative. Another respondent, a friend and fellow professor of new media art, asked us if we were critiquing the clinics themselves in Barcelona, *––because you know that I am one of those queer people who traveled to Barcelona for treatment!* She was referring to the fact that, as a French person living in France in the

mid-2000s she was not able to access treatment due to the prohibition of LGBTQIA++ access to ARTs (this legislation changed in late 2019). This meant she had needed to cross borders to Spain to extend her family. Towards the end of this discussion Anyely mentioned she has a daughter, which not all our colleagues knew. This seemed to clarify to some that we were not critiquing having or not having of kids. I felt the need to clarify I did not have any investments in nostalgic ideas around "natural" reproduction and that following transfeminist and Reproductive Justice critiques, "the objection is to medicalization and commodification, not to artificialness" (Briggs, 2010, p. 363) and that, *no, we are not critiquing the use of ARTs or the Barcelona clinics.*

The comments about the temperature of the research stayed with me. Perhaps the queer and antiracist critique of the heteronormative family and its techno-infrastructures sounds frosty. Perhaps family is warm and assisted reproduction is cold; art is hot while social science is chilly; speculative fiction lights up the room while statistics are like being shut out of the house with no keys in mid-winter. It's also possible that by sharing so much of the clinic and bank marketing material we had managed to freeze along with the cryopreserved materials and digital infrastructures we were studying.

Back in Espoo I think about the cosmology of temperature in Marx's writings: how it does and doesn't fit today's world. "Capital", Marx wrote in *The Communist Manifesto*, "melts everything solid into air" (Marx, 1888). But Marx was writing before the advent of domestic refrigeration, the discovery of glycerol as a cryoprotective agent in the 1950s and long before the invention of data server farms that require immense charges of electricity to keep cool. Capital melts everything –the world is melting– but it also increasingly *freezes* to flow. Technologies of cold have developed in tandem with the needs of racial capital: "the ability to control, produce, and claim ownership over cold was a matter of imperial economics and the politics of empire" (Woods, 2017, p. 90). The global development of "cryopolitical" (Radin & Kowal, 2017) infrastructures has been keeping food, biological substances and data cool since the late 19th century, "enabling such materials to become mutable and mobile, able to be manipulated, relocated and recombined" (p. 3). Cryopreservation, for example, is key to the expansion of the global fertility market (Chapter 4): the capacity to freeze gametes that have already been through

intense diagnostics is what enables the clinics and banks to provide customer guarantees that their bioproducts are of quality: "classic", "gold", "premium".

In the Gender and Sound class we listen to the final pieces on the loudspeakers. I'd mixed the sounds of walking in the forest, the clicking of the sauna heater, steps across a frozen river and an audio recording of a data center I'd found online, threading a violin string through that matched one of the data center tones. I wanted to record everything *in* Espoo, but never received a reply from the data centers, obviously. I consider pursuing this attempt to get inside but decide against the distraction. Creating this sound work though –walking around– helped me appreciate the relevance of the movements of my body to this research project. I detour according to the continent's geopolitics of temperature. Europe's data frozen in Finland. Europe's egg cells flying out of sunny Spain.

FIGURE 23. "Ela's pesto" from *The Wife of Them All* (2022). Dir. Rebecca Close. Film still screenshot. Image courtesy the author.

November 2019

––*I wish Anyely could join us.* ––*Me too,* Syowia says as we walk around Oslo. Syowia Kyambi, an artist based in Nairobi, had invited Anyely and I to give a talk as part of the public program "Carrying Histories", a residency she was curating for the arts organization Praksis. We couldn't travel together in the end as Anyely was applying to renew her residency card. Anyely and I have worked together for nearly a decade. Collaboration requires constant dialogue and self-reflection, yet we have no systems in place to structure this. I only know that Anyely hates unnecessary meetings and ideas that have not been thought out properly, ––*Is this the first idea?* She'll ask. I had assumed that all ideas are the first ideas and arrive fully formed. ––*I think you need to darle una vuelta mas.* When work frustrates we stop. When work works we work. It is a fully functioning dysfunctional domestic semi-professionalized artist-duo situation. We also appreciate the fact of working in different disciplinary fields: *you're more sociological, I'm more historical, you're more artistic, you're a perfectionist, I'm precise.* We are free when we complain about work without the other trying to solve it. Listening to problems without trying to solve them –my favorite definition of love. ––*Take this to my friends,* Anyely handed me Spanish wine to take to close friends Masaya and Antulio from Venezuela, now based in Oslo, who I was going to stay with. ––*Have fun!* Happy that after months of working on *Classic Gold Premium* it is ready to share.

Anyely and I had contacted Kerry Rodden about coding *Classic Gold Premium* around a year after meeting them and their partner during the same CAD+SR fellowship. We explained how we wanted to ––*make an interface that would highlight the colonial legacies of the vocabulary used across the websites of the fertility industry.* Over a few months Kerry and I met online on Saturdays, early in the U.S West Coast morning, which was the only time they could spare between work and parenting commitments. ––*It's true,* Kerry said, *the profiles of these websites are so weirdly competitive, like fantasy football, like choose the best player! Maybe we could organize the interface like*

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that, like a game. We were imagining this counter-website through the lens of traditional UX principles (it had to be "easy to navigate" we agreed) but also through personal experiences of video games, and the gamified selection of anything from weekly shopping to gamete donors. I listened intently when Kerry said, *––yeah...we decided not to go down that route in the end!*

The work of creating the website together moved beyond the definition of code as a tool for programming digital devices (Petzold, 1999) and towards a practice of critical and creative thinking (Cangiano & Reas, 2016 as cited in Slotte Dufva, 2021, p. 272). The term "creative coding" is normally tied to a particular set of tools or arts institutions where hacking and art collide. Beyond this Tomi Slotte Dufva (2021) proposes "creative coding as composting", which, following Haraway's use of the image of the compost, emphasizes the transformational and organic dimension of code as a social practice. Kerry is well-versed and with my basic knowledge I was able to follow along and intervene in and play with the design once the structure was built. By giving ourselves time to talk through experiences of queer reproduction, the project became a social and political technology for sharing: Kerry and I developed a way of working that not only "balanced the expressive with the functional", following formal definitions of creative coding (Knochel & Patton, 2015 as cited in Slotte Dufva, 2021, p. 272), but developed creative coding as a mode of research: a way of knowing about social and biological reproduction.

The first prototype was conceived for a gallery setting. A PC in the space would display URL1, where a selection of words commonly used in the fertility industry are displayed: "motility", "washed", "basket", "hobbies" etc. Anyely and I had assigned each word a value in terms of money in euros, as well as four further value systems: the assisted reproduction of race, data, bioeconomic work and affective capital. These values appear on a second URL, which would be projected on a wall behind the PC. As you click on the PC showing the homepage, the values move up and down on URL 2. We assigned the word "altruism", for example, with a monetary value of 900 euros, because that is how much fertility clinics pay egg donors in Spain. We assigned "altruism" a 1/0 value for assisted reproduction of race; a 1/0 value for bioeconomic work; a 1/0 value for data; and a 1/0 value for affective capital. We called this list of words "the algorithm", which is how it is labeled in the source code, suggesting that this is how the

assignment of value actually functions: as an arbitrary list whose assigned values could just as easily be rewritten. Practically, the feedback relationship between the two URLS functions through a re-appropriation of user data surveillance technologies (local storage in this case), which we used, ––*not to survey you or play you but to play with you*.

I open the talk at Praksis with a reflection on artist duos. I had been remembering how I used to escape my first graduate job working in a cheesy art gallery in Shoreditch in London by attending reading groups hosted by a couple who'd set up a DIY film school in their living room in Bethnal Green. The project had a profound impact on me and I always wondered why they didn't make more of a thing out of the fact that they were a couple, living together, who had transformed their home into a school. A few years later, in 2013, I'd planned a trip with Anyely and diásporas críticas, the collective we formed a part of: we were going to give a workshop on manifestos and poetry. We arrived to Barcelona airport, about to board our flight to London but were stopped at the gate, unaware of the fact that just a year before the UK had changed the visa regulations for Venezuelans. Despite our Spanish residency cards and our *pareja de hecho* registered civil partnership, Anyely couldn't come to the UK. According to the UK's Surinder Singh clause, I could potentially have argued to exercise my rights as a resident of the European Union to move freely *with my family*. The airline would have had none of it though: this was the dawn of a new age of decentralized migratory control, where airline workers, landlords and bosses began to work for the privatized migratory control system, something they seemed to do willingly and for free. We left the airport stunned. Got on the bus stunned. Back to the flat stunned. Sat on the edge of the bed for what felt like a decade. A part of me is still on the edge of the bed trying to work out why we couldn't fly together. The apartment-studio-school in Bethnal Green was a welcoming and rigorous space of study. It taught me that it is possible to transform what being in a relationship means: a relationship can be anything! It can be a school! The other day Manu and I were talking about relationships, and they said to me, ––*oh yeah! Anyely told me how you used to have a boyfriend! So tell me about it! Tell me the gossip!* I'd laughed, but was delighted at this invitation to share all this knowledge I had with Manu, who was about to celebrate a one-year anniversary with their first boyfriend. ––*Whatever relationship you are in, you have to*

keep an eye to your things, your drawing for example, it's special. And it's yours! Your drums. Yours! As long as you remember, you know, it's all good! One gets absorbed in the schools of others, I was trying to say. And there are schools and there are schools.

I start the talk at Praksis in Oslo, *––you never know whether artist-duos are together, so, just saying...*The talk is called "Counter-Chronologies of Reproductive Control". I share an illustration of biological material and fertility capital, *––flying across borders: the fluidity with which gametes cross borders marks a stark contrast with the policies of the migratory control system and forced sterilization that continue to structure reproductive politics in Europe. The story of progression of reproductive rights not only does not accurately describe the current situation, but violently silences many peoples fragmented experience of "family time". The idea of a counter-chronology resists this alienating linear account by foregrounding conflicting times, time zones and temporalities of familial life.* I close the talk with a performance-reading of a text I had written with Anyely that excerpts and reframes the words that appear across the website. I'd invited Syowia and Masaya to read the text with me over an ambient music track as we clicked through the words mentioned.
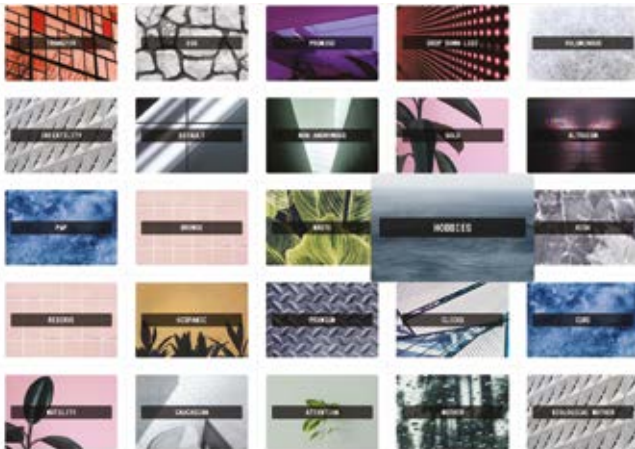
FIGURE 24. Detail of *Classic Gold Premium* URL1 "words". Image courtesy the author.
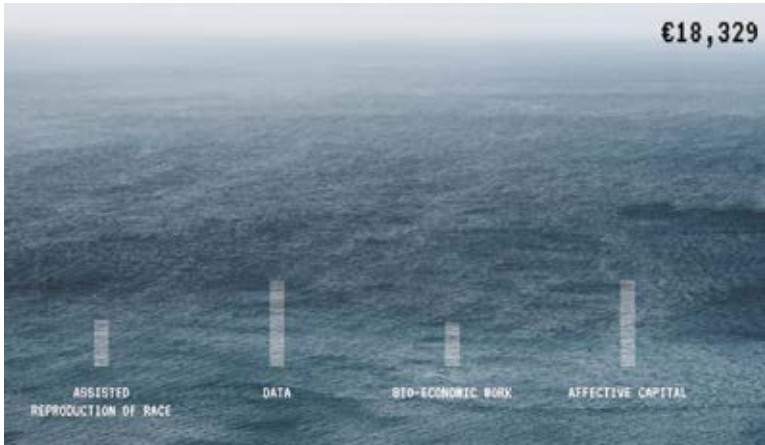
FIGURE 25. Detail of *Classic Gold Premium* URL2 "valves and euros". Image courtesy the author.

