Eros, Women, and Technology

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Abstract

Eros, Women, and Technology seeks to address the potential of a vibrant position for the body and a vital role for women in technoculture. The important job of imagining and re-imagining the potential of technologies to bring benefits, costs, and concomitant effects requires a plurality of approaches. Using a highly interdisciplinary methodology, I focus on an original project of research-creation undertaken between 1998 and 2011, featuring video interviews with thirteen contemporary artists and designers. Participants' personal stories were gathered using my radical method of nude narrative enquiry, and analysed using affinity mapping to identify important questions regarding erotic experience, expression and imagination, body image, pregnancy and mothering, and relationships between mothers and daughters. Themes of the erotic body and technology in education, family life, creative practices, and intellectual and professional pursuits, uncover a range of technological contents and discontents.

Through an examination of the history of women's education, a positive chronology of their historical achievements is reported. Theoretical grounding is established through the Chora as conceptual locus for the female body in creative and technological practices. Related thinking of second- and third-wave feminists Balsamo, Battersby, Braidotti, Butler, Grosz, Irigaray, and Young addresses issues of female bodies, maternity, relationships, and the place of women in technoculture. The role of the camera as a favoured technological tool is examined through the work of photographic pioneers Julia Margaret Cameron, Claude Cahun and Marcel Moore, and Francesca Woodman, and parallels are drawn through my videographic artworks. Arendt, Blixen, Cavarero, and Kristeva provide theoretical framing for narrative in contemporary art and design projects using mobile technologies to locate and disseminate compelling personal and community stories. Insights are offered into the lives of creative women research participants who reinvigorate ways of thinking, making, and Being in technoculture. Concluding concepts, ideas, recommendations, and strategies are offered to inspire wider consideration. Original research expands from the narratives and professional practices of intellectuals, artists, and designers to build a better understanding of women's individual efforts, and collective work, on the frontlines of eroticism, creative making, and technological change.

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In memoriam, Alex Davidson: 27 July, 1930 – 5 April, 2013.

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Introduction: Eros, Women, and Technology

> *The gendered transformation of the technological imagination is not solely a matter of theory, but a matter of praxis. As much as we try, we will never be able to know in advance how this imagination will be changed by the participation of women (or anyone else for that matter); its transformation will be evident when it gets enacted.*[1]
>
> *—Anne Balsamo, 2011*

Eros, Women, and Technology seeks to address the potential of a vibrant position for the body and the vital role for women in technology. In my research I examine the ways that women artists, designers and makers have attempted a reconsideration of the body in technology, and in so doing, contributed to technological ways of thinking and making. The important job of imagining and re-imagining the potential of technologies to bring benefits, costs, and concomitant effects requires a plurality of approaches. My approach to this important task is through research-creation, the creative process that comprises an essential part of my enquiry and research activity.[2] I ask how a reconsideration of the erotic body and technology may be achieved through the force of creative imagination.

I am a practice-based researcher, and arrive at knowing through doing and making. This research-creation project fosters the development of new knowledge through the study and exercise of methodological, aesthetic, and technological innovations. I have employed this highly interdisciplinary methodology to examine the ways that women artists and designers have developed practices that entwine the erotic body with

technology. At the heart of research-creation is the emphasis on the process of making as an essential part of the search for knowledge, with the insights gained through design and artistic practice, and the artifacts and outcomes standing as evidence of new knowledge. Through my research-creation, I make an original contribution across the fields of communication, the arts, and the philosophy of technology. Alongside my own work as an artist and designer, this dissertation claims a reinvigorated position within technological culture for the erotic female body and imagination.

An explanation of terms

I want to clarify at the outset the intended meaning of terms used repeatedly in this work. By Eros, I mean the expression of passionate desire and love as a creative force situated in the body. Erotic actions are instinctual and physical, and can be sensual, preserving, and life enhancing.

When I refer to the body in this text, I am referring to the entire material structure and substance of the human organism. Through the body, humans situate themselves in the world. All of thinking, making, and being springs from the body, and these feed back to the body and nourish the erotic, sensual, and aesthetic impulses. An embodied perspective assumes that nature and culture are interactive systems that act on the body.

The female body has been open to multiple interpretations across the biological, psychological, and life sciences. I reflect upon the feminine erotic body as a locus for my research-creation from the position of the arts and humanities. Feminist thinking, as

articulated from de Beauvoir[3] through to Butler[4], Grosz,[5] Irigaray,[6] and others, rejects the concept of a female corporeal subjectivity as against male cerebral objectivity.[7] It is problematic for feminist thinking when the supposed duality of mind and body is extrapolated as opposition between men and women, and an unhelpful notion that I reject.

Along with feminist intellectuals such as anthropologist Annemarie Mol, I cast doubt on the concept of the female body as a single, bounded entity. Mol refers to the "body multiple"[8] in this context, and asserts that woman can no longer be conceptualised as contained by her skin, in a sort of capsule of feminine identity. Women's bodies are always connected to other bodies; they extend themselves into culture, and interact with objects, practices, and technologies. These combinations disrupt any ontological concept of the female body as something that one "has" or one "is" to include what the female body can do, with whom or with what she may interact, how she may change through these interactions, and therefore, such combinations also include new states and appearances that the female body may assume and become.[9] They produce such other ways of becoming a woman, echoing de Beauvoir's assertion that "One is not born, but rather becomes, a woman."[10]

The concept of the *Chora* is referenced in many contexts in this research. I use the Chora as a conceptual locus to ground my research-creation and to locate the female body in design and art-making practices and within culture. I am in the august company of Kristeva, who describes the Chora as " . . . an essentially mobile and extremely provisional articulation . . . the process by which significance is constituted."[11] Along

with Grosz, Kristeva, and others,[12] I reclaim the Chora from the Timaeus of Plato.[13] The Chora is re-imagined here, as a place of feminine creativity, generativity, and reflexivity.

With reference to culture, I subscribe to Raymond Williams's description of culture as being ordinary, and characterized by a shared structure and feeling understood by a majority of people in a given society. Williams's description of culture as "a whole way of life"[14] also defines artistic and intellectual pursuits commonly referred to as cultural activities. Culture and technology are not separate domains of human endeavour, desire, or aspiration. Cultural and technological innovations often go hand in hand, and have shared social repercussions.[15] I have followed Balsamo's lead in formulating a unifying concept of culture and technology inclusive of both terrains, and will refer to this domain as "technoculture."[16] Technoculture is a useful term for my study, as it relates to artistic practice in its generation of knowledge creation, and makes explicit the connections between everyday life, cultural production, and technology.

I understand technology to be a set of interrelated processes, methodologies, innovations, instantiations, and ways and means of intervening, and bringing things into appearance, within culture. Technology does not refer to bounded objects or things, but rather hybrid technical assemblages with social and cultural impacts. Balsamo defines technology as "a complex cultural arrangement that is determined by cultural forces that precede it, as it also organizes and reproduces those forces over time."[17] She insists that technology should be considered not just in terms of its epistemology, or as a form of applied science, but in terms of the anthropological—as what humans do—and in the sociological—in terms of its consequences and impact on social relations.[18] I agree with

Balsamo's construct of technology as a way of being, which is now becoming ever more entangled with matters of reproduction. To this point, she states, "[a]ll technologies reproduce cultural arrangements. In this sense all technologies can be considered *reproductive* technologies."[19] Technology is what humans make and how they do so, along with associated sociocultural arrangements, attendant consequences, and impacts.[20]

This definition affords technology equivalence with the processes of making, and revealing through making, consistent with Heidegger's philosophy of technology as part of the existential structure of life. I employ Heidegger's concept of Technics as art, pursued within a technological habitat that cannot be understood in isolation from Being.[21] Technics, according to Heidegger, is therefore a process of corporeality and "Being-making,"[22] akin to art making. Technics encompass a multitude of arrangements of cultural reproduction, which include techniques and tools, professional and artisanal activities, functions, infrastructures, and methods of cultural circulation and distribution.[23] I maintain that practically all human activity has been touched by Technics and its all-encompassing effects. This is why it is so vitally important that women should be active participants with Technics and within technoculture.

An interdisciplinary feminist approach

How can women's particular insights, methods, and epistemologies be uncovered in the context of the feminine imagination? How are creative practices and research-creation vehicles to be mobilised in this regard?

These questions are the focus of my research-creation and study, particularly vis a vis a more equitable participation for women in technological innovation, and finding a place for the erotic body in technoculture. In order to avoid setting technology and the body or technology and culture in opposition to each other, I take a highly interdisciplinary, feminist approach to my work. This involves plural ways of thinking, reading, and writing, which will be evident. I take liberties with academic writing, and co-opt different voices, depending on whether I am dealing with theory, methodology, research-creation, narrative, or artistic practice. Because this research aims to extend concerns and questions from the arts, humanities, and education, it repeatedly crosses over to domains entailed in technological practice, such as design and innovation. I liberally invoke further methods, questions, and analyses across all of these disciplines, taking a feminist epistemological approach to my research, with an emphasis on the generation of particular knowledge and production. My work is positioned alongside a number of historical and contemporary artists and designers who work within technology. There is sometimes a need to rise to the polemical in support of these ideas and practices.

I do not construe gender as an entirely socio-cultural enactment, however, I agree with Butler that gender does matter.[24] As I have observed in this study, the gender of a designer or artist or thinker also matters and has an impact on what is designed, made, or thought. I assume that if more women were educated and involved as experts in the production of technoculture, their contributions will change that culture in distinctive ways. I do not argue that women's participation would make technologies intrinsically better, but certainly different. This assumption does not invoke biological essentialism,

which, according to Sue Rosser, connotes either superiority or inferiority to women if the source of difference is rooted in the logic of biology.[25]

At the same time, I argue that the Chora theoretically and ideologically locates women's creative and self-reflexive impulse. I don't believe that this constitutes a contradiction, as I locate the Chora in feminine imagination rather than in biological determination. In this respect, Balsamo states: "The technological imagination has always been gendered, which is not to say that gender has always been recognized or fully explored as a source of imaginative inspiration."[26] Gender does matter, when we consider imagination and its products, but it has yet to be understood as a distinctive source.

How are we to bring women's plural positions into being in the world? While this thesis aims to unearth and address specific cases of gender inequality in the technological realm, I do not wish to hold these up for lengthy scrutiny. Rather I prefer to acknowledge them, set them aside, and move on to pragmatic matters. Women have distinctive contributions to make to technological culture, and must create their own opportunities to do so. The main objective of this research is to examine and understand the diversity and potential that women's contributions can create, and to understand and mobilise ways to bring the feminine imagination more prominently into the creative realm, and to the larger project of technological and cultural innovation.

Women and technology

The question of women's participation in technoculture remains a vexed one. Why are women under represented in almost all endeavours related to technology? Barriers to women's equitable participation in technoculture are systematic and interrelated, ranging across matters of history, biology, ideology, society, and educational and professional opportunity. [27] These complex matters cannot all be addressed here, but in matters of education and professional opportunity, particularly in the creative fields, they deserve the scrutiny brought to bear through this study.

Issues of sex and gender have disproportionately influenced the careers of many women artists and designers, across all genres and fields. Art historian Anne M. Wagner writes about gender and the role of sexuality in women's intellectual and artistic work. She insists that "[t]hose issues involve the social and professional experience of women who make art, as well as the forms their art takes; they require both public and private negotiation of the roles of women . . . as well as that of artist; they shape the various means used to claim authorship or voice or identity in a work of art, as well as the value placed on that art in the public realm."[28] Finding recognition in the art world and as a valid contributor to technoculture has been a double bind for women artists who also work with technology.

Feminist philosopher Braidotti states in her essay, *Feminist Critiques of Science,* that " . . . by addressing the question of female nature, by addressing the question of human nature, by deconstructing both, of course we lay open the question of, not only the power of knowledge—who decides what in which situational contexts or in which discursive

contexts—but also . . . what do we do with the regular and systematic recurrence of exclusion of always the same others . . . "[29] These same "others" Braidotti describes as, persistently: women, non-whites, children, and the physically disabled, with females topping the list by sheer volume of their representation in this population. The discursive context in which I situate my investigation into this overarching exclusion, and the means for combatting it, are found in artistic and creative practices. These practices have offered me a way into technology, which I would not have otherwise accessed.

But even as new technologies are increasingly integrated into work, social life, and the final frontier of the home, designers and makers of technological processes, tools, and artefacts overwhelmingly continue to be men, especially in the case of engineering, design, manufacture, and implementation of digital technologies. Men have extended themselves into the world through their technological accomplishments, while women have yet to exert an equally significant impact on technological innovation.

Since the industrial revolution, technologies and tools designed by men have predominated, but this was not always the case. Women were involved in the production of early tools as designers and users. The perception that men are the primary toolmakers is just one of the deep, persistent factors in women's lack of participation in the technological project.[30] Traditionally designed and used as extensions of the body, tools originally had close approximations to the limbs, and the muscular-skeletal system, with enhanced reach and strength that replicated body functions.[31] Following McLuhan, computing tools have flipped the need for corporal mimesis, more often shaping humans than being shaped by human intervention.[32] Digital tools are now viewed as extensions of

the brain, the senses, and the nervous system. How may women become more expert creators and innovators of digital tools? How may they bring a reinvigorated focus on corporality within digital technology? And what can women, through creative making, add to the correlation between the erotic body and the playful mind?

These are cogent questions. It is evident that women and men in western society use digital technologies such as computers, mobile phones, software, and entertainment platforms (with the exception of games, where males excel) almost equally. In North America and in Europe, women and men are on parity in the use of such technologies in education, the workplace, and the home. In mobile technologies for communication, women are the predominant users.[33] There is a gender imbalance, and therefore an inherent disconnect between men—who are primarily in control of imagining, designing, and building these technologies—and women, who make up at least half of the audience. This situation isn't likely to improve unless current education and employment practices evolve and adapt. Despite slow gains by women in the technological fields, gender disparities are so persistent they are unlikely to self-correct in the foreseeable future.[34]

I believe that the effort to involve women in the technological enterprise is complex, and starts with a reconsideration of girls' and women's roles and access to education, employment, and the professions. Women's participation in the technological project is vital, and should be encouraged and taken seriously by decision and policy makers.

This research will show how women can be involved in all stages of technological culture, from conceptualisation and analysis, to innovation in research and design (including management and implementation), to dissemination and uptake. I explore how

women are involved creatively in the technological project, and recommend strategies to involve more women. While there is no proof that equity for women in the technological sphere will bring about distinctive benefits or betterment, nor that the role of the body in technology will be better addressed by women, nevertheless, the current situation is historically lopsided, slow to change, and worthy of reconsideration.

Addressing a "wicked problem"[35]

How is the gender imbalance in technoculture to be addressed? One of the central wicked problems to be discussed in this thesis is the low representation of women in STEM (science, technology, engineering and mathematics) fields. A reconsideration of the persistent imbalance between men and women in technological education and employment might be a good place to start. There is a functional correlation between women's significant underrepresentation in technological fields at universities and their lack of representation in these professions, which this study seeks to explore.[36] In the ever-accelerating race to find new efficiencies and innovations, on the one hand, and new markets, on the other, the training and participation of more women in technological professions is an obvious answer. While there is no easy fix for such a deeply entrenched situation, there are ways to begin addressing the problem.

In the United States, the National Science Foundation (NSF) initiated the first program to attract the participation of women in STEM research in 1991. Despite improvements, gender composition in employment indicates that women have remained

under-represented in all STEM occupations and age groups every year since the program began.[37] Gender equity and better opportunities for minorities (including women and men) in these fields continue to present steep challenges. I propose that education, especially founded in liberal arts curricula, class environments that are inviting for girls and women, and more female instructors and mentors in education and the professions, may begin to address the root problem of gender disparity in technological fields.

Women's education and imagination

Balsamo highlights the importance of education; specifically of educating the "technological imagination," which she describes as " . . . a mind-set, and a creative practice of those who analyse, design, and develop technologies. It is an expressive capacity to use what is at hand to create something else."[38] This formulation is at the root of my interest in the agility of creative practice as an expression of the technological imagination. It forms the basis of my research-creation. My interpretation includes understanding the potential for adaptation of objects and their uses, and adaptation of habits of use. This type of thinking is mobilised in art and design practices that employ creative ways of thinking and addressing problems, which can drive technological innovation. This study will show that women have the ability to participate in this process, and innovate in powerful ways. With a focus on better education for women in all creative and technological fields, and on employing more women in research and industry, the gender imbalance may begin to decrease, with unpredictable outcomes for individuals and for technocultural society.

This is the background for the arguments, narratives, interviews, and analysis in this dissertation. Its primary purpose is to address the complex problematic pertaining to an embodied situated within technoculture. Is there a possibility of a more triadic relationship between the erotic body, the creativity of the Chora, and the insistent demands of technology? May this be achieved through the creative imagination? How do women participate in and contribute to this important task? This study sets out examples, descriptions, and analyses of women's exemplary projects and practices in technological culture. With a unique approach to narrative enquiry and methodology—elaborated in the first chapter—I examine the practices of women artists and designers, some historical, and others who are contemporary participants in my research study. With examples of their work and my own research-creation, in photography, videography, image making, and mobile art and design, I aim to show how a group of women have made important contributions to the theories, methodologies, and practices of technoculture.

In my research study, I ask difficult questions, and try to show the alternate approaches and responses that originate with women. I demonstrate some of the important innovations being undertaken by creative women. The central aim of this research is to reveal the potentially transformative effects of women's ideas and creative imaginations, and to celebrate these women's specific contributions. Thus, this study is in itself a critical and creative examination of my efforts and the efforts of a group of women in the arts and technology.

This dissertation seeks to expand upon the individual narratives and work of the particular women of this study, both historical and contemporary, in order to offer role

models to other women and men, and to show ways of surmounting barriers such as discrimination, and the burdens of child care, to construct creative practices that are enmeshed within everyday life. I show the ways that women have made a unique contribution to technological change by enumerating their critical and innovative ideas. Through my own artistic practice and the work of other contemporary artists and designers whose work is the focus of this dissertation, I propose reinvigorated ways of thinking, making, and living, within technoculture.

Organisation of the chapters

In the first chapter, I set out the theoretical and methodological ground for my fieldwork. I survey the work of second- and third-wave feminists who address issues of women's bodies, maternity, female relationships, and the place of women in technoculture. I discuss the influence of these feminist philosophers on my work. I introduce and elaborate on the radical nude narrative methodology that I developed for my fieldwork. I explain the ways that feminist philosophers and critics have influenced my thinking, my research methods, and my creative practice, in critical ways.

With Butler, I explore gender as cultural creation; Cavarero's narrative theories are used to explain the urge for a unifying life story; and I contend with Battersby's normative distinctions of female characteristics in order to reclaim the style of "femininity." This philosophical labour has been vital to my thinking, and my embodied position as a woman working with other women in the creation of technoculture. The

theoretical concept of the indivisible Chora, from Plato to feminist reconsiderations, is introduced in this chapter. Grosz offers a critique of the Greek legacy of the dark and impenetrable Chora, while Cavarero raises the issue of its constitutive ambiguity, and Kristeva emphasizes the motility of the Chora as the site of pre-verbal and pre-semiotic consciousness. With the help of these feminist thinkers, I reclaim the Chora as a conceptual site of female knowledge and self-reflection, and a functional, generative source of feminine creativity.

In Chapter Two, I examine the history of education for women. I propose that education offers opportunities to address gender inequities in the professions of science, engineering, mathematics, philosophy, and technology. A positive chronology of educated women and their intellectual achievements is set out. I cite examples of women and innovators who initiated advances in arts, culture, and technology, and I describe the education of foundational feminist philosophers, including Simone de Beauvoir and Simone Weil. The growth of public education for women and the correspondence between women's education and larger societal change are tracked. I discuss a study conducted by feminist philosopher Luce Irigaray on language differences and inflection in the education of girls and boys. The chapter concludes as I raise some of the dilemmas faced by contemporary women scholars in academia, from gendered narratives in academic texts to the need for more women faculty members and mentors.

Chapter Three focuses on several pioneering women artists who used their own and other women's bodies as vehicles for creative expression. I examine the ways that such artists have co-opted the concept of "the reflected gaze"[39] and speculate on the reasons

that the camera has become a favoured technology for creative exploration. Artists whose work inspired this chapter are introduced, beginning with the Victorian photographer Julia Margaret Cameron. The legacy of women photographers who situated their practices in the home and with their family members is discussed. The collaborative narrative self-portraits of Claude Cahun and Marcel Moore are investigated. The focus of this chapter is the biographical narrative surrounding Francesca Woodman's photographic and videographic oeuvre, accompanied by her powerful investigations of the female body, and her self-portraits of feminine appearance and erasure.

In Chapter Four, I examine contemporary art and design projects that use mobile technologies such as portable audio, portable computing, mobile phones, and GPS as tools to assist in creating and disseminating compelling narratives. I discuss the ways that women have taken up this challenge, creating expressive projects that use mobile technologies as vehicles for personal and community story telling. As theoretical framing, I refer to the conceptual theories of Hannah Arendt and Adriana Cavarero on the function and the desire for a unifying narrative. A chronology of mobile artworks from artists Janet Cardiff, Terri Rueb, and Alyssa Wright are presented. The impact of these narrative theories and practices on my own work is discussed, alongside a presentation of my collaborative research in mobile art and design.

Chapters Five and Six, consist of the presentation and analysis of my original research-creation, fieldwork, and participant interviews. To theoretically frame these two chapters, I revisit Arendt's position on the importance of narrative for making sense of the events in a life, and her own framing references to author Karen Blixen's storytelling. I expand

on Cavarero's characterisations of narrative as the art of *Scheherazade*, who "entrusts her existence to the passion of telling stories."[40] Irigaray's writing on the important relationships and stories of mothers and daughters lays a foundation for participant narratives on this subject. Turkle's formulations of affective and evocative objects—which she describes as "relational artefacts" and "objects to think with"[41]—support the interview approach and narratives explored in the chapter. My interviews with participants, and their stories of erotic and emotional events, are shown as intensely personal narratives of awakening, creativity, maturity, and the play of the senses. They illuminate important linkages that woman artists have helped me to make between Eros, the body, culture, and technology.

I carried out the studies in these two chapters in two distinctive phases. The first stage, described in Chapter Five, consists of a series of narrative interviews with ten women artists, scholars, designers, writers, and technologists, conducted in 1998. I describe my rationale for the radical nude narrative methodology and interview technique I developed. I document their narratives, and using an affinity-mapping model, organise and reanalyse their stories of erotic embodiment and relationship. I formed a bond with these participants, as both a fellow maker and an avid listener, as we encountered each other within the shifting boundaries of interviewer and participant. Some of their stories are presented here with their explicit permission for inclusion. I have included a series of images captured from the video interviews, which are illustrative of the interview process. Participant's quotations form the body of these chapters, with minimal intervention in the text. The original contributions presented in these chapters are the outcome of my participant's collaborations in this project of research-creation.

In Chapter Six, I reflect on the second stage of my fieldwork and research-creation as I document, organise, and analyse a new set of narrative interviews, conducted in 2011. These interviews feature eight artists and designers working with a range of technologies, from operating systems to software development, data visualisation, digital games, and mobile and social media. Four of the women from my original 1998 study also participated in the 2011 study, providing a unique perspective on their changing lives and the evolution of their practices as artists, over a period of thirteen years. Using a more traditional narrative enquiry, I interviewed the women on questions about the effects of technology in their personal and professional lives. The aim was to discover how contemporary women use, and are affected by, technology. I again employ the affinity-mapping model developed in Chapter Five for the analysis. These interviews reveal how creative women have addressed the difficulties of balancing their personal relationships with the demands of working and living in a technologically mediated world.

The aims and conclusions of this research-creation project

The studies detailed in Chapters Five and Six, resist generalisation about women's lives, situations, attitudes, sexuality, or positions in their particular cultural milieu. Their individual stories as presented here, are not meant to stand in for the lives and experiences of other women. I am cognizant that reports of experience must not be allowed to replace attention to the historical processes that position subjects, and produce their experiences. Experience itself is not taken as the origin of the explanation, or the authoritative ground, but rather, that which seeks to explain, and that about which

knowledge is produced. In this way, I reflect upon, and write about my own cultural situation as an artist/scholar and technologist. This study includes only a small group of women from a span of the contemporary, found within particular sectors of North American and European society. My studies are highly delimited, omitting as they do the situations of women in non-western cultures and the developing world.

