ORIGINAL ARTICLE

Motherhood, Subjectivity, and Work

WILEY

MotherHack: Creative coding as an artist-mother

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Abstract

Enmeshed in the materiality of caregiving, becoming a mother changes how one relates to the world and others. These changes involve how a mother as subject is defined by others through cultural and societal idealizations of motherhood and parenting norms, but also through the leaking boundaries between the mother and other subjects as she is attuned to the needs of caregiving. In this analysis, I consider maternal subjectivity in terms of working as an artist-mother, defined as an artist who is also a mother and whose practice does not distinguish between these roles. In particular, I focus on the process of my development of a creative coding project, *Emergent*, during the COVID-19 pandemic. Through this analysis of the process of developing *Emergent*, I attend to the questions of maternal subjectivity that arose through its production, drawing from the embodied experiences of working as an artist-mother, in order to understand maternal subjectivity through the practice of computation. Here the work of producing art becomes the means of considering maternal subjectivity differently through embodied experience, as the labor affiliated with care-giving is entangled with the process of art making.

KEYWORDS
artist-mother, exploratory computing, maternal subjectivity

1 | INTRODUCTION

Enmeshed in the materiality of caregiving, becoming a mother changes how one relates to the world and others. In this analysis, I consider maternal subjectivity in terms of working as an artist-mother, defined as an artist who is also a mother and whose practice does not distinguish between these roles. In particular, I focus on the process of my development of a creative coding project, *Emergent*, during the COVID-19 pandemic, attending to the questions of maternal subjectivity that arose through its production, drawing from the embodied experiences of working as an artist-mother, in order to understand maternal subjectivity through the practice of computation. Here the work of producing art becomes the means of considering maternal subjectivity differently through embodied experience, as the labor affiliated with care-giving is entangled with the process of art making.

In general, caring for small children does not offer a conducive context for computer programming that involves extended periods of focus and concentration (Rosenberg, 2008). In the project *Emergent*, which was created during the COVID-19 pandemic—a time period noted for its care-crisis and insufficient childcare supports (Dowling, 2021; The Care Collective et al., 2020)—I pursued an approach in creative coding that responded to and accommodated the responsibilities for taking care of two small children. The title *Emergent* references these qualities of the artwork, as it is an allusion to adrienne maree brown's definition of emergent strategy as a "strategy for building complex patterns and systems of change through relatively small interactions" (brown, 2017). I use the method of exploratory computing, which Montfort (2021) defines as a means of artistic inquiry through computing, as art-based research (Eisner, 1981; McNiff, 1998), drawing explicit connections between computation and culture. Questions of maternal subjectivity are considered through processes of computer programming that drives the impetus for an art project. The resulting project involves an assemblage of generative animations, some utilizing biometric data collected from a fitness tracker I wore during the pandemic, stitched together through random looping cycles. This biometric data functions as a numerical archive of my care-giving activities during this time. In the creation of *Emergent*, my subjectivity as an artist-mother is realized through creative production, where embodied acts of mothering are entangled with the process of programming through art making. These experiences translate into the resulting form of the project itself and the aesthetic encounter that it provokes, with the interruptive quality of production is evident in the aesthetics of interruption (Putnam, 2022) of the final output.

1.1 | Defining artist-mother

Deirdre Donoghue defines the artist-mother as an artist whose "processes engage with their maternal experiences and subjectivities" (Donoghue, 2019, 191). There is an increasing body of research, practice, and support networks around artist-mothers to address the challenges of creative work and mothering, including work in art history (Betterton, 2014; Buller, 2012; Buller and Reeve, 2019; Chernick and Klein, 2011; Liss, 2009; Loveless, 2018; Marchevska and Walkerdine, 2020), performance studies (Šimić and Underwood-Lee, 2016, 2021, 2022), and accounts from artist-mothers themselves (Benigson, 2019; Estrada et al., 2023; Loveless, 2014; Nolan, 2022; Wade, 2016; Šimić and Underwood-Lee, 2017, 2020). Much of this work has arisen in response to the proliferation of flat ideas and idealized representations of motherhood, instead presenting practices and the work of various artist-mothers situated within a range of embodied experiences. Due to the diversity of maternal embodied ex-periences, which, as the artworks and literature present, extends beyond pregnancy and child-rearing to include abortion, miscarriage, infertility, fertility treatment, adoption, surrogacy, fostering, being child-free, being mothered or not mothered, and other lived experiences of mothering, it is not possible to present a general or universal understanding of what constitutes an artist-mother. Not all artists who are mothers even identify with the com-bination of the terms, as Šimić and Underwood Lee (2021) found in their research. Šimić and Underwood Lee emphasize the significance of not treating entangled identity positions as fixed or rooted in biology, but drawing

from Alison Stone, they argue that the use of combined terms make evident the multiplicity and layering of identities that come with being both a mother and an artist. As Estrada, Somsen, and Buteyn note, artist-mothers are "multi-dimensional, with many intersecting roles and responsibilities that play out in complex ways in their art" (Estrada et al., 2023, 13). Therefore, it is not uncommon for artist-mothers to situate understandings of their practice within the framework of their personal, embodied mothering experiences. This current analysis is consistent with this approach to studying maternal subjectivity, which focuses on my personal experiences of developing a project while mothering two small children in Ireland during the COVID-19 pandemic.

Maternal subjectivity is understood as inherently relational (Stone, 2012), dynamic, and multiple, which include relations to other subjectivities as well as the entangled subjectivities of being a mother and artist. Subjectivity is influenced by external forces, where the subject is not just individually informed, but collectively shaped as it acts and is acted upon (Butler, 2015; Putnam, 2022). A significant challenge that arises for artist-mothers are the conflicting expectations and responsibilities affiliated with these roles, which do not always accommodate the other, meaning subjectivity is part of an ongoing "hacking" process that involves modification, adaption, and negotiation.