The Performance-reading Script

PIN
I've got your pin number.
BASKET
Which stories shall I put in my basket?
ATTENTION
One of time's four qualities: also the breath
WASHED
what divides each note that way?
what song of faster ones?
CONSENT
The fifth quality: the word from which we get 'consent'
sentire meaning 'a feeling'
INFERTILITY
The causes of infertility worldwide are
the programs of forced sterilization,
commercial toxicity & defective public health systems.
CURE
We demand the cures.

ANCESTRIES
Assigned to some people
The world assigned to others
Who must take up the question and who
in taking it up curiously, disguises its taxonomic function.
HOBBIES
Delete hobbies: a social-technical device for affirming class.
Classify privileges. Classify whiteness.
MOTHERS
you have to assume I exist
because of all the mothers I have mothered
and all the mothers I've had
GENETIC PARENTS
"Genetic Parents for the Redistribution of Bioeconomy profits"
INTERFACE
It's our interface between imagination and material reality
our interface between production and reproduction
our interface between human and machine
these are our borders
FREEZE
Freeze borders. Watch them melt away.

      The audience gets immediately that when I click on the PC, something happens on URL2 projected behind: they exist in the same time and are causally connected. The voice, though, introduces another time: our voices are kind of always out of time. Each time had its own structure and pressures. The time that it takes for the values to change on URL2 is regulated by the health of fiber optic cables, down link layers, servers and the WIFI connection. The time it takes to click on the words after hearing them is dependent on my bodily responses: sometimes I am slow because I am distracted so there are long stretches of silence that surprise me (I had told Masaya and Syowia not to continue reading the words until I had found and clicked on the right word according to the script). Sometimes I try and get ahead and click on a word before I hear it, because I know the order. By the end of the performance-reading I'm not sure if the rhythm of the piece is set by the time of the interface or the time of the voice; the performance script or *the interface as a script.*

The next day after spending time with the fellows in tutorials I walk to Praksis offices to meet Syowia and Nicholas Jones, the director and founder Praksis. *––I think it would help if you gave more framing, as most people haven't heard of reproduction, reproductive politics, assisted reproduction or forced sterilization or egg donation etc.,* Nicolas says, as we reflect on the previous evening. I tell them both how early in the coding collaboration, Kerry and I talked about how bringing web-based works into art spaces often leads to, *––very underwhelming experiences,* I quote Kerry. *––But there is something in the work,* Syowia continues, *it was incredible how after everyone began to talk.* It's true: after we turned the lights back on we stayed in the space and talked for hours. A performance artist, based in the U.S, shared his experience of being a donor; Masaya shared insights from her sociological research into invisibilized informal economies of care and how the migratory control system has impacted her own family's movements over the last decade. Many more fellows and audience members began to share thoughts on their own relationship to ideas of reproduction, family and borders. *––That's when it is happening*, I say to Syowia, who looks at me and says one of her Syowia words, eyes shining, *––BINGO!*

I've been carrying around an image for a couple of months that I haven't shown in any talks or written about. I don't know what to do with it. It's a screenshot of the website of Spanish sperm bank The Instituto de Reproducción Cefer from the year 2000. On the homepage of this early version of their website it says "SIDA Y REPRODUC-CIÓN"("AIDS AND REPRODUCTION") and below is a diagram –an image– of the HIV virus.

The combination of the words "AIDS" and "reproduction" with a visual of the virus marks an extraordinary break with what one normally sees on the homepages of bank and clinic websites, more commonly populated by twisting helix's, baby faces and pregnant women without heads.

CEFER was the first sperm bank to open in Spain in 1977. By the mid-1990s they were already offering "sperm washing" for HIV-positive men undergoing fertility treatments. Although sperm washing does not guarantee the complete elimination of the HIV virus, the process of removing non-motile sperm and extracting the disease-carrying material from the semen means that the "washing" procedure significantly reduces the risk of viral transmission. It also improves

FIGURE 26. Sketch based on image of Instituto de Reproducción CEFER's 2000 website. See entry for 24th August, 2000, for "AIDS and Reproduction" page at www.institutocefer.com via: https://web.archive.org/

the chances of fertilization, which is why sperm washing is today advertised for most In vitro procedures in fertility clinics globally, and is also sometimes marketed as an "add-on" that customers can pay extra for. Today, CEFER's site mentions how they were the "first in Spain, and second in the world" to introduce sperm washing procedures for HIV-positive men. Yet a visual representation of the virus is no longer displayed (Instituto Cefer, 2021).

I am fixated with this image in a similar way that I had, over the last five years, become fixated with the art, video and poetry practices developed during the HIV/AIDS crisis, especially works like Pratibha Parmar's *Reframing Aids* (1989) that explore the crisis in terms of the wider political implications it had on national border regimes, police practices and intensified racial and sexual surveillance (Close, 2017; Klusacek & Morrison, 1993). In 2018 I invited colleagues to read a live-translation into Spanish of a fragment of Parmar's *Reframing Aids* at a talk and performance program in Barcelona focused on memory, art and archives. The historian Karo Moret said to me after our reading, *you know, sometimes we get stuck in history, like you're stuck in 1989*. I wondered then if I had the right to be stuck in 1989,

when I would have been 2 years old. As Parmar's film documents, the crisis had far reaching material and historical consequences that would determine the discourses on race and sexuality for generations to come. In the UK, the HIV/AIDS-related media hysteria conditioned the introduction of section 28, an anti-LGBTQ+ censorship law that led to the exclusion of many books, films and art from public libraries and museums, and a general culture of silence in education and public broadcasting around sexuality. The country was effectively frozen between 1981 and 2003, when the legislation was finally withdrawn.

I freeze before this screenshot of a fertility website from the year 2000 because it seems to faithfully register the material and structural link between the HIV/AIDS crisis and today's heteronormative worlds of fertility (see Chapter 4). I think about the cosmology of temperature in Lacan's *The Mirror Stage as Formative of the I Function* (1949). In psychoanalysis "identification" is "the transformation that takes place in the subject when he assumes an image", where assuming an image means to recognize oneself in the image, and to appropriate the image as oneself (Lacan, 1949, p. 76). When a toddler sees an image of their own body in movement in a mirror, it appears as an "exteriority" that "freezes". It is the capacity to *freeze* an image in the mind of what is actually in movement that enables the process of identification to take place (Lacan, 1949, p. 76). Lacan's theory of identification cannot explain though why I freeze before the screenshot. I freeze intentionally in a way that cannot be explained by my "ego being situated in a fictional direction by which he [sic] must resolve, as 'I', his [sic] discordance with reality." I freeze not to identify, and thus to "resolve my discordant reality as 'I'", but to sit with the discordance. There is an element of fabulation I admit, "a fictional direction" according to which I can see something that is categorically not there: the website mentions *sida y reproducción* not in recognition of the historical and material links between HIV/AIDS crisis and assisted reproduction but as a way to address particular consumers of fertility services and products. It is only Pratibha Parmar's *Reframing Aids* that faithfully registers the social, material and historical link between HIV/AIDS and reproduction.

Jose Esteban Muñoz's (1999) theory of disidentification offers another way to understand this frozen state: disidentification as a practice "does not dispel those ideological contradictory elements; rather, [...] a disidentifying subject works to hold on to this

object and invest it with new life" (p. 12). I'll let it go at some point. Maybe that is what I'm doing now through writing: investing it with new life.

INFO SKETCHES AND SCIENTIFIC DATA-VIZ
V. SCIENCE FICTION TWISTS

January 2020

At some point towards the end of the month Anyely calls. *––We found a place! Es sucio todo, filled with basura. The windows don't close. There is no bathroom or kitchen...Yet! ––Sounds perfect!* I say, joking but happy to imagine us into the future. We were now three months without a home. *––How is Anu?* Anyely is staying with a friend at an anarchist-feminist squat. She tells me about the garage in the basement where all the martial arts groups train. *––They just hung the punching bags and there's a good tatami made from old car tires–– Can't wait to see it!* Many families arrived there through the Plataforma de Afectados por la Hipoteca (PAH) ("Platform for People Affected by Mortgages"), a Spanish grassroots organization that takes direct action to stop evictions and campaigns for housing rights that was set up in the wake of the 2008 financial crisis. The PAH assemblies have been increasingly led by migrant workers and families, who have been the most affected by the housing crisis and the administrative barriers to accessing rented accommodation in Spain. *––There is something I need to tell you...my residency renewal application was... delayed. ––Ok...it's going to fine*. But I wasn't sure. *––We'll wait. We'll apply again if we need to*, I say, trying to sound certain. That evening I don't sleep.

I'd spent the month organizing information I had gathered for a class called "Data Now", which introduced basic data scraping techniques and open-source software for data-visualization.[50] As I was using large, but not necessarily "big", quantities of information, not necessarily "data", I decided to work more sincerely under the term "info sketches". The first info sketch addressed the circulation of the terms fertility and assisted reproduction in the UK media. Repro-

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ductive technologies are often framed as a cure for infertility. This not only ignores the fact that many LGBTQIA++ patients are not biologically infertile, but that assisted reproduction does not cure global infertility, which is rather the effect of multiple factors including commercial toxicity and poor healthcare services. I wanted to see if there were any significant changes in the way these notions are talked about in the mainstream media in the UK and so did a scrape to search for the keywords "fertility" and then for "assisted reproduction". I copied and pasted the output into a spreadsheet and used a tag cloud generator (https://tools.digitalmethods.net/beta/tagcloud/) to create an overview of the most common words used. There was no noticeable difference between the two, which informed my use of "fertility" interchangeably with "assisted reproduction" throughout this project.

"ASSISTED REPRODUCTION"

Reproductive (57) London (37) technology (29) women (15) Hospital (10) sperm (9) cloning (8) clinic (8) couples (8) humans (7) embryos (7) expert (6) University (6) parents (6) stored (5) babies (5) child (5) families (5) pregnant (5) assist (5) patients (4) science (4) genetics (4) doctors (4) donors (4) being (4) genes (3) vitro (3) advances (3) Italy (3) discarded (3) breakthrough (3) Monday (3) government (3) Denmark (3) private (3)

"FERTILITY"

treatment (59) women (23) problems (17) couples (17) issues (16) woman (13) Hartlepool (12) male (12) affected (11) eggs (11) clinic (11) children (10) Network (9) health (8) family (8) female (8) Human (6) Authority (6) freezing (6) cutting (6) Radio (5) mothers (5) medical (5) cancer (5) ovarian (5) liscensed (5) gametes (5) failing (3) government (3) London (3) parents (3) rejected (3) music

FIGURE 27. BBC News scrape for the words "assisted reproduction".
FIGURE 28. BBC News scrape for the word "fertility".