I honour the women artists, writers, and makers of this study, by bringing their stories together in this dissertation, for observation, comparison, and analysis. I allow myself to follow some of their lines of conjecture, and to relate some of the issues I have raised in my research, in order to make recommendations and draw conclusions. From their interviews, I formulate cogent suggestions and ideas for technological change. My original research-creation expands upon the narratives and professional practices of these intellectuals, artists, and designers, to build a better understanding of individual efforts and collective work on the frontlines of eroticism, making, and technological change.

My participants' suggestions for improving technology as an intrinsic part of culture, in the ordinary, day-to-day sense (as Williams intended), are revealed in the final chapter. I conclude with a review of key findings garnered from the research and fieldwork. I propose strategies for women artists and designers, to rejuvenate their efforts to liberate the erotic body and the imagination and to find a place for both within their practices. Finally, I propose evolving alternatives, which women and men alike may find viable and enjoyable. Through my own research-creation and the narratives and collaborative ideas of the women of this study, I ultimately formulate an embodied, creative, ethical model for living within technoculture.

Chapter One

The Chora and the Role of Narrative

> *Real female innovation (in whatever field) will only come about when maternity, female creation and the link between them are better understood.*[42]
>
> *—Julia Kristeva, 1977*

This chapter lays a theoretical grounding and methodological rationalisation for the research-creation and study undertaken in Eros, Women, and Technology. One of the major questions that this research seeks to address is the place of woman's body and Eros, in relation to the overarching demands of technology. In response, questions of why the body matters, and specifically, why the erotic female body matters, arise. These are the primary stakes for the arguments presented in this research. Woman's erotic body stands mute and waiting to be addressed, against millennia of philosophical reasoning that subordinates embodiment to the intellect.

Ontological unity

Rather than viewing the body and technology as diametrically opposed, my research proposes an ontological conversation between the body and mind, which flows from the state of Eros. This contradicts notions of Eros and embodiment as feminine qualities, in opposition to the intellectual, spiritual, and creative pursuits. This notion, impossible to prove or disprove over the millennia it has held sway, has been hotly disputed by

feminists, notably since de Beauvoir. Grosz, who refutes the long-held belief that "Women are somehow more biological, more corporeal, and more natural than men,"[43] makes the point that such dichotomous thinking is false. The intellect versus the body, reason versus passion, transcendence versus immanence, or psychology versus biology, are simplistic bifurcations[44] of the drives, abilities, and key characteristics of all human entities, male, female, or otherwise. The binaries of these two conditions of Being have been attributed as distinctive to the female and male sexes, since ancient times. The key ontological flaw of this bifurcation is that in any dyadic relationship, one will always win out or be toppled over by another, as the intellect has done over the body since the Greeks, and in early modernity, when science, philosophy, and religion were overtaken by rationalism and the dominance of Cartesian logic.[45]

According to the binary mind-body theory, summarised by Grosz: "Conventionally conceived within philosophy as the opposite of mind, corporeality has been associated as the negative within pairs of binary opposites. Where the mind is correlated with reason, subject, consciousness, activity, interiority, and masculinity, the body is implicitly then associated with passion, object, non-consciousness, passivity exteriority, and femininity."[46] In such a dualistic system, the primary term of the intellect becomes denied, negated, or opposed by the subordinate term, in this case the body, and in particular, the female body. Grosz points out that this thinking leaves woman as an inscrutable enigma, capable of sensuality but barely capable of the production of certain types of intellectual activity. This may relate back to the rather contained and inscrutable qualities of the body,

particularly female bodies, and the attendant mysteries of reproduction, opposed to the intellectual production of verifiable, quantifiable, objective knowledge.[47]

The Dutch anthropologist Annemarie Mol refers to the "body multiple" in this context, in her work on the body in medicine.[48] Her observations on the ways that the body reacts to and is affected in multiple ways by medical intervention can be extrapolated out to thinking about a multiple body that learns and knows in multiple and different ways. In this research, I follow Mol's suggestion of an alternative conjunction to the dyadic mind/body relationship, and propose instead a multiple and shifting, not easily definable relationship between the body, the intellect, and the spirit. I propose that Eros, together with sensual and intellectual awareness, longing, and an appreciation of love, goodness, and beauty, may be a transformative force when combined with creativity, and the acquisition of knowledge.

This helpful, coherent notion is supported by the research undertaken in this study, and many others, which show that women's and men's intellectual and embodied responses and learning styles in education, and acquisition of knowledge, are different, but not inequitable. In fact, it may be that if knowledge is somehow more easily accessed kinaesthetically by a majority of women, as a recent study of learning styles of men and women at Michigan State University suggests,[49] it may actually be helpful in formulating joined-up thinking and more unified forms of reasoning and learning. There are different ways to acquire knowledge, which is why a sensual, kinaesthetic mode of research-creation has been chosen as an alternative and appropriate method for this study, to be further explored.

A phenomenological approach

Erotic fulfilment is, ultimately, discovered in the desire for life, and is realised in wholeness, balance, and the striving for a unity of the intellect, the body, and the spirit. This can provide such a multiple model for lived, embodied, and intellectual eroticism. It also offers an ethic for the creative technological imagination, and supports the potential for feminist practices of creative embodied practice, thinking, and analysis. This notion has been formulated as a basis for feminist phenomenological becoming, or appearance in the world. It is adapted from Husserl, for whom the indivisibility of the manifestation of phenomena, in appearance and essence, are inseparable through eidetic intuition.[50] If I think of my own body and the body of another, they both manifest themselves in my thinking, despite the fact that I am clearly present, and whether or not the other is present or not present. My embodied essence and the embodied essence of another present themselves to me in a form of appearance, actuated by my eidetic recall, exactly akin to the other's actual presence.

With further reference to the concept of becoming, or coming into appearance, a Heideggerian phenomenological approach to the creative emergence of the individual in culture can be employed. An appearance in culture is achieved through the process of making, according to Heidegger.[51] Logos, or bringing forward into appearance, brings things into being. Logos, beyond signs and representations, represents the real and the true, the presence of being and reality, and access to concepts and things in their pure, unmediated form. I extrapolate further to contend that making also brings things into appearance, and expand the theory to support my conjecture regarding making through

research-creation. Accordingly, the act of making may then also bring knowledge and knowledge-makers forward into appearance.[52]

In this thesis, the word "making" is used interchangeably with "creation" and "creativity," but as a more humble and a more direct description of the process of bringing material artefacts into the world. Research-creation as a method could therefore be termed *research-making*, and in fact, it is the act of making which distinguishes research-creation as a method. It is aligned with creation and creativity, and acts of bringing things and persons into being, whether through physical making, gestation, birth, and mothering, or through erotic rebirth within the creative process, enabled through and by the body. This concept also attributes creation to intellectual, emotional, or spiritual gestation and birth, which is bound up with what one can extrapolate as the creative processes of making.[53]After Heidegger, I refer to makers through this text interchangeably with artists, designers, and artisans, and those who engage in the process of thinking and making cultural artefacts. Making in this sense distinguishes itself because of the interaction between human processes and materials, be they technologies, tools, uses, systems, ways of thinking, or other interventions. Making takes into itself the entire realisation of potential—and bringing into appearance, bringing into being—that human endeavour offers to the world of materiality.

The idea of Being, or coming into appearance through making is taken from the Heideggerian concept of Technics, from the Greek *Techne*, which is the method of using tools to produce an object; the art and craft of its production. Techne resembles epistemology in its implication of knowledge of principles, although Techne differs in

that its intent is making or doing, with material outcomes, as opposed to intellectual contemplation.[54] As a technological habitat and way of living, Technics are ontological processes that cannot be understood in isolation from human Being.[55] When I refer to technology, as I will do throughout this thesis, the conflation of phenomenological Being and making contains the complexities of meaning I wish to convey. Technology is interoperable with the defining characteristics of Technics, in the phenomenological sense. Within the scope of this thesis, the particular form of culture I ascribe to the arena of making and Being, or the conditions which allow coming into appearance through making, is the current state of Western culture, which Balsamo and others refer to as technoculture.[56]

The phenomenological concept of becoming, in a feminist interpretation taken from Judith Butler, infers that the gendered body inhabits a mode of situation, and therefore, contingency and constitutive possibility.[57] Butler's description of gender, and even aging, as cultural creations, acknowledges that the body is always in an active process of becoming.[58] This interpretation opens up theoretical conceptualisations of the gendered body. In this regard, Butler cites de Beauvoir's formulation of feminine gender as one of her most distinguished contributions: "One is not born, but rather becomes a woman,"[59] Adoption of the female gender, for both de Beauvoir and Butler, is not the acceptance of a fixed set of biological facts. Butler further states: "As a consequence of being in the mode of becoming . . . the body is that which can occupy the norm in myriad ways, exceed the norm, rework the norm, and expose realities to which we thought we were confined as open to transformation."[60] Gender becomes a negotiation between an

individual and the cultural norms one finds oneself living within. As such, gender can be seen as the interplay between individual choices and acculturation. All individuals become their gender from an already embodied and culturally saturated position. Therefore, notions of gender formulated by cultural and societal norm have effects felt by both women and men. In the case of a woman, her body, her culture, and the choices she makes combine to formulate her gender. This ontological manoeuvre allows a woman to take some part in her own creation within gendered norms. Such a creative act may allow her to step aside from the dualism of body and mind, and the masculine valorisation of the mind over the body, originated by the Greeks and synthesised by Descartes. For some of the women interviewed for this thesis, the body has become a choice, a mode of enacting and re-enacting sexuality. They have chosen to take different stances within sexuality, as lesbian, bi-sexual, transsexual, or multiples of these positions. Their experiences, some of which are related in this thesis, affirm Butler's definition of "the discursive limits of sex."[61] When she refers to the discursive production of sexual identity, Butler writes: "To become a woman is a purposive and appropriative set of acts, the acquisition of a skill, a 'project' . . . to assume a certain corporeal style and significance."[62] While I agree with Butler that nature—or fixed, embodied materiality—does not constitute feminine sexuality, I insist that being a woman goes further than an appropriation of a feminine style or a certain skillset.[63] Feminine embodiment, importantly, centres not just in women's adaptations to culture, but on Eros as an ontological, constructive, and creative force.

The Chora

This research investigates ways that women's particular insights, methods, and epistemologies may be uncovered, in the context of the feminine imagination. According to Freud, human behaviour is controlled by the basic instincts of the life-drive and the death-drive or *Thanatos*. While the life-drive focuses on survival, including human desire and pleasure, the death drive is self-destructive. Freud's theory attempts to explain destructive phenomena that afflict humans, and the origin in the Id of forces that result in suicide and war. When the death drive comes into conflict with the life drive it is transformed into behaviours such as aggression, destruction of objects, and feelings of guilt.[64] In contrast to the Freudian death-drive, Eros is an embodiment of the life-drive, in opposition to the death-drive, which seeks the destruction of the individual and a return to an inorganic state.

In the early Greek imagination, the ineffable maternal body became synonymous with the Chora.[65] To the Greeks, the Chora was conceptualized as a woman who receives all things, yet who never departs from her nature. Her uncanny body remains distinctive, set apart. Mysteriously, she never assumes the form of any of the things that enter into her, as occurs in sexual intercourse. But she is able to replicate herself, in birth.[66] Elizabeth Grosz despairs of the Greek conceptualisation, which has become so conflated with pregnancy and gestation: " . . . it is no wonder that Chora resembles the characteristics that the Greeks, and all those who follow them, have long attributed to femininity, or rather, have expelled from their own masculine accounts of being and knowing (and have thus de facto attributed to the feminine)."[67] Grosz suggests that the

Chora is symbolically prior to the paternalistic order, and the separation between self and other/mother and child/signifier and signified.[68]

Associated conceptually, but not to be conflated with the womb, the concept of the Chora is utilised here as a space of possibility, with womb-like qualities. The Chora encompasses the realm of possibility; it is generative and creative. I propose to investigate a conceptually embodied life-drive, and the aligned relationship between the erotic female body and women's creative acts, through the concept of the Chora.[69] Using the methodology of research-creation, the Chora as a site of conceptual birth and rebirth, will be located. The Chora may be puzzling, difficult to understand, or describe—it is invisible, marked by hesitancy, invested with revelation, and finally, arrival.[70]

This research reclaims the Chora as a reinvigorated site of feminine erotic knowledge and creativity. It shares the endowment of the female Chora with positive characteristics, as advocated by Kristeva and Irigaray. Kristeva insists on recognition of the receptacle of the Chora by virtue of its maternal and spatial origins " . . . as a debt that representation owes to what it cannot name or represent."[71] She refers to the "semiotic Chora" as the site of the preverbal unconscious, indifferent to language. But, delightfully, the Chora is responsive to sound and to music! For Kristeva the Chora is enfolding, musical, " . . . a rhythmic space, irreducible to an intelligible verbal translation; musical, anterior to judgment."[72] Luce Irigaray also stresses the specificity of female morphology and its independence from the rational or the verbal. In her essay "How to Conceive (of) a Girl" Irigaray stresses the indivisibility in pregnancy of mother and child, the mother not as one but as two. "Bodilyness" is shared with the mother, though the child has as yet

no way of measuring herself, nor the container in which she presently resides, which could be seen as the Chora of her surrounding world.[73]

The concept of the Chora offers great potential for self-knowledge, discovery, and growth. I can vouch for the uniqueness of female experiences of embodiment in menses, pregnancy, and birth. I hold the Chora to be a phenomenal space for creativity and contemplation of the unmediated relationship between a mother and her child. The concept of the Chora is productive, maternal, profoundly rooted in the body, and linked to prenatal totality. It has rhythms and flows, which cannot be described or catalogued within the realm of symbolic language and form. It is a safe place of openness, fluidity, and feminine speculation and creativity, essentially prior to language and the hierarchies of culture. Cavarero also seeks to retrieve the Chora concept as positive, welcoming, and constitutive, but also as an ambiguity, enabling the conception of Logos in the realms of form and speech.[74]

The lives of women are lived in bodies of flesh, with inevitable dependencies between selves and others. Christine Battersby maintains that normative dualities falsely mask the wide range of difference in individual women's life stories. Battersby makes a distinction between the feminine and the female, particularly as she observes that the notion of femininity often signifies a relational position. Battersby also proposes a philosophical framework arising from the Chora, exemplified by the differences between "masculine" and "feminine," where a definition of the female may be characterized as a sort of lack of the masculine. This lack of positive definition concerns other hierarchical and value-laden dyads, such as mind/body, reason/passion, public/private, and

nature/culture, which can engender inequalities that have significant effects on personal lives.[75]

Overemphasizing a distinction between the feminine and the female may set up a hierarchal dichotomy. Here I insist that womanly and female characteristics may be characterised as "feminine," and I use this term to connote such characteristics throughout this research. In fact, I would go further, to assert that it is time to reclaim this term. Femininity does not reside in the realm of the pretty, the delicate, the scented, and the restrained. It is harder to qualify and delineate; it includes other smells, sounds, tastes, blurred boundaries, and fluid flesh, all qualities of the erotically feminine. I will return to this important distinction in my fieldwork and research-creation, detailed in Chapter Five.

Lived lives, action, experience, and phenomenological transcendence

Accounts of gender roles remain highly debated and theorized, but these debates often ignore the actual lived experiences of women. The challenges of the female position in a technologically mediated world are complex, cultural, and political. Most societies script the role of their female members as caregivers, who spend some or most of their time engaged in unpaid or low-paid domestic work. Family life rests solidly on the shoulders of women in all parts of the world.[76] This is a familiar sexual division of labour. This generalisation of women's fitness for other forms of existence is lived, and mediated, and represented by women's bodies the world over. Alluding to this vast unexplored potential, Grosz asserts, "Analyses of the representation of bodies abound, but bodies in

their material variety still wait to be thought." [77] This research seeks to redress this situation, with the premise that it is possible to renew de Beauvoir's concept of the "lived body" through action, creative practice, and experience.[78]

This research imagines the ways that women's plural positions as artists, designers, and erotic makers, may be brought into being in the world. Artistic experience offers the possibility that meaning may be made, through individual's orientation and action in the world. In this way, the body becomes the primary locus of experience, and making, open to living in the world, with its multitude of possibilities. Merleau-Ponty identifies the senses as the interface with which the body, while still maintaining individuality, "puts forth beyond itself, meanings capable of providing a framework for a whole series of thoughts and experiences."[79] Knowledge and action—as formulated by Merleau-Ponty—are dialectic, along with the creation or apprehension of content (or knowledge) as a foundation, leading intrinsically to Being.[80] This translation of Merleau-Ponty's notions of phenomenological embodied appearance, experience, and transcendence form a foundational epistemology for the work of this thesis.

Considerations of sexuality and the roles assigned to men and women may be found by closely observing bodies and their ways of Being in the world.[81] The concept of Being in the world builds on the Heideggerian concept that encompasses subjective and objective consciousness and all things ascertained through *a priori* knowledge, as well as sense perception, and experience. A woman faces the material facts of her flesh and her body within a given set of experiences, which are contextualised by environmental temporal, and situational phenomena within a given set of cultural circumstances.

Iris Young expands on a phenomenological concept of Being in the world, with her theory of embodied action and the "lived body."[82] Young acknowledges the lived body as the exquisite heterogeneous construction through which humans may experience the world as sexual beings. "People experience their desires and feeling in diverse ways that do not neatly correlate with sexual dimorphism or heterosexual norms. As a lived body, moreover, perceptual capacities and motility are not distinct from association with sexual specificity; nor is size, bone structure or skin colour . . . The idea of the lived body thus can bring the physical facts of different bodies into theory without the reductionist and dichotomous implications of the category of 'sex'."[83] Young neatly ties together action with bringing-into-appearance in much the same way that making, according to my argument, achieves this effect. Her theory also corrects the idea that women (and men) assume roles through a self-conscious distinction between nature and culture. This research also seeks to confound this distinction, which both conflates and divides gender against nature and culture.

The historical women of this study

I am interested in erotic events in the lives of women and the stories of growth that spring from women's creative energies, impulses, and struggles. As Grosz points out, women's experiences are varied, and it is unlikely that, as culturally, geographically, and politically diverse as women inevitably are, they share exactly common experiences.[84]

I first undertook this research because I wanted to discover, hear about, read, and write about the very different stories of erotic, life-shaping events of a diverse group of women. As Irigaray demonstrates, there are many possibilities, techniques, procedures, and methods for discerning and creating these sorts of knowledge. Like Irigaray, my approach is partial and motivated.[85] I choose to study the situations, and creative work of specific women artists and to analyse their work within the context of Eros, the body, and technology. Chapter Three situates a group of historical women as important founders of a tradition of feminist image-making, giving the opportunity to then follow with the work of contemporary women makers in the rest of this study. The historical women artists of this study are creatures of their own eras. It is not possible to hold up for scrutiny in contemporary terms the stories of historical pioneers of women's education, studied in Chapter Two, or of the photographers Julia Margaret Cameron, Claude Cahun and Marcel Moore, explored in Chapter Three. And even the nearly contemporary work of Francesca Woodman is such a product of its time (though recently analysed) that it is not possible to compare her experience to the experiences of contemporary women intellectuals and artists. However, some of their materials survive, and their extant work offers a material opportunity for analysis.

It is possible to offer some observations and analysis of their potential impulses, interests, drives, and intentions. And observations regarding form, composition, technique, and contemporary reception are certainly available. The objects, writing, images, and discoveries these individuals made have outlived them, and they are

presented here to tell their stories. The narratives of their work form historical, theoretical, and epistemological foundations for this larger study.

The historical situations of these women intellectuals and artists offer grounding for the situations of contemporary artists, designers and makers, some of whom agreed to be interviewed or re-interviewed for this study and research-creation. The women artists and designers—discussed in Chapters Four through Seven—are inheritors of this legacy of historical women artists, and in some cases technological pioneers of their own generations. This research-creation study focuses on their ideas, their conceptual awakenings, and very real struggles with making and bringing themselves and their work into being. Documentation and analysis of these processes is undertaken in the field study and research-creation undertaken in Chapters Five, Six, and Conclusions.

Broad shifts in attitudes towards women makers and scholars, in educational opportunities for women, in general societal expectations for women, and in the accumulated history and imagery of women's art-making practices, have intervened over the years between Woodman's creative appearance, and the young artists and designers of this study. Medical advances—most importantly birth control—have given women heretofore-unprecedented control over reproductive and career choices. Third-wave feminism has arisen, accompanied by a concomitant change in perceptions of opportunities and priorities, particularly for Western women. Much has improved, yet other things have not changed much over the period of about a century, between the historical, and contemporary makers I have chosen for this study.

The theoretical impulse and desire for narration

The Italian philosopher Adriana Cavarero describes the relationship between one's life and one's life story in terms of the desire one has for that narration. Narration creates a unified figure out of a life story, and is often an act of retelling or re-story-ing the past, in an effort to create form and unity. Cavarero notes that real lives are disjointed and fragmentary; they do not in-and-of-themselves form an easily narrated story. She points out that real lives do they coalesce around events in dramatic story arcs, or follow three-act play structures, with a coherent beginning, middle and end, and instructive outcomes along the way. There is a none the less, a desire for such a sense of narrative arc and a unity or coherence to one's life story, which may be achieved through the narration of that story. Referring to her concept of the "narratable self,"[86] the self created through the act of narration, Cavarero claims, " . . . the self desires and is open to the tale of a life story that unfolds in his or her lifetime in a way that uniquely reveals who that person is."[87] Argentinian author and critic Sylvia Molloy speaks of her theories of narration, autobiography, and genealogy as "always a re-presentation, that is, a retelling, since the life to which it supposedly refers is already a kind of narrative construct." [88] After Blixen, she notes that "Life is always, necessarily, a tale. We tell it to ourselves as subjects, through recollection; we hear it told or we read it when the life is not ours."[89] It is my assertion that narrative takes time, reflection, and a willing narrator and audience, and their collaboration helps form this coherent structure. A source of feminine autobiographical narrative relates to the creative self-reflexivity of the Chora.

The unifying intention of a narrative enquiry is posed by the one who lives it, in the

form of desire for an answer to the questions, which also spring from the Chora. An individual may ask, "who am I," and "what does my story mean?" From the perspective of those near life's end, the question, "who will tell my story?" becomes all-important. These questions beckon to us; they are often gathered from correspondence with loved ones, emerging from recollections of family conversations and events. These sorts of stories do not rely on a simple reordering or retelling of events, nor are they simplistic references to verifiable facts, but rather re-articulations of the stories we tell ourselves, in an attempt to hold them in memory.

A genealogical approach to narrative

The model for the research and field study is a genealogical approach to a phenomenological paradigm embracing diverse perspectives and accepting multiple personal realities. Narrative methodology assumes that it is possible to understand more about of the beliefs of participants through judicious questions and close listening to participant's personal responses. Responses inform and compose a personal narrative, which is being related by the participant and shared with the interviewer. The process is essentially collaborative, but respectful of distance between the participants and of the uniqueness of the individuals involved.

For the research-creation, I adapted feminist philosopher Toril Moi's down-to-earth and even rather mundane genealogical approach to narrative methodology. In her book *Simone de Beauvoir: The Making of an Intellectual Woman*, Moi writes about the

differences between heroic tales and personal histories or family stories, the later more often authored by women. She likens these stories, not to the grand narratives more often constructed by men, but to genealogies. Moi explores the differences between the arc of formal narrative and the branching genealogy: "Personal genealogy does not reject the notion of 'self' or the subject but tries instead to subject that very self to genealogical investigation . . . " [90] Moi explains that although the self may be the heroine or protagonist of the story, there is no obvious arc or triumphant ending. Moreover she states that such a genealogical project " . . . can never lead to a final totalisation of knowledge"[91] where there is no end to the textual network explored by any given narrative. For this reason, unlike the grand narrative, the genealogical text remains unformed and unfinished. It has no need or intention to provide an overarching coherence, a sense of dénouement or conclusion.

Indeed, Moi expresses a genealogical approach within every-day life when she writes: "Genealogy, in fact is very much like housework: like the housewife, the genealogist stops her work for fairly pragmatic reasons: the floor is clean enough; it is time to start cooking instead; it is too late, and one is too tired to continue. The next day there is always a need for more cooking, more dusting, more cleaning; occasionally, nothing short of complete redecoration will do."[92] My approach, like Moi's, likens the process of formulating, collecting, writing, and analysing genealogies to notions of women's creative work, a function of the Chora.

This approach turned out to be a good fit with the participants in my interviews, who generously shared incidents from their every day lives and genealogical histories. Their

stories were pieces of personal and family history woven in and around the life of the body, domestic activities, childcare, and personal and familial relationships. The "redecoration" Moi speaks of was sometimes played out as a cathartic moment or break in the interview, or a point where an abrupt realization or synthesis was reached, but more often it was just that enough had been said; the task had been completed. There was art to make, or lunch to make. It was time to get on with the rest of the day.