Some artist-mothers may utilize their practice to cultivate new presentations of the maternal through the content of their art. Others do not address the maternal explicitly, but the experience of becoming a mother can change how one produces art. As Irish performance artist Amanda Coogan describes, being an artist-mother can be "like the bricks and mortar, the foundations" of an artist's practice (Coogan & Šimić, 2017), particularly when this practice engages with the embodiment of lived experience. Helen Benigson, who intentionally coincided her PhD research regarding the Internet and motherhood with the conception, pregnancies, and births of her two children, describes how creating art as a mother afforded her "a site of subjective, intuitive and embodied productivity from which to formulate questions around" motherhood (Benigson, 2019). That is, mothering is manifest through the embodied experiences of productivity that entangle relations of care-giving with creative practice. This entanglement enables artistic production to become a means of exploring maternal subjectivity, even if the content of the art is not explicit as such. Moreover, the aim of the current paper is to understand maternal subjectivity through processes of maternal art making.

1.2 | Mothering in the creative and cultural industries

Like other workers in the creative and cultural industries, artists face particular challenges in employment that are not designed to accommodate mothers and other care givers. Liddy and O'Brien (2021) discuss how the working conditions of creative and cultural industries, which tend to include long hours, unpaid and underpaid work, and a need for flexibility in terms of availability, can clash with care-giving responsibilities, resulting in trade-offs in navigating the ability to work that masquerade as choice. Dent (2021) refers to how there is a particular stigma around the maternal in creative and cultural industries, making it challenging if not impossible to combine care-giving with creative work. Judah (2022) elaborates upon the various challenges artist-mothers face, where difficulties arise in practicalities of negotiating care-giving responsibilities and creative practice in the art world, but also there is a certain mythos around artists as being anti-domestic. Judah observes how the early 20th century avant-garde "thought domesticity a drag" as artists were romanticized as bohemian figures, where "a visionary, experimental life of the mind was considered at odds" with heteronormative family units (Judah, 2022, 11). Such romanticisations tended to not only exclude women with children from pursuing artistic careers, but also led to a reluctance to accept the maternal as subject matter in art. In other words, the maternal was deemed as something incompatible with being an artist, a proscription that persists even in the 21st century. Artist-mothers exist as what Buller and Reeve (2019) refer to as inappropriate bodies, where maternity encompasses a contradiction of both being a cultural ideal and taboo, existing in an in-between state that the art world struggles to accommodate.

For artists, creative work includes the time in the studio to produce art, but there is strong emphasis on visibility and networking that involves engagement with the broader art world through unpaid activities in order to

gain opportunities (Aranda et al., 2011). The result is a way of working that does not meet typical impressions of what it means to work. As artist Hito Steyerl states, "contemporary art's workforce consists largely of people who, despite working constantly, do not correspond to any traditional image of labor" (Steyerl, 2011, 34). Artists, like mothers, work in ways where the labor may not always be valued or treated as "work." Art work has an unstructured nature that is not always straight forward, yet involves great material, physical, and intellectual investments. At the same time, there are certain expected norms around what it means to work in the art world. These norms pose challenges for artist-mothers, such as having uninterrupted time and space in a dedicated studio to make art, being able to network by attending exhibition openings and other events during hours that clash with care-giving responsibilities, being able to accommodate studio visits with curators and dedicate long hours to exhibition preparation and installation, and participating in residencies that involve being away from home for prolonged periods of time. The Mothership Project, an organization dedicated to improving access for parents in the arts, have highlighted the following core issues that parent-artists face in Ireland: "time, money and precarity; the perception of artists with children; studio provision, creche facilities and working from home; and child friendly residencies" (The Mothership Project, 2019). An artist's work load involves additional unpaid administrative tasks, such as writing artist statements and work descriptions, entering materials to open calls and communicating with curators in order to attain exhibition opportunities, applying for residencies, grants, and other funding, and the general bookkeeping affiliated with being a freelance worker. Despite the financial success of a small minority of the art world, much artistic labor is unwaged or underpaid, creating a gap for many artists between making art and making money (La Berge, 2019; Sholette, 2010). Moreover, while the independent nature of work offers certain flexibility, the unstructured yet substantial nature of an artist's workload can pose challenges for mothers that differ from those working in other industries (Judah, 2022).

1.3 | Mothering in the Irish context

There are particular features to mothering in the Irish context, where there is a unique kind of patriarchal culture influenced through colonialism, nationalist reactions in the formation of the Irish nation-state, and Catholic ideology. Liddy and O'Brien describe Irish society as having "traditionally supported a home-based role for women and assigned them primary responsibility for caring work and childcare" (Liddy & O'Brien, 2021, 197–98). Ireland has one of the highest fertility rates in the EU (The Mothership Project, 2019), however there is little state support for childcare, which is treated as a private responsibility, resulting in "childcare costs to parents in Ireland [that] are among the highest in the OCED" (Liddy & O'Brien, 2021, 198). Liddy and O'Brien also observe how there is heavy reliance on informal networks for sharing childcare of responsibilities, including depending upon relatives such as grandparents, siblings, and other family members for additional support. Ireland does provide paid parental leave, though as Eileen Drew (The Mothership Project, 2019) notes there is gender disparity in how much time is offered. Ireland provides 6 months paid maternity leave, though only 2 weeks paternity leave is offered to fathers that they may avail of at any time during the first 6 months after a child's birth. Paternity leave also applies to same sex couples ("Paternity Leave" 2022), meaning that in couples with two females, only the one who has given birth may avail of maternity leave. There is also an option for an additional 6 months of unpaid maternity leave available. Drew observes how providing greater maternity than paternity leave can have "a knock-on effect, where the mother can become the default carer in the household" (The Mothership Project, 2019, 8). In Ireland, a monthly child benefit of €140 is available to parents and guardians per child, normally paid to the mother or step-mother (Irish Government, 2019). However, such payments cover only a fraction of childcare costs (Tonna-Barthet, 2019). The allocation of child benefit to mothers can be understood as promoting men as breadwinners and women as caretakers (Fahey & Nixon, 2013), which is further supported by article 41.2 of the Irish Constitution that states:

> In particular, the State recognises that by her life within the home, woman gives to the State a support without which the common good cannot be achieved. The State shall, therefore, endeavour to ensure that mothers shall not be obliged by economic necessity to engage in labour to the neglect of their duties in the home.
>
> ("Constitution of Ireland", 2020)

While this text was included in the original 1937 Constitution of Ireland, it continues to instigate debate, with a potential referendum to be held to alter the phrasing (Conneely, 2021; Laird & Penney, 2023). Moreover, historically and culturally, mothers in Ireland have been perceived and treated as primary caregivers of children, functioning as societal expectations that are reaffirmed through current legislation such as parental leave allocations. Such factors directly impact my situated experiences as an artist-mother living and working in Ireland, as I discuss further below.

1.4 | Ethics and the maternal taboo

Other challenges arise within the practice of artist-mothers, including the taboos of engaging with one's own children in the production of art. The approach an artist-mother takes varies, just as there is variance in parenting styles. Sometimes the presence of children within an art work can provoke negative responses from audiences, including claims of exploitation and abuse (Judah, 2022). Such responses can place judgment on the artist's parenting, functioning as a type of mother-blaming, or the cultural tendency to negatively judge a mother's actions in regards to child-rearing if it appears inconsistent with societal norms (Putnam, 2018). In other instances, a work of art may be dismissed by equating playful engagement with one's children as frivolous (Kallenberger, 2023). In both cases, when the act of mothering intersects with artistic production, it is deemed unsuitable as art, contributing to ongoing acts of erasing the lived experiences of the maternal from art. In contrast, like the act of parenting itself, collaborating or engaging with one's own children in the production of art is situated and relational, emerging through the interactions of creative processes between art and mothering. As such, the ethics of producing art with one's own children exists as an ongoing relational ethics of care with focus placed on interdependence, rather than fixed moralistic virtues. María Puig de la Bellacasa emphasizes the significance of such relationality in her definition of an ethics of care, where ethics is "about thick, impure, involvement in a world where the question of how to care needs to be posed. That is, it makes of ethics a hands-on, ongoing process of re-creation of 'as well as possible' relations and therefore one that requires a speculative opening about what a possible involves" (Puig de la Bellacasa, 2017, 6). Such features are evident in the work of U.S. performance artist Marni Kotak, who describes how she modified her performance practice after receiving negative feedback for her proposed project *Raising Baby X*, where she "present[s] the everyday act of raising [her] child as a work of art" (Kashef, 2019, 159). After accusations of potentially harming her child by making him the subject of voyeurism, which she had not intended, she responded by placing a GoPro camera on her son so that it captures her acts of mothering from his point-of-view. Initially the project involved events that were public, with performances based on milestones of her child's growth presented in galleries. Over time, this practice has evolved as she has "come back to focus on the everyday act of raising [her] son first and to create art out of this practice" (Kashef, 2019, 160). When a mother engages with her children in processes of artistic creation, it can arise from the lived reality of raising young children as an artist, especially when time and space to produce art are entangled with acts of care-giving: "The reality of working from home as an artist parent is that you share your space with children doing kid things [...]. This is your milieu: it is what normal looks and feels like" (Judah, 2022, 45). In many instances, including the examples discussed here and within my own practice, the act of producing art with your own children are an exploration of mothering itself, opening the possibilities of creating with children and of becoming together through relational exchanges of care as aesthetic experiences.

Within my own practice, I engage with a process of ongoing, active consent with my children through the creation and possible display of art. However, I do have an ambivalence about engaging with my children in shared artistic practice. In part this is due to the taboo nature of work that features children and the backlash that can arise. This ambivalence also comes from a desire to pursue other interests and activities within the environment and expectations of intensive mothering. Hays (1996) defines intensive mothering as the assumption that a child requires absolute and consistent nurturing from a single primary care-giver and "that the mother is the best person for the job" (Hays, 1996, 8). She argues that intensive mothering has become the societal norm for child-rearing in U.S. and European contexts, despite its emotional, material, and financial demands rooted in white, middle-class, cisheteronormative values that isolate the mother as the expected caregiver, creating ideals that are out of reach for many individuals (Nash, 2021; O'Reilly, 2021). Therefore, *Emergent* was not initially developed as a project relating to motherhood. Instead, my maternal subjectivity emerging from the acts of caregiving captured through the FitBit data and the process of developing the project within the milieu of working from home with two small children make it indelibly entangled with my maternal subjectivity, even if the content of the art is not explicit as such.