FIGURE 29. Screenshot of (python) scrape program.

FIGURE 30. Voyage.tools.org summary of 91 staff impressions texts.

Common to the gamete donor catalogues across the globe is a piece of writing called "staff impressions": descriptions of donors made by the clinic staff. I gathered a set of "impressions" from three different sperm banks in Europe (26 from London Sperm Bank; 33 from European Sperm Bank and 32 from Cryos International) and input the texts into a word cloud tool (voyage.tools.org). The most common words were: "medium", "sized" "person"; "straight", "shaped", "brown": "eyebrows", "nose", "face", "happy". This "info sketch" suggested the face as a main content and informed my analysis of the *sonnetization* of donor catalogues (Chapter 2).

I also wanted to create a general overview of the visual culture of global fertility discourse. The project unfolded over a series of phases. In phase 1 I used Google maps to search for fertility clinics and banks in 11 major or capital cities (chosen randomly: Barcelona, Cape Town, Mexico City D.F, Dubai, Lagos, London, Melbourne, Mumbai, New York, Paris, Rio).

FIGURE 31. *Replicating Tropes* Phase 1. Cities and clinics on Google maps.

In phase 2, I compiled a list of 10 clinics in each city, copying down the URLS of the clinic or bank's homepages. If it was the case that the clinics were clustered in particular areas of the cities, I noted the names of the neighborhoods.

FIGURE 32. *Replicating Tropes* Phase 3. Detail of screenshot generator output of 110 fertility and bank homepages.

In Phase 3, I used an URL screenshot generator (https://wiki.digitalmethods.net/Dmi/ToolScreenshotGenerator) to quickly download screenshots of the homepages. This created a data set of 110 homepage images.
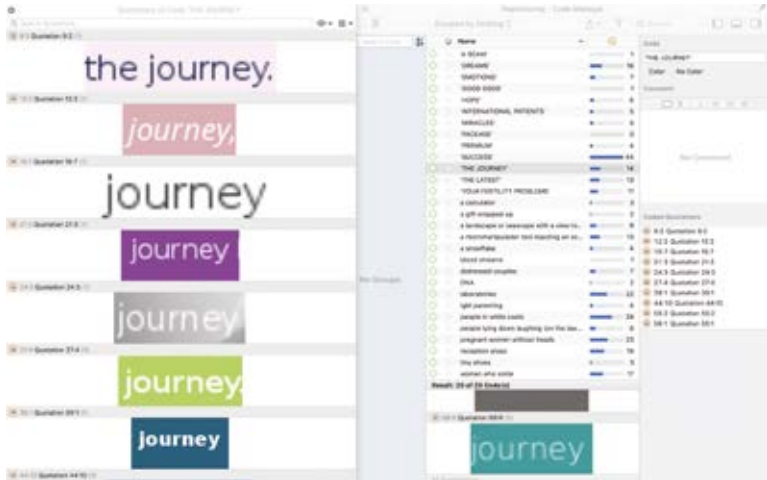
FIGURE 33. *Replicating Tropes* Phase 4. "The Journey The Journey The Journey" excerpted from various screenshots of different fertility clinic and bank homepages.

In phase 4, I used Atlas.ti software to label the words and images that appeared often. The final image *Replicating Tropes* presents the frequency of images and words in terms of the font size: so, the word "success" was mentioned 44% of the time; an image of a pregnant woman without a head occurred at a rate of 32%; the word "dream" was mentioned 16% of the time etc.

When I shared *Replicating Tropes* with a friend, a designer, he commented that ––*The design of these sites is so bad, perhaps a good solution would be to like contact the designers and get them to make it better.* I wasn't sure what to say, apart from to shake my head, it's true, ––*the bad web*...I realized I needed to build a better conceptual framework for critiquing the interface in the fertility context beyond observing *bad design and bad poetry*. *Replicating Tropes*, with its peculiar vanishing point and datafied banality, conceptualizes

```
                              international
                        miracles
                        emotions
                          hope
                       the latest
          micromanipulator tool injecting an oocyte
                      the journey


                          dreams

              smiling women
                      plush reception areas
              equipped laboratories
          pregnant women without heads
              people in white coats


                      success


          REPRODUCING TROPES
        (100 pt = at a rate of 100%)
```

FIGURE 34. *Replicating Tropes* (2020)

the interface not as an "image", that can be replaced with a better one, but as *a perspective zone, a site of material and historical struggle*.

In the data viz class our teachers constantly warned us against representing correlation as causation. The resulting visuals may be seductive, but any suggestion of cause is "illusory" and offers no explanation (Xiong et al., 2020). I'm seeing correlations as causations everywhere: between the booming business of migratory control and the booming business of IVF in Europe; the rise in the number of IVF cycles and the number of families separated due to deportation regimes. This could perhaps be visualized with a simple bar chart but I'm also experiencing a kind of data delirium or informational fatigue. My favorite "data visualization" technique is a screenshot from Google maps that shows the clustering of fertility clinics across capital cities and this requires no data visualization techniques at all, only that you look it up online and notice (this material made its way into *The Wife of Them All* film).

In the last month I had begun writing a short story: a series of characters move around the cities where they live navigating the intersections of waged and unwaged reproductive work. One of the characters visits a clinic in Barcelona, and so I was able to write up the things I remembered from my visits to clinics in Madrid and Barcelona in 2018. At that time I had been considering the possibility of egg donation. The 900 euros payment would have funded an art project I was working on. While in the UK you can potentially do both, under, for example, London egg and sperm bank's "donate and freeze" programs, in Spain clinics were irritated when I asked after this option. The distinction between "patient" and "donor" is strict, demarcated by age and class. Donors are young, patients are older. Donors are paid, patients pay. I think of a friend telling us at a party in *Pomaret* in Barcelona, how when they were younger they had donated eggs a couple of times. They told us of how the clinic had wanted to take a picture of their face for an internal document that would be used by the staff to match the donor with the patients. They had tried to refuse, saying ––*If any heteros saw this picture they would surely not choose my eggs!* We were laughing about our "queer egg-faces" circulating on the fertility market, ––*who wants a baby with this face!* I told them how the nurse who interviewed me in Madrid had asked about my sexual history. When I'd mentioned ––*My partner is a woman*, she'd exclaimed, ––*Oh right, so you are not having sex*. We were beside ourselves, watching the sun come up over the fertile garden of the squat, located in a neighborhood in Barcelona that is, coincidentally, the city's "fertility neighborhood".

It was through trips to clinics in Barcelona and Madrid that I'd started to understand that in order to protect our parenting rights in Spain we would *have to* go to a licensed clinic. We couldn't DIY inseminate and then just put a name on the birth certificate, as any heterosexual couple could. Consent, like freedom, is worked out in a protological field.

How to visualize technologies of assisted reproduction in relation to all the technologies of *assisted non-reproduction* that constitute the landscape of reproductive politics in Europe and globally? I decide the characters in the story are going to "hack" the global fertility clinic websites, "unfreezing" the personal data from the donor profiles and distributing it, *as visas and passports*.

SOCIAL CERAMICS,
DYKE AUTO-APOTHEOSIS, TINSEL
IN THE CLINIC AND GENETIC LACUNAE

April 2021

I meet Madeleine in the Born neighborhood in Barcelona as she'd agreed to help me walk the *Monument to Networks of Mutual Aid* back to the station. *Monument to Networks of Mutual Aid* was a sound and ceramics installation that wove a critical narrative of mutual aid against the extractive and disciplinary mechanisms of state and privatized politics of care. The installation had been stored at the Born Centro Cultura i Memoria (El Born CCM) for nearly a year, since its display there in December 2020. The COVID19 crisis intensified a crisis in care that many have experienced for years. In response to inadequate government solutions to the pandemic, many feminist, antiracist, migrant activist networks and migrant-run religious communities self-organized across the city of Barcelona. This was the context in which I initiated a series of audio-recorded conversations with people who were implicated in the distribution of food, the production of masks and other tasks associated with care during the early days of the pandemic. The process was carried out during September and November 2020 with the collaboration of artist Violeta Ospina and presented as part of "Dissenting History" – a series of talks, conferences and workshops around decolonial memory that I co-curated with Anyely at the Born CCM. The installation shared fragments of the interviews in Romanian, Arabic, Spanish and Catalan.[51] The installation itself was spatialized as a two-channel audio that sounded around directional speakers arranged in a circle. In the middle Violeta and I placed a series of ceramic pieces –pots, plates, cups– that I'd fabricated already broken down the middle. Over the break, I inscribed words, poems, slogans or spiritual texts shared by the collaborators during the interviews.

[51]   The collaborators included Aurel Bunda and Antonia, from La Parroquia ortodoxa rumana Sant Jordi; Samuel Cespedes, Carina Ramirez Castro and Nicky Susana Justavino Cedeno, from Sindillar Sindihogar; Linaxa, Wenda Trejo y Baro Aboubacar Landry, from la Red de Cuidados Antirracistas; Aly Saad, from the Centro Cultural lslamico Catalan; Aminah Akram and Hafsah lmaan Shabbir, from Minhaj-ul-Quran (Foro Minhaj Dialogo).

The Born CCM itself is an archaeological site with a permanent exhibition of ceramic materials spanning the Roman period to the 18th century. The ceramics in the permanent exhibition are mostly kitchen and storage vessels and all broken: broken plates, broken earthenware bowls, pans, lids, pitchers, jugs, clay pots, casserole dishes, broken oil dispensers, broken jars and mortars. Apart from the gleam of cobalt-blue of the Barcelona blue ceramics period of the 15th century most of the pieces are dulled by time, making a stark contrast with the colors I used in *Monument*. The permanent exhibition was closed during the *Monument* installation in 2020, but later I got to see it with Manu. We were passing by the museum and I persuaded them to go in with me, even though I'd promised that today was dedicated to *goth clothes hunting*. Manu feigned interest in the smashed plates, dulled by earth and time, accompanying me around the vitrines. Manu is profoundly polite. Plus, it was their school holidays, and we were doing ceramics nearly every day on request *––Look at this one!* They pointed out a plate with a rabbit painted across the surface, broken in two. Blue and white. Blue and white. Brown. Green. Earth. Terracotta. We pause before one of the vitrines at the back hovering over a selection of tiny, tiny ceramic pots, dice, a chair, a tiny lamp: *––Ancient dolls house*? *––Hagamos los dados mañana?!*

When Madeleine and I arrive to the museum to pick up the installation, I realize I could have carried it home myself: the pieces fit into a single cardboard box. The reduction of the "monument" to the cardboard box brings up similar questions that had unfolded over the course of another ceramics project entitled *Networks of Care and Critique*. I tell Madeleine how the project began with conversations: I would sit down with friends and people whose work I admire and we would discuss the forms of care –intellectual, emotional or physical– that have been important over our lifespan. They would arrange the information on a genealogical-style diagram divided into decades and I'd make a ceramic plaque of the diagram, which belonged to them.