Narrative learning

Mary Catherine Bateson has refined a version of narrative method focused on learning, using the positive and adaptive features of improvisation to respond to uncertainties and allow the flow of the interview or conversation to guide the outcomes. This method allows for more flexibility in the interview process and consequently, sometimes very surprising and revealing outcomes.[93] It was helpful, in hindsight, to have improvised a version of Bateson's method for this work. I undertook the research-creation in this thesis to investigate my theory of the importance of the erotic body in women's making and technological endeavours. In the first study in 1988, a radical and improvised form of nude narrative inquiry was employed as the primary method, to observe, listen, gather, and analyse women's stories. In many ways, the work started out as an intuitive form of research, although the intention was to create an exhibition of video work, and to approach this as an art-making endeavour. The improvisational nature of the fieldwork was characterised by a willingness to listen with little or no intervention and with no set goals, in order to allow a story to unfold and see where it would take us.

I investigated personal narratives of the life-changing events initiated by the body with my research participants. As a feminine symbolic threshold, aligned with the Chora, these events may mark arrival, but they are also characterised by disappearance and a disconcerting tenuousness. Sometimes these events change the experience and perspective of the participant so thoroughly that they constitute rites of passage.

A radical nude narrative method

The narratives presented in this research-creation study illustrate interactions between unique individuals. Personal narration reveals meaning and answers questions important to the narrator. It is the responsibility of the interviewer to be open, able to listen. A radical nude approach to narrative enquiry was used to assist in capturing the texture of women's personal stories and narratives, with all of the personal detail and spatial dimensions that cannot be quantified into facts and numeric data. This approach involved the planned, entirely voluntarily decision of the artists who agreed to participate in the study and research-creation project, to be interviewed in the nude. As the interviewer, I was not nude, again, by mutual consent. Further information about the organisation of this consensual arrangement is detailed in the method of production set out in Chapter Five.

The rationale for my radical narrative method is rooted in an examination of the ways that a woman's body affects her own erotic life story. In this work, I have noted the different roles that individual women's bodies take in their narratives. I have observed the

ways in which women evoke their bodies, and the ways that the body also speaks. Often the physical manifestation of change plays itself out in a distinctive physical narrative, and repercussions expressed themselves strongly through the language of women's bodies. The body has knowledge that tells its stories in expressive ways. The very neutral visual aesthetic style of the documentation allowed the women's bodies to tell their stories quite directly.

Apprehending nonverbal aspects of any narrative requires sensitive observation and rapt attention to the nuances of body language.[94] Such sensitivities are usually devoted to the care of pre-lingual infants and children, who rely on their caregivers' abilities to read their bodies. I learned the patience required for this type of attention as a primary caregiver for my infants and young children. It is clear to me that, as a caregiver learns to read a child's body, s/he begins to sense, deeply and innately, the child's state of health and happiness. All humans rely on this non-verbal bond between caregiver and infant. The nursing quality of the Chora allows women to pay attention to such relationships. The Chora rewards her care by bestowing in return the ability to nurture creative and artistic projects through long years of gestation and production, until finally they are released into culture. It is not a coincidence that many women (and some men) look on their creative projects as children, which require nursing until they are strong enough to stand on their own in the world.

Within all narratives, there are omissions, which may tell us as much about the story as those details the narrator chooses to include. It is important to note that extraneous material, or details too revealing of an individual's identity, were omitted from my

documentation in this research-creation. However, attempts to smooth any messy, conditional stories that emerged from the complex and often contradictory events of an individual's life were not made.[95]

In any narrative, there is a discursive element, a need to tell the story to an Other, in order to be properly heard. My role as the recipient of these narratives was crucial, in fact, they would not have existed in this form otherwise, and my contribution to the form and trajectories of their stories is fundamental. I documented and reported as accurately as documentary video technologies will allow, even despite highly authored and edited outcomes, these interviews maintain a rawness and immediacy. For veracity, it is therefore also important to mention the parts I chose to leave out. Omissions occur in all accounts I give of the participant narratives. I chose to omit some of the women's narratives due to issues of privacy and confidentiality. Others are omitted because of irrelevance to my larger project.

Through my analysis of the video interviews, I reflect upon the embodied experiences of the women interviewed from my own position as a listener. I include myself as a participant in discussions in these interviews, even though I tried not to interrupt or respond in an overly conversational manner. It would have been difficult, if not impossibly contrived, to do otherwise; setting up a false pretence that I was objectively disinterested in the sensitive situation I had created. I acknowledge that my own interests, and my own position as an artist-maker, influenced the selection of interview participants. This included the questions that I raised with participants in the interviews and the issues on which I chose to focus with each of them.

The contemporary women of this study

The women who consented to participate in this study are highly diverse group of visual artists, designers, media producers, and writers. They range in age, profession, sexual experience and preference, nationality and cultural identification. They also range in occupation. Some are professional artists while others are dedicated amateurs. All of them are caregivers. Some are named while others chose to remain unnamed. Their participation is confidential, but not anonymous. They represent themselves, in a unique and individual manner, by their narratives. Their body language also represents and reveals them in the telling of their stories, as captured by my photographic and video documentation. The reader and viewer may understand their narratives more intimately through the expression of their bodies.

The women who shared their stories with me often related narratives specifically about changes in the female body. Many told of transformations they underwent through sexual awakening, childbirth, the long process of mothering, menopause, and ultimately, aging. The body's knowledge often precipitates important events, which can lead to crisis, joy, resignation, or resolution. Whether an individual has been thrust into the events of her life or has actively created her path; there is significance in recognising and facing the doorway one must pass through. Once a woman crosses such a threshold, she may encounter profound change, but there is no going back. She must resolutely proceed, entering a new stage of her life.

This research-creation focuses on these individual women, as commentators with unique positions, and the ways that they voice their situations as creative makers,

working with their erotic bodies in technoculture. The artists, designers, and scholars who participated in this study have made their own creative contributions, which I document. I see my work or research-creation, as an attempt to create a more complete picture of the contemporary history of women artists and designers in technoculture. Through this research, I also offer a partially realised picture of the multi-dimensional nature of erotic, embodied, female experiences of these women. I investigate the influence of technology on my research participants' bodies and lives, and in turn, propose that these women have made an impact on technological practices.

A critical view of the effects of technological pervasion

I advocate a critical view of technological interventions in culture, particularly in the ways that technology affects women. In this research, I investigate the possibility of a more integrated relationship between the erotic body, and the insistent demands of technology, through the conceptual Chora, and women's creative imaginations. This investigation forms part of my larger project of research-creation, which seeks to place the contemporary group of women artists who I interviewed, into an evolutionary continuum of creative women and their work. I set out to ask these women how they think critically and self-reflexively about the ways that technology affects their bodies, their sexuality, and their creative practices. Their narratives and my analysis formulate responses to my research questions regarding women's creative imaginations.

Women have important choices to make in their engagements with technology. I position myself in opposition to the increasing fetishisation of technological devices and practices that ignore or deny the body. I refer to the computers and mobile devices that so many individuals, including children, are tethered to in everyday interactions. These devices are useful, and have become integrated into many individuals' everyday lives with positive benefits. But they also have drawbacks, including the ways that screens monopolise attention and draw their users into virtual environments that absent them from embodied personal interactions and communication with real people in the real world. I advocate a critical attitude towards technological pervasion, and for education and awareness about its effects, particularly on everyday practices, communication, and human-to-human interaction. This is a vital matter for young adults and children, who have become, increasingly, younger and younger users: juvenile and infantile beta-testers for the technology industries.

Context of the interviews

The interviews in Chapters Five, Six and the Conclusion were conducted over a span of time between 1998 and 2011, with a group of thirteen women participants, all of whom identify themselves as individuals working in the creative realms. The women who participated in my study contributed a great deal to my understanding of how feminine experience has shifted and changed over the last decade. Not all of the women I interviewed appear directly in this work, though their contributions inform the larger body of the research. The common thread between the contemporary artists I interviewed

in my research-creation study, and the artists I profiled in Chapter Three, is their intimate use of the body—usually their own bodies—as primary subject matter.

A second set of interviews was conducted in 2011 with some of the same women from the original 1998 interviews. I was able to ask how their artistic work had evolved and changed, especially in relation to the vast technological shifts that have taken place over the last decade. These women operated as a sort of control group in my interview process. Another, smaller group of younger women, all of whom are working in some way with technology, were also interviewed. Many of these women were children in 1998. I was able to examine the different approaches that younger women take to their work, observe changes to the ways women work, the new pressures that technologies bring, and the effects of technology on these young women.

Methods for comparative analysis

I used three methods for making these comparisons: first, through the interviews with the original participants in 1998, second, through the subsequent interviews with the same participants more than thirteen years later, and third, through the interviews with a new group of women, also in 2011. The affinity mapping and analysis of the interviews took on a cognitive, ideational form, employing a cross-sectional analysis across multiple thematics that arose concerning erotic emotions and ideas, body image, motherhood, and relationships of women to lovers, friends, children, and their own mothers. The interview participants' affinities around these themes allowed for an informal multi-directional

comparison of their opinions, values, experiences, observations, and in conclusion, recommendations. The research-creation process involved multiple modalities, including solving technical problems, making aesthetic decisions, defining narrative priorities, and approaching ethical issues that arose in the interviews. Throughout the process, a highly contingent, "good enough"[96] approach to the research and analysis was taken, acknowledging the challenges of time, and the impossibility of capturing or recreating, within a highly condensed one-hour interview, a full picture of any one individual's views or creative practices.

Field notes from both the 1998 and 2011 interview sessions assisted in this process, and were used to create "thick descriptions"[97] involving recall of some of the finer details of time, place, interactions, mood, emotion, and situation, in both sets of interviews. "Thick description" is a term used by anthropologist Clifford Geertz to describe his approach to ethnography, which enables the reader to get a feel of the texture and detail of a narrative episode, by contextualising the information gathering and interview experience.[98] The term originated with British metaphysicist Gilbert Ryle. "Thick description," according to Ryle, involves applying intentionality to forms of behaviour, employed in what he called "concept of mind."[99] Geertz expanded the meaning of the phrase to include the intellectual effort involved in ethnographic research, which should involve rich description, so that both researcher and reader can contextualise it. The sociologist and communication scholar Norman K. Denzin introduced the "thick descriptions" phrase to the vocabulary of the humanities. Denzin adapted the phrase again to include details and sequences of events, voices, emotions, feelings, meanings,

social relationships and interactions, and, critically, their significance for those involved in the process.[100] It is Denzin's approach that I employed for my field notations and used for my interview analysis.

With the field notes, alongside the transcripts, the interviews were analysed, and observations of both spoken and embodied responses to questions were made. Videos were reviewed closely in order to note any tension between the words and body language. Taxonomies were built of the diversity of experiences recorded, and note was made of similarities and recurrent themes. From this, affinity maps of certain topics were made to emphasize such themes. Videos were edited to create short selections to represent these intensely embodied erotic narratives, for observation and analysis.

An adapted hermeneutic circle

Finding appropriate methods for addressing the interdisciplinary voyage of making, and bringing into appearance through creative art and design practices has been challenging. The hermeneutic circle presents itself as an appropriate methodology to approach the contingencies of research-creation. An adaption of the hermeneutic method was used to differentiate between historical, personal, and theoretical positions, and between the contemporary and historical materials used in this research study. Hermeneutics is the study of the process and methods of interpretation, primarily of texts and other platforms of meaning and exchange, set out by Heidegger as the "hermeneutic circle."[101] This was a Heideggerian adaptation of the nineteenth-century theory of

hermeneutics, which primarily explained the relationship of parts to whole. In Heidegger's formulation, the circle expresses a method of apprehending the ontological structure of understanding in a motion that moves from the known to the unknown through *fore-understanding*.[102] Heidegger's theory of the hermeneutic circle was more fully explicated in Hans Georg Gadamer's text, *Truth and Method*.[103] Meaning is created hermeneutically in a circular interaction between the participant's interviews, the video documentation, and the field note texts, where previous understandings and tacit knowledge were brought to bear on the materials in order to create new meanings. Meaning is thus produced through social interaction as the consequence of a social consensus agreed upon by the participants and I at the outset of our research journey.[104] This is the essence of my research-creation methodology.

Hermeneutics is particularly useful and pertinent to the modal logics found in the documentary materials, which responded to various states of necessity, possibility, and contingency in the participants' narratives. There was a necessary correspondence between the conceptions of the interpreting subject (myself as the researcher, observer and maker) and the need for sensitivity in interpretation of the narratives of the participants. These correspondences occur outside of or alongside my work of making, but importantly, they have become part of my own story as a researcher and maker. My own research-creation, my investigations of the work of women makers, and my interpretations of their work, are intertwined throughout this thesis.

A return to the Chora

My fieldwork and interviews sprang directly from the impulse of the Chora. They were conducted as part of an art-making enquiry and practice undertaken in the context of self-reflexive practice-based research. Sometimes called research-creation, this emerging field of scholarship is particularly relevant for individuals working within art and design traditions, where making is a form of research and knowledge creation. Research-creation is defined as the creative process that comprises an essential part of a research activity, where the process itself fosters the development of knowledge through aesthetic, technical, instrumental, or other innovations.[105]

This intense self-reflexive approach also references my own memories and narratives, which are brought to the analysis. My practice involves writing, photography, image making, and video making. I insist that these forms of making constitute original research-creation, fostering the development of original knowledge and making unique contributions to the field. I reflect upon, analyse, and write about my research and practice in ways that question other practices of thinking, knowledge making, and production. I am interested to know more about how other women think, create knowledge, produce their work, and situate themselves as makers. "So what is a woman to do, setting about writing about women?" asks educator Patricia Spacks, in her book *Female Imagination.* "She can imitate men in her writing or strive for an impersonality beyond sex, but finally she must write as a woman, what other way is there?"[106] Indeed there is no other path for me but to write and make as a woman, always informed and supported in the Chora, striving towards Eros, and situated in technoculture.

Chapter Two

The Education of Intellectual Women

> *I take 'intellectual woman' to mean any woman who has ever taken herself seriously as a thinker, particularly in an educational context. Whether or not they choose to turn their intellectual interests into a profession, such women know what it means to take pleasure in thought.*[107]
>
> *—Toril Moi, 1994*

This chapter examines a history of women's education, from the point of view of their historical accomplishments in technology and culture. The challenges that women have faced in their attempts to pursue education that fits them to become full participants in culture are assessed. It will also consider women artist's imagination and making, from the conceptual standpoint of the Chora as a source of women's knowledge and power. The gender divide in technology is assessed, and imaginative pedagogical responses to the wicked problem of women's lack of participation in technoculture, are considered.

The history of education has its inspirational female figures, some of whom are relatively unknown. In order to understand the evolution, progression, and scope of educational opportunities for women, I was inspired to find out more about those who pioneered and advocated for women's education, their accomplishments, and the examples they set with their own scholarship.

The situation and methodology for this study

This study focuses particularly on a number of noteworthy accomplishments and creative works of scholarship of European women, from the middle ages onwards. It also reviews practices of private and public education for women, and the effects and outcomes on wider society that were initiated by these projects. It details early progress, setbacks, and still further progress up to the contemporary era, for women's education. And it offers up some of the great historical figures and champions of women's education for information and celebration.

I initiated this research into the history of women's education as part of the preparatory research for this dissertation while I was in London. I had undertaken historical research, using materials and special collections at the British Library. The opportunity to handle historic first editions from the great collections of the British Library was an inspiration. It did not escape me that I was privileged, as a woman scholar, to be handling these books, and to have my seat in this place of historical learning.

Alongside the books and manuscripts at the British Library, I undertook a quantitative analysis of statistical data regarding women's education, particularly in science, technology, and philosophy, and reviewed secondary published data, public records and surveys, demographic information, and special reports from the British Philosophical Society, and from the United Nations Department of Social and Economic Affairs, all of which are referenced in this chapter. This research helped me examine social attitudes, structures, and practices of women's education in Europe, and laterally in North America, from within an historical perspective.

The setting for this chapter

Higher education has a relatively brief history for women. The halls of higher learning were off-limits to women for centuries, and access to public education has developed only over the last hundred years in Europe and even later in North America. With little time to establish a substantial tradition of female scholarship and creative work in the public realm, there are few models of leadership. Entry into the fields of philosophy and the sciences have been particularly challenging, as, up until the early twentieth century, women were generally considered incapable of philosophical or scientific thinking.

Hegel recounted his position on women's education clearly in the *Philosophy of Right* (1821) when he proclaimed: "Women can, of course, be educated, but their minds are not adapted to the higher sciences, philosophy, or certain of the arts. . . . The difference between man and woman is the same as between animal and plant."[108] This was the dominant view, which took more than a century for women who wished to enter these fields to overcome. So, it is instructive to learn how Simone de Beauvoir and Simone Weil breached numerous educational and professional barriers in the 1930s, to become outstanding philosophers, and how they uniquely benefited from the French system of public education.

A significant body of female scholarship in any field is scant prior to the 1900s, but there are some noteworthy exceptions. Because of traditional barriers in the sciences, most examples are found in the arts. I examine a number of European artists and scholars, with a focus on those who also advocated on behalf of educational opportunities for

women. These were women working within fields of technology (in the wider sense of intervention and bringing knowledge into appearance within culture). The emphasis here is on women who contributed to technological innovation, whose practices focused on action and outcomes, using tools and techniques.

If attention to artistic activity originates in the body, and is focused in its erotic attenuation by the mind, then action (when motility—along with the auditory, visual, and tactile senses—and the intellect are all brought to bear on the task) can be seen as an integral process of creative work. In this way, erotic intentionality brings the mind and body and all of its senses into play in acts of artistic creation. Mobilising knowledge, action, and creative work, and bringing such knowledge into appearance in the public realm, is a critical undertaking for women. Individuals *Become*, and are confirmed by their words, deeds, and actions, when the products of their intellectual and physical labour are brought into appearance in the world. Hannah Arendt notes that such public appearances and actions " . . . possess an enduring quality of their own because they create their own remembrance."[109] Arendt's emphasis on action calls for individuals to show courage and boldness, to use their intellects, education, and skills to the public good.[110] In *The Human Condition*, she writes about the exposure that action requires: "The connotation of courage . . . is in fact already present in a willingness to act and speak at all, to insert one's self into the world and begin a story of one's own."[111] Arendt set an example as a woman scholar and philosopher; through her boldness and action, she offered publications and a public agenda for others to build upon. This chapter offers the work of women who have been motivated by the public good to create their own

exemplary scholarship, and to improve conditions for women by giving them wider access to education and knowledge.

Towards an epistemic pluralism: a brief history of women's education

This chapter attempts to uncover women's insights, methods, and epistemologies in the context of education and the feminine imagination. A selective historical chronicle of Western educational opportunities for women from the late middle ages until the twentieth century is undertaken, with an examination of the works of key scholars who have contributed to female education and erudition. This is accompanied by an analysis of the individual educational experiences and contributions of Christine de Pizan, Simone de Beauvoir, and Simone Weil, philosophers and educators whose historical development as scholars has significance for this thesis.

Key differences in the language used in education of girls and boys in contemporary Italy are then compared, drawn from a study by feminist philosopher Luce Irigaray. Finally, the advantages contemporary women have gained in tertiary education at the post-secondary level are reviewed, and I speculate on how these advances might form a foundation for further development of women's educational opportunities.

Education for Western women has had a relatively constrained and uneven history, although it may appear privileged in comparison to women's education in other societies. Girls and women in the West have exceptional access to education at all levels. It is therefore extraordinary to note that, barring a few notable exceptions, which will be

examined, Western women remained largely home-schooled prior to the nineteenth century. For centuries, they were for the most part denied entry into the domains of scholarship, philosophy, and the arts. These barriers correlate to those in science, medicine, politics, and the higher echelons of business and industry. For the few who did succeed, privilege and persistence against long odds were the keys to rare success.

Women's under representation in almost all endeavours related to technology has resulted in a systematic lack of equitable access to the professions, especially for women seeking entry into STEM fields.[112] Inequality of educational access for women, particularly in science and technology, has only begun to be addressed in a comprehensive way within the last sixty years. History supports the assertion that inequality in education has reproduced a technological skills divide, reflected in women's historically meagre production as technologists, designers, and technology scholars, according to a 2007 UNESCO international report on Science, Technology and Gender.[113] This chapter aims to show how better opportunities for women in education will assist in the important task of re-imagining technology, in terms of both benefits and costs. Public education for women has emerged as a positive force for cultural change, as will be demonstrated in this chapter, which will also reflect on the positive effects of increasing participation by women in higher education.

The Book of the City of Ladies: Christine de Pizan[114]

Figure 1 Christine de Pizan, *The City of Ladies*, miniature illumination on parchment, 15th century
Source: Wikimedia Commons http://en.wikipedia.org

Christine de Pizan (1365–1430) was born in Venice, the child of intellectual parents, who had both been educated at the University of Bologna. She was one of the first secular women in Europe to have an independent career as a scholar. Her legacy as one of the few female intellectuals from the Middle Ages whose work survives rests on her scholarly treatises, in particular *Le Livre de la Cité des Dames* [The Book of the City of Ladies], one of her main contributions to the legacy of feminine scholarship. This important work has survived as a valuable insight into the exceptional achievements of a medieval scholar who wished to educate her audience in the ethics and morality of

marriage and the proper treatment of women by society and the church. She encouraged her audience to practice moral self-edification, and insisted that morality was not an exclusively male preserve. She employed different voices and tactics that would appeal to both female and male readers, and gained a wide audience for her work.[115] De Pizan celebrated the inventions of the classical heroines and goddesses, and through examples of exceptional achievement by historical women, defended the virtues and qualities of her female contemporaries.

As a child, Christine accompanied her father, Tommaso da Pizzano, to Paris, where he had been appointed physician and astrologer to the court of King Charles V. De Pizzano encouraged his daughter's education, and at Charles's court, she was given access to tutoring and reading in one of the finest libraries in Western Europe. Her father insisted she learn to read and write in French, Italian, and Latin. Thus, for a woman of her time, she received an unusual scholarly education. At fifteen, she was given in marriage to Etienne de Castel, a royal secretary to the court. Their marriage was a happy one, producing three children. Upon the death of Charles V in 1380, her father lost his position and their income dwindled. He died in 1387. With the untimely death of her young husband during the sweep of the Black Death across Europe three years later, Christine was left the sole support for her three young children and her mother, at the age of twenty-five. The loss of both her father and her husband forced her to adopt an existence for which her privileged life at court had scarcely prepared her. Christine's impoverished position, her intellectual abilities, and her mastery of French, Italian, and Latin gave her the impetus to work as a writer of poetry, prose, and biography. She began

as a copyist, working in the flourishing manuscript workshops of Paris. In 1399, she began accepting commissions for her own literary works. De Pizan wrote lyric poetry, which was well received at the court of Charles VI. Gradually she took up more serious work, writing political and moral treatises, and biographies commissioned by her royal patrons. Her access to the Duc Louis d'Orléans and the court of his brother Philip in Burgundy, gave her accreditation, and wealthy and educated audiences for her work.

In 1404, de Pizan's biography of Charles V, *Le Livre des Fais et Bonnes Meurs du Sage Roy Charles V*, was published, to great popular acclaim. The following year, she wrote her masterwork. *Le Livre de la Cité des Dames* was a beautifully argued rebuttal to the Aristotelian conception of women as half-formed men, or monsters of nature. The book is also a polemic against misogyny. De Pizan viewed misogynist attitudes, particularly those doctrines originating from the clergy, as pernicious and harmful to men and women alike.[116]

The dominant view of the body in the middle ages was derived largely from Hippocrates, who elaborated on Philistion's theory of the four humours, or elements: earth, fire, water, and air, which comprise all living things, and their related qualities of coldness, heat, moisture, and dryness. Although these qualities had effects that varied with the seasons, heat and dryness were natural to the male state, whereas women were ruled by coldness and moisture. Men were considered the natural superiors, rulers of all that was hot and dry, fire and heat being primary instruments of nature. The cold humours associated with women were felt to indicate deceptiveness, trickiness, unruliness, and changeability, which made both their bodies and minds unstable.

Menstruation was another sign that women were too cold and feeble to regulate the amount of toxic humours in their bodies. Menstrual blood was thought to have the ability to seep out of eyes, to poison children and induce madness in dogs. The womb, considered an animalistic organ that needed to be fed constantly by sexual intercourse or reproduction, was believed to govern women's nature. Women were thought to be in danger of going mad if the uterus—which, it was believed, wandered at will within the body—migrated towards the head and overtook the mind, overpowering women's speech and senses.[117] Women were considered to have so few redeeming virtues and such an excess of negative qualities that their entire sex threatened to drag fathers, brothers, husbands, and sons down into the mire.