1.5 | Adapting process

Due to the ongoing responsibilities and expectations for mothering, becoming a mother can influence how an artist works. There is an impact on the quality and amount of time and space for working, as well as the materials an artist may use: "working in short bursts of time while a child is napping, or at night (assuming, that is, that you have a child that naps solidly and sleeps at the appointed hour) makes certain media [...] challenging" (Judah, 2022, 42). There is also an impact on how one can engage in creative processes, as regular interruptions require being present and attuned to the needs of children, instead of entering a separate space of reverie, creative ideation, and reflection. Lisa Baraister describes the mother as a subject of interruption, where interruptions are not aberrations but the norm. She states:

> The daily breaches in maternal thinking, maternal activity and maternal repose conducted by the infant, toddler and young child add up to an onslaught on a mother's mental, emotional and social functioning that can be experienced with nightmarish intensity.
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> (Baraitser, 2009, 67)

Artist Fern Thomas describes how this persistent need for presence means her "ideas exist on small islands, possibly never allowed to meet up" (as quoted in Judah, 2022, 20). Moreover, artist-mothers may develop different methods of working and utilization of materials as a result of these impacts on time and space.

Canadian artist and scholar Natalie Loveless created the work *Maternal Ecologies* in the first 3 years after the birth of her child 2 months prematurely. The project was comprised of daily practices that brought together feminist politics with performance art. She states: "These emerged from my need to find new ways, after the birth of my son, of thinking across practice-theory lines, as an artist-mother-theorist working in the academy, both unwilling and unable to separate my status as mother from my status as artist or academic" (Loveless, 2014, 149). Loveless emphasizes how she engaged with her entangled subjectivity as an artist-mother-theorist, developing a project with the digital technologies at hand in the production of art.

Loveless broke the work into three stages, corresponding with the first 3 years of her son's life. In the first year, "Maternal Prescription," Loveless invited five other artist-mothers to perform with her every day for 3 months. She sent each artist a performance action rooted in the "ecologies of care that texture everyday (maternal) life" (Loveless, 2014). These actions centered the mundane, immanent intimacy of caring for small children, including "listen to baby's breath," "watch baby sucking on finger," and "observe the rise and fall of breath." The performed

actions responding to the instructions were documented on a Smartphone as video and still images, which were then uploaded to a blog and created online networked ecologies of shared performances between five mothers dispersed across three different countries. For year two, "Documenting Firsts," Loveless identified and documented a "first" for her child every day for 210 days. For the third year, "Gone/There," Loveless gave her child her smartphone to document her departures to and arrivals from work each day for the last 3 months of his second year, ending when he turned three. These performed actions, rooted in the everyday and conveyed as fragmented excerpts of the present, together make a maternal ecology that take the form of a website and printed cards. Qualities of duration and accumulation are significant throughout *Maternal Ecologies*, as the process of creative production is interwoven in the embodied experiences of maternal subjectivity and through adapted methods of art making that accommodates both.

1.6 | Impacts of COVID-19

As with many other industries, COVID-19 drastically impacted how artist-mothers worked. The closure of schools and daycares, along with stay-in-place orders that required many workers to now work from home, intensified domestic situations for mothers, parents, and other caregivers (O'Reilly and Green, 2021). For artists, this meant the closure of studios, galleries, and other art spaces. These circumstances posed challenges for artist-mothers attempting to reconfigure their practice within these dynamic and intensified situations. As Irish artist-mother Katherine Nolan states: "the pressured, undervalued, unsupported, unrecognized aspects of mother-makers' lives, who were already playing multiple roles, squeezed into too little time, headspace, and energy, were further intensified through the pandemic" (Nolan, 2022, 15). Artist-mothers responses to the pandemic varied, with some adapting their practice to these contexts. For instance, Nolan (2022) recalls how pandemic restrictions that canceled a live performance for an ongoing project, *Fluid Flesh*, led her to focus on how to re-perform the work for camera within her home. U.S. artist Lindsay Johnson describes how her painting practice provided a vital means of coping with the stresses of the pandemic and, as a Black parent, her struggles "with trusting the sudden interest in equity and inclusion" (Johnson, 2023, 151). She also made the choice to turn her art making into a revenue stream, which she describes as empowering and providing a sense of control during this fluctuating time. In other instances, the changing patterns of daily life and domestic circumstances led artist-mothers to explore new ways of cultivating a creative practice. For instance, Irish artist-mother Ruby Wallis began walking alone at night during the first lockdown period of 2020, using this uninterrupted time and space to cultivate her practice as she worked within various constraints that occurred during the early stages of the COVID-19 pandemic. These walks contrasted the layered experiences of her daily life, enabling her to work through ideas. She started taking photographs at this time, which she posted on social media. This series developed into the project, *A Woman Walks Alone at Night, with a Camera*, that she later published as an artist photo book (Wallis & Sun, 2022). Even though Wallis had not intentionally intended the development of such a series when she started her walks, it grew directly from her experiences of cultivating moments of respite during a time when care-giving responsibilities intensified.

Wallis's project points to another feature of the COVID-19 pandemic, where the closure of art spaces and necessary shifts in art world practices resulted in changes that in some instances increased access for artist-mothers. As in-person events curtailed at this time, openings, studio visits, gallery events, performances, exhibitions, and more moved to virtual platforms (Bissell and Weir, 2022; Habelsberger & Bhansing, 2021; Jeannotte, 2021). When posting on social media may have previously been treated as a means of marketing one's practice, it became more accepted as a means of presenting art. This shift was supported through the Arts Council of Ireland, who offered an award after the start of the pandemic for artists to develop work for presentation on the Internet (Arts Council of Ireland, 2020). In addition, with livestreaming becoming a norm for synchronous communication at this time (Putnam, 2024), it changed ways of engaging with events in the art world that are vital

for networking and increasing visibility. This change to virtual channels offered other means of access and participation that may otherwise be limited for artist-mothers due to childcare responsibilities and geographic separation. In other words, it became possible for artist-mothers to participate in events that otherwise may have been more challenging to attend, while also drawing greater attention to art works presented in digital contexts, including social media.