I presented the pieces in exhibitions and talked about them in many different institutional or independent art and activist spaces. I made the plaques with people I know well, who are active in trans*feminist organizing in Barcelona, Helsinki and London, involved in queer parenting and/or are artists. Many collaborators remain anonymous, as do their plaques. *––But the monumentalism started to contradict the pleasures of the exercise itself, rooted in listening...*

FIGURE 35 & 36. *L and A's Networks of Care and Critique* (2019). Image courtesy the artist.
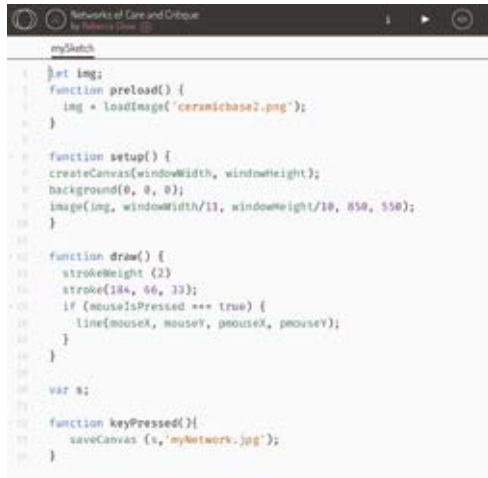
Anyely once said she thought this project was a bit ––*Moralist*, *como moralista-feminista*...A bit didactic maybe. I wasn't sure, it had its own anarchic material-social logic. ––*I decided to "liberate" the exercise: write it up as a drawing software program.*[52] I mention how someone had got in touch about the ceramics-now-drawing-software project via email: they'd found *Networks* online through the Openprocessing platform and wanted to know if I'd be able to do a session and then send a ceramic piece to her in India.
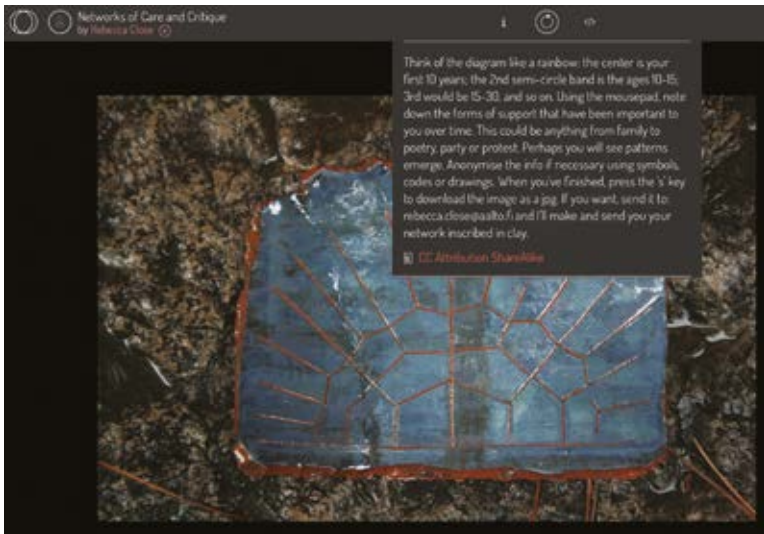
FIGURE 37. Networks of Care and Critique drawing software on Openprocessing platform. Screenshot. Image courtesy the author.

FIGURE 38. Networks of Care and Critique source code. Screenshot. Image courtesy the author.

––People are starting to get in touch about the research on reproduction in general. In Helsinki, Abdullah had put me in touch with his friend Arlene. Arlene is a U.S artist of color now based in Helsinki who wanted to share experiences of discrimination in the fertility clinic system in Finland. We sat on a bench outside the Oodi public library and talked nervously at first but were soon laughing out loud *––the clinic's bizarre architecture, failed experiences of asking, or not asking, friends to be donors.* The fertility clinic in Finland is notoriously discriminatory to LGBTQIA++ people and single women. Sociologist Julian Honksaalo (2018) explains;

> Due to the population politics in Finland that emphasizes the value of white, Finnish, heterosexual couples and their biological offspring, not just transgender and queer reproduction, but also the reproduction by single women, is a secondary issue in health care legislation and practice (p.42).

Arlene and I talked about the fact that this has led to the flourishing of alliances between trans*, queer people and single women. At some point in our communications, I shared the work of Mwenza T. Blell (2022) on reproductive justice in Finland and put Arlene in touch with someone I had met from the Monimuotoiset perheet–Diverse Families network. Later too, Arlene helped share a writing workshop I did on reproduction and poetry, connecting me with people who wanted to make creative work around these issues. *Do you mind if I write about our conversation?* I asked her as we walked towards central station. By this point in the project I had begun to think about whether it might be possible to pull these more spontaneous networked encounters to the center of the project, as they seemed to evidence the material and social dimension of this, and any, research project. *––Hmmm, maybe, let me think about it, just keep in touch, and keep sharing.*

––Are we in your thesis? Madeleine says, glowing.

––You're in everything! I tell them how *––I recently did a Networks of Care and Critique session with Michelle O'Higgins, who I'd met through the Critical Interfaces course run by the School of Machines in Berlin. We sat together quietly on a zoom call, mapping then sharing. It was a beautiful conversation as we guided each other through our homes, schools, families, friends, teachers, partners, art practices, libraries, parties and political training. I liked their map as they had chosen to annotate using symbols and drawing: only a few words.*

––When can I do one? ––Today? ––I want to come up and do some ceramics. I've been meaning to ask you but thought maybe it was private? But then I heard that you and Anu were doing it. I've been wanting to do ceramics since leaving Goldsmiths––Oh my god! What do you mean? I only do ceramics in social bursts, this installation! I hold the cardboard box up to the sun, *––or when someone else wants to!* I told her how Anyely and I go down to the river to collect mud for making clay, how last week a guy picking figs helped us carry the buckets back to the main road, *––s*o *heavy! Recently I've only been doing ceramics with Nahxe's 5-year-old and Anu who comes round for evening sessions and we make as many mugs as possible in two hours. Come to the house.* We walk down to the candle shop, which Madeleine tells me is Barcelona's oldest shop, slip into the bodega next door, order food and beer. *––I have to ask you something: is it*
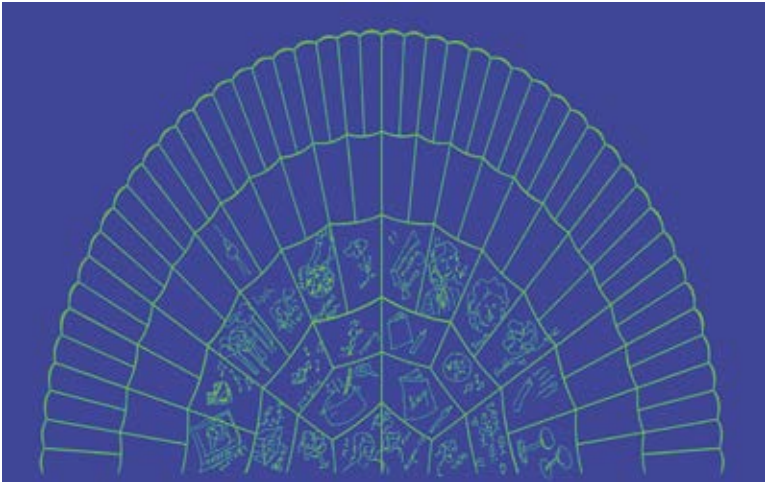
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ok that I write about us and do you want to be named? Madeleine is asking me for permission to publish a short story on a substack that would circulate among a London literary group and their networks. The story features a fictionalized account of a night last summer when, with Fer and other friends, we had *careened around the city*, fallen from the beach to the street to bars to clubs, *screeched our satirical poems from our phones into the night*, and had *steaming summer sex––Do we still need to ask permission?*! Madeleine and Fer are the only people named in this fiction that I did not send an excerpt to, because we agree: this is what dykes do; auto-apotheosis, *––because...who's listening?*

––How was the clinic? I change the subject. A couple of months ago, Fer and Madeleine had called to ask me which clinics in Barcelona I would recommend. I'd suggested one that I had visited, which was one that my friends had used, whose son is now 2. *––It's affordable*, I said, *and they are quite chilled. ––Oh my god, it was intense. When we walked in there was this manikin standing awkwardly by the window which was a floor to ceiling window, like in a clothes shop, you know? And around the manikin they had draped*

this pink tinsel. ––Christmas tinsel? I ask. Which one did you go to? The one in Gracia? The one I went to was more low key.... ––It wasn't just the manikin and the tinsel. The woman who attended us was so weird. When we asked her about the choice of the donor, she laughed at us when we asked about how they make the decision, and was like 'HA, YOU don't have to worry about that, in fact you CAN'T, it's ILLE-GAL for you to know who the donor is, so you leave it up to us, HA.' But I asked again, and she looked at us "we have our ways" and laughed,

FIGURES 40 & 41. "Isle's trip to the clinic" from *The Wife of Them All* (2022). Dir. Rebecca Close. Film still screenshot. Image courtesy the author.

like a cartoon evil laugh. Plus, she kept trying to sell us plastic surgery. ––Wait, what?––Yeah, the clinic does fertility treatments AND plastic surgery. ––What was it called? ––Eva. ––Oh no! I meant to tell you to go to Eugin...Well at least you got the first visit out the way.

We talk about donors. Madeleine tells me how they are starting to feel uncomfortable with the idea of anonymous donation. ––*It's like I can imagine that when you know who the donor is, you can just be like, child, that is your donor, his name is X, he was born in X country. But if you don't know ANYTHING about them, it becomes a bigger deal: a genetic lacuna.* I tell them about the name registered on the birth certificate of my maternal grandfather. My grandfather was brought up by his mother alone, as the man named on the birth certificate had disappeared when he was one. We knew only that they both worked as domestic workers in Hammersmith in London, as this was registered on the birth certificate and some military records where my grandfather and his mother are listed "dependents". Everyone in my family had different ideas about the missing father's ethnicity, because my grandfather had sometimes talked about experiences of being called racialized slurs. Anyely and I became obsessed with the story. Over three months, which coincided with another round of residency card applications, we spent every evening tracking down archival documents, anything that might tell us who he was. In the end though there was no way to link any of the people we found to my grandfather or his mother, as there was no marriage certificate. ––*The point of this story*, I head towards the summary, aware of the damage done by white people indulging in genealogical research and then indulging in talking about it, ––*is that this process is now informing the way we are thinking about kids conceived using anonymous donors. ––You could always go to a clinic in the UK, where all donation is non-anonymous? ––Mmmm. But we STILL haven't been able to go the UK!* Madeleine turns red with rage, sharing. We order more. ––*I am SO sorry about the tinsel!*

TOUCHING/TRANSFORMING CRITICAL ARTISTIC RESEARCH ON SUOMENLINNA, PERFORMING THE INTERFACE II AND THE PURSUIT OF INTERFACE-FICTIONS

June 2021

Freja, Sepideh and I had been meeting online throughout the first pandemic year to plan: if restrictions allowed, we were going to meet at HIAP on Suomenlinna, Helsinki, share work, write together and host a public talk by Skolt/Sami theater director Pauliina Feodoroff. Restrictions do allow, and as I board the ferry I spot Freja and Sepideh: we laugh in delight as our flat heads and shoulders that we know well from zoom fill out suddenly IRL. We had written a text for the seminar, called Touching/Transforming, which summarized our discussions around how the virtual touching of academic disciplines and institutions through artistic research processes may lead to their "real" material transformation. It was a conceptual framework no doubt influenced by the sudden regulation of touch during pandemic times.[53]

Pauliina's talk addresses, among other things, the history of land expropriation in Finland. The subject of land uses and care for the land is a central thread in our discussions over the following three days. At some point our conversations turn also to experiences of discrimination at work; as artists, lecturers, students, researchers. Everyone talks: the racist art history taught at universities; the systems of evaluating and examining artworks; the institutional struggles in academic departments around syllabus. I share something about the experience of working with diásporas críticas and moving to Ecuador for two years; teaching in a department for critical theory and experimental practices; living close, making daily life and parenting commitments fluid; but how the ground began to shake far beyond our professional and personal networks; unstable leadership leading to hostile working environments; the national petroleum crisis; the devastating 2016 earthquake; getting wind of rumors that there was a "lesbian harem" who were "looking after a child" until it dawned on us that *we* were the rumor; how it became difficult to stay in the city as *a*

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[53]   This was later published in the article *Touching/Transforming: Notes Towards Collective Critical Artistic Research Practices and Processes* (Bäckman et al., 2021).

family, though we didn't use that word at the time. Mira says, −−*What I'm hearing is that you were shocked at a representation of your lives in a way that has nothing to do with your lives.* I am stunned by the simplicity of the statement.