Le Livre de la Cité des Dames was an impassioned argument against this contemporary view of women, as well as a plea for the return of respect to women and the institution of marriage. De Pizan created a poetic evocation of the trials of courtly love, and an impressive list of the qualities and deeds of famous mythical women and historical woman scholars and artists. In so doing, she exhorted her male and female readers alike to accept the authority of women as exemplars of morality, truth, scholarship, and accomplishment.[118]

The text of The Book of the City of Ladies is framed as an allegorical refutation of Matheolus's *Lamentations*[119] a popular thirteenth century tract against marriage, in which the author vilifies women for making men's lives miserable. De Pizan stated that she wished to write a rejoinder to the *Lamentations*, and while searching for a method during a period of creative uncertainty, had a vision in which she was visited by the three virtues

Reason, Rectitude, and Justice. They told her she was chosen by God to refute, point by point, the accusations of Matheolus. The book she would write would be organized as a city designed to house ladies of great virtue and protect them from the attacks of men. Virtuous and noble women would form the foundations and walls, towers and battlements of this allegorical city. This rhetorical strategy, with its key metaphor of the city as a bastion against evil held together by the common pursuit of virtue, was also employed by Saint Augustine in his influential treatise *The City of God.* The allegory underpins de Pizan's central contention that women had made important contributions to the moral and spiritual development of civilization, epitomized by her metaphorical urban community.[120]

In the opening narrative of *Le Livre de la Cité des Dames*, Lady Reason takes the author to "a flat fertile place, where fruits of all kinds flourish and fresh streams flow, a place where every good thing grows in abundance" and where she is instructed to "[t]ake the spade of your intelligence and dig deep to make a great trench" in order to lay the foundations for the city.[121] Lady Reason and the author carry on a dialogue about the qualities of the powerful, intelligent, and virtuous women who will help build the City of Ladies. Thus, de Pizan was able to create a historical legacy of the virtuous, intelligent, industrious, and talented women of antiquity, along with their wonderful projects and noteworthy accomplishments. This was intended as an education for her male and female readers, but also as a way for her to combat and refute the slanderous treatment of women in the *Lamentations*.

De Pizan also intended her female readers to learn about and identify with the lives of exceptional women, and the wonderful accomplishments of their sex.[122] In this overview of the text of *Le Livre de la Cité des Dames*, I focus on the technological and public accomplishments that de Pizan cites amongst her heroines and Goddesses. Among the great women she names are Nicostrata of Pallas, the founder of the city of Rome on Mount Palatine, who set down civil rules, laws and a legal system, and gave her people the foundational Latin alphabet,[123] and the Goddess Minerva, also known as Pallas, who invented the Greek alphabet, numbers, the designs of carts and chariots, and methods of forging armour and making weapons. The industrious Minerva is also accounted for her invention of music and musical instruments, flutes, pipes, trumpets and other wind instruments. Minerva was, importantly, an inventor of agricultural methods and industries: sheep shearing, spinning and weaving, methods for pressing oil from olives and extracting juice from fruit.[124] Isis, queen and goddess of Egypt, is hailed for her knowledge of agriculture, and for showing her people how to create gardens, grow plants and graft cuttings of one species onto another.[125] Queen Ceres of Sicily, goddess of the harvest, is also celebrated for her inventions and techniques, including the plough, the grinding of corn for flour, and animal husbandry. She was traditionally held responsible for the end of the nomadic life in her domains, and for the settlement of her people into towns and cities.[126]

De Pizan introduces to her audience women they might have identified with, such as Arachne, daughter of the wool dyer Idmonius of Colophon, who perfected the art of dyeing wool and processing flax for linen cloth. She invented tapestry weaving and the

art of trapping fish, birds and animals with nets and snares.[127] Another inventive commoner was Pamphile of Greece, who according to de Pizan, discovered uses for cotton and introduced the art of gathering and weaving silk to the Greeks.[128] Tamaris, a Greek woman of the ninth Olympiad, who devoted herself to painting, and who created an otherworldly portrait of Diana for her Ephesian worshippers,[129] and Marcia the Roman painter who outstripped Dionysius and Sopolis, the best artists of her time are other examples. Marcia was also a technologist who invented a technique for creating powerful self-portraits using a mirror.[130]

Lady Reason finishes her list of accomplished women by assuring de Pizan that "[a]nyone who wanted could cite plentiful examples of exceptional women in the world today: it's simply a matter of looking for them."[131] De Pizan countered misogynist stereotypes in the *Lamentations,* and with her enumeration of the great achievements of historical women, demonstrated that this view was both morally and historically incorrect.[132] With *Le Livre de la Cité des Dames,* she invites her readers, men, and women alike, to join in a celebration of feminine skills and technical accomplishments.

De Pizan also constructed her work to fulfil the need for a feminine dialectic. Her work valorised women, but also began conversation, communication, and support between women. The *Book of the City of Ladies* modelled feminine agency and built a legacy of female knowledge, giving her contemporaries a means to test their ideas against the powerful and learned role models. Her book offered a framework for the protection and support of a delicate but promising construction of a feminine epistemology.

Le Livre de la Cité des Dames is only one of a number of texts de Pizan wrote in defence of women. It became well known during her lifetime, and was translated into Flemish in 1475 and English in 1521. It belongs to the genre of biographical catalogue, established in classical antiquity, which commonly celebrated the lives of famous men, but in this case, women were the subjects of celebration.[133] Her text remains the only surviving critical refutation of the dominant male ideology of the Middle Ages.[134]

Women artists and intellectuals of the Italian Renaissance and Early Baroque

Education was a key to entry into the arts during the flowering eras of the *Quattrocento* and *Cinquecento* in Italy,[135] particularly in the city of Bologna, home of one of Europe's oldest universities. In Bologna, it was understood that female illiteracy was detrimental to the family as well as the larger community. The Bolognese bishop Gabriele Paleotti, perhaps due to the influence of his mother, a renowned scholar, encouraged the education of girls.[136] The Bolognese bishop had a long-standing favourable attitude toward women scholars. He supported and encouraged the influential writing of Caterina Vigri (1413–1463), the daughter of an aristocratic Bolognese at the court of the Duke of Ferrara.[137] Together with a number of other young women of the court, she founded a monastery of the Order of the Poor Clares,[138] in association with the Church of the Corpus Domini in 1431, and became its first Abbess in 1456. She was also the first known female painter of the city, and promoted the pursuit of the arts among her novices and nuns. She inspired the Bolognese with her best-known book, *Le Sette Armi Spirituali* [The Seven Spiritual Weapons],[139] which she wrote as a spiritual guide for the

novices of her order. Her legacy was the rise of literacy in Bologna during her lifetime and after her death, and her inspiration to other women writers, especially of religious and secular treatises and of poetry.

Lucrezia Marinella (1571–1653) was a renowned humanist scholar and author, active in Padua and Venice in the 1600s. Marinella's upbringing in a learned household gave her access to a significant library, and she had the support of her father Giovanni and her brother Curzio, both distinguished physicians and natural scientists who had a keen interest in the condition of women.[140] She wrote poetry, biography, treatises, and lives of the saints, including an epic poem on the life of St. Christian Colomba—who chose martyrdom rather than become the wife of Emperor Aurelian—and the lives of St. Catherine of Sienna and the Virgin Mary. Like de Pizan, Marinella wrote an influential rebuttal to a popular misogynist text. *I Donneschi Difetti* [The Defects of Women] was Giuseppi Passi's vitriolic work.[141] Published in 1587 it is possibly one of the most vicious attacks on women ever written. His notorious text contributed to rationales for the horrifying witch hunts of the counter-reformation. From 1580 to 1630, these persecutions led to some of the largest peacetime mass executions in Europe. In *La Nobiltà e l'eccellenza della donne co'diffetti e mancamenti de gli huomini* [The Nobility and Excellence of Women and the Defects and Vices of Men], [142] Marinella wrote a powerful polemic celebrating the virtuous qualities of women and castigating the misogyny and brutish habits of men. She argued for women's spiritual, physical, intellectual and moral prowess, rebutting the arguments of Aristotle's, which she deemed misogynist, and demonstrated her deep knowledge of literary and philosophical traditions.[143] Using her

writing to effect a change in social attitudes in a dangerous era of sexual distrust and misogyny, she demonstrated persuasively that women were fully the equals, if not the superiors, of men, and deserving of respect and admiration.

Works such as Marinella's and that of her contemporary, Moderata Fonte [Modesta Pozzo] (1555–1592), who wrote *Il Merito Delle Donne* [The Worth of Women],[144] the creative flowering of women was glorified in songs, stories, and poetry. In his 1590 poem, *La Gloria Della Donne*,[145] Giulio Cesare Croce celebrated women from antiquity up to his present day Bolognese contemporaries. Likewise, Francesco Agostino della Chiesa, a Piedmontese Bishop of Saluzzo, wrote in 1620 about Marinella and other salubrious female authors from Italy, Spain, France, Germany and England, in *Teatro delle Donne con le lettere, con un breve discorso riguardante la preminenza e la perfezione del sesso femminile* [The Theatre of Lettered Women, with a Brief Discourse Concerning the Pre-eminence and Perfection of the Female Sex].[146] In 1678, the art critic and scholar Carlo Cesare Malvasia wrote his biographies of famous Italian women painters in *Felsina pittrice: vite de' pittori bolognesi* [Felsina Painters, Lives of the Bolognese Painters].[147] There followed an increase in the secular education of Italian women in the arts during the *Seicento*,[148] which filtered through to other regions of Italy and continental Europe.

Figure 2 Lavinia Fontana, *Minerva Dressing*, oil on canvas, 1613
Source: Wikimedia Commons http://en.wikipedia.org

Other important women to have emerged from the Bolognese milieu in this truly remarkable period were the painters Lavinia Fontana (1552–1614) and Elisabetta Sirani (1638–1665), who in their own ways, rejected the creation of traditional eroticised images of women for portrayals that emphasised strong character, virtue, courage and intelligence. Fontana was mainly a portrait painter, of great originality, while Sirani was the first woman painter in Bologna to specialize in religious, historical, and literary subjects.[149] These areas were thought to be unsuitable for women artists, as it demanded superior erudition and knowledge of the subject matter. Portraits—regarded as replicas of nature and thus not demanding true creativity—were viewed as a more suitable *métier* for female artists. With detailed research into historical subjects, evident in her work, Sirani made every effort to break down these subject-matter barriers for women artists. She also founded the first secular painting school for women in Europe, where she trained more than a dozen artists, making painting acceptable as a profession for young women who, unlike herself, lacked an artistic family tradition. In a career of scarcely more than a decade, Sirani became Europe's most prolific female artist, creating and cataloguing over 200 paintings, ten etchings, and numerous drawings.[150]

Another important woman artist of the early Baroque, near contemporary of Sirani, was Roman painter Artemisia Gentileschi (1593–1656). She was apprenticed to her father Orazio, a prominent artist. He introduced her to the work of Michelangelo and to his mentor Carravagio, who became her greatest artistic influence beyond her father. Gentileschi, like her father, was a painter of historical subjects, although his subjects tended to be limpid depictions of the Madonna and decorous, semi-clothed mythical

women. Gentileschi broke this tradition, and portrayed women with recognizable emotions in their facial expressions, and bodies that obeyed gravity. She used her feminine knowledge of women's anatomy, and her own body, as the erotic models for her work. Her work as a woman painter clearly comes from the Chora of her imaginative being. She delved into her feminine imagination and experiences to depict her favourite subjects: wronged women from biblical history, who took strong revenge. Four of her most famous works, created between 1612 and 1625, depicted Judith beheading her rapist, the Assyrian Holofernes. These paintings show a series of stages of the gruesome deed, with the most dramatic portraying two strong and enraged women, murdering the sleeping tyrant. Judith, aided by her maidservant, holds Holofernes down, whilst she graphically beheads her aggressor, one hand holding his hair, the other wielding the sword. Gentileschi would have known Caravaggio's work, and may have been influenced by his dramatic portrayal of the actual moment of the beheading in his own allegorical painting of *Judith Beheading Holofernes* (1598-1599). Certainly, her use of dramatic chiaroscuro in the painting references the Baroque style, but in contrast, her composition and characters are vigorous, mobile, energetic, and considerably more determined than those in Caravaggio's depiction. As a woman, Gentileschi had the conviction and artistic power to create a more life-like image of feminine vengeance. Critic and art historian Mary D. Garrard finds this not surprising in a woman whose work sprang from the complex intersection of artistic creation, feminine rage, and maternal procreation,[151] surely a fitting description of the impulses that spring from the Chora.

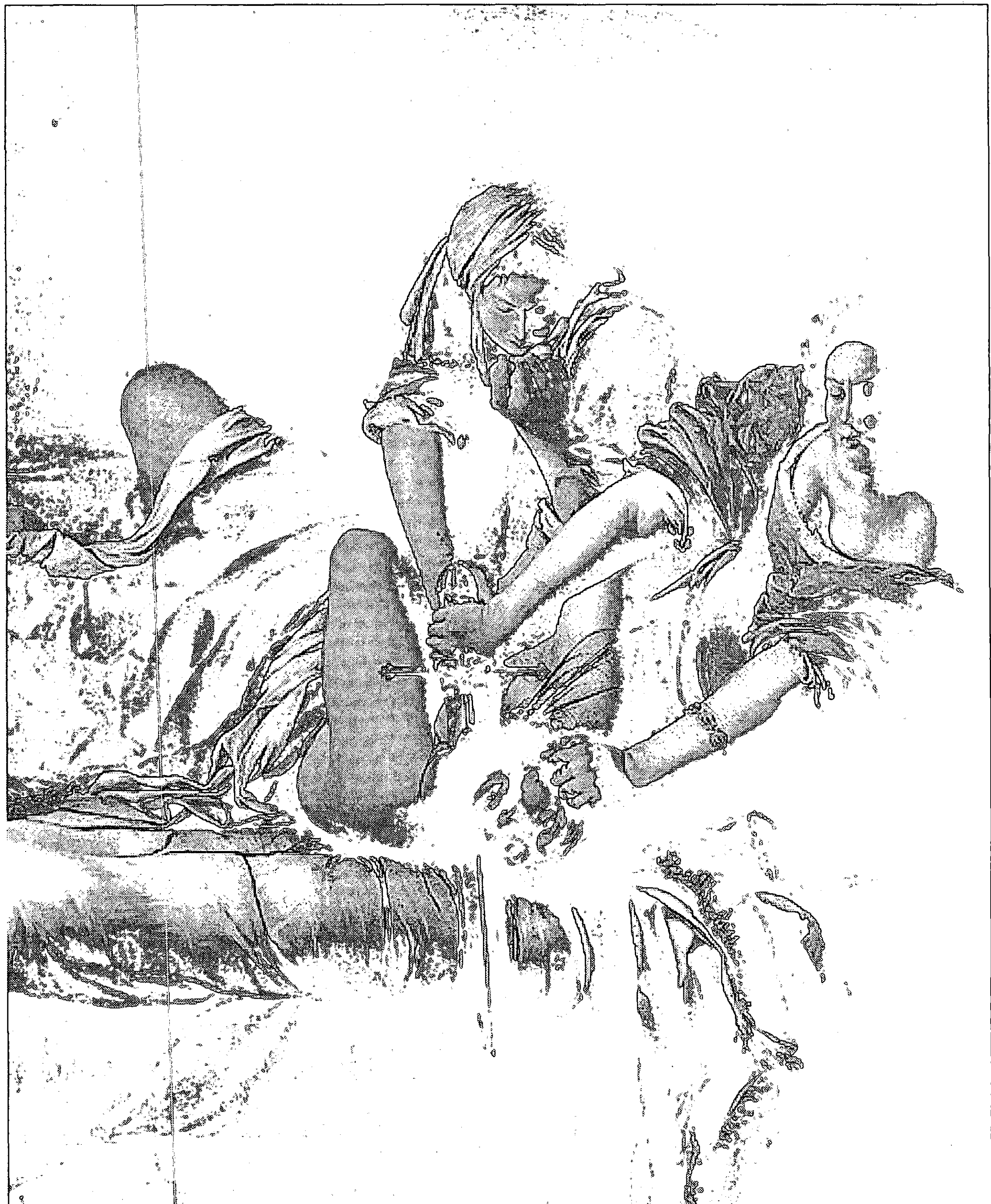


Figure 3 Artemesia Gentileschi, *Judith Beheading Holofernes*, oil on canvas, c.1612–1625
Source: Wikimedia Commons http://en.wikipedia.org

The biblical subject of Judith and Holofernes was often taken as an allegory of the courage of the commune versus the tyranny of the elite, but Gentileschi may have intended a more literal interpretation. She seems to have used her own experience of rape at the hands of Agostino Tassi, one of her teachers and a trusted colleague of her father, as the motivating force behind her many explorations of the subject.[152] Gentileschi broadened her depictions of biblical and historical women with autobiographical intensity, often using herself as a model and creating a series of strong characters whom she then inhabited: Susanna repelled by the gaze and touch of the lecherous elders; Lucretia Borgia in vengeful fury clutching her breast in one hand and a sword in the other. Gentileschi embedded into many of her works references to her own experiences working in a society that deeply distrusted feminine agency, in which all of her colleagues and patrons were men.[153]

Gentileschi's preoccupation with vengeful female subjects was no doubt related to her rape and Tassi's much-publicised trial in 1611–12. Taking this powerful man through the courts in a highly public trial, on suspicion of an act that was so common it was not even thought to be a crime, required bravery, and determination. Without the support of her family or society at large, young, unmarried, Gentileschi took on a powerful aristocrat, and won her case. Although convicted and sentenced to exile, Tassi evaded punishment through the influence of powerful patrons, which infuriated Gentileschi.

Gentileschi did eventually marry, despite the fact that the publicity around her rape singled her out as a woman who had been stripped of her virginity and her honour. Her artistic output was not interrupted by her pregnancies or the birth of four children. After

leaving her native Rome, she worked for patrons in Florence, Naples, and England, and was later appointed to the prestigious Florentine *Academia del Disegno* [Academy of Design] in 1616.[154]

Post-reformation women's education

There was little in Britain or the rest of Europe to compare with the flowering of women's education and artistry in Renaissance Italy; no texts for women approaching Vigri's Seven Treatises, nor careers such as those of the famous Italian *pittori* to be emulated. Books on women published in England and the rest of Europe at the time focused on controlling women's unruliness and educating them in idealized feminine morals such as piety, wifely duties, and the forbearance required for child bearing and rearing. Suitable topics for women's education included religious observations that fostered modesty, humility, and a sense of moral duty, and selective education that would not enflame their undisciplined imaginations. Women were trained for domestic duties and honest work, to keep their hands busy and their tongues still. These subjects constituted the predominant framework of the meagre publications and female education in most of Europe.[155]

But by the early sixteenth century, the protestant reformation and the views of the humanists were emerging. In the Germanic regions of continental Europe, the teachings of Martin Luther had begun to take hold. Luther was strongly supportive of compulsory schooling for boys and girls from primary and secondary levels, and advanced education

for qualified men and women. Luther's teachings led to the formation of co-educational schools and a wider acceptance of women's education.[156]

Elsewhere, Sir Thomas More allied with Disiderius Erasmus of Holland to initiate advances in women's education. In England, More set an example by educating his three daughters in the subjects of classical literature, philosophy, mathematics, astronomy and physics, rhetoric and logic. Erasmus's treatise *On Christian Matrimony* strongly supported women's education, and was inspired by Catherine of Aragon, the first wife of Henry VIII, who had brought the Spanish scholar Juan Luis Vives to the English court to educate her daughter, Mary Tudor. Vives was a religious educator who wrote *De institutione foeminae Christianae*. Richard Hyrde, tutor to More's daughters, translated Vives's treatise into English and published it around 1540 as *The Instruction of Christen* [*sic*] *Women*.[157]

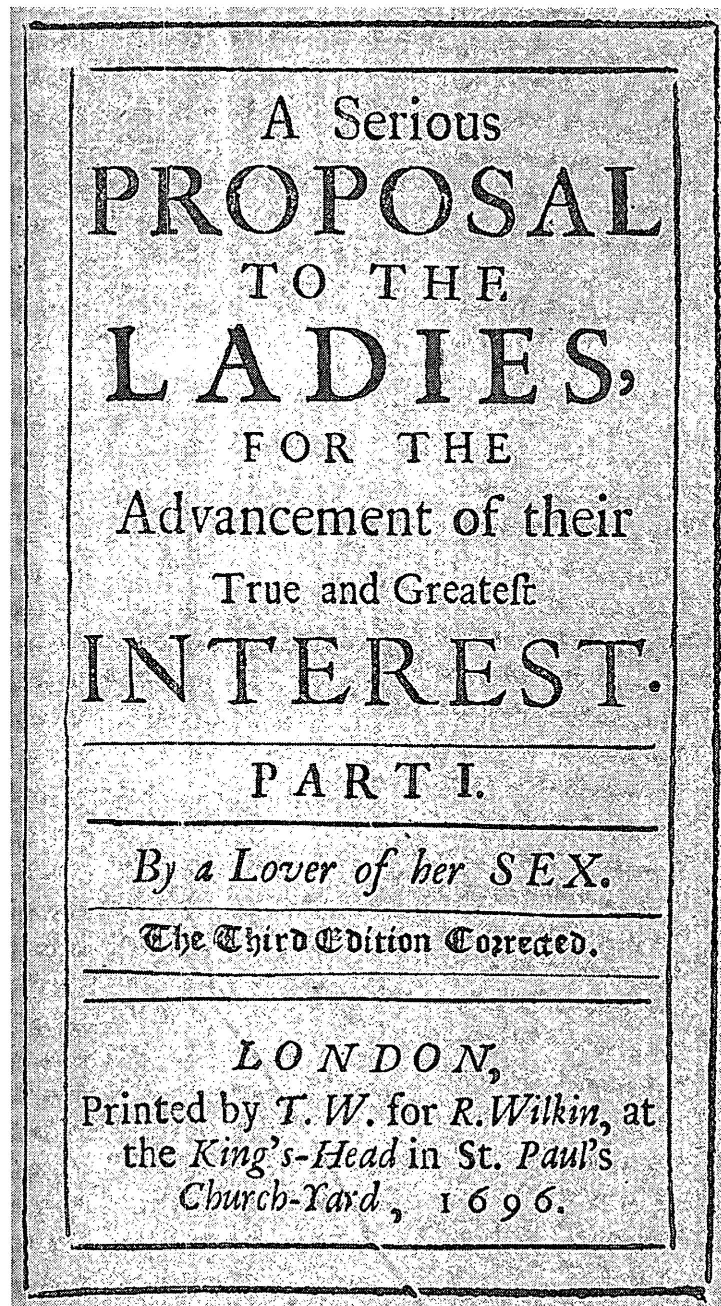
Hyrde's introduction to the English edition of Erasmus's *Treatise on the Pater Noster* also contained a defence of learned women. It was translated by "a young and virtuous well-learned gentlewoman of nineteen years of age."[158] This was Margaret More Roper (1505–1544), daughter of Sir Thomas More, Hyrde's brilliant pupil. The text they collaborated on was among the first English publications relating specifically to the scholarly education of women. By the mid sixteenth century, a classical education modelled on Hyrde's teaching and More's programme for his daughters had become the foundation for the education of daughters of noble and well-to-do families all over Britain and in the courts of Europe.[159]

The education of English gentlewomen

An increased openness to women's education was led by Elizabeth I, whose erudition in mathematics, theology, rhetoric, logic, and French, Italian, Greek and Latin inspired more English nobility to educate their daughters.[160] The pedagogue Richard Mulcaster, in his 1581 publication *Positions*, urged the populace to follow the Queen's bright example. He saw education as suitable preparation for women to live better lives, for the benefit of themselves and their families, and for assuming public leadership roles for the benefit of larger society. Because women, in his words " . . . [are] our mates and sometimes our mistresses . . . and sometimes exceed us in dignity and calling, as they communicate with us in all qualities and honours, even [in reference to the Queen] up to the sceptre . . . why ought they not in anywise but be made communicants with us in education and training, to perform that part well which they are to play, for either equality with us or sovereignty above us?"[161]

In 1673, the scholar Bathsua Makin (c.1600–1675), a tutor to Princess Elizabeth, daughter of Charles I, wrote *An Essay to Revive the Antient* [sic] *Education of Gentlewomen*,[162] in which she outlined a model for a new institution: the secular girl's school. She had started such a school in the London suburb of Tottenham High Cross, where she taught gentlewomen "the Principles of Religion and all manner of Sober and Virtuous Education."[163] In her essay, she outlined the syllabus. Half of her students' time was spent writing and learning to keep accounts, followed by dance, music, and singing. During the other half of their time, they were " . . . employed in gaining the Latin and French tongues." [164] Students, who wished to, might also learn experimental philosophy,

Greek, Hebrew, Italian, and Spanish. These were all subjects that the extraordinary Makin was competent to teach at her academy.