Other funding mechanisms for artists in Ireland were launched during this time, with the introduction of the Agility Award in 2021, also as a direct response to the pandemic (Arts Council of Ireland, 2021). The Agility Award, which continues even after most pandemic restrictions impacting the arts have lifted, offers up to €5000 for artists at any stage of their career, which provides increased funding opportunities for individuals as an alternative to their highly competitive bursaries. I received an Agility Award in 2021 to develop *Emergent*, proposed as a project to explore other means of presenting performance digitally beyond lens-based media, which was my first successful funding application awarded from the Arts Council of Ireland.

1.7 | Situated context

I am not proposing that this analysis of maternal subjectivity as a general model of mothering or working as an artist-mother, but instead present it as a particular situated instance. I am a white mother of two young children living in rural Ireland. I am an immigrant from the United States, hold a PhD, and in addition to being an artist, work full time as an Assistant Professor at an Irish university, making me the primary wage-earner in our household. I am married and my partner and I aim to split caretaking and household responsibilities equally. He is also an immigrant to Ireland (originally from Germany) and works freelance in the creative and cultural industries. There are certain financial and social privileges affiliated my personal identity and work situation, including the white privilege of living in a European context that support my legitimacy as a mother. Drawing from the principles of reproductive justice (Ross & Solinger, 2017), I have written elsewhere: "white, heterosexual, cisgender, middle-class artists without disabilities in stable, legally recognized relationships are less likely to have their maternal legitimacy challenged […], which can impact the type of [art] produced and how it is received" (Putnam, 2022, 19). Moreover, my art and mothering may not be held up to the same scrutiny as someone without these privileges, enabling me a freedom in creative exploration and analysis that others may not have while influencing the challenges that I do face as a parent.

As noted previously, there are particular features of parenting in Ireland, which promotes intensive mothering combined with European neoliberalism, resulting in limited state support for childcare. As both my partner and I are immigrants living in rural Ireland, we do not have a family network of assistance that is the norm in this locality for sharing care-giving responsibilities. There are limited childcare services where we live, as daycares close at 2 p.m. and there are no after school options available. This means that additional support with childcare involves informal arrangement with childminders, which are costly and very limited in availability. Despite funding from the Agility Award that I proposed to use in part to pay for childcare, I was unable to hire a regular childminder. As such, since we have only been able to occasionally avail of such support, my partner and I trade off care-giving responsibilities. Here challenges arise due to our work in the creative and cultural industries (along with my workload as a fulltime academic) that require flexibility in scheduling and make consistency difficult. I currently work from a home studio (a corner of the main bedroom), which means I lack dedicated space for artistic production. As a result, maintaining an artistic practice, especially during COVID-19 and its aftermath, has meant constant negotiations of time and space along with the competing demands of various responsibilities with limited external support. Here the challenges of intensive mothering collide with European neoliberalism where responsibilities for child rearing is focused primarily on the nuclear family unit (Lewis, 2019; Lynch, 2022; The Care Collective et al., 2020).

1.8 | Mothers and/as computers

As noted above, working as an artist-mother means adaptation of methods, which in the case of *Emergent* involves computer programming. The challenges that arise with the responsibilities of mothering and the ideological weight of motherhood can be found within the history of computing. I discuss this history in order to acknowledge the precedence for my labor practices as a means of "hacking" motherhood and working with exploratory programming. In addition, I draw connections to particular material challenges affiliated with programming that extend beyond the scope of artistic production. Jane Abbate describes how computing provides "a particularly good arena for examining the intersection of gender and technology" (Abbate, 2012, 4) due to the drastically changing presumptions over gender and suitability for computation work that took place during the twentieth century. Early computing work during World War II and the1950s was predominately performed by women, with the term computer first referring to a young woman who performed calculations (Light, 1999). These processes soon became automated, with women first doing the feminized work of computer operation in the United Kingdom and the United States (Abbate, 2012). Hicks (2017) shows how sexist civil service labor practices in the United Kingdom discriminated against more suitably trained women, including a marriage bar and classifying women's computing jobs as machine labor to prevent progression. Such legislation prioritized motherhood for women, who were presumed to work until marriage, when their responsibilities would shift to the maintenance of the household and their husband providing primary financial support.

At the same time, the novelty of computer programming enabled some women to utilize the ambiguity around these new skills to their advantage, cultivating careers in this growing area, which in some instances were in spite of the inhospitable conditions for working women, especially women with children. For instance, Stephanie "Steve" Shirley, who worked for the UK government "until the glass ceiling had made it impossible for her to advance any further" (Hicks, 2021, 143), started the computing company Freelance Programmers in 1962. Shirley made an effort to hire other skilled women who were blocked from progressing within computing or retired due to marriage, providing "her employees flexible, family-friendly working hours and the ability to work from home" (Hicks, 2021, 144). Even as Shirley facilitated the capacity for women to work, especially married women and those with children, she did not make this infrastructure apparent: "although she worked from home with her child, often accompanied by other women employees and their children, she presented as polished and professional an image as possible, playing a recorded tape of typing in the background whenever she took a phone call in order to drown out the noise her young son might make" (Hicks, 2021, 145). Despite her feminist approach to doing business, Shirley needed to meet expectations regarding the computer industries that excluded working mothers in order to be taken seriously as a programmer. This often unacknowledged history, where women played significant roles in programming, including Black women who experienced the intersecting discrimination of sexism and racism (Shetterly, 2016), highlights how there is precedence for mothers working in computing. At the same time, computation can provide a means of "reshaping gender categories," which according to Abbate historically has included female programmers using their status as professional to create new subjectivities that "united femininity with technical expertize" (Abbate, 2012, 4). Within this context, I focus on how computation can enable the forging of an identity of the artist-mother through work—my MotherHack—as maternal subjectivity becomes re-defined through processes of programming.