The next day we had the opportunity to share works in progress and I invited Freja, Marie-Andrée, Mira, Ali, Abdullah, Sepideh and Pauliina to read *The Wife of Them All* script live. Pauliina said −−*this would work on the stage. This reproduction stuff is heavy, but this enters it through a human perspective. It's good material. Is there any more?*

The following week I travel to Hämeenlinna to inscribe my civil partnership in the only Digital Population Services information office that is open and has appointments. The lady is very nice and takes all my documents. Einat had asked the night before, *why are you trying to inscribe your civil union if Anyely and Manu are not coming to live in Finland? −−I want all the rights afforded, just in case. I get it,* they say, *I get it.* A few months later I receive the reply: "your application has been rejected based on the fact the Spanish 'pareja de hecho' arrangement is not as formally strong as a civil union in Finland". *Ok,* I shrug, relieved that this decision does not structurally impact our lives.

Over the next few weeks in Espoo I work on revisions to the *Classic Gold Premium* interface and reflect on how the performances had been going. In December 2019 I'd shared the work as part of a talk and performance on the politics of reproduction at Hangar, in Barcelona. Around the same time Anyely shared *Classic Gold Premium* in a workshop on race and technology, part of the Smart Cities Week in Barcelona. Just before lockdown, Anyely did another talk at the LGBT center in Barcelona called, "Algoritmos de raza: la lógica racial de la reproducción asistida" (Algorithms of race: the racial logic of assisted reproduction) and shared *Classic Gold Premium*, inviting the audience to come up and click the words. Performing the interface together allowed for a distinctive rhythm to pace our unfolding conversation; flow, break, start, stop, talk, click, space, wait, walk, sit, talk. The interface's grid-like visual segmentation of the words highlights the materiality of this language: these word-object-commodities weigh heavy on our conversation about the peculiar role of colonial language in structuring not just value-production in commercial assisted reproduction but the reproductive imaginary at large −−*How*

do we talk about and imagine social and biological reproduction? It matters... Mario and David talk about the racial logics that also organize adoption in Spain, and many share experiences of queer parenting or their engagements with fertility infrastructures in Barcelona.

FIGURE 42. Anyely (left) sharing *Classic Gold Premium*, with ASL interpreter at the LGBT center in Barcelona, March 2020. Image courtesy the author.

        I made *Classic Gold Premium* with Anyely and Kerry with the idea that "socializing" the "personal" computer in a gallery or workshop setting would always be radical and fun, and it was. But sometimes it was awkward. In January 2021 the interface work was part of an online exhibition *Unbounded Unleashed Unforgiving: Reconsidering Cyberfeminism* (curated by Liss LaFleur & Melanie Clemmons). It worked well in that setting, though I wanted there to be *more story, more narrative, more science, more fiction*. Walking around Helsinki, it occurs to me, *it's just a website*: it can be the website for the unfolding animation film. The project then begins to approximate the excessive interdisciplinarity of the Internet interface, with its combination of moving image,

syntax, buttons, shifting valves, data extractive techniques, audiovisual content and lyrical address: the interface as fiction; the interface as perverse-satirical-parody; the interface as counter-song, from the Greek *parōidía* meaning "a song sung alongside another".
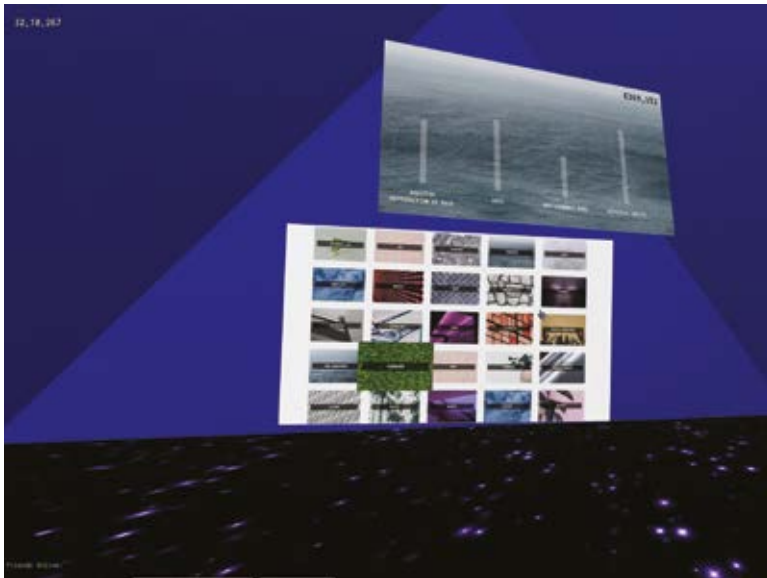
FIGURES 43 & 44. *Classic Gold Premium*, in "Unbounded Unleashed Unforgiving: Reconsidering Cyberfeminism", January 2021. Image courtesy the author.

CLAY ANIMATION, TIME-LAPSE MICROSCOPY AND THE RACIALIZED DISCOURSE OF PLASTICITY

July 2021

I invite the readers who are voicing characters in the animation film and who are based in Barcelona to the Biblioteca Francesca Bonnemaison, a historical feminist space in the city. Sabrina is first. We meet in the morning in the lobby of the old building. I have known Sabrina for years through transfeminist organizing spaces in the city, parties and martial arts meet ups. We air kiss and put our masks back on, begin warming up her voice. Sabrina is reading the character of Fran, *––She's a mother*, I'd explained, s*he's the mother of Ela, the daughter character, but she is also a mother of movements, like you! ––I love it,* Sabrina says, eyes sparkling. We have two hours for the read-through but manage it in a bit less. Usually, by the third go, the smoothness of the reading and the presence of the speaking-body collide: *you're here!* Sabrina is happy: *––I loved doing the voice for an animation! Never done that before.* We talk for a while in the studio. She tells me the origin story of her social media and sex-worker avatar, "Shirley McLaren" *––I always say I'm Scottish and Mexican!* And how she's leaving the city. *––NO! ––Yes. Amsterdam for a major new role.* We complain about Barcelona, how inward looking it can get, *––...you'll be back! ––No, I don't think I will.* The following week I meet with Alejandra who is reading the part of Julia. I met Alejandra in December 2020 when she came to the opening of the *Monument to Networks of Mutual Aid* installation with her colleagues from Sindihogar –a domestic worker's union in Barcelona who had participated in the project. I remember Alejandra had said she liked the ceramics and the interviews but that, *it would maybe help to be able to see people's mouths moving as they speak.* We met up a few months ago and I told her about the animation project: *this time there will be visuals!* I asked if she would be interested in reading the part of Julia, *she's a poet, domestic worker, activist and works in one of the clinics. It's sci-fi–– Sounds fun!* And now Alejandra dives into the script, *she should be a singer, like me. And this line would be better like this.*

After the recording we go find a mint tea at Paloma Blanca at the top of Rambla Raval, but it's shut so we walk down to another good tea place on Sant Pau, in front of the dilapidated church. We talk

about barriers to finding housing and work in the center of the city; we talk about poetry, singing and her father, who was a violin player in Buenos Aires. We both have friends in London who live on boats ––*maybe they know each other?* I love walking around the city with Alejandra. She stops people in the street to say, ––*you look absolutely stunning!* Then turns to me, *You've got to say it when it's true!* I think about asking Alejandra what she thinks about the visuals for the character she is reading, but as I go deeper into animation I have started to notice the potentially infinite division of labor that an animation film entails. This is also something I have begun to consider working with Meri Varó, who is helping animate my drawings and edit the footage with me. They, like most of the characters that populate this fiction, do a million things: professional filmmaker, videographer, lighting expert, DJ, bar worker and trained acupuncturist. We get distracted while working, talking about high and low sex drives, romance, mastectomies, the best place in the city to get a non-binary haircut ––*Practically impossible. Pau in Gracia is good though,* or who we were when we were teenagers ––*it sounds like you were more of a jock, I was more emo, no sports.* We'd been to family weddings recently and used up a whole work session planning suits––*oops, but...so handsome!!* We work to Meri's playlist: female led grime from the UK –––*I can't believe I never heard these tracks!!*

So far we haven't talked about the reproductive technologies that are the focus of the film. Maybe it's because queer reproduction is the Barcelona background, kind of the scene. We have so many friends who have or have not used ARTs, who have donated eggs or sperm for cash, want and do not want kids. At some point we're sitting in a bar talking about the film with friends, and Meri tells us about a session they had with a witch, ––*He made me try and think about whether I wanted to have kids: I literally don't! Never have! But the witch insisted: think beyond the care you have already had to give, and now...NOW do you want kids? NO! Think harder, the witch said, beyond the people you have already supported! And then suddenly I was like...wait...it sounded like a new question... maybe, maybe I would.* I told them how that week I had a dream I was carrying around a gym bag full of donor sperm, but it wasn't for me: it was for other people and it had spilled. ––*I was like this is gross!* They'd laughed but looked away, respectful of the privacy of this bag.

I send Meri more clips. We are immersing ourselves, albeit anarchically, in the history of animation as we test and learn new techniques. I share Mary Ellen Bute's work *Synchromy No.4: Escape* (1938): the ember of an orange triangle falls across the screen behind a dark pulsating grid: an imprisoned triangle ––*Can you believe Bute was doing this with stage lighting?!* And Oskar Fischinger's *An Optical Poem* (1938) in which gold, yellow and orange circles and squares rotate around an unfixed perspective point: moons, celestial bodies, cells or the elusive bokeh circles that blink and retreat when natural light falls in and out of focus on film––*Can you believe Fischinger did that by hanging paper cut-outs of the shapes from wires and moving them around manually!!*
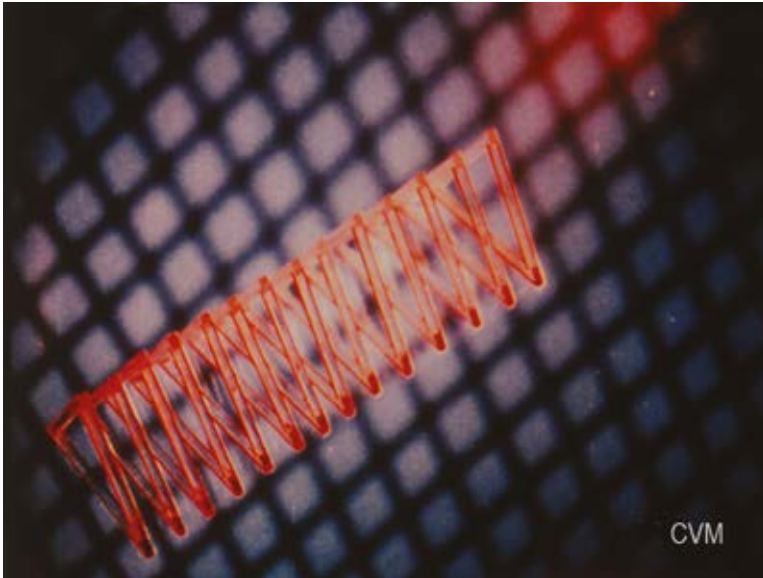
FIGURE 45. *Synchromy No.4: Escape (1938)* Dir. Mary Ellen Bute. Film still. Image courtesy copyright Center for Visual Music, Los Angeles.