A Serious
PROPOSAL
TO THE
LADIES,
FOR THE
Advancement of their
True and Greateſt
INTEREST.

PART I.

By a Lover of her SEX.

The Third Edition Corrected.

LONDON,
Printed by *T. W.* for *R. Wilkin*, at
the *King's-Head* in St. *Paul's*
Church-Yard, 1696.

Figure 4 Mary Astell, *A Serious Proposal to the Ladies*, book, 1696
Source: Open Library http://openlibrary.org

A Serious Proposal to the Ladies and other enlightening works

In 1696 and 1701, the English scholar Mary Astell published her two part book, *A Serious Proposal to the Ladies*, "[w]herein a method is offer'd [sic] for the Improvement of their Minds."[165] She advocated the founding of a university for women, particularly as a refuge for those who did not wish to marry or go into service. In *Letters Concerning the Love of God* (1695), *Some Reflections Upon Marriage* (1700), and *The Christian Religion* (1705),[166] she wrote philosophical texts on metaphysics and epistemology, religion and morality. Throughout her texts, Astell was concerned with the individuation of created beings. Ultimately, she maintained, there are four kinds of created beings: minds, bodies, mind-body unions, and the particles that compose bodies. Astell's position was that human beings are mind-body unions, though she also believed that humans couldn't comprehend the connection between mind and body. Although she was a rationalist, she could not persuade herself of the Cartesian distinction between mind and body. "For if we disregard the body wholly," she wrote, "we pretend to live like angels whilst we are but mortals, and if we prefer or equal it to the mind, we degenerate into Brutes."[167]

Equipped with this rationalist account of individuation through the mind-body union, Astell showed that the uniformity of women's inabilities was not rooted in their nature, but arose because of social practices. Thus, the difference between the abilities of women and men should be explained not metaphysically, but epistemologically. She developed three rational themes of mind and body: an emphasis on the mind over the body; a theory of innate ideas as the origin of knowledge; and a methodology that leads

the novice from confusion to clarity. To do this kind of work, individuals need first to examine ideas about morality and religion, separating through metaphysical reflection what is innate from what is adopted by custom. Ultimately, all reasoning and deduction should begin with ideas that are clear and "as distinct as the nature of the subject will permit."[168] Astell departed from the Cartesian project by proposing reflection on teleological arguments about the design of God's creation as a strategy for female meditators to release themselves from a scepticism regarding their own worth.[169] These arguments were designed to help the novice realize that God would not have created her as naturally defective, proud, vain, or un-improvable; to search for the perfections bestowed upon her and discover the role they played in her life, in her community and in creation as a whole. Astell's advice to young women was that they should learn to suspend judgment until they had clarity on how to direct their will to a sufficient and noble end.[170] Although her dream of a university for women was never fully realized, Astell's text was widely read, and she founded a charity school for girls in London in 1720.[171]

A new era of enlightened attitudes towards universal women's education was ushered in in 1792 when British writer and philosopher Mary Wollstonecraft (1759–1797) wrote her manifesto, *A Vindication of the Rights of Woman.*[172] It was published in London and Dublin, and eventually also in Paris and Boston. Wollstonecraft argued for national and standardised education for all. She advocated women's participation in economic and political affairs, and for civil status, arguing, "[i]s not that government then very defective, and very unmindful of the happiness of one half of its members, that does

not provide for honest, independent women, by encouraging them to fill respectful stations? But in order to render their private virtue a public benefit, they must have a civil existence in the state, married or single."[173] She argued that, lacking this freedom, women were unable to take useful roles in society, when they might have " . . . practiced as physicians, regulated a farm, managed a shop, and stood erect, supported by their own industry . . . How much more respectable is the woman that earns her own bread by fulfilling any duty, than the most accomplished beauty!"[174] Wollstonecraft insisted that with improved education, women would fulfil their potential and become capable of making outstanding contributions, which would otherwise be lost to society.

In 1866, the crusading English educator and suffragette Emily Davies (1830–1921) wrote the scholarly polemic, *The Higher Education of Women*,[175] to prompt educational reform. In 1863, she had obtained the right of women to sit for secondary school matriculation when she recruited 83 candidates for a trial examination at the University of Cambridge. The women excelled in every subject except mathematics, for which they had apparently received insufficient instruction. Davies had not been entirely aware that her students would have to sit the maths exams, which were unprecedented for women. She was also active on the London School Board, and the Schools Enquiry Commission of 1864–67, advocating for women's education at all levels. Although the authorities advocated that subjects of mathematics and Greek be omitted or modified for women, Davies insisted that examinations for women should be the same as those for men. In 1867, the University of Cambridge opened the full matriculation examination to women.

A

VINDICATION

OF THE

RIGHTS OF WOMAN:

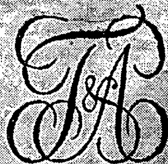
WITH

STRICTURES

ON

POLITICAL AND MORAL SUBJECTS.

BY MARY WOLLSTONECRAFT.



PRINTED AT *BOSTON*,
BY PETER EDES FOR THOMAS AND ANDREWS,
FAUST's Statue, No. 45, Newbury-Street,
MDCCXCII.

Figure 5 Mary Wollstonecraft, *A Vindication of the Rights of Woman*, book, 1792
Source: Open Library http://openlibrary.org

In 1869, in response to a call by headmistresses for higher education for women, Davies co-founded Girton College, in Hitchin, Hertfordshire. Girton was relocated to Cambridge in 1873, with Davies as Mistress, becoming the first college in England to educate women at the university level.[176]

Wollstonecraft and other educational reformers' views were largely stifled in Europe at the end of the eighteenth century, when conservative forces swept through Europe, forcing issues of education and equality for women into retreat.

The education of the daughters of the French bourgeoisie

In Paris, prior to 1789, only one-third of the female school-age population had been provided with a full education, but this changed with the Revolution.

The French intellectual Olympe de Gouges (1748–1793) wrote frank denunciations of slavery. She had also written polemics on the right of women to divorce, and—scandalously—advocated women's right to enjoy sexual pleasure outside of marriage. In 1791 she published her response to the revolutionary 1789 *Déclaration des Droites de l'Homme et du Citoyen*, [Declaration of the Rights of Man and the Citizen], *Déclaration des Droits de la Femme et de la Citoyenne*, [Declaration of the Rights of Woman and the Citizen].[177] Speaking for the oppressed women of France, she asserted that women also had the right to free speech, and to take up positions as agents of intellectual progress and capital production. She continued to promote women's equality with the publication of her *Contrat Social* [Social Contract], in which she argued for gender equality in marriage.

After the executions of her patrons, the Girondins, de Gouges was arrested in July 1793. Fatally aligned with the wrong side, she was sentenced to death by the Jacobins for her Girondin sympathies and sent to the guillotine on the third of November.[178] With the execution of de Gouges in 1793, and the death of Wollstonecraft in 1797, two of the strongest voices for education and emancipation were silenced. The backlash against the French Revolution effectively stalled reforms to women's education in Europe and North America for nearly four decades.[179]

In the 1830s, a period of rapid industrialization in Europe brought a growing need for an educated workforce. Pious, educated wives and mothers, as well as skilled, industrious, and obedient workingwomen, were viewed as a potential benefit to society. Dutch educator Anna-Barbara Van Meerten-Schillperoort (1778–1853), a self-taught author of educational texts, had made an important contribution to women's education in Europe. Between 1817 and 1840, she and her unmarried daughters ran a small model school for the higher education of women in the prosperous town of Gouda. Through her ambitious teaching and her publications, she became known as a pioneer of women's education, and one of the first European experts on sex education.[180]

Women's education in North America

Wollstonecraft's arguments for women's educational equality resonated with reformers in the United States and the colonies of British North America (British Canada). Her treatise was distributed out of Boston. In the early nineteenth century, North America

was swept by educational reforms advocating education and equality for women. Middlebury Female Seminary founder Emma Willard (1787–1870) also championed education for young American women when she opened the Seminary in 1814, the first institution in the United States to offer higher education for women. In 1819, Willard published *Address Proposing a Plan for Female Education*,[181] and in 1821 moved her school from Vermont to Troy, New York, where it was known as the Troy Female Seminary.[182] Her example inspired a number of other small seminaries and academies for women, but most were not the equivalent of the university education that men received, focusing on general education and domestic skills. In 1833, the first co-educational institution in the United States, Oberlin, opened its doors to men and women of all racial identities. They were given the opportunity to study the same curriculum together in an educational setting that was unprecedented in the English-speaking world. Oberlin's first Bachelor of Arts degrees were conferred on a class of nine men and three women in 1841.[183] At around the same time, the Wesleyan Female College at Macon, Georgia became the first college to confer higher degrees on women, in 1836. Judson College for women was founded in Alabama in 1838, and in 1849, Rockford College in Illinois became the first women's college to be established in the North.

Public acceptance of higher educational opportunities for women was slow, with much active and vocal opposition, and a backlash against women's education in the late nineteenth century. Harvard professor Edward H. Clarke published his popular treatise against women's universal education, *Sex in Education or a Fair Chance for Girls,* in 1874, in which he argued against burdening females' delicate sensibilities and intellects

with advanced scholarly pursuits, with a warning that education may tax the reproductive apparatus, especially if women studied during menstruation.[184] At the same time, educational leader Henry Tappin argued vigorously against equality in higher education, maintaining that the inferior intellect of women would dilute university education for men, making it impossible to establish world-class universities in the United States.[185]

Following the American Civil War, higher education for women became more widely accepted, with the establishment of superior women's colleges in the North. Vasser College, established in Poughkeepsie in 1861 by Matthew Vasser, provided scholarships and high standards of education for its students. Vasser declared that "... woman having received from her Creator the same intellectual constitution as man, has the same right as man to intellectual culture and development."[186] In 1875, Wellesley College in Massachusetts offered the first scientific degrees for women, and in 1885 Bryn Mawr became the first college to offer women opportunities for graduate study comparable to Harvard and Johns Hopkins.[187]

Opening European universities and colleges to women

At the beginning of the 20th century, it was still very difficult for European women to obtain a university education. In 1910, there were just over a thousand women studying at Oxford and Cambridge, but they had to obtain special permission to attend lectures and were not allowed to pursue degrees.[188] Lady Margaret Hall and Somerville College, which both opened in 1879, were the first women's "societies" at Oxford,

followed by St. Hugh's, established in 1886. St. Hilda's opened in 1993, and St. Anne's, which had originated as the Society of Oxford Home Students, was incorporated by Royal Charter, in 1952. It took seven more years for women's societies to be fully recognized; it was not until 1959 that women's colleges were given full collegiate status at Oxford. Although women had been allowed to sit some University examinations and attend lectures for over forty years, women were not fully admitted to Oxford until 1920, and then only through the women's societies. Recognition for female scholars was slow, supported by few women's colleges in Britain.

If women students at Oxford were unusual, women fellows were exceptional. The first female professor was not appointed until 1947. Ida Mann, a reader in Ophthalmology, was the first woman to hold the title of Professor at Oxford. The first woman appointed to a full Oxford professorship was Agnes Headlam-Morley, who became Montague Burton Professor of International Relations in October 1948. Mann and Headlam-Morley were both fellows of St. Hugh's. The five all-male colleges, Brasenose, Jesus, Wadham, Hertford and St Catherine's, began admitting women in 1974. St. Hugh's began admitting men in 1986, and the college now has a roughly equal mix of men and women. St. Hilda's College, originally for women, was the last of Oxford's single-sex colleges. It began admitting men in October 2008.[189]

In France, at the beginning of the twentieth century, the education of young women was even less developed than in the United Kingdom, but it was also somewhat more common for young French women to go on to higher education. The primary and secondary education of girls was almost exclusively determined by their mothers, and

overseen by the Catholic Church. The struggle between Church and State over women's education dated back to 1863, when Victor Duruy, who was Minister of Education, encouraged the creation of municipal *cours supérieurs* for girls. This reform was greeted by outrage from the Catholic Church, which in France dominated the education of children, especially girls. The major educational reforms in France brought about by Jules Ferry in 1880, fomented a nearly total schism between church and state schools. Reforms took many years to have an effect. Although they certainly provided a legal framework for women's education, the new laws were not particularly radical or feminist: their main goals were to segregate the sexes at the secondary level, and to educate laywomen to become the wives of the Republican élite.[190]

Prior to 1902, there were still very few state secondary schools for girls outside of Paris, and no university equivalent to the all-male *École Normale Supérieure* (ENS), from whose ranks all of the secondary state schoolteachers in France were selected. Educational reform was seen by the Church as an attempt to establish secular alternatives to convent schools, thereby removing girls from the care of nuns and clergy at an impressionable and vulnerable age. Although all children had access to a free, non-religious primary education, much of the bourgeoisie considered the mixed-sex state schools to be godless institutions unfit to care for their daughters. Even up until the 1920s, bourgeois mothers would regularly attend classes to supervise their daughters, and a religious education was still considered the only decent option for most young women in France.

One of the positive effects of an 1880 law establishing state-run secondary education for women was that this new form of secular single sex education required non-religious female teachers. This meant new opportunities for women to train for and enter secondary school teaching as a profession. At that time, prospective secondary school teachers had to pass *baccalauréat* (*bac*) examinations to be admitted to university, where they would earn their license and training diploma. This posed another problem for the rigid qualification system in France: the new laws also barred women from studying for "the *bac*," thereby preventing them from entering universities and training as teachers. This led to the establishment in 1881 of a new state *École Normale Supérieure* for Women, outside of Paris, at Sèvres. Men and women who qualified at the two prestigious *Écoles Normales* had guaranteed access to state-sanctioned teaching jobs.[191]

Sèvres provided training for women in subjects that were taught at the secondary level: letters, sciences, mathematics, history, and geography. Philosophy, classics, and modern languages were not a part of the secondary syllabus for women, so they were not offered at Sèvres. Women who wished to qualify in these subjects had no choice but to go the same route as their male counterparts; to acquire the *bac* and go on to a university. Because of the peculiarities of the reforms, from 1880 until 1908 it was the exclusive realm of the independent schools, the majority of them Catholic, to prepare girls for the *baccalauréat*. It was not until after 1908 that the *lycées* were able to offer women the same preparation for university as they did for men, and secondary education gradually became equivalent for both sexes. The rationale for this may have been entirely practical: with the slaughter of a whole generation of young men in the Great War, many women

faced the prospect of never marrying. Teaching was considered one of the few respectable professions for a woman.[192] The ratio of women to men rose slowly in the *Écoles Normale Supérieure* between 1926 and 1939, to about five per cent. However, at the *Institut Catholique*, one of the top preparatory universities, about thirty-one per cent of pupils were women, a ratio that was not equalled at some of the Oxbridge colleges until around 1980.[193]

The education of Simone de Beauvoir and Simone Weil

The young Simone de Beauvoir was educated in post-war Paris at *Cours Désir*, a Catholic secondary girls school in Paris.[194] It is no wonder that the precociously intelligent young woman balked at the strict educational path that her devout Catholic mother had set out for her. Her contemporary Simone Weil, on the other hand, was allowed to follow her brilliant brother André into the *Lycée Henri Quatre*, and entered the *khâgne* in the female division, under the tutelage of *Émile August-Chartier*, teacher of both Sartre and Merleau-Ponty. The *khâgne* was the second year of intensive preparation for the *baccalauréat*, and successful candidates went on to one of the prestigious *Écoles Normales.*[195] In 1924, the *École Normale Supérieure* (ENS) in Paris opened its doors to women, although not as official *élèves de l'école,* [students], but rather as *bourse de l'Université*, [fellows]. On writing the *bac* in 1925, Weil placed at the top of the list, with de Beauvoir just behind her in second place. Third on the list was Merleau-Ponty.[196] They all met at this time, often, apparently, exchanging philosophical views.[197]

It was not possible for women to study all of the subjects at the *École* at Sèvres, including philosophy. Just as at Oxford and Cambridge, women had attended classes there for some time without official recognition. Following protests, full student status was accorded to women in 1927. This capitulation allowed women to take classes and sit examinations, but they were still excluded from the right of habitation and use of the refectory, apparently to protect them from mixing socially with their male colleagues. This unfortunately excluded women from the informal intellectual and social pursuits of the university.[198] In 1925, the year that both Weil and de Beauvoir completed the *bac*, admittance to the *École Normale Supérieure* was not yet an option for women.

De Beauvoir went on to the *Institut Catholique*, and then to the Sorbonne to study classics, mathematics, and then philosophy. She had hoped to pursue philosophy at the Sorbonne, but on the advice of her teachers at the Cours Désir, who contended that the study of philosophy would mortally corrupt her soul, her mother prevented it. They said one year at the co-educational Sorbonne would cause her to lose her faith and her good character. Simone was sent to the single-sex Institut Sainte-Marie, at Neuilly, to study mathematics for one more year in preparation for the worldly ways of the Sorbonne. [199]

Weil could not refuse the opportunity to go to the best university in France, and in 1928, she entered *École Normale Supérieure* to study philosophy. She and one other woman joined three women who had entered the ENS in 1927. These three pioneers had been given the nickname "The Gleaners," after the famous 1857 painting by Jean-François Millet, depicting three peasant women working in a field.[200] This derogatory metaphor likened the women's academic activities to the lowest form of work (literally

picking up the stray grain left behind by the men who reaped the harvest) performed by women of the lowest class in French society. In 1928, Weil was among the first five audacious women attending the most prestigious and patriarchal university in France.

Neither de Beauvoir nor Weil was deterred from an intention to study philosophy. They were inspired by pioneering philosopher Léontine Zanta, the first woman to be conferred with a doctorate in philosophy, in 1914. Her success was greeted with some surprise; philosophy as a discipline was considered so taxing, and the *agrégation* so formidable, that it was considered an exclusively male domain. Nevertheless, both young women were ultimately allowed to sit the philosophy *agrégations*. In 1929, at the age of twenty-one, de Beauvoir succeeded brilliantly in the examinations; she took second place to Jean-Paul Sartre. Sartre was then twenty-four, and, in addition to having had four extra years of study, had already failed the exam the previous year. Hers was the greater achievement, and according to the reports of the examiners, though first place was awarded to her male colleague, she was the more outstanding student. De Beauvoir became only the ninth woman in France to become an *agrégée* in philosophy.[201] Two years later, in 1931, Weil also obtained the *agrégée* in philosophy, standing fifth in her class, after Claude Lévi-Strauss, who stood third.[202]

Both women made enormous contributions to feminist thinking, made possible only by having had access to higher education. Weil wrote philosophical, mystical and practical dissertations on Christianity, on the ethic and importance of work, and social activism, including *Gravity and Grace* and *On Science, Necessity and the Love of God*, which were published after her death in 1942 at the age of thirty-four. De Beauvoir wrote

numerous philosophical texts, including her most important and well-known work, *The Second Sex*, published in 1949. Her writing was a radical turning point for feminist philosophy and heralded the introduction of second-wave feminism.

Trends for North American women's education in the late twentieth century

The 1920s were a highpoint for women and education in North America, with female students representing forty-seven per cent of students in colleges and universities. In the 1930s through to the 1950s, another backlash occurred, and women's enrolment in higher education dropped below thirty per cent, as enrolment in the women's college declined so rapidly that many ended up in precarious positions financially. The shift away from single sex education and the rush to co-education spurred on by the massive post-war demographic influx of students in the 1960s also decimated attendance at the women's colleges, although numerous formerly men-only institutions opened their doors to women.[203] Radcliff College at Harvard admitted women in 1963, and at the same time, the Servicemen's Readjustment Bill of 1944 created the need for more higher education options, which also allowed some women's colleges to go co-educational.[204] The last institutions of higher learning in North America to open their doors to women were the military academies, which opened to women in the 1970s.[205]

The 1960s saw the opening of the first junior colleges and community colleges, for which one of the intended constituencies was women. Community colleges, also termed "the people's colleges," "open-door colleges," and "democracy colleges,"[206] with

commitments to access and opportunity, were seen to be more welcoming to women, people of colour and ethnic minorities. But it was not until the 1980s when women became the majority of students at community colleges, that women's experiences of higher education, as students, faculty, and administrators, began to be the subject of study and research. Not only are student populations more diverse at the community colleges, so are administrative and teaching ranks, with more than fifty per cent of women in both areas, as compared with thirty-four per cent at the four-year universities.[207]

Some observations on contemporary trends in education

The evolution of women's education eventually produced many social, political, and cultural benefits. The pioneering educators introduced in this chapter understood that ensuring women's access to education would provide wide-ranging and tangible benefits, not just for women, but also for their families, and ultimately to society. Large studies on gender and education, undertaken by UNESCO in 2007 and the United Nations in 2011, corroborate this, clearly showing the benefits of better education for girls and women.[208] Women with formal education are more likely than uneducated women to use contraception, tend to marry later and have fewer children. As the level of female education goes up in the population, fewer women and children die in childbirth. It has been estimated that with every additional year of schooling per thousand women, two maternal deaths can be prevented.[209] A child born to a literate mother is fifty per cent more likely to survive past the age of five than a child born to an illiterate woman. Increasing the level and reach of women's education also has positive effects on their

children's educational achievement level. Educated children, particularly those who receive higher education, lead longer, healthier lives.[210]

This seemingly complex set of interlinked phenomenon, understood by the pioneering female educators, now stubbornly and optimistically occurs in all societies, countries, and cultures where women's education is widely and publicly supported.[211] Nevertheless, gender disparity in education is a global problem that has not seen much improvement for women in the developing world.[212] A key finding on women's education was reported by the United Nations Department of Social and Economic Affairs in *The World's Women 2010*, which found that the vast majority of young people are literate, and that improvements in youth literacy rates have been accompanied by declining gender disparities.[213] However, according to the United Nations, women still account for two-thirds of the world's illiterate, and another two-thirds of non-attending school-age children are girls. This is astounding, considering the known benefits for all societies that are the outcome of women's education.[214]

A feminist study of difference in boys' and girls' education

Feminist scholar and philosopher Luce Irigaray is interested in women's education, and more generally in communication between the sexes. In the 1990s, she conducted research with school children in the region of Emilia Romagna, Italy, regarding equality of opportunity between girls and boys in education, and their attitudes towards one another. She was interested to discover how they might become more aware and

accepting of their differences, and she hoped to teach them to converse about sexual and other differences in a respectful manner. Her initial findings indicated that girls were more open to creative and rich communication, often taking the lead in dialogue with the boys. These conversations were lacking in the classroom, and in the school curriculum there was little emphasis on relational or communication skills. Then as today, most subjects taught at school are presumed to be gender-irrelevant. However, according to Irigaray, when it comes to girls' and young women's education: "Their exceptional relational skills are neither valued nor cultivated in school."[215] She also discovered that girls felt their educational programmes offered more learning opportunities for boys than girls, creating obstacles for girls to succeed and go on to higher education.[216]

Reasons for optimism

Currently, a phenomenon is occurring that is turning around Irigaray's findings regarding women's opportunities in higher education. In Europe and North America over the last two decades, the relaxation of quotas on women scholars and the increasing acceptance rate of women into post-secondary education, has improved the balance of female to male scholars. Young women have been proving themselves as adept as their male peers at every level of generalized testing, and are succeeding in greater numbers at all levels, with women now comprising nearly fifty per cent of the student population world wide.[217] While girls are still underrepresented in primary education, with fifty-four per cent of the seventy-two million children in the world not enrolled in primary education, women are now increasingly represented at the post-secondary level.[218]

Since the mid-1990s in North America, more women than men have enrolled in and are now graduating from colleges and universities. This phenomenon indicates that we are beginning to see the feminization of higher education. Where historically men have been more likely to finish college, since 1991 the number of women in North America ages twenty-five to twenty-nine with a bachelor's degree or higher has exceeded the number of men of the same age with the same credentials.[219] Moreover, this phenomenon is present among all major racial and ethnic groups. Women not only represent a majority of young adults enrolled as university undergraduates, they now comprise nearly three-fifths of all graduate students.[220] Men's dominance in tertiary and post-secondary education overall has been reversed, and gender disparities currently favour women everywhere but in sub-Saharan Africa and Southern and Western Asia, with women predominant in the fields of education, health and welfare, social sciences, humanities and art.