2 | MATERIALS AND METHODS: CREATING *EMERGENT*

As noted in the introduction, I use exploratory computing in the process of developing *Emergent* as a method of art-based research (Eisner, 1981; McNiff, 1998). Emphasis in this analysis is placed on the development of the project, how my subjectivity as an artist-mother in Ireland during the COVID-19 pandemic restrictions influenced my engagement with creative coding, and how the process of making art in turn informed my subjectivity. This method

emphasizes the total involvement of the researcher through the corporeal experiences of working as an artist-mother. Attention is not just placed on the output of artistic production, but engaging with art as a form of embodied, qualitative research. In addition, I am not presenting an exhaustive analysis of the content of the work, which I have further developed elsewhere (Putnam, 2023). In that article, I treat generative animation as digital performance, with *Emergent* functioning as a performative intervention in data collection and analysis through its repurposing of consumer biometric sensors.

2.1 | Exploratory programming

Nick Montfort defines exploratory programming as a method to "iteratively design both artworks and humanities projects, in a process that enables the programmer to discover, through the process of programming, the ultimate direction that the project will take" (Montfort, 2021, 1). Emphasis is on the process of computation, rather than fulfilling specific deliverables or predefined outputs, thereby enabling computing to function as a means of inquiry. Montfort stresses how this approach highlights how computing and programming are culturally situated, drawing explicit connections between computation and culture. Within the context of producing *Emergent*, computation enables inquiry into maternal subjectivity and how this subjectivity is situated within my embodied experiences as an artist-mother in Ireland during COVID-19.

For *Emergent*, I started with creating a generative animation sketch per day. I tracked this process in a blog that I hosted on my website (http://www.elputnam.com/blog/) and on GitHub. After creating the sketch, I posted a screen recording of the animation on my social media accounts (Facebook, Instagram, and Twitter), along with a link to the sketch on a web page, with the text descriptor "Sketch of the Day" and the date. Through the creation of each sketch, I engaged in a process of iteration as I developed themes, exploring the capacities of the software and what it could produce.

2.2 | Processing: Sketching with code

The generative animations that comprise *Emergent* are created using p5.js. p5.js is the JavaScript version of Processing, which is a creative coding software and language developed by Casey Reas and Ben Fry in 2001. Processing was originally made using the Java programming language. Initially, Processing sketches could be exported as Java applets, which in the early 21st century, could be shared on the web. Such features were significant to the community building that work with and continue to develop Processing (Reas & Fry, 2018), though the use of Java on the web soon came to be replaced with JavaScript.

JavaScript is a high level programming language that was developed by Brendan Rich in 1995 to run programmes in Internet browsers (Soon & Cox, 2021). Once Java applets failed to function online, JavaScript quickly became the primary language of the web (Crockford, 2008). As a language it is "relatively uncomplicated in terms of getting started, but has the capacity for proficiency development" (Soon & Cox, 2021, 31). In 2014, Laura McCarthy created a JavaScript version of Processing: p5.js.

While the functions of the two versions are the same, there are some significant differences in how one codes and how code is executed in Processing versus p5.js. For instance, Processing requires a dedicated Integrated Development Environment (IDE) for coding. A software that uses an IDE, like Processing, means that one requires a computer that has the ability to run this program. In contrast, p5,js, as a JavaScript library, can be used in any text editor and does not require a dedicated IDE. p5.js is also accessible through a web editor available on the p5.js website, which means it is possible to develop sketches on different devices, including tablets and Smartphones. McCarthy has expressed interest in increasing diversity within programming (McCarthy, n.d.; Soon & Cox, 2021), which she did through developing a more accessible version of Processing for the web and is present within the

community and language around p5.js ("Home | P5.Js," n.d.). Attention is not just on the software, but who is using it and developing it, a significant acknowledgment of how programmers are subjects that are influenced by the capacity to produce and how such opportunities are made available through the affordances of programmes.

I took advantage of the many resources and available code affiliated with p5.js as Open Source. At times I would use a "hacking" approach, where I adapt and modify pre-existing code for a different outcome or purpose, sometimes in an atypical fashion (Coleman, 2014; Jordan, 2008). At times I appropriated already existing codes, which included code from Winnie Soon and Geoff Cox in *Aesthetic Programming* (2021), Gross et al. in *Generative Design* (2018), and Daniel Shiffman's *The Nature of Code* (2012) along with his Coding Train web video series (2019). I modified different parameters of the code, extracted sections from it, combined it with other code or wrote new code, and more, in order to create something different. Through hacking, modification, pastiche, and writing code, the resulting imagery, and in some instances sound, take on unexpected forms and patterns. It is through the process of programming that I became familiar with the affordances and restraints of my tools—technical objects that include hardware, software, and the JavaScript language—which in turn influence my thinking about what I can create using these materials. Even though I was working as an individual, I was connected to a network of knowledge through the collaborative society (Jemielniak & Przegalinska, 2019) around Processing and p5.js. I also consulted with a programmer for resolving more complex technical issues. In addition to reviewing the books and videos listed above that presented coding techniques, I took advantage of the Processing Forum, either searching posts to see if others came across similar issues in programming or when I could not find my solution, I posted questions. Typically I received a response to my query and developed a solution within 24 h, enabling me to work toward the short-term, low-stakes goal of the sketch per day.