I also share *The Sculptor's Nightmare* (1908): the origin of clay animation film. In the film a sculptor is tasked with a new commission: to make the bust of the then president Theodore Roosevelt.

Instead of getting to work he goes out to dinner, gets smashed, gets arrested and falls asleep in jail. While asleep, in his dream, he sculpts away, finishing the dream bust, only to wake up in the morning empty handed, grasping at thin air in his cell. It gets to the heart of what would become the clay animation genre: something about process, the unconscious, threat, manipulation, the biological body, dreams, invisibility, utopias, time and work.

FIGURES 46, 47, 48, 49 & 50. *The Sculptor's Nightmare* (1908) Dir. Wallace McCutcheon. Film still screenshot. Image courtesy Library of Congress. Public Domain Mark.

In *Hollywood Flatlands: Animation, Critical Theory, and the Avant-Garde* (2002), Esther Leslie traces the resonances that the animation form had aesthetically and politically with the communist and socialist movements of the 20th century: how Rodchenko saw in the animated line a way to construct not represent; how the cartoon has a "flexible and cavalier attitude to representation" (p.20); how the Dadaists deployed its clownish gags across their work as an "intentional violation of logic" (p.16); how Sergei Eisenstein was dying to meet Walt Disney; how the first version of Walter Benjamin's *The Work of Art in the Age of Mechanical Reproduction* originally included a fragment on how Mickey Mouse "unmasks social negativity" (p.81). Esther Leslie concludes: "Animation, the giving of life, battles with annihilation, always overcomes, always reasserts, the principle of motion of the continuation of renewal" (p.2).

This sense of perpetual movement is palpable in many of the clay animation films of the 1950s and 1960s, which embraced the ultimate elastic material: plasticine. In *The Origin of the Species* –made at the Carpenter's Center at Harvard University by Eliot Noyés in 1967–

FIGURE 51. *The Origin of the Species* (1965), Dir. Eli Noyes. Film still screenshot. Image courtesy Eli Noyes.

the clay morphs from bust to amoeba, human to animal, dinosaur to human child, and of course the title takes its name from Charles Darwin's 1859 treatise. These clay animation films approximate the contemporaneous time-lapse microscopy tradition in the life-sciences. In both early time-lapse microscopy in the lab and mid-20th century clay animation in the studio there is a merging of audiovisual drama and life process, and an emphasis on manipulation and control. Both are characterized by certain audiovisual techniques: the close-up and the forward march of time-lapse, which suggests something of the progressive advance of bourgeoise time.

I tell Meri about the early time-lapse microscopy footage I'd found in the Wellcome Collection archives in the UK. They have a complete set of films made by the British pathologist and bacteriologist R. G. Canti who carried experiments out at Strangeways Research Lab in Cambridge between the 1920s and 1940s. I was struck by a film attached to a reel of three labeled S*trangeways Research Laboratory compilation reel* (1931-46) made by the 20th Century developmental biologist and embryologist A. F. W. Hughes. I was astounded to see how Hughes had made his own drawn animation sequence: a shaky pencil line illustrates the structure of a cell, drawn by the hand of the scientist and made invisible through the stop-motion technique. The film is beautiful. It was made using a process called Dark Field Illumination. A chance exchange with the physicist and expert in optical instruments for cell and tissue imaging Dr. Gail McConnell informed me that this technique, "involves bringing light to the specimen at a high angle so that only highly scattering objects are detected by the imaging objective".[54] Dark field illumination produces a high contrast that highlights movement: the entire surface of the film dances. The film reads like a draft of Disney's *Fantasia* (1940). Indeed, they were made around the same time.

I was also drawn to the film as it seems to be at least partially decontextualized in the Wellcome archive. The title, as it appears in the archive and in the film itself, is *Dark Ground Illumination*. As discussed above, this is just the name of the cell imaging technique used. The archival label goes on to state that the film is "possibly from *Tissue Culture from Phase Contrast.*" But *Tissue Culture from Phase Contrast* is a different film, also in the Wellcome Collection archives,

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54   Personal email correspondence (2022).
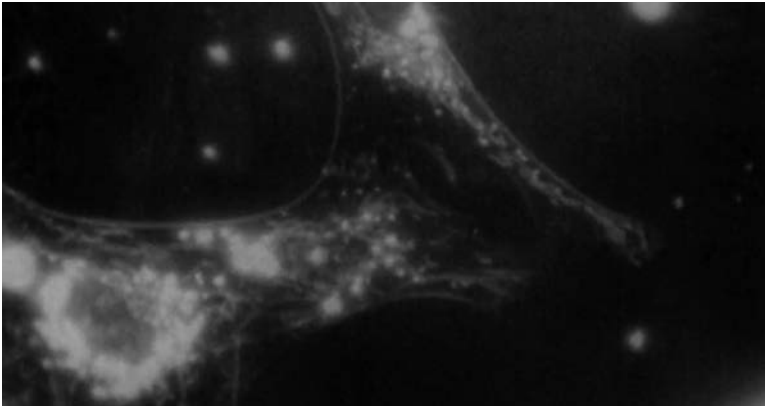
FIGURE 52. *Dark Ground Illumination* (1931-46), Dir. A. F. W. Hughes. Film still screenshot. Image courtesy Wellcome Collection. Public Domain Mark.
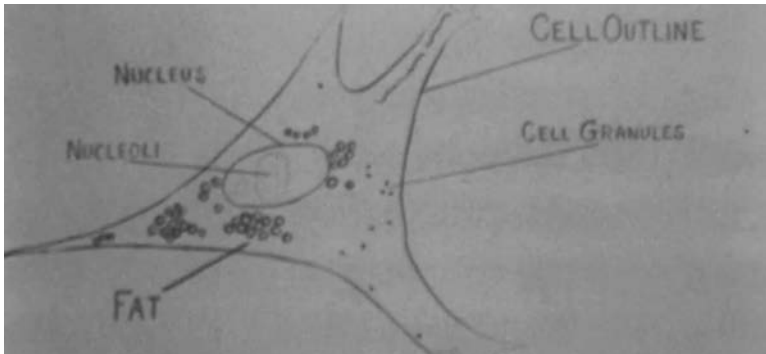
FIGURE 53. "Drawn animation by Hughes" in *Dark Ground Illumination (1931-46)* Dir. A. F. W. Hughes. Film still screenshot. Image courtesy Wellcome Collection. Public Domain Mark.

but does not include such a visually striking sequence and the microscopy footage is well labelled in that film, stating before each sequence what we are looking at ("the outgrowth from culture of embryo chick fibroblasts" or "mitosis in frog culture").

Dr. McConnell was also able to tell me that, "the objects wriggling around inside the cells are likely mitochondria: these are the powerhouse of the cell and they produce energy to sustain the cell." There is though, at this point, no way of knowing exactly what cells we are looking at. It is possible this filmic experiment was more important to Hughes than what he was filming, as otherwise he may have chosen another title, naming the film with the biological process or cell captured. Historically, feminist and queer video and new media art have considered just this: how a media apparatus, a set of optical instruments and audiovisual formal constraints, can take precedence over the content; how a *way of seeing* may gain authority not through accurate representation, fixed referents or correct labeling, but through repetition and decontextualization. Thinking about the feminist science studies tradition of flipping the microscopic lens to observe disobediently (Haraway, 1996), I decide to further decontextualize this footage, or rather recontextualize it to suggest the infrastructural drama of reproductive lives in the city, host to busy roads but also today IVF labs, clustered in the highest rent paying areas: the infrastructures of social and biological reproduction in the 21st century.

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FIGURE 54. "Pearl's city" from *The Wife of Them All* (2022), Dir. Rebecca Close. Film still screenshot. Image courtesy the author.

FIGURES 55 & 56. *Gumbasia* (1953), Art Clokey (Director). Image courtesy Art Clokey.

In another clay animation film called *Gumbasia* (1953), directed by Art Clokey, plasticine in primary colors pulsates in geometric shapes, ordered in grids to a soundtrack of rhythmic drumming. It was while watching *Gumbasia* that the combination of the advancing march of stop-motion with the endless elasticity of plasticine began to feel modern-colonial. The concept of "biological plasticity" in the life sciences is fundamentally linked to the racial science legacies of biological control the colonial approach to the human body as a site of scientific knowledge extraction and experiment. Julian Gill-Peterson (2018) provides a chronology of the concept of plasticity as it was used within developmental biology, a field that legitimized itself through the study of trans children and teenagers, who, "were central to the medicalization of sex and gender during the twentieth century in a very specific way, made valuable through a racialized discourse of plasticity" (p. 3). Today the concept of plasticity continues to structure thought in the fields of neuroscience and epigenetics. While many feminist scientists and social scientists hope to potentialize theories of plasticity and epigenetics for their capacity to "unsettle[s] the equation between biological determination and political normalization" (Malabou, 2016, p. 432), Gil-Peterson (2018) concludes that "far from being a progressive vector of malleability or change, the racial plasticity of sex and gender was a decidedly disenfranchising object of governance" (p. 4).

The colonial lineages of biological plasticity hardened me to the elasticity of plasticine. I would go into craft shops and nearly buy plasticine for the film but didn't. In the histories of trans*feminist and queer reproduction struggles, there is, though, a reclaiming of plasticity that is decidedly anti-colonial. I make a series of ceramic geometric objects, a hand and a telephone: hard and shiny objects that better express the hidden stages and labor of making gender, sexuality, sex and family *plastic*. I like the idea that one's relationship to plasticity is partially opaque: you can't see it being sculpted, you cannot zoom in, or watch it advancing, frame for frame. The glazed shapes –the circles, the sun, the pentagon, the house, the lines, the buildings, the boats, the triangles, the city– move around, clinking. You only get to see us once we're shiny. I still have a million drawings to do for the character of Mina. Meri labors on.
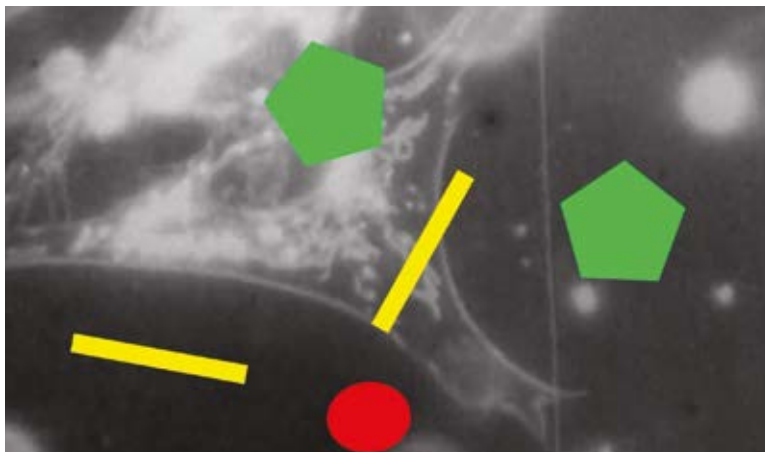
FIGURE 57. "Fran's city" from *The Wife of Them All* (2022). Dir. Rebecca Close. Film still screenshot. Image courtesy the author.