A 2012 survey by the American National Center for Education Statistics indicates that young women in secondary school are more likely to aspire to attend college or university than young men,[221] with 35 per cent less likelihood that they would enrol in post secondary education immediately after high school graduation.[222] In North America, in every year since 1980, fewer men than women have been enrolled in post-secondary education, at thirty-nine per cent versus forty-seven per cent in 2010.[223] The study also indicates that women who enrol in post-secondary education will persist, and graduate at higher rates then men.[224] Educational access and improved opportunities for women should not be reversed or limited because of women's success. The reintroduction of

gender quotas in higher education would be counterproductive and ethically incorrect. Two areas for concern are the falling numbers of young men going into higher education and the persistently low number of women entering STEM fields at the post-secondary levels. These phenomena both deserve consideration and further investigation.

Barriers remain

The fields of science and philosophy continue to reproduce ideological and cultural barriers to women's entry, related to outmoded notions of the scientist/thinker as heroic man. Communications scholar Carolyn Marvin quotes an issue of *Scientific American*, codifying the concept of modern man heroically harnessing electricity and manufacturing, hefting technology like thunderbolts, and, Atlas-like, lifting the world up on his powerful shoulders. These men are personified as " . . . the real men of the world . . . the men who are doing the world's work, and at the same time, steadily lifting humanity to higher and yet higher planes of capacity and power."[225] The metaphor of technology as a force that must be harnessed and controlled by "real" men persists to the present day. Closely tied to notions of power and expertise, technology is still positioned as the province of men, who paternalistically elevate society through their work and technological prowess, and in a heroic encounter with the unknown, protect society's weaker individuals, especially women, from a force they cannot comprehend or resist.[226] The predominance of gendered narratives about technology in popular and academic texts further reifies this notion. There are systemic problems as well, including the current demographic distribution of teaching faculty in STEM programmes, and the chilling effect of women's classroom

experiences of being ignored, ridiculed, or inappropriately singled out in such predominantly male disciplines as engineering and computer science.[227] Rosser, a scholar whose work is focused on the attraction and retention of women in the sciences, emphasises the importance of combating these inequalities with more female instructors, and strong female mentors, guides, and role models for young women studying in traditionally male fields.[228]

Women still face many barriers, particularly in access to higher education in the STEM fields of science, technology, engineering, and mathematics. Despite significant increases in enrolment for women at the post-secondary level, they remain underrepresented in STEM fields, and in philosophy. In the United States, less than fifteen per cent of students enrolled in advanced computer science programs are women.[229] There is a need to identify the barriers to women's entry and participation in the sciences, technology, and philosophy, and the consequent low levels of enrolment in these fields. In their 2011 report on women in philosophy in the U.K., British philosophers Helen Beebee and Jennifer Saul note that there is a disparity between the student population and the teaching faculty in university philosophy programs. Women students are nearly fifty per cent of the student population in philosophy, while women professors comprise less than twenty-five per cent of the teaching staff. These figures closely resemble the low female faculty to student ratios for women in mathematics. Computer science, physics, and engineering show even lower percentages of faculty members to students.[230]

More women faculty members are needed to provide a female-positive classroom environments, and mentorship for their female students hoping to pursue careers in these fields. Women working in technocultural fields can also be stronger supporters of their colleagues and mentors for female students.[231] It takes effort to find women doing interesting work in these fields, and in large and small ways, women and men in technology must learn to recognize and be alert to the ways that individuals in their fields accrue and hold onto cultural authority and power, to exclude women who wish to break into this closely guarded realm. The gender gap could be bridged with educational incentives, such as improving awareness and training among faculty and staff for greater sensitivity to chilling effects in the classroom; training and hiring more female role models; and making technological subjects more attractive to women and girls.[232] Encouraging individual girls and women, and their families, and communities, to reconsider their resistance to women studying technical subjects would be a step forward. This is a cultural change, which will take some time and persistence. Without these means, the effects of occupational segregation resulting from low uptake of post-secondary training and education for women will perpetuate a technological gender gap. To combat the current situation, men and women in education and the professions can help promote science and technology education to better fit women and girls to become equal participants in technoculture.

Balsamo proposes a number of positive strategies for valorising women's work in the sciences and technologies, including vigilant condemnation of mass media's gendered representations of women and men in technology, and new tools for educating women in

these fields.[233] Her work in this regard is useful and imaginative. She advocates the collective creation of a personalised media primer for girls that would act as a guide through the difficult terrain of higher technological education, training, and professional life. Her goal for teaching and learning in technological fields is for more women teachers to create imaginative pedagogical tools that could build multimodal learning capabilities, while at the same time appealing to women's skills in kinetic and sensory learning.

I advocate that women scholars add their research findings, their writing, their creative, philosophical, and technological accomplishments across related fields, to as many publications, exhibitions, lists, and histories of achievements as possible, so that a strong record of success can be demonstrated, for others to build on. As this current situation changes, it will become possible to ascertain the powerful contributions women have to make to technoculture. Better pedagogical tools for teaching women in the sciences, philosophy and technology; more women faculty members; and enhanced access to appropriate education and professional opportunities, will equip women to imagine and realise new and creative ways of thinking. If these strategies are adopted, women in larger numbers will be ready to make their contributions to technology, and the culture that shapes everyday life.

Chapter Three

Eros and the Reflected Gaze

However theorized and/or objectively perused, the body remains inherently vulnerable as the most private and intimate 'thing' we 'have'. It is also the most public.[234]

—*Lucy Lippard*

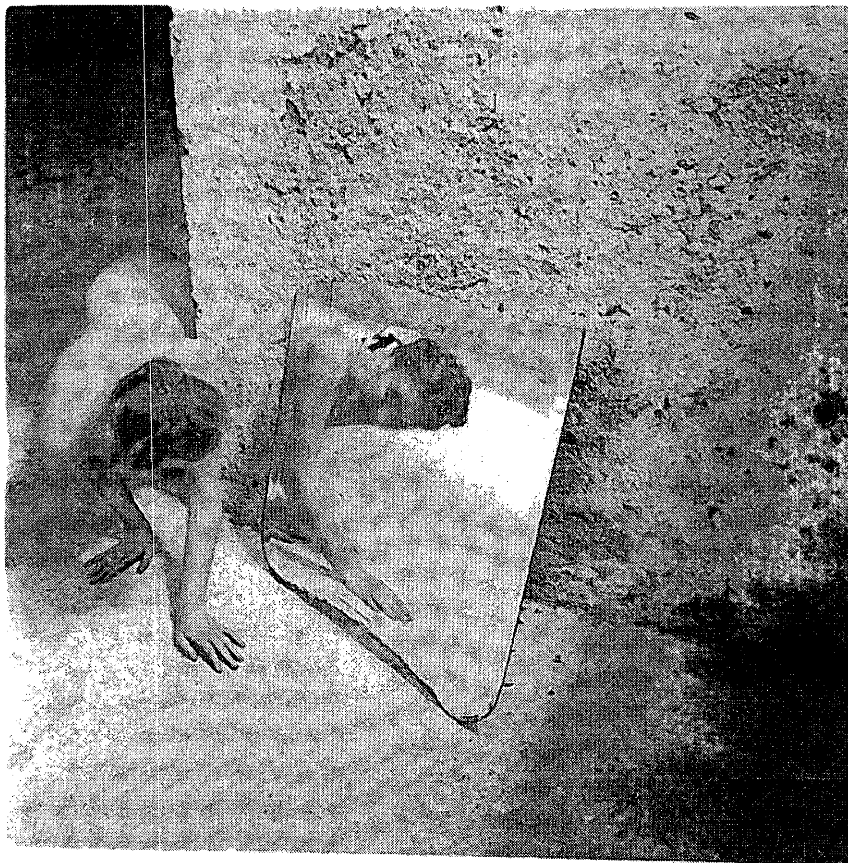


Figure 6 Francesca Woodman, *Self-Deceit #1*, Italy, silver gelatine print, 1977–78
Source: Ingleby Gallery, www.inglebygallery.com

Women artists have struggled in the past to find recognition for their creative practices, and to become recognised and valid contributors to the art world and to culture more generally. This chapter addresses the question of women's participation as artists in technoculture. Beginning with an overview of women entering the field of photography, it explores the ways that a number of women have participated in and contributed to this task. An examination of the ways that women artists have taken up the camera as a technological and creative tool and adopted photography as a vehicle for their creative imaginations is conducted through the work of four photographers: Julia Margaret Cameron (1815–1879), Claude Cahun (1894–1954) and her partner Marcel Moore (1892–1972), and Francesca Woodman (1958–1981), who is the true protagonist of this chapter. Although there are many other photographers whose work would be equally strong in representing this tradition—Lee Miller, Maya Deren, Cindy Sherman, and Sally Mann, to name just a few—further exemplars fall outside of the scope of this chapter. The concepts of ocularity and the gaze, women as subjects, and the creative imagination are discussed. The ways that women photographers adopted technologies in order to capture the nuances of the female body concerns the relationship between the erotic body, the creativity of the Chora, and the demands of technoculture. This chapter focuses on these women artists' particular insights, methods, and epistemologies, and how they have been uncovered, in context with their work.

Many women artists and makers have found creative inspiration exploring the line between representation and obliteration, in an attempt to define the interior and exterior of the female body. Women makers who embrace this persistent creative question are

actively engaged with the phenomenology of the body through their work. Women artists often use their own bodies as subject matter, sometimes as a matter of expediency. Others employ their own bodies as an artistic reply to the issue of female scopic objectification. "Scopic"—coming from the Latin *Scopium*, which is to look, to view, or to examine—references the experience of the subject in interaction with another. Western cultures are described as predominantly scopic cultures, predicated on vision, in which women are often viewed as objects of desire or attainment.[235] For women artists, claiming the female body as the subject of one's own work becomes a way to negate the scopic and engage directly with the vocative. This work that springs from the Chora and women's knowledge, engages the experience of presenting oneself in order to see oneself. The creative impulse to be in control of that viewpoint, is embedded in women's rejection of the scopic relation and uptake of the vocative position. Taking control of the gaze, and using one's corporeal form and artistic practice as a *call* to the viewer, is a tactical interaction for women artists. In this effort, both theoretically and in practice, the strategic reclamation of feminine identities and woman's bodies becomes the subject matter of the artist's work.

Maria Dibattista describes women artists who work with " . . . the body as material locus, the vital and sentient centre"[236] as engaged in creative practices that continuously enliven and engage with the conceptual and corporeal body. She notes that the body, " . . . except for the artist's labour of registration, might fade, historically evanesce, and disappear from view."[237] Some of the artists in this chapter deal in themes of erasure, hiddenness, blurring, and the ghostly disappearance of the female subject into her

surroundings. Sometimes the environment is allegorical, such as the highly charged interior environment of the house, or its opposite, the wild and uncontrolled "natural" surroundings, into which the artist blends. This is work employed in the creative labour of embodiment, subject to sexual vibrancy, reproduction, and ultimately, death: Eros with its helpless subjection to its conjoined alter, Thanatos. This chapter focuses on women artists who have taken control of the use of their bodies and images as primary subject matter. The practice of using their bodies, and the bodies of their lovers in their work has been seen in the past as scandalous.[238] This chapter affirms such work as creative practice emanating from the Chora. It shows how the work of such artists, particularly their self-portraits, addresses and seizes the gaze, using it in self-reflexive and productive ways.[239]

Ocularity and the gaze

From ancient times up until the middle ages, vision was considered to be connected to tactility: looking, especially gazing, was thought to be a sort of ocular finger—a refined way of touching. Euclid described vision as a cone-shaped impulse, with a point that must meet the object of the viewer's gaze.[240] Early scientists postulated the physiology of vision as a beam that was emitted from the eyes out into the world. Vision could be extended and retracted, to reach out and touch the visible object, scene, or person, and brought back to the eye of the beholder. To the pre-moderns, seeing was an act that had real effects on the viewed as well as the viewer. The multi-disciplinary philosopher and critic Ivan Illich has studied and written about theories of vision and the gaze, and describes this early conceptualisation of vision: "The gaze radiates from the

pupil to embrace an object, fuse with it, so that the eye is dyed with the object's colours."[241] The gaze was a dualistic operation founded on the metaphysical belief that the world not only coloured the gaze, but the world also obtained its colour *through* the gaze. Eros was at the heart of this theory of transocular vision, and the gaze was used as a form of address. Directed towards the body or face of a loved one, the recipient could literally be touched and recreated by the lover's glance, and their image brought back to rest inside the lover's eyes. Gazing at a loved one was a form of erotic exchange. By the end of the thirteenth century, the Franciscan scholars Roger Bacon and William of Ockham were speculating on the nature of visual cognition as a form of embodied grasping and intellectual naming of metaphysical simulacrum that swarmed out from the object in view. This visual contemplation was considered an embodied experience, an erotic exchange. The "lustful eye," *libido videndi*,[242] became an object of philosophical and theological reflection, especially as it related to the gaze upon religious icons and persons of the female sex.

The female body has always, under historical and modern regimes of the gaze, been under pressure to remake and reconstitute itself. The gaze of the "lustful eye," once an exchange, was lost in modernity. Looking became an aggressive, acquisitive activity, the privilege of men. In the age of mechanical reproduction, images of women became another focal point of the male gaze. Female subjects dissolved and fragmented under the gaze. Women's bodies disappeared as they were disassembled and reassembled by the male photographer, designer, or filmmaker, and ultimately, the male viewer. Feminists, who did not wish to be the focus of the male gaze, objected to these practices of looking.

Women and cameras

This chapter discusses a number of women artists who use their bodies to interrogate and reveal themselves in an intellectual, psychological, and sexual sense, using the technology of photography. It demonstrates how these artists, in using the camera to capture and create their images and direct them back upon the viewer, are able to realise and exploit the potential of technology to reproduce and subvert the gaze.

Photography was a utilitarian technological practice and later, an art form, that was almost exclusively the province of men, until after the turn of the nineteenth century. As cameras gradually became more affordable and equipment more widely available, the technology became accessible to women. In the 1920s, a number of important women turned to the camera as a tool for creating art.[243] The camera had an aura of casual factuality, and photography was just beginning to be seen as an art form. Women felt comfortable treading such new terrain and taking an original approach to the figure; an alternative to painting or sculpture, which are both forms associated with representation of the female nude, by predominantly male artists.[244]

Many women who entered photography began by pursuing it as a documentary form. The American photographer Berenice Abbot, who learned her techniques in Man Ray's portrait studio as his assistant, spent nearly ten years of her professional career—from 1929 onwards—creating a documentary portrait of New York City.[245] Margaret Bourke-White was the first woman photojournalist to be hired by Fortune Magazine in 1929, and in 1935 by Life Magazine, where she made her name as an outstanding war correspondent. Dorothea Lange shot her vivid documentary photographs of migrant

workers and itinerant farming families displaced by the dustbowl and the Great Depression as part of her employment by the Farm Security Administration. Her iconic images speak to the strength of women and their families struggling to survive in poverty, and stand today as a vital document of the era.

The camera also allowed women to create images that represented on-going personal narratives. Women's choice of subjects for these photographic narratives: themselves and their loved ones—revealed their isolation, but also the developing internalization of the female gaze.

Photography is an accessible medium for women working in the home to meet the demands of family life.[246] The domestic environment also provides the privacy that women often crave when they are experimenting with their creativity; a safe space to try things out, with very little commitment other than what little leisure time can be found. Her children, lovers, and friends may also collaborate in this casual and homely approach to image making. The home provides a field or ground, an uncontested woman's space, in which to stage creative work. There are numerous examples of women who started their photographic careers working in the home, often using the domestic environment as a backdrop, including Julia Margaret Cameron, Claude Cahun and Marcel Moore, Lee Miller, Francesca Woodman, Cindy Sherman, and Sally Mann. All of these artists, who used portraiture and self-portraiture as a medium, endured accusations of narcissism. Some bore the brunt of more recent feminist critiques that the portrayal of an attractive female nude form may collude with, rather than question, the scopic gaze.

The camera can be also used experimentally, and its uses as technology, along with its potential output, are infinitely malleable. There are not many right or wrong ways of using a camera. The lens essentially extends the ocular gaze and mediates it through choices of lenses, exposure, and printing techniques, bringing the artist's understanding of form, composition, cropping, and lighting into play, acting on both the capture and output of photographic images.

Julia Margaret Cameron

Julia Margaret Cameron was a talented Victorian amateur photographer who took up photography later in life, at the age of forty-eight. She was a prolific matriarch; a mother of six children, with her husband, Charles she adopted another five children, making her creative artistic achievement all the more remarkable. Cameron's most popular works were staged biblical or romantic narrative tableaux pieces, usually using her children and nieces and nephews as subjects.[247] She also created portraits of her family, and these photographs were more naturalistic; posed, but not staged. Cameron was the aunt of Julia Stephen (neé Jackson), who became the mother of two famous creative daughters, Vanessa Bell and Virginia Woolf. In *My Niece Julia Jackson,*[248] she captured a young woman reaching maturity, showing the beauty, and bearing of her niece, with an image that required no artifice in its reproduction.

Figure 7 Julia Margaret Cameron, *My Niece Julia Jackson*, albumen print, 1867
Source: National Photography Collection, http://www.nationalmediamuseum.org.uk/

Cameron engaged with photography as a form of self-expression at a time when women had very few outlets for their creativity. Her approach to photography was not the attainment of technical mastery, but rather, to use it as a way to document the domestic, the familial, and the feminine situation of her time.[249] Cameron was single-minded in pursuit of her images, casting her children and relatives as winged angels, cherubs, saints, and players in biblical and romantic narratives. As evidenced in Cameron's photographic tableaux, photographic portraiture often shared functionally similar attributes to the

contemporary theatrical tropes, with its use of costumes, props, masquerade, and mis-en-scène. In these early photos, a moment was caught within the larger continuum and presented with all of the accoutrements of a theatrical narrative. Fundamental to both photography and the theatre are such oscillations between illusion and reality, artificiality and documentary presence, the illusion of objectivity, and the reality of a projected subjectivity.[250]

Claude Cahun and Marcel Moore

> *Under this mask, another mask. I will never finish lifting up all these faces.* [251]
>
> *—Claude Cahun*

Contemporary women's artwork in the photographic genre was radically prefigured by the work of surrealist artists Claude Cahun and Marcel Moore. Photography, at that time considered a magical new technology for documenting reality, played an important role in subverting truth and realism for the surrealists. In the 1920s, photomontage and collage emerged from the work of Dadaists and surrealists to become a major transformational tool, adopted by women artists as both a technique for creating new hybrid images and identities, and an aesthetic that represented the fracturing of identities, roles, and expectations for modern women.[252]

Cahun spent some time in her early years working as a player and stage actor with an experimental theatre troupe in Paris.[253] Knowledge of the theatre assisted Cahun and Moore in their use of costumes, make up, and the assumption of a diverse range of

fictional characters and roles. Their work plays with predominant notions of Eros in indeterminate or hybrid sexual representations. As young Jewish lesbians, and outsiders in the dominant Parisian society, Cahun and Moore based their playful works on the dramatic alterations in Cahun's appearance, using the camera almost casually to capture her playful interrogations of hybrid female and male identities.

Figure 8 Claude Cahun, *Self-Portrait,* black and white photograph, 1928
Source: BBC News "In Pictures: Brighton Photo Biennial" http://news.bbc.co.uk

The mirror takes an important role in the work of Cahun and Moore. In their *Self-Portrait, 1928*, Cahun is posing as *une garçonne*, an androgynous female-male, with short-cropped blonde hair, no makeup except a tan and wearing a masculine, Pierrot-checked, high collared shirt. Her image is doubled in a wall mirror, her reflection turning away, and seemingly viewing someone off camera with intense observation, while she as the subject looks directly and unflinchingly at the camera. Cahun as subject is viewed as an objectification of androgynous glamour, an image that she created together with Moore. In their collaborative self-portraiture, the masculine-feminine dialectic of the scopic photographic gaze is turned on its head, and the enquiring gaze of Cahun as subject is as piercing and interrogative as the capturing gaze of the photographer/viewer.

Figure 9 Claude Cahun, *Portrait of Claude Cahun*, black and white photograph, 1915
Source: Bridgeman Art http://www.bridgemanart.com

In many of her self-portraits, Cahun portrays herself as a vulnerable individual who unashamedly meets the gaze of her viewer. Her steady eyes acknowledge Moore, and allude to the nature of their intimate relationship. In one of their earliest collaborations, *Portrait of Claude Cahun, 1915*, her hair frames her head like Medusa's crown of snakes. Her visage is beautiful rather than monstrous or frightening, and she appears in bed, the most private of interior spaces, the sheets tucked up to her chin. Cahun was clearly an object of romantic desire, but the usual power dynamics of a camera wielded by a male photographer did not apply. As a female subject, her body had an intimate reality that was not the site of projected or anonymous fantasy on the part of the artist or viewer. Nor was she someone to be controlled or defined by the artist. These "self-portraits" were made by Cahun and Moore for their own consumption, and were never widely circulated. They were souvenirs, personal mementos meant for their eyes only.[254] In this way, the artists employed the vocative gaze in their work, which called out and enunciated to them as both the creators and the intended audience.

Cahun and her collaborator co-created a prophetic interrogation of female subjectivity, performative identity, and the female gaze, beginning in their teenage years and continuing over the entire span of their lives. Cahun and Moore's extant work includes a range of literary works, prose and poetry, translations, political tracts, and an extended autobiographical/imaginary confessional. Together Cahun and Moore created objects and photomontage work, and an extraordinary legacy of highly personal black and white photographic images. Cahun and Moore called their collaborative photographic and photomontage work "self-portraits." Although these mainly consisted of images of

Cahun, the women claimed no individual authorship to their work.[255] The fact that the two women were stepsisters, life-long companions and lovers, is also a form of doubling, and their work together is in itself a mirroring of their unusually close relationship.

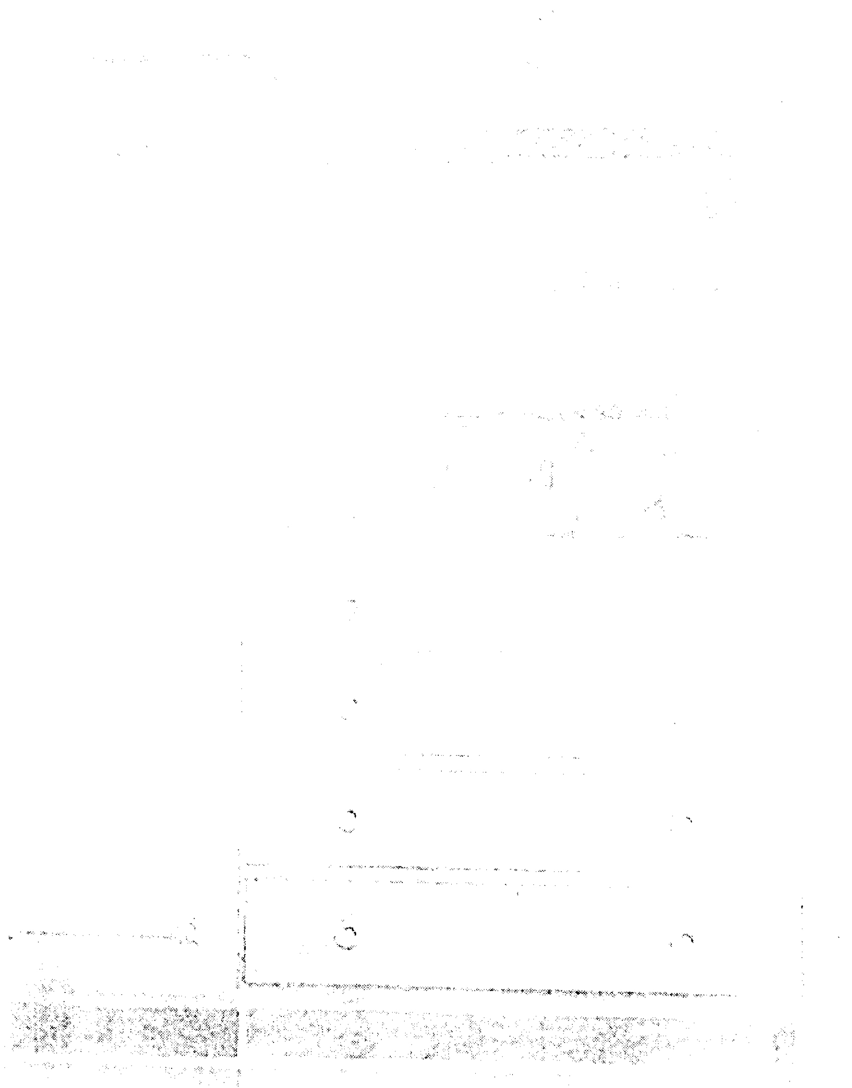


Figure 10 Claude Cahun, *Self-Portrait*, black and white photograph, 1932
Source: Bridgeman Art http://www.bridgemanart.com

The artistic practice of Cahun and Moore, and their exchange of the gaze through their photographic work, was an erotic act, an evocation of the "lustful eye."[256] The "self-portrait" images are radical, challenging, and subversive of both mainstream and avant-garde conventions. It is impossible to connect the images with a single author, or to discover a singular woman subject in the photographs. There are two identities at play, separate but inextricably entwined, exploring selfhood and partnership with their image making.[257]

Francesca Woodman

> *" . . . behind the search for self . . . lies the insistent cultivation of liminal space."*[258]
>
> —*Margaret Sundell*

Photographer Francesca Woodman created a significant body of highly idiosyncratic work and personal photographs in her short life. Her black and white large-format photographs are mainly self-portraits; in some instances, accompanied by female friends. Her photographs, self-portraits, and her few short videos most often portray her as a nude or semi-clothed subject, often in abject surroundings, where her body seems to fade into or emerge from the architecture, furniture, and wallpaper of various abandoned houses and studio spaces. Her body and its reflected image, is her major subject matter, whether glimpsed in a broken mirror, left behind as a negative space or stain, or in blurred movement, barely occupying a decayed interior. DiBattista describes her forlorn and

haunting oeuvre, which "captures the fragility of the female body . . . as an unmitigated pathos."[259] Any analysis of Woodman's work is shaped by the brevity and incandescence of her career: over a ten-year period she made about 800 images and a handful of short videos; most of her artistic output was created while she was still a student. Her reputation and the reception of her work have been influenced by the poignancy of her brief life, and early death, at the age of twenty-two.