3 | RESULTS: "LITTLE ISLANDS OF IDEAS"

As a visual artist working with digital technologies, I have been using Processing since 2014 as a self-taught programmer and creative coder. 2014 is also the year that I became a mother, having given birth to my first child that October. Moreover, my identity as an artist working in programming and creative coding is connected from the beginning with my subjectivity as a mother. Many times I would work on different sketches after my child went to sleep, taking regular breaks as she awoke for milk or comfort. The resulting process of programming involved working in truncated blocks of time. When I began developing *Emergent* in 2021, I shifted from Processing to p5.js in order to facilitate programming within these constraints. Since working with p5.js did not require a specialized IDE, I could develop sketches on my iPad, grabbing moments during the day or working in bed next to a sleeping child. The low stakes of the work in *Emergent* as a sketch per day meant that I also did not need to work late into the night in order to resolve major issues in the code. Instead, I was able to adapt the work to the time available. Overall, my process of working—programming—functions as my means of artistic production and is influenced by the responsibilities of mothering, which become manifest in the type of work that I produce.

Throughout the development of *Emergent*, I accumulated over 70 sketches documented on the blog and in GitHub repositories. The regular creation and presentation of these animations online function as a dispersed iteration of the project. The increased use of virtual spaces during COVID-19 for the presentation of art meant this display was consistent with other artists' projects at this time, enabling the animations to garner attention as artworks that may not have otherwise occurred. I also created an exhibition ready format that involved selecting a number of animations and presenting them together.[1] The resulting output from these "little islands of ideas" has a fragmented quality that is more akin to a quilt or a mosaic than a typical comprehensive work of digital media, like a video, game, or website.

Within the exhibition versions, animations are displayed through multiple browser windows in a cluster (see Figures 1 and 2). Each browser window included a number of selected sketches, programmed to generate in random order and for a random length of time, making each viewing of the animations unique. Despite being
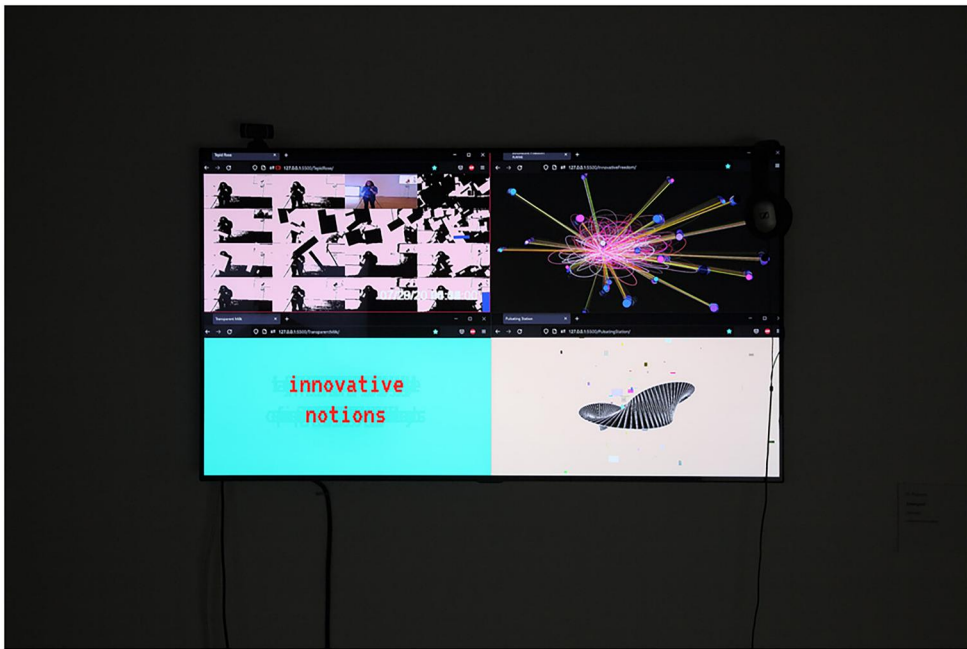
FIGURE 1 Installation shot of *Emergent* in Stanley Picker Gallery, London, UK, September 2022. Image courtesy of the artist. [Colour figure can be viewed at wileyonlinelibrary.com]

FIGURE 2 Installation shots of *Emergent* in Emerson Contemporary, January–March 2023. Image courtesy of the artist. [Colour figure can be viewed at wileyonlinelibrary.com]

created as individual animations, these are clustered together, resulting in overall compositions that are dynamic, erratic, and interruptive, affectively correlating with my embodied experiences and sensations of producing the work through truncated blocks of time. The four channels that make up the exhibition version of *Emergent* include one channel of generative animations based on biometric data collected from my FitBit that I wore since the start of the COVID-19 pandemic (*Innovative Freedom*), one channel that manipulated footage from a live webcam feed to enable direct audience engagement (*Tepid Rose*), one channel that generated a series of 3D animations (*Pulsating*

Station), and one channel that presented a title generator I developed to name the animations (*Transparent Milk*). A fifth channel with a text-to-speech generator presented random cycles of my writing about the work was included where additional computer hardware was made available.

3.1 | The artist-mother and the aesthetics of interruption

I discovered through the processes of computation that the resulting data from the FitBit that I incorporated into the animations did not necessarily match the embodied experiences that the data conveyed. For instance, the sketch *Android Dream* (see Figure 3), which was included in the channel *Innovative Freedom*, is generated based on sleep data selected from a month at random from May 2020 to October 2021. The FitBit categorizes sleep data into levels—deep, wake, light, and REM—that are measured in seconds. While the tracking of sleep is typically used to enable better insight into sleep patterns in order to improve sleep hygiene, I found that during the COVID-19 pandemic, no matter what the resulting data presented in regards to my sleep, I experienced a persistent state of lethargy. I created *Android Dream* in order to share my experiences of exhaustion, tied to the ongoing anxiety of the period and the challenges affiliated with raising two small children at this time. The resulting animation is frantic and disturbed, as images of my face twist and turn in a broken sequence that is anything but restful. Moreover, despite the fact that it is embodied experience that produces this data, reading them as abstracted numbers does not encapsulate the full experience of mothering that produced this information. The abstraction of the body through quantification gives the impression that it can be reduced to static figures, isolating the body from its techno-geographic milieu that is corporeal, dynamic, and more than just numbers. This breakdown in presenting information parallels my moments of "breakdown" as a mother and the breaking down of my working method to accommodate interruptions. Hence, the process of developing *Emergent* within a milieu of mothering is evident within the aesthetic experience of the animations, which I describe as an aesthetics of interruption.