ROE V. WADE ON THE HORIZON AND AFFIRMATION NOT DELUSION

April 2022

Can you imagine our kid! So feral, so good at Kung fu and piano! As I get to the bar Anu and Dani are talking about the kids they might have had, *together!!* Anu works with kids, teenagers and adults through self-defense and martial arts workshops. She recently organized a two-day trip for all the kids in our extended network, where each got to be accompanied by their *favorite adults, NO PARENTS!* It was a *Fin de semana de tias y sobris –* "weekend of aunts and niblings". There were games all day and a night forest adventure, something about dressing up as the *maquis*, the Spanish Civil War revolutionaries. The kids and the *tias* returned exhausted, happy. *But I'm like your kid, you're Kung Fu kid! You're like my Kung Fu parent!* She looks at me like, *No, I'm your teacher, Soy tu...friend!* Once I said how, *sometimes one's partner can be like a mother, or a sibling, or a father.*

Shocked, Anu said, *baby, only your mother is your mother,* which is also what psychoanalysts say: *you only have one father.* I nod, but have been much parented by partners, teachers and friends. Anu shares a memory with us of a teacher in primary school who taught her, *how to BE. ––What do you mean?* I ask, but I know what she means. She says, *like how to make people feel at ease, how to bring people in, organize, make connections between groups. ––That is what you do! That is your skill! ––Well I learnt that from him.* Nahxe arrives after classes and doesn't have her daughter so can stay late. She orders a beer and begins a gripping summary of the Netflix documentary on *Roe v. Wade. So then she switched sides and began to work with the Christian right... and then switched sides again back to the feminists!!!* We are laughing because of the drama, but the Supreme Court decision is on the horizon. *It won't happen will it? Yeah I think it will.* That evening *Bolleras de Manresa*, a self-organized queer collective, were putting on a session of DJs for Lesbian Visibility Day. When we get to La Sequia everything is silent. A disco ball refracts light playfully around space. People are smoking outside or getting a drink. A wire needs plugging in. We say hi to Leti and Gemma and at some point the music turns on, people come in from the terrace. Anyely and I are sleep-walking from Ecuador's time zones and the bliss of family proximity. Manu was on vacation so we were able to travel. We went to Cuenca, stayed in a tree house on a farm, went on long walks, met some cows. Manu was drawing a lot and we were constantly writing and singing songs. I met Manu's boyfriend, shared the animation project. We talked about the story and watched the parts of the film that were finished. *Do you want to read the part of Ela?* I'd asked.

I'd had a grounding conversation with the sociologist Sonja Mackenzie during my stay at Cambridge University's ReproSoc. On a long walk in February at the edge of the city I was telling her about –– *Sappho's DIY artificial insemination network AND they were a poetry magazine!! I've just finished the soundtrack with Nick and Dunya. –– But you haven't shared it with Manu yet?* Sonja looks at me. *––We haven't seen each other for nearly a year now. ––Why?* Partly pandemic related travel restrictions but also, I explained, *the Venezuelan passport crisis, we've been waiting for Anyely's passport for years.* There have been severe delays since 2016 to the issuing and renewing of Venezuelan passports. The solution has been to issue *prórrogas* (extensions) to existing passports that last maximum two years, but

of course to travel anywhere you need at least 6 months on the passport, which means that families using Venezuelan passports have a miniscule window through which all their passports must coincide in order to travel together. *––It's a nightmare.* Sonja said to me *––You must share it with Manu.––I can't wait.* Would Manu like this project, which draws on aspect of our lives?

Sonja told me about the process of publishing around her and her family's experience of moving, temporarily, from the U.S to the U.K. She'd written a series of blog posts and journal articles that center on the experience of having to explain "*how* they are a family" at the UK border, and Sonja's experience of applying, as a British citizen, for British citizenship for her U.S born daughter. In the article *Bloodlines and/at the Border: The Structural Intimacies of LGBTQ Transnational Kinship* (2021), Sonja excerpts a section of the letter that communicates the UK Home Office decision that her daughter cannot claim British citizenship because she was born before 2006 (the year that the UK first recognized automatic co-parenting status for same-sex parents) and that her "mother" (referring only to the person that birthed her) was a U.S national. The decision effectively ruled that Sonja's daughter is not her daughter. In the article, Sonja asks, "what is the role of 'the border' as a means of re-producing LGBTQ inequities?" I told her how many family members and friends are able to visit Spain via the administrative mechanism of the "letter of invitation", which thankfully does not require that we evidence biogenetic relations. Yet this also highlights, *––our lack of legibility as a family.* I remain ambivalent about using the term to name us, in part because of *what the family has been*, all the things done in the name of "the family", but also because it might be considered delusional. Anyway, *––too busy planning how to get there*. Where? *––Family time.*

In Guayaquil, in the middle of our two-month trip, we had all the time in the world. *––Of course I want to read Ela!* Manu has always been into acting. When they were 10 they did their first play in Guayaquil, directed and hosted by a local theater group run by two Brechtians. Manu co-wrote the script with the other kids. *––You were so good!* I remind them*––I know!* We decided we wouldn't do the audio recording in Guayaquil, *––soooooo noisy!!* On one of our tree-house days in Cuenca we decided, *––now! English, or Spanish? ––Let's try English,* they say. *––So, how did it go?* Anyely asks as we bound down the stairs. *––So good!* Manu says, jumping back on phone, boyfriend calling, *––*

oh my god they were amazing. They literally did the best reading out of everyone. ––I know, Anyely says smiling, *I heard it.*

A few months later Sonja and I would meet again at the Reproductive Futures conference in Tampere in Finland, three days of incredible presentations and panels on reproduction. One thing I was surprised at over the duration of the conference was how many times I heard reproduction scholars expressing concerns regarding the "focus on queerness" when in fact ––*heterosexual parents also experience discrimination at the border and heterosexual patients also experience discrimination in the fertility clinic.* One prominent reproduction scholar had challenged a speaker, perhaps productively, but no less provocatively considering the history of the pressures on LGBTQIA++ people to "explain themselves" (crystallizing in the imperative to "come out of the closet"), ––*What exactly is queer about this research?* After months of thinking about this comment I later gather my thoughts: queer research is historically rooted in the direct action demands of HIV/AIDS-related activism, through which experiences of state violence were transformed into knowledge and concrete demands. According to this queer research tradition: there is no research without personal experience, no knowledge without the explicit critique of state violence and no study of "research subjects" from the "outside". Research on reproduction might be grounded in a queer politics to the extent that it transforms the personal experience of discrimination and exclusion into knowledge; and to the extent that it demands an end to the policing of the borders of the family, labor, and nation.

In Tampere's rainbow flagged bars, Sonia asks, ––*Did you get to Ecuador? ––YES! ––Did you talk to Manu? ––YES!* We talked about losing teenagers to their phones and boyfriends,––*they'll be back!* We trust. And now, back to Barcelona with Anyely––*so quiet....–– I know I know.*

Nahxe and I talk about the future under the rainbow flag in La Sequia ––*What's the red for? Sex! ––Or Communism? ––What's the purple for? ––Feminism of course! ––Ok, but what's the blue for? –– It's for police! Because you know that there are some LGBT police?! Qué asco, por favor!!* Our conversation turns to our plans for a cooperative housing project. It doesn't exist yet. Nevertheless, we spend the evening dreaming up energy plans for the house. ––*There's a new system that people are trying out in an area of Cataluña, a system of*

*plants that keeps the building warm in winter and cool in the summer.
––We'll have hammocks swinging under the tall trees, humid spaces in
the shade and make use of the dark corners––And in the winter...the
windows will shut!* We are countering scarcity mindset. We promise
to warn each other if we start sounding deluded.

TIME, TEMPORALITY AND TIMING:
A POETICS OF REPRODUCTION

December 2022

Madeleine, Fer and I prepare for a writing workshop at Glasgow Wom-
en's Library based on the research presented in Chapter 3 of this the-
sis. The workshop will begin with an introduction to *Sappho Maga-
zine* and the networks they contributed to and that supported them.
I will briefly mention the artificial insemination network, explaining
how and why *Sappho is a good example to look at when trying to
define "queer reproduction", in its social and biological dimensions,*
and then we'll work with some of the poems in *Sappho*, many of which
were published anonymously. I develop the framing of the workshop
in conversation with Farzane Zamen, who works at Glasgow Wom-
en's Library, and is also an artist and singer. On a call, we share expe-
riences of forming part of families that are distributed in some way
across borders. She tells me how her uncle, who lives in Iran, says of
whatsapp, Skype and zoom, how, it's not a solution and it's not the
same as being together in person, *but it is the medicine.* We discuss
the workshop as a place to think and write about these experiences
of *family time* that are kind of out of time; how a family is not only
"queer" because it is made up of people who identify as queer, but that
many families today are organized in queer ways, to the extent that
our experience of time does not coincide with the time of the nuclear
family. We talk about the fact that taking "queer" out of the title of the
workshop in the promotional material might help invite a wider audi-
ence, *as someone who is not queer may want to come!* I agree and our
conversation, which had become so intimate so quickly, informs the
workshop's public text: *The family has long been a mode for organ-
izing time: from meal times to notions of the biological clock. Poetry
also regulates time, using attention and the breath as units that order
or disrupt the reader's sense of duration and permanence. Does*

reorganizing the family –across borders or through alternative social structures– reorder time, and how might this be registered by a poem?

In the workshop, after Madeleine introduces the Canal press project and bilingual magazine, I share thoughts on how the concepts of time, temporality and timing may be used to think about the structure of a poem. We look at these three poems (below), published in Sappho between 1972-1981:


```
NOT WHO I AM


Because the nine-to-five scene
Insists on my deception
Wants only the
        Myth of me
            And not who I am,
Because my nine-to-five friends
Insist on my meeting
The men who will
        Think I am
            Not who I am,
I carry my hidden self
Heavy, from nine-to-five
And in your six-o-clock
        Arms I can
            Lay my self down.
```


D.I.Y. FANTASY

Big bull dykes
on motor bikes
demanding rights
and starting fights
is what I likes;
so Friday nights
I touch the heights
in fantasy

with big bull dykes.

L.W.

FIGURE 58. Workshop Poem 1. Anon, (1973) Not Who I Am. Sappho, Vol 1. Issue 11.
FIGURE 59. Workshop poem 2. L.W, (1981) D.I.Y Fantasy, Sappho, Vol 8. Issue 12.

Time is any content of the poem that mentions the time of the day: the hours that order the day and aspects of daily life. These three poems all register the organization of our time into experiences of work and leisure: the mention of "the nine-to-five scene", "nine-to-five friends" and "your six o'clock arms"; "so Friday nights / I touch the heights"; and "Sunday morning."