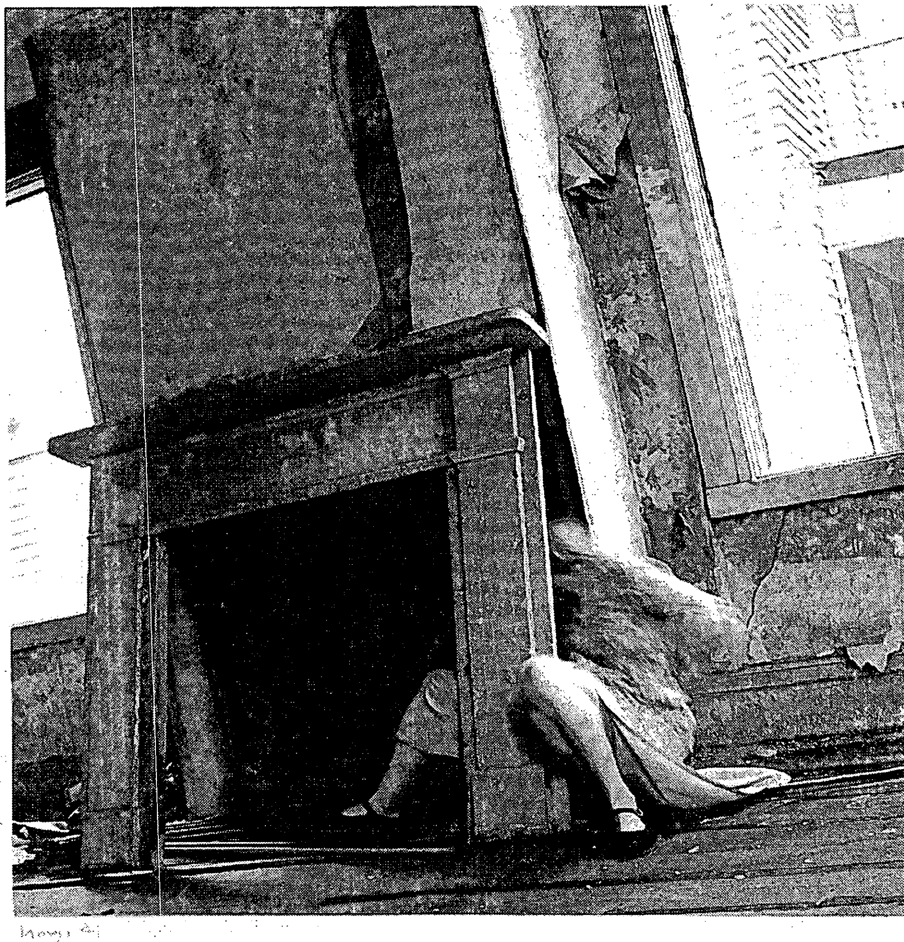


Figure 11 Francesca Woodman, *House #4*, Providence, Rhode Island, silver gelatine print, 1976
Source: Ingleby Gallery http://www.inglebygallery.com

Woodman's is the story of a precocious young woman pursuing an artistic practice in the second half of the twentieth century. As a young female artist she made her way through college at the Rhode Island School of Design in the 1970s, grappling with all of the lingering tropes of the Bauhaus tradition in the art school, and mid twentieth century male dominance in the college faculties, the galleries, and the art world. There are uncanny similarities with Woodman's experience and my own; as an art student in London and Toronto at that same time, I worked in photography and video, encountering similar conditions. My student work parallels Woodman's output, in its use of autobiographical materials, the body, and its playful experimentation with new technologies.

At that time, women artists were defining what it meant to be a woman in the arts, while culture itself was undergoing an extreme upheaval. Feminism gave women new tools to critique male dominated society, to demand equality, and change their roles in the home. Young women expected access to education, meaningful work, and success. Alongside these ambitions, medical advances allowed women to take control of their fertility, and experiment with their sexuality, free of the fear of pregnancy. It was also a time of transformative technological change, with the introduction of early computing, video, and advanced analogue technologies, announcing the on-going advances that were to transform society at the end of the millennium, with new digital technologies.

Woodman faced these challenges and opportunities as a young artist, and took advantage of the new freedoms that the cultural and technological changes occurring in the late 1970s and early 1980s afforded. I am immensely grateful to have grown up in

that same era, to have attended art school, and developed as an artist through that time. Although there were many obstacles, I was able to overcome them, mostly through sheer determination, and youthful exuberance. The inescapable and poignant reality that overshadows Woodman's story, and is transposed onto her work, is that she did not, and was unable to survive the ordeal.

A young artist in transition

In her photographs, Woodman deals with the transience of the female body in a knowing, mature manner, posing herself in her self-portraits in a sort of open confrontation with the inquisitive, transfiguring lens of her camera. She captures herself in transition: sometimes dematerialising into walls and furniture, camouflaged, covered in paint, powder, or dirt, or emerging, blurred, transcendent, barely touching the ground. The performances she stages, often created in sequence, are deeply personal, mysterious and highly evocative. Woodman's photographs are sensual and rich with symbolic allegory, suggestive of incomplete narratives. Her confrontation with her own body casts her as the artist and her muse, a photographic researcher, and an experimental subject.

Woodman mobilised a string of feminine metaphors in her work: the female body becomes house or shell, woman as concave space, woman as superficial reflection, woman as interior habitation, her soft and pristine body is placed within a degenerate environment. Woodman consistently portrays the feminine body as dissolving, destabilized, incoherent. Like Cahun, Woodman was fascinated by her reflected image.

In her recurring uses of glass and mirrors, Woodman is often seen regarding or displaying herself, or peering into the mirror as if a more pristine world lay just beyond. Woodman uses these props to instantiate metaphors of capture, doubling, flattening, and loss of the body. The image in the mirror generates a tension between childish narcissism and adult sexual voyeurism, making a powerful vocative appeal to the viewer, who sees Woodman seeing herself. In the autobiographical work that starts in her early teens, Woodman's young body is seen in many guises, curled up, crouching, crawling on all fours, awkwardly splayed open, or leaving the ground, in a performance of playfully embodied innocence. The work is erotic, but not sexually charged, emerging with startling vulnerability, from her young female body. Her nude self-portraits over the ten year period of her practice, chart her journey from childhood into adulthood.

Woodman's work also bears traces of earlier traditions of the woman as artist's model, the figure in front of the camera rather than behind it, placing herself ironically in the usual role of the model while at the same time obscuring herself as the artist, splitting her gaze and her occupation of the photographic space. The duality of her working method, as the artist in control behind the camera, and the subject captured by it, became a mode of personal interrogation and realization. Subjectivity, personal expression, the narrative sensibility of the photographer, as well as the presence of the *maker* in the image, became the central tenets of Woodman's work.[260] This was particularly fertile ground for the young artist. She used her body and the bodies of her friends as models, to gauge and delineate height, width, depth, weight, and insubstantiality in the architectural spaces in which they were positioned and within the square format of the photograph.

Her work engages in a constant capture and transformation of her own sensory experiences, her interactions with objects and articles in the environment, and with environmental boundaries, in a phenomenological investigation of time and space.

Woodman grew up in a family of artists. Her mother is the famed ceramicist Betty Woodman, and her father, George Woodman, is a celebrated painter and photographer. Both taught in the Fine Arts Faculty at the University of Colorado, in Boulder, where the family lived, and Woodman grew up with her younger brother Charles. As parents, the Woodman adults modelled an artistic life for their children. They opened their Colorado home to visiting artists, among them David Hockney and Richard Serra, and pursued their artistic careers with the children running in and out of their studios. With the firm knowledge that she would become an artist herself, Woodman started her own creative explorations at the age of thirteen, camera in hand, with a series of precocious black and white self-portraits.

With her early photos, she embarked on a playful and technically sophisticated exploration of the potential of the photographic medium. She chose the gothic locale of an old tumbled-down cemetery in Boulder for one of her first photo sessions. In these photographs, her figure is caught in pale and glimmering high contrast, a blur of motion in the fading light of the grave yard. It is an early example of her use of the blurring technique that became one of her trademarks. By using slow shutter speeds in fading light, her image is captured as an unresolved, ephemeral, ghostly spirit, obliterating her as a fixed subject in the composition.

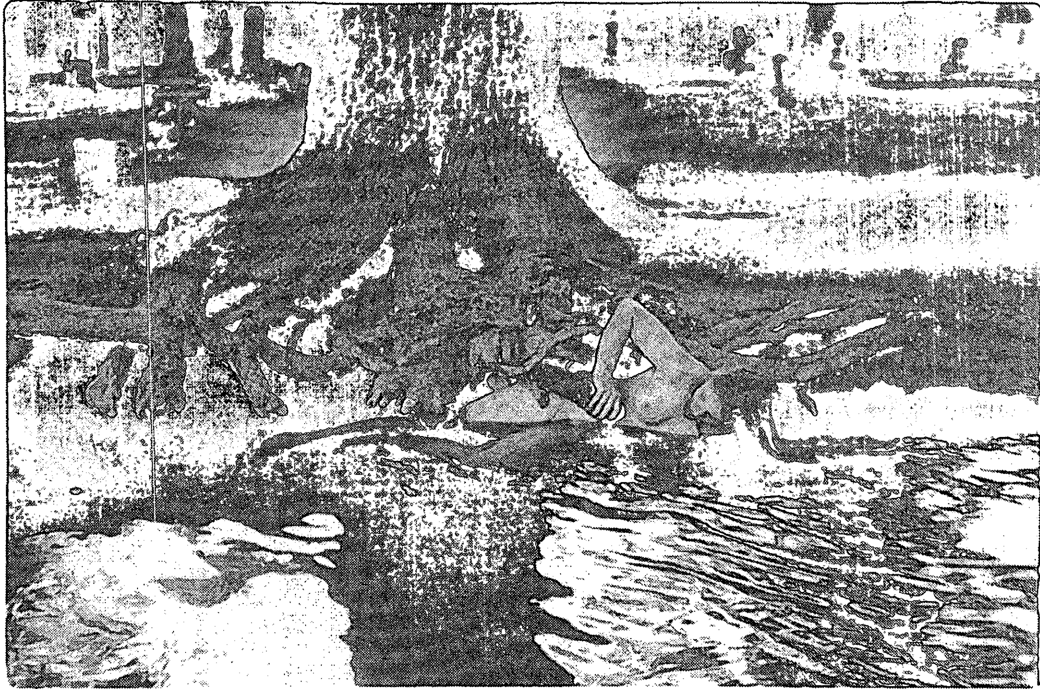


Figure 12 Francesca Woodman, *Untitled*, Boulder, Colorado, silver gelatine print, 1972-75
Source: Ingleby Gallery http://www.inglebygallery.com

The photographs are dramatically composed. Semi-clothed and nude, she slides through the decorative opening of a nineteenth-century grave. In another photograph, shot from above, she presses herself into a narrow gap in a rock. In yet another, she is seen half-submerged in water, entwined in the roots of a tree, which appear to be embracing her naked body in an almost-primordial return to nature. The photographer must have been preternaturally aware of the seductive juxtaposition of her adolescent flesh against the abruptness of the carved and weathered stones and twisted tree roots,[261] The images, which emit a white, ghostly light, are evidence of Woodman's youthful interest and skill in photographic printing and the manipulation of light and exposures. With more knowing than a thirteen year old could possibly evince, Woodman seems to

play with notions of the temporality of her young and beautiful body, arrested in the moment by the camera lens of her camera.

Woodman worked with a medium-format Yashica Mat Twinflex double-lens reflex camera, a gift she received from her father. The medium-format camera required a slow, reflective approach: time for setup and consideration of the lighting and composition. The camera took only twelve exposures per roll of black and white film, and produced a square negative. This type of camera is held at waist or chest height rather than up to the eye. With a tripod, it was possible to take long exposures, which captured her subject's movement in an artistic blur. Even as a beginner Woodman rarely used a light meter, preferring to experiment using the exposure guides on the film boxes, she learned to gauge lighting and exposure intuitively. She learned to print in her father's darkroom at home. She was never fastidious about the quality of her prints, and often experimented with burning and dodging for heightened contrast and ghostly effects. She wrote on her prints, annotated them, creased, and burned them. Sometimes she used them as stationery or as notes and postcards to friends, with addresses and postmarks on the verso of the print. Some of her photos of interiors show that she lived with her prints, stuck them on the walls, lined them up on the mantelpiece, or heaped them in piles on the floor. Her photographs were objects to be looked at, and manipulated.[262]

Student work

Woodman attended the Rhode Island School of Design (RISD) from 1975 to 1978 as an undergraduate student, at a time when individuals wishing to become professional photographers rarely took this academic route. RISD incorporated photography into its curriculum in the early 1950s, granting undergrad degrees in photography in the early '60s as a subset of graphic design.[263]

Figure 13 Francesca Woodman, *Horizontale,* Providence, Rhode Island, silver gelatine print, 1976
Source: Ingleby Gallery http://www.inglebygallery.com

Skills were taught through rigorous Bauhausian technical and thematic approaches. The skills to work through formal problems of design and perception were earned through assignments on space, light, composition, and camera technique, which Woodman dutifully carried out, naming the works accordingly; *Horizontale*, and *Verticale, Depth of Field, Directing Lighting,* and *Space2*. In *Horizontale*, it is clear that Woodman was also playing with a printing technique to achieve a solarized effect around the upper leg of her model, classmate Susan Eslick.[264] The glove that Eslick holds over her pubis adds a horizontal element, and produces a somewhat surreal effect in the doubling of the hand that holds it. Theorist Rosalind Krauss has studied Woodman's work and observed that she quickly achieved and then surpassed the limits that such formal exercises might impose, transforming them into her own personal and highly idiosyncratic experimentations.[265] Krauss notes that, "[s]he internalized the problem, subjectivised it, rendered it as personal as possible."[266] While using the assignments to give form to her own investigations already underway, she showcased her precocious abilities as a practicing artist to her teachers and fellow students.

Woodman's student work from this period also shows her awe of the magic of light, reflection, motion, and the way that the camera sees things and captures them. Woodman approached the camera as technological tool for capturing light, evanescence, and fragility. Her work shows the mastery of her chosen technology, which she learned through sustained practice.

then at one point i did not need
to translate the notes; they went
directly to my hands

Figure 14 Francesca Woodman, *then at one point I did not need to translate the notes; they went directly to my hands*, Providence, Rhode Island, silver gelatine print, 1976
Source: Ingleby Gallery http://www.inglebygallery.com

In her diary, Woodman compares her photographic experiments to the piano exercises she practiced as a child. Playing the classical variations involves learning, practicing, mastery, and then forgetting what you have learned in performance: "What

happened is that I played the piano for a long time. The pieces I played most were themes on variations, Scarlatti, etc. This occurs in my imagery."[267] On the edges of a series of photographs from 1976–77, she scrawled, "I could no longer play. I could not play by instinct . . . And I had forgotten how to read music" and "[t]hen at one point I did not need to translate the notes; they went directly to my hands."[268] Here Woodman is referring to her mastery of her craft, and the ability to let go of training once it has become embodied. She was learning how to give way, when skill and technique background intuition, to the creativity that is given free play, in an advanced artistic practice.

Like Cahun, Woodman was interested in reflection, and shot images of her body enclosed in vitrines and glassed or walled spaces. The photographs from the *Space2* student series of 1975–76 employ a vitrine case, with her nude body fully enclosed, hands and breasts pressed against the glass, face and head often blurred by movement or focus, a captured female body attempting to break through a tortuous glass enclosure. These photographs seem to bear witness to the narrative of a violent act, with her body framed, clinched, and pressed against the glass. She is using formal elements of the Bauhaus processes of composition, the planes and contours of the body made physically and brutally palpable, in pressing her body against the glass plate.[269]

Experimental video work

There is further evidence of Woodman's spontaneous playfulness and experimentation in her few extant video works. Abandoning overt objectivity to allow herself to participate as an "in-between" presence, Woodman in these video experiments invites a sort of voyeurism by her self-conscious portrayals of her own female body.[270]

Figure 15 Francesca Woodman, *Untitled*, Providence, Rhode Island, silver gelatine print, 1976
Source: Ingleby Gallery http://www.inglebygallery.com

Woodman's video works all document a sort of performance, complete with off-camera instructions and dialogue. We cannot know whether she intended to edit out the sound in the final mix, but in the few extant videos, the live soundtrack remains. There is no particular narrative arc, simply a succession of scenes recorded from the same approximate fixed point of view, much as she would have fixed her viewpoint with the still camera. Video allowed her to expand on the temporal concerns of blur and motion she so effectively experimented with in her photographs.

In the 1976 video *Trace*, a young woman in a fur coat and boots walks into the frame and towards a chair in the corner of a room. She removes her coat, revealing her naked body, unzips her boots, then reaches towards a can on the floor and sponges herself with white paint. She then lies down on the floor, carefully arranging her body. A click signals a cut, and the scene instantly changes: white powder dusts the floor and her body, and the woman gracefully gets up from the floor, placing one foot outside of the silhouette. Looking back once at the shape her body has created on the floor, she turns and walks out of the frame. Off camera, two female voices discuss the image on the floor: "Oh it's such a wonderful shape!" and "Oh, I am really pleased . . . I guess I should take a photograph," which is what she did.[271] We have the evidence in two photographs taken after the video performance, in which she sits in the chair that had held her coat and boots, still naked, but now wearing her familiar Chinese slippers, her feet at the head of the silhouette.

Woodman's forays into video were not extensive, but her journals show that she had a sophisticated understanding of its potential for creating the effects captured by her still camera: " . . . liquid can be used to delineate motion, i.e. paint poured down M.

accentuates her motion plus its own / shoes full of powder to pour / the shapes of motion on my floor left by powder tracing. / This coincides well with black paint flowing off forms / / wallpaper—becoming environment."[272] In this excerpt as in others, she relates her ideas for photographs and videos in a fluidly interchangeable method, noting the phenomenology of materials and their interactions with the body.

The entrapped body

In her 1976 *House* series, Woodman plays on the trope of the madwoman in the attic, well known from the Brontë novels, which she reportedly adored. In her choice of nineteenth-century environments and vintage housedresses, her work suggests the narrative of the gothic melancholy of a fin-de-siècle girl-woman, entrapped in the devouring house; her female body and psyche engulfed by the decaying domestic environment.[273] She investigates projecting her body into these liminal spaces—deteriorated walls, broken windows, a gash in the floor, peeling wallpaper, an open fireplace propped up against a wall—with her nude or semi-clothed body vulnerably enfolded, displayed, or captured within them.[274] A liminal relationship is set up between Woodman's blurred subjects and the house as uncanny structure, strangely animated and alive in its disuse and disrepair, full of detritus, empty of cleanliness and order, inhabited by the female ghost who cannot become the housewife. The house also plays the role of a kind of *camera obscura*, with subjects prone to both appearance and disappearance.[275]

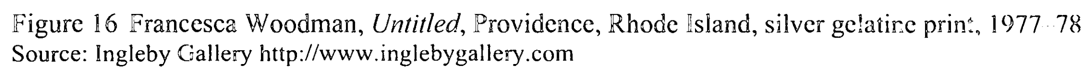


Figure 16 Francesca Woodman, *Untitled*, Providence, Rhode Island, silver gelatine print, 1977–78
Source: Ingleby Gallery http://www.inglebygallery.com

In another series exploring the entrapped body, Woodman captures a pose strikingly similar to Cahun's in the 1932 self-portrait in which she poses doll-like, in a large armoire. In Woodman's untitled work of 1977–78, she portrays herself barefoot, in a printed dress, seemingly sleeping or perhaps insensible, enclosed in a museum vitrine,

which also displays animal taxidermy. She is menaced by a growling raccoon, a frightened fox, and inquisitive birds. Like the dead animals trapped in their taxidermy skins and feathers in the glass case, Woodman represents herself as a dead creature, also entombed in the vitrine. Like Cahun in her 1932 self-portrait, Woodman's body doesn't quite fit in the enclosure, and she is dressed up and on display. Her body, head, and hair spill out of the open display case and onto the floor. In a final entrapment, all of the subjects are captured and fixed by the frame of the photograph.

In 1977–78 Woodman embarked on a series entitled *On Being an Angel,* in Providence, Rhode Island, which she continued later that year in Rome. In this series, Woodman seems to be attempting to levitate, bending backwards until falling, or to fly, leaping to escape the gritty environments she inhabits, detached from her paper wings. She also appears nude, hanging in doorways, as a blurred, unseen presence. She seems to be half-sensed if not seen by the young woman who sits, facing the viewer. These images are less ghostly and more visceral, with traces of joyful comedy, and black humour. Much as Cahun did, Woodman cleverly employs the chemical properties and technologies of photography as a magic lens to reveal what cannot be properly perceived, much less seen. These images have a playful and experimental quality, but with hindsight, it is difficult not to view them as meditations on her early death.

Woodman was aware of the image she projected of herself: knowing and often humorous. Commenting on the persistent self-portraiture of her work, she acknowledges its importance: "I kept trying to change my direction and photograph other things . . . I mean I am as tired as the rest of you of looking at me. But as you can see most of them

are in this back section of less successful work. I think that I tried too hard to see why I do what I do there are lot of things which if I look at them too hard grow shy and stiff."[276] The excerpt from a letter to her mother is a highly sophisticated critique of her creative method, showing an understanding that her best work was spontaneous. She acknowledges that, for reasons of convenience but also her own artistic compulsion, she uses her own body and imagination as primary subject matter in her best work.

Figure 17 Francesca Woodman, *Untitled*, Rome, silver gelatine print, 1977–78
Source: Ingleby Gallery http://www.inglebygallery.com

Working in the world

When Woodman graduated from the RISD in 1978, she stood out from her class as an advanced and confident experimental photographer and video artist. She had a distinctive style and voice, which referenced classical, gothic, and surrealist subject matters—a formal, rigorous, process-driven approach. In an undated excerpt from her diary, "Notebook #6, Journal Extracts," she wrote: "I am interested in the way people relate to space. The best way to do is to depict their interactions to the boundaries of these spaces. Started doing this with ghost pictures, people fading into a flat plane—i.e. becoming the wall under wallpaper or of an extension of the wall into the floor. Closer to what I am doing now is my beginning last Spring of M. or myself enclosed by a glass coffee table. Also video tapes—people becoming, or emerging from environment."[277] It is possible to discern in Woodman's quotation something of her working process. She links her new work back to her earlier experiments and she mentions her growing interest in capturing these visual and psychological effects with video. In the quotation, we see a young artist with a very sophisticated understanding of the effects she is trying to create with one medium, and clear interests in exploring others.