Sullivan (2012) introduced the concept of an aesthetics of interruption in relation to Baraitser's (2009) definition of the mother as a subject of interruption. For Sullivan, the aesthetics of interruption "bear[s] witness to the fragmented, interrupted consciousness of the mother" (Sullivan, 2012, 108), which is manifest in formal qualities of a work as well as subject matter. I have elsewhere elaborated upon this concept in relation to digital performance (Putnam, 2022), where the aesthetics of interruption is presented through the form and content of certain artist-mothers working with digital technologies, manifest through features such as the gap, glitch, and lag.
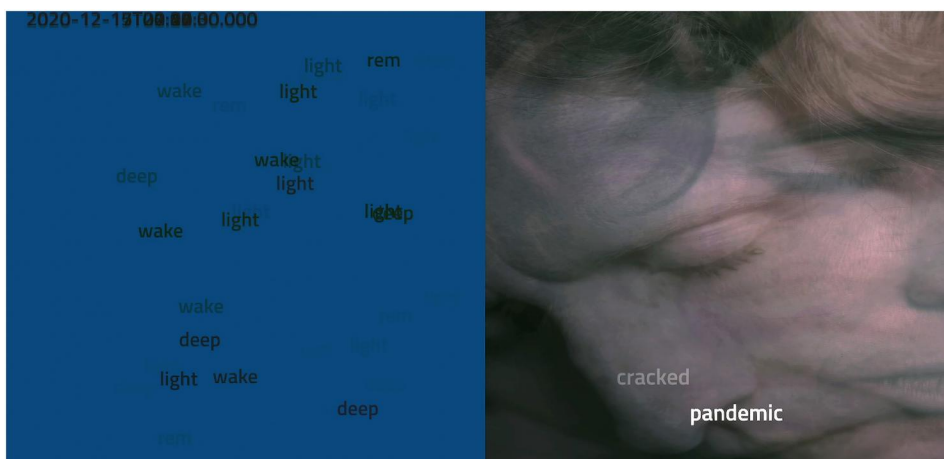

FIGURE 3 *Android Dream* from *Emergent*, 2020–22, Generative Animation. Image courtesy of the artist. [Colour figure can be viewed at wileyonlinelibrary.com]

Within *Emergent*, these qualities of interruption as they relate to maternal subjectivity are present on a number of levels, as made evident through processes of exploratory computing. First there are the interruptions experienced when programming the work using p5.js, resulting in a project that is comprised of many animations created as short-term, low stakes goals. The phenomenological experiences of mothering while working influence the overall form that the project took as it impacted the time and space dedicated to the creation of the project. These qualities were maintained in the exhibition of the project as a dynamically generated montage of clustered animations. Second there are the formal qualities of the animations themselves as an aesthetics of interruption, which are designed to generate in an interruptive fashion, with stark transitions and anxious geometries programmed with various random parameters to be presented in erratic ways (Putnam, 2023). Third, there is the project's content, with some animations based on my biometric data as a maternal subject of interruption while parenting two small children during the pandemic. As this analysis of the process of producing *Emergent* shows, as an artist and a mother, my subjectivity is defined through my work, but also this subjectivity is multi-faceted as it emerges through acts of creation and care. It is a subjectivity that emerges from different and at times conflicting expectations and responsibilities that are affiliated with being an artist-mother. Hacking within this project does not just involve modifying and adapting code using p5.js, but the MotherHack of working as an artist-mother in a manner that acknowledges and engages with the leaking boundaries between caregiving and artistic labor.

4 | CONCLUSION

When creating *Emergent*, I used a medium, computer programming, that does not lend itself easily to the interrupted embodied experiences of mothering. Through the process of exploratory computing, I connected the method of working to an inquiry of maternal subjectivity. Moreover, *Emergent* results from my situated and embodied experiences as an artist-mother within the context of the COVID-19 pandemic, while at the same time influenced my subjectivity as such: the artist-mother both works and emerges from the work. Rather than treating motherhood as a universal ideal, mothering is an ongoing process of development rooted in embodied experience. As a project, *Emergent* accumulated over time, with flickering fragments providing ephemeral glimpses into the ecology of this dynamic work: a geometric abstraction of my subjectivity as an artist-mother.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

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ENDNOTE

[1] Thus far, *Emergent* been exhibited in a number of contexts, with the final form depending on the hardware available for presentation, which may include Technical support for exhibitons was limited, w *Emergent* was first shown as part of the *Digital Art in Ireland Exhibition* curated by Conor McGarrigle with Sample Studios at the Lord Mayor's Pavilion in Cork, Ireland during May–June 2022. For this iteration, four windows were presented on a single projected screen. It was later presented at the Exhibition of Digital Research in the Humanities and Arts Conference at the Stanley Picker Gallery

(London, UK), curated by Bill Balaskas (September 2022), on a single screen; and in the solo exhibition *PseudoRandom* at Emerson Contemporary (Boston, MA, USA), curated by Leonie Bradbury (January–March 2023), on five separate monitors with five computers (see Figure 2).

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