Temporality is the political imagination constructed by the poem. The temporality of these three poems is a political imagination structured by experiences of sexual dissidence. The poems are focused on pleasure, but also do not omit bad or awkward feelings. The ability to combine comfort and complaint is perhaps what constitutes the poem's queer temporality.

SUNDAY MORNING

come on and get up

don't lie so close then

get up and we'll go out into the sunshine and have a picnic and read a book
in the forest

I shall get a headache

not if you wear a hat to keep your head from the sun and I will make bread
and cheese and take a bottle of apple juice so come on and get up

don't lie so close then

come on come on I will wear my new jeans and the check shirt and take
this very good book to read because it's a very good book and not very
heavy and we can buy some fresh fruit on the way

but sunday is our lazy morning

but if we don't go now the sun will go in and it will be a horrible day and
we won't want to go at all so come on and get up

you get up first

FIGURE 60. Workshop poem 3. Anon, (1974), Sunday Morning, Sappho, Vol 3. Iss 7.

Timing is any technique that determines the reader's experience of the poem on the page or read aloud: line breaks, rhyme, repetition, alliteration, visuality, sonic structures etc. Timing is craft and the poem's visual and sonic materiality.

We go into the exercises, which use the Sappho poems and our own work as examples, *making associations in this way between someone else's work and your own work, or between a text and a memory or a personal experience, is a way of reading and writing that extends beyond the academic literacy model. We write and read excellent poems. We also remember and affirm.* At the end of the workshop, after a reading circle in which everyone shares lines from poems they have written that they like, I ask if anyone wants to share anything about the experience of the workshop. The poet Gail McConnell says, *––can I go first?*, laughing, *I've been to a lot of shit online meetings and workshops, and, this was not one of them*! The rest of the feedback was delight *––for the rummaged poems, ––the feminist methodologies, ––Canal the queer co-op press, ––Glasgow Women's Library, ––the short time we got to spend together*.

Chapter 7
CONCLUSION

THE LINK BETWEEN QUEER REPRODUCTION STRUGGLES AND HETERONORMATIVE REPRODUCTIVE BIOLOGY

One of the questions that drives this research is: in the forms of reproductive choice on offer in the contemporary fertility clinic is there not a glimmer of the self- and collective- determination of reproductive resources evidenced in, for example, the lesbian-led artificial insemination networks of the 1970s or the queer and antiracist networks of care forged in response to the political management of the HIV/AIDS crisis in the 1980s and 1990s? How are these forms of Queer and Crip interdependency resistant to the liberal eugenics that also fundamentally determine ART clinical practices and protocols today? These questions resonate with the critical project of "queer biology", which, as Sarah Franklin (2015) comments, involves a consideration of how "emergent forms of lesbian, gay, trans and queer self-fashioning and identity" link to "the explicit bioartifice involved in much contemporary parenting by heterosexual couples" (p.174). Chapter 3 of this thesis considered precisely the link between queer reproduction struggles and heteronormative reproductive biology; between lesbian Artificial Insemination and the predominantly heteronormative worlds of IVF; between a lesbian poetry zine and (inter)national reproductive imaginaries. This thesis has pursued a study of the explicit bioartifice of contemporary fertility as a set of interfaces, networks and viral entities spatialized as fertility fixed capital and has affirmed the ways in which these same digital infrastructures may be redirected or restored through networked artistic, poetic and editorial practices on- and offline.

POST-INTERNET RECOVERY WORK

While the decision to name the editorial project *Them, All Magazine* emerged organically in relation to the animation film *The Wife of Them All* (whose title itself references Gertrude Stein's 1949 libretto *The Mother of Us All*), the editorial project's title also mobilizes, like *Sappho*, a form of gender non-conformity as a mode of networked action. *Them, All,* like *Sappho*, picks up on and strengthens the social and artistic dimension of experiences of sexual and gender dissidence

and affirms the transformative links between sexual dissidence, cultural activism and reproductive biology and politics. Developed parallel to the critical writing in Chapter 3, *Them, All Magazine* demonstrates a re/productive relationship between archive and practice –past and present– that is observable across many contemporary critical artistic/research processes as they follow, explicitly or not, a historical materialist method of "bringing up" the past in order to imagine and materialize sustainable and just reproductive futures.

WRITING GESTURALLY AND THE INTERDISCIPLINARY INTERNET INTERFACE

A main proposal of this thesis –that the network, interface and the viral be taken up as Marxist Feminist and Queer Marxist themes and modes of artistic response– has involved bringing together different disciplines. I departed from the work of scholars in the field of Software Studies, where the interface, the network and viral are staple topics; I have referenced Marxist Feminist and Queer theories of gender, sexuality, reproduction, labor and capital; I have analyzed contemporary assisted reproduction with reference to reproductive sociology; and I have referred to reflections across the field of Critical Artistic Research regarding the pursuit of gestural and non-linguistic ways of knowing in order to position the production of artistic and poetic materials as fundamental way of knowing something about sexuality and reproduction after the Internet. In other words, the positioning of this research as "artistic" is what has secured the possibility that knowing about queer reproductive work after the Internet involves writing *about* interfaces, networks and the viral as well as writing *as* interfaces, networks and the viral, without a single "medium" taking precedence. This thesis has developed a Queer Marxist post-internet art and writing practice that unfolds across plastic and theoretical registers in response to the analytical study of the reproductive politics of the Internet interface. *Writing gesturally* as a method of layering critical, poetic, editorial, audiovisual writing, holds space for the gestural as a mode of knowing grounded in critiques of the politics of the body, the commons and historical becomings. The disciplinary dispersion that writing gesturally demands, far from radical,

should also be considered a normal research method in the age of interfaces: a normal strategy for knowing with and after the poetic, political, plastic, theoretical and audiovisual Internet.

THE INTERFACE, NETWORK AND VIRAL IN PRODUCTION AND REPRODUCTION

This thesis has considered the interface, network and the viral as technological, political economic and social forms that intersect communication technologies, medicine and computer science and that exist prior to and post- Internet. While these entities sometimes operate as metaphors in my project, I have also been careful to select specific aspects, focusing on particular networks, particular interfaces and particular examples of the viral in order to situate them within geopolitical and historical contexts. In this sense, I depart from general observations regarding the "judgements of value and aesthetics that are built into computing" (Fuller, 2008, p.1) while also "moving against the generalizations of 'the virtual' or 'cyberspace'" (Fuller, 2017, p.88). Choosing specific case studies (from the Spanish facial matching algorithm company to the UK 1970s zine and U.S work of Net Art) has enabled a cementing of a combined Software Studies and Queer Marxist perspective on reproductive tech. The interface, the network and the viral are also profoundly ambivalent: today they occupy a central role in capital accumulation, emergent class antagonisms and the processes through which class-consciousness is racialised within and across national contexts. Yet it is precisely for this reason that they should be, and, as detailed above already have been, taken up as themes and modes of artistic and poetic-political response.

SOCIAL REPRODUCTION STRUGGLES AND DIGITAL FIXED CAPITAL

Queer reproductive work has been explored throughout as both a set of concrete activities and as a transformative dynamic between collectives of workers and their surroundings (Chapters 3 and 4), which unfolds over time as the built environment of the city or as particular

pieces of software (Chapter 2). I have analyzed aspects of the digital infrastructures and interfaces of the fertility industry –the cryopreserved sperm bank, the facial-matching algorithm and elements of the contemporary fertility services website– as at least partially the result of the processes through which social knowledge forged in the context of struggles around reproduction and sexuality is incorporated into the capitalist production circuit. Chapters 2 and 4 approached the facial-matching algorithm and the ART donor catalog website as "digital machines" (Negri, 2019): explicit heteronormative bioartifice and fertility sector fixed capital that embodies the memory of past cycles of extracted, now excluded, queer reproductive work. In Chapter 2, I brought Marx's theory of fixed capital to bear on the online-offline worlds of assisted reproduction, which helped to explain why fertility neighborhoods have begun to emerge in capital cities and why entire countries, such as Spain, have emerged as reproductive tourism destinations. Reworking Harvey's (2001) notion of the "spatial fix" as the "fertility fix", I showed how the fertility add-on economically *fixes* capital flow problems in the financialized fertility sector while ideologically and politically *fixing* a social reproduction crisis.

POETIC INFRASTRUCTURES
AND AESTHETIC INTERFACES

Bringing theories of fixed capital together with sociologies of assisted reproduction and Queer and Marxist perspectives on reproductive work and fixed capital introduces a vital infrastructural lens to the study of contemporary fertility that reaches beyond questions of individual reproductive choices. A main motivation for deploying artistic creation (of interfaces, films, poetry publication and editorial projects) was, on one hand, to introduce the question of poetry to the political functioning of digital infrastructures, and, on the other hand, to introduce the question of aesthetics to the technical operation of digital interfaces. The reader-viewer of the animation film *The Wife of Them All* sees what the characters see: their individualized imaginative worlds and personal reproductive choices, but also the post-internet and urban landscapes they move through and inhabit. This artistic research project has emphasized the role of poetics and

aesthetics to the technical and political functioning of the infrastructures and interfaces that condition reproductive control.

AUTO-WRITING AND THE NETWORKED DIMENSION OF RESEARCH

Chapter 6 highlights what is often hidden in accounts of the production and distribution of contemporary art, film and poetry: the social relations that any artistic creation and research process energizes. In "The Queer Reproduction Papers" theories of freedom, reproduction, time, poetry, animation, biology and plasticity circulate between friends, colleagues, workshop participants and between speakers and audiences, activating moments of self- and collective reflection and intimacy. Failures to connect and theorize are not omitted either. As Jose Esteban Muñoz writes of the queer and trans* auto-writing projects, "this is not about simple positivity and affirmation" (Esteban Muñoz, 2009, p. 14): I suggest how the brittle moments do some of the work too. In line with the expanded definition of queer reproduction (Chapter 1), I focus on aspects and experiences that might fall outside of the reproductive "topics" cemented by recent autotheory book projects on IVF or the queer family. In particular, Chapter 6 picks up on the reproductive politics of housing, activism, art, nation, borders, bureaucracy and the racial politics of contemporary fertility discourses. In Chapter 6, and in a number of the poems in the collection *Réplica*, the speaker approximates a normative discourse on the queer family: the "I" constructed in these literary moments of the research is indebted to a rich poetic and political tradition of Lesbian, Queer, Black Feminist and trans* writing that has considered, documented and affirmed familial connections beyond biological, genetic and species relatedness.

ARTISTIC RESPONSE

My close readings of *Sappho* magazine and Clover Leary's *Gay Gamete* helped me to construct a conceptual framework for reading and critiquing works of art and poetry in relation to, and in the context of, social reproduction struggles, reproductive politics and

reproductive crisis. Following Douglas Crimp's (1987) "cultural activism" framework, this thesis builds an expanded frame through which to read both activist actions and works of art and poetry as *responses* to governmental policies of reproductive control. This interpretive model is going to be of growing importance as polarized politics intensifies globally and as the fascist reproductive imaginary replicates. There is currently no cease to mediatized discussions around w*ho gets to be a worker, national and parent.* This political dimension of the research also furthers a main academic objective of the project: to challenge the chronological enclosing of Queer and Feminist video art, cyberfeminism, post-internet art, new media, Net Art, software art and poetry as completed or divided movements, theorizing instead a series of intentional tactics that respond to specific modes of governance.

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