In 1980, Woodman began an intensive period of experimentation with a new direction in her work using collage and photomontage. Technically, she experimented with Diazotype printing, using sepia or cyan tones, on large rolls of the paper normally used in the production of blueprints for architecture. The enormous shift in scale from her intimate gelatine silver prints, to the larger-than-life scale of the Diazotypes, allowed her to work at architectural scale and with architectural materials, in complex, multipart

works. She wrote on June 18 1980 to the Rome-based American artist Suzanne Santoro: "Anyway the exploration in Blueprint was very fruitful and I can now make images from any size negative into any size of Blueprint. This winter I concentrated on building a temple, plans etc. are enclosed. I wanted to talk about lofty and calm things, since my life is neither, and also to get away from the very intuitive personal pieces that have characterized my work in recent years."[278]

Woodman exposed these large sheets of light-sensitive paper with natural daylight, using negatives constructed from tissue paper and acetate, or projected her imagery with a slide projector onto the paper, which was slowly exposed by the projector bulb. She then used a commercial blueprint processor to make her prints. The poor light sensitivity of the paper necessitated very long exposures, which required her to spend several hours producing a single photograph. She used the Diazotype process in her works *Caryatid* and the 1980 photomontage *Temple,* to which she refers in the letter, which both included old and new pieces, as well as reproductions of historical photography. *Temple* is a large piece, which stands more than fifteen feet high, evoking the façade of a Greek temple. The new work represented a departure for Woodman, away from the indulgence of intimate self-enquiry and small scale towards a more formal enquiry about relationships between classical statuary, architecture, and the female body. Her new work was highly determined and present, while retaining the sensitivity of her earlier work. They bore the hallmarks of rigorous, mature artistic production.

Figure 18 Francesca Woodman, *Caryatid*, New York, diazotype, 1980
Source: Museumviews http://museumviews.com

Woodman craved recognition for her new work, and felt the anxieties that most new graduates have about their future. She started working in colour, taking a new direction. With colour photography, she made some unsuccessful forays into fashion, failing to make a professional liaison with photographer Deborah Turbeville, whom she hoped to work for as an assistant. Her attempts to get the commissions and funding she needed to continue to develop her work seemed to have stalled. A series of mishaps ensued: an important grant application was denied; her bicycle was stolen, and her relationship with her boyfriend collapsed. Struggling through depression and psychiatric illness, which had been diagnosed after a suicide attempt in autumn of 1980, Woodman stopped taking the medication she had been prescribed. On January nineteenth, 1981, Woodman jumped from the roof of a loft building on the East Side of Manhattan. Nobody at the scene recognized her or knew her name. She carried no identification.[279]

Francesca Woodman's death can only be attributed to the tragic outcome of a troubled mind. She was disillusioned with her attempts at a career, but it seemed she was satisfied with her artistic output, and glad that commercial constraints had not coarsened or degenerated her work. Woodman's interest in her artistic reputation and its preservation emerges in a note written to a friend around the time of her first suicide attempt: "I finally managed to try to do away with myself, as neatly and concisely as possible . . . I would rather die young leaving various accomplishments, some work, my friendship with you, and some other artifacts intact, instead of pell-mell erasing all of these delicate things."[280] Death, like photography, was a process for Woodman. This private intimation perhaps indicates that she had some foreknowledge of how her life

would end. She would compose the outcome, and be as concise in her final act as she was in creating her highly orchestrated images, fixing her work in space and time.

Rebirth's pleasures

The fertile imaginings and poignant portraits of Cameron, and the self-portraits of Cahun and Moore, and Woodman, question and thus redefine woman's erotic interiority and exteriority. Through their work, they set themselves against notions of disappearance, decay, death, and *Thanatos*, with their own erotic feminine embodied appearance and persistence. Artists who use themselves and their bodies as the subjects of their work set up a tension between the autobiographical subject they portray and the audience. This upsets the balance: the supposedly detached gaze of the artist as neutral observer or documentarian affects the reception of the work, setting up tensions and critique. Many artists who work in this arena are viewed as self-publicists, narcissists, or exhibitionists.

Critic Lucy Lippard has written extensively on women artists and women's art, and the genre she refers to as women's "body art," taking a firm grasp on the subject in her aptly titled 1976 essay, "The Pains and Pleasures of Rebirth."[281] She points out, perhaps rather obviously, that body art was the result of a legitimate and necessary desire for artists to affirm their female-body experience. She writes that there is added significance to the work in reference to the history of art, which positions women as the object of the predominantly male gaze. However, when women take on self-representation, this paradigm may be overturned. Lippard states, "When women use their own bodies in their

artwork, they are using their *selves*; a significant psychological factor converts those bodies or faces from object to subject."[282] Such self-display may be turned back onto the viewer as a defence, a shield, an enquiry, or even a form of intimidation. But the woman artist who uses her body in her work walks a thin edge, and her work can sometimes be re-appropriated. While having the right to use her body as she sees fit, she may find that her work falls into the void between the critical and the voyeuristic, and has in fact been viewed as titillating, even as she seeks to expose the very insult of men's titillation.[283]

I quote artist Marina Abramovic, with no attempt to include her as a main subject in this chapter, but rather as a commentator. With her notorious body art performance *Rhythm O, 1974,* she undertook a work of brave research-creation, to explore the dynamics of passive-aggression on the female body. In an evening performance at Studio Morra in Naples, Abramovic stood by a table and offered herself to the assembled spectators, mainly men, who were told that they could do what they liked with a range of objects and her body. A text on the wall read: "There are seventy-two objects on the table that can be used on me as desired. I am the object." The range of objects included everything from the benign to the deadly: water, a bottle of perfume, a feather, a rose, honey, grapes, olive oil, a comb, a lipstick, paint, and a candle, but also a whip, chains, nails, needles, scissors, knives, a saw, an axe, matches, razor blades, sulphur, and a gun, complete with bullets. After six hours the performance was halted by concerned spectators: by the end of the performance all of the artist's clothes had been sliced off her body with razor blades; she had been painted, cleaned, decorated, cut and crowned with thorns; and finally, had a loaded gun pressed against her head. Not surprisingly, having

plumbed such depths, or alternately, having reached such an apotheosis, Abramovic described the piece as the logical conclusion of her artistic research on the body.[284]

Women's body art and photography seeks to uncover the woman artist's identity, often trying on new roles and challenging the boundaries between the self, the body, and identity. The boundaries between the culturally projected image of women and women's own projections of themselves were breached by women's body art. The work forms a distinctive trajectory from private to public selfhood: a vehicle for catharsis, and self-revelation. Women's body art and photography has been used as a path to knowledge, offering artists the opportunity for the exploration of their own notions of beauty, feminine attributes, and identities, separate from the representation of women by male artists. The boundaries between the culturally projected image of women and women's own projections of themselves were breached by women's body art. The work formed a distinctive trajectory from private to public selfhood, a vehicle for catharsis, and self-revelation. Women artists have used the Chora and the body as a path to artistic self-knowledge, offering the opportunity for an exploration of their own notions of beauty, feminine attributes, and identities. Multidisciplinary artist Carolee Schneemann, who transformed the discourse on the social body in art with her performances in the 1970s, summons the mythic nature of her own liberation from the scopic gaze, and the vocative call in her work: "In some sense I made a gift of my body to other women: giving our bodies back to ourselves. The haunting images of the ancient Cretan female bull dancer: joyful, free, bare-breasted, skilled women leaping precisely from danger to ascendency, guided my imagination."[285]

Chapter Four

Women's Narratives in Mobile Environments

> *It is true that storytelling reveals meaning without committing the error of defining it, that it brings about consent and reconciliation with things as they really are . . .* [286]
>
> —*Hannah Arendt*

Hannah Arendt wrote that narration " . . . reveals meaning without committing the error of defining it." Narrative allows the storyteller to consent to a reconciliation of herself and her story within the framework of an agreed-upon construction of reality.[287] This may or may not be the "truth." It is most certainly a personal evocation of truth and reality—of things as they are perceived and mutually agreed upon—which is a way of constructing meaning. Arendt implies that narration is a delicate art that requires a certain amount of consensual collaboration between the narrator and her audience, as they expand the boundaries of the known, and reach a level of shared understanding and belief in the unknown together. The construction of narrative interaction has been employed by women artists, and used as material to create collaborative and playful public mobile artworks, engaging the body in the physical landscape or cityscape, with the use of mobile technologies.

Women's collaborative mobile artworks engage with personal and community narratives, subjects of memory, and personalised annotation of public space. At the same time, this work brings a reinvigorated focus to corporeality, within digital technology. All

of these artworks are experiential, and ask their audiences to come out into the world, to use their bodies and their senses, to walk and observe, to inhabit their surroundings, and to play. These artistic collaborations, often between the artist and their audience, are examined within the context of the feminine imagination, and the new opportunities that technology offers, to enable an emerging genre of public art.

Women's insights and experiences of being in the landscape, both wild and urban, have been explored through narration, using experimental research-creation methods, personal stories and memories, and mobile technologies. Women artists and designers, who have effectively created a new artistic form, have used these methodologies and new technological tools. This chapter shows some of the ways that women artists are learning to become expert creators and innovators with digital tools. I pioneered some of the early collaborative research-creation and scholarship in the mobile art space, and so I include my own artwork here.

Identity and mobility

The permeable and fluctuating nature of human identity, assisted by the adoption of personal digital tools, provides compelling opportunities to reformulate, narrate, and represent aspects of one's story to the world. Mobile social media tools enable individuals to function as self-promoters and public commentators, with practices that offer a personal and often very explicit engagement between the self and technology. In the process, boundaries shift between the storyteller and her stories, distributed in the

digital realm, and her audience, who as participants, talk back, add to and redistribute these stories. This chapter discusses the ramifications of such creative and collaborative engagement, and the widespread digital dissemination of personal narratives. The designers and artists discussed here are seeking to substantiate embodied experience and meanings of place, to take them out of the virtual world and place them firmly into the real. Their mobile art and design works present situations that transfigure connections between the real and the virtual. They are often enlivened by interactions with other participants spending real time together in real places, and co-creating a collaborative experience. These collaborations are achieved with the use of mobile technologies.

Personal digital technologies, such as mobile phones and cameras, have become ubiquitous tools of production for personal narration, and dissemination. Narrative relationships can be small and intimate, or may contribute to a larger collective memory, a conversation with culture-at-large. Communications interpenetrate and become imbued with social currency as they are referenced, augmented, and disseminated through diverse channels. Personal narratives expand and multiply, with participant's additions and interactions, becoming multi-vocal cultural productions. Stories may relate to the *maker's* culture, community, place, or home; they are tales where the personal and particular become universal through audience participation and transmission. Stories that were originally grounded in particular place and situated in time may become new responsive hybrid narratives through digital retelling. The most powerful place the real, embodied, personal experiences of the narrator alongside the interactions and responses of the audience (who may be present or virtual), to create a participatory opportunity.

Participation can be in the form of an embodied experience, as in the case of interaction with others in a physical space, which may be augmented by virtual layering created by mobile devices. Such hybridity allows accretion in the ephemeral space and timeline of the interaction with personal, and eventually, collective meaning. In this way, the site of narration may be transformed into a place of exhibition. These hybrid spaces and activities present opportunities for important relational interactions, which are attentive to participants' identities, presentations of self, and locations in physical and virtual space.

An exploratory reading of mobile narrative practices presented here focuses on exemplars from the recent history of women's narrativity in mobile space. These formative projects address Cavarero's notion of the construction of a *narratable self*[288] by which she infers the creation of meaning and selfhood, through narration. The narratives presented are personal, revealing, and expositive. They are relational in their address to their audiences, and closely tied to the communities and places where they were created. These women have created artworks that contribute to a public space that is open, diverse, and richly imbued with the delightful intimacy of personal stories. This space in turn scaffolds the larger aims of these community narratives, which create stronger and richer communities through story telling.

The artist/narrators use strategies and methods of working in both located and virtual space, using mobile technologies to take and reshape stories in unexpected ways. The trajectory of the projects follows an arc from the highly personal to the political as the potential of locative media has become better understood. Narrators and audiences

experiment, rehearse, manipulate, and play with the media, using the results to create stories from the past and strategies for potential futures.

Relational narratives

Hannah Arendt elucidated the function of narrative enquiry in her conceptual construction of the "narratable self" in *The Human Condition*. She quotes the author Karen Blixen (*nom de plume* Isak Dinesen): "All sorrows can be borne if you put them into a story or tell a story about them."[289] Arendt refers to Blixen's use of narrative when she writes of the ways that individuals may realize themselves as unique existants through the act of narration. Narrative assuages grief, through its making and its telling. Arendt insists such strategies are needed, because who someone is remains inexpressible in philosophical terms; uniqueness of the individual being a concept that philosophy fails to address. Philosophy, Arendt maintains, is primarily concerned with *what* questions, modes of thinking and reasoning about larger questions of existence within the frameworks of culture and society. Philosophy does not traffic in the stories of unique individuals and their relationships to one another; yet, who someone is, although not uncovered philosophically, is also not ineffable. Arendt states that knowledge of oneself, *who* one is, can only be achieved through the continuous appropriation of stories. In answering the question "who are you?" one would reply, as Dinesen suggests, with a story.[290]

Arendt sees the narration of life stories as an alternative to philosophical analysis, because narration both deals in uniqueness and illustrates the interactions between individuals. She proposes the theory of an existant's narrative, which can be revealed and made manifest through actions and speech, and continuous appropriation through "words and deeds, which ex post facto, form the unique life-story of that person."[291] Arendt maintains that narrative reveals meaning in a life that would otherwise be perceived as merely an intolerable sequence of events.[292] She asserts that narrative is the tool that allows the individual to avoid this meaninglessness, so that "every individual life can eventually be told as a story with a beginning and end."[293]

Italian feminist Cavarero focuses on the moments when the disjunction between discourse and life is suspended through personal memories and the act of narration. In the most personal sense, the interior narrative enquiry becomes self-reflexive, revealing, and expositive. She describes a relationship between one's life and one's life story, in terms of the desire for that narration. Lives are disjointed and fragmentary and do not form an easily narrated story, nor do they coalesce with an appearance of unity around events. A life does not follow the structure of a three-act play with a coherent beginning, middle, and end. It is the creation of a sense of unity, form, or arc, which is desired by the narratable self. Cavarero writes that, "[t]he self desires and is open to the tale of a life story that unfolds in his or her lifetime in a way that uniquely reveals who that person is."[294] In reference to the narratable self, Cavarero infers the formation of the unique subject, and a collective struggle towards subjectivity, which makes clear the fragility of each individual.[295] She suggests, echoing Arendt, that the setting or context of this

subjective narration is attentive to *who* rather than *what* we are. Cavarero's "plural and interactive space of exhibition"[296] explicates a relational interaction and provides a place for the exchange between narrator and narrative recipients. Finally, place, in turn, provides a context and a local reception that brings plurality and communality to the exchange.

Cavarero's notions of the importance of context and the place of narrative exchange can add to our understanding of locative mobile art making. Mobile art practices allow individuals to experience stories and places differently. Narrators may use these opportunities to access and re-narrate situations, and remediate surroundings. Some projects attempt to uncover and disseminate personal and community narratives, with broad aims. These range from serendipitous discovery of the past to more strategic support for collective community-building and social exchange. Hence, the personal narrative builds relationship to the community or to public narrative. Such practices allow the collective process of sharing and co-constructing narratives to annotate existing communities in new ways. They may also support the creation of new communities built around playful forms of co-inhabiting physical and virtual space.[297]

Mobile story telling in public space

How may these mobile art practices engage communities in social practices and narratives that are personal, playful, and provocative? In this emerging genre, locations and contexts are often public, and audiences are on the move. The participatory realm

creates speculative links between individuals and their narratives in real places, which then turn into virtually augmented environments. These mobile projects create a compelling new medium for exploring the history and life of a community. Locative storytelling overlays many narratives on community space, offering new opportunities for creative interaction, to storytellers and participants alike. As I will show, mobile art can then be used as a force for community building, critique, and social change.

Over the last decade and a half, a growing body of narrative works enacted with the use of new digital technologies and networks reveals individual and community interest in public storytelling practices. These works have set precedents in emerging mobile locative media and art practices. The most innovative and groundbreaking projects engage whole communities in participatory creation of personal/public narratives. Most interesting are exemplary projects that address the challenges of realization, aesthetic implementation, and artistic installation in hybrid public spaces. Makers of this form of hybrid mobile environmental art do not attempt to classify the form they have created. Their signature "mashup" of mobile, online, and other narrow- and broadcast technologies is combined with strategic calls to action for multiple players in the urban landscape. Calling their work "urban games," "interactive art," "immersive theatre performances," and "research projects," they have pioneered a new art form. They may use the genres of strategy games to create so-called "big games," played in urban space, using both live-action and video elements, mixing these with surveillance technologies. At their best these games stimulate the same adrenalin-infused sensations associated with physical chase-and-capture games, complex and multi-layered, embodied, location-based,

technologically mediated experiences.

Locative media origins

Locative media is a useful term that refers to mobile works, which are attached to real physical places and their communities. The web-artist, mapper, and media activist Karlis Kalnins coined the phrase. Before Kalnins called attention to the importance of such attachment to place, mobile media was thought of as existing in the spaces defined by and between servers and handsets or receivers. In 2003, he used the term as a radical test-category for processes that facilitate the annotation of physical space by combining mobile data communications and computing with Global Positioning Systems. Its catalytic premise was the growing civilian awareness and engagement with a construct that had precise military origins. *RIXC*, an international media arts collective and network of researchers working with mobile, context-aware computing devices and applications, held its first "location-based" workshops in the summer of 2003. They were hosted at *K@2*, on the site of a former Soviet military naval base in Karosta on the west coast of Latvia.[298] The influential Latvian artists Rasa Smite and Raitis Smits, who were working on the *Acoustic Space Lab* project at the *RT:32 Radio Telescope* in Karosta, led an important series of "transcultural" mapping workshops, crossing cultural boundaries to further explore this new territory.[299] Locative artists and researchers came together to investigate inter-dimensionality in their experimental proposals. One dimension they explored was the ability to simultaneously move through and address physical and electronic space. Their work explicitly acknowledged the potential and use of the

satellite-based GPS navigation technology created by the United States military. Their innovation was to adapt that technology for geographically and socially mediated artworks and investigations. The introduction of these technologies into the civilian domain presented new possibilities for social interaction, annotation, and the use of public spaces as sites for a new kind of shared experience.

Forest Walk and *Trace*

Long before *K@2*, a number of pioneer artist-investigators were working with combinations of location and mobile technology in innovative ways. In 1991, the Canadian artist Janet Cardiff created her first audio walk at the Banff Centre in Alberta, assisted by some of the first personal mobile audio technology, the Sony Walkman tape recorder and player. Her *Forest Walk* (1991) project guided participants through the local pine forest with an audio cassette deck and headphones, equipped with walking directions and observations interspersed with a dramatic audio monologue. The dialogue became part of each participant's own unique experience of literally walking in Cardiff's footsteps in the Banff pine forest. Cardiff admits her instructions were difficult to follow and the sound quality was poor, but the experiment dramatically changed her approach to embodied environmental narrative. *Forest Walk* became the prototype for many of her later mobile audio walks and situated artworks.[300] *Forest Walk* is a foundational mobile narrative work, a beautiful and simple concept that was built upon by other artists in later mobile artworks. Although the artworks that followed employed more sophisticated

technologies, they are no more effective in mobilising the body and the erotic personal narrative, in conjunction with a rugged walk in a wild landscape.

Figure 19 Janet Cardiff, *Forest Walk*, audio walk, 12 minutes, 1991
Source: Janet Cardiff George Bures Miller http://www.cardiffmiller.com/artworks/walks/forest.html#

Artist Teri Rueb created her memorial project *Trace* in 1999, building on ideas explored by Cardiff's audio walks. *Trace* was composed of embedded narratives, poems, songs, music, and conversation that responded to participants' movements through a

plotted path in the Canadian Rockies. *Trace*, also created at the Banff Centre, was one of the first geo-annotated mobile art projects.

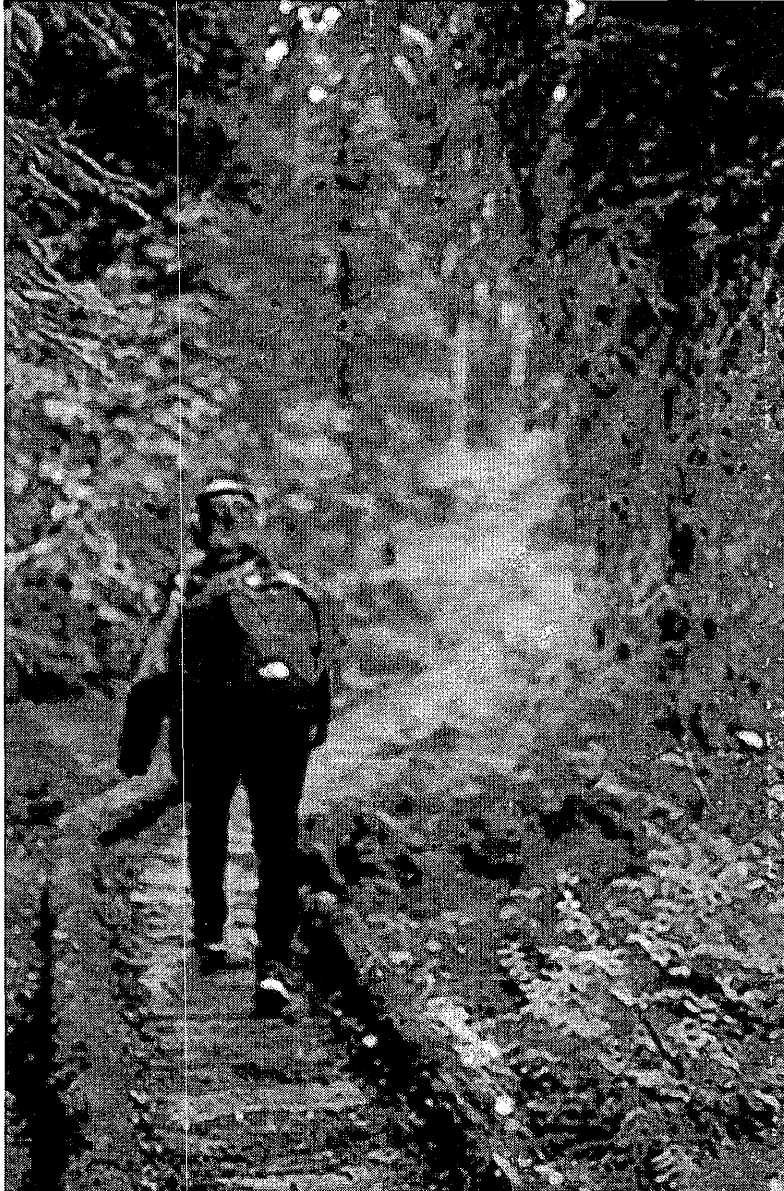


Figure 20 Teri Rueb, *Trace*, environmental sound installation, 1999
Source: Teri Rueb http://www.terirueb.net/trace/index.html

Trace used GPS coordinates embedded in the landscape to access a database of collaboratively created media works, spoken word narratives, poetry, instrumental and vocal music, which the participant navigated by walking through the environment. Rueb's interactive walk was a site-specific work created for the network of hiking trails near the renowned Burgess Shale fossil beds in Yoho National Park, British Columbia.

Trace created a narrative soundscape that was at once personal and intimate. Each walker brought a sense of collaborative reflection to the piece, such as the particular season, weather conditions, or time of day. The audio material, interacting with the landscape, and the walker's reactions to the whole, formed the experience; with rudimentary mobile locative technology (a large, heavy custom knapsack equipped with a portable computer, headphones, and a GPS receiver), this became for each participant a networked experience shared with other walkers. *Trace* experimented with relationships between shared experiences of sound, narrative and place making, and foreshadowed many of the techniques that locative media artists would later refine.[301]

More than a decade after *Trace*, Rueb's project *Elsewhere: Anderswo* (2009) sought to engage visitors in a sonic experience of dislocation and play, in an urban space in Oldenburg, Germany. The work is based on the premise that whereas children readily create imagined spaces in familiar places through make-believe; adults often seek out familiar qualities in the new. This may include reading qualities into a landscape related to prior experience or knowledge. Rueb writes, "Idiosyncrasy reigns in these 'vernacular landscapes,' patched together unconsciously as memory blurs fact and fiction, real and imaginary, actual and mediated experience."[302] With the work, Rueb explores an

alternative aesthetic where the dislocations in place making of an outsider or *ausslander* are fully embraced. She notes that, "While the physical place itself still served as the literal and conceptual ground for the work, the sound overlay may seem foreign and out of place, out of sync or registration, as if rendered in crude translation."[303]

Interwoven with the narrative are fragments of sound that evoke highly specific landscapes, some of them familiar from television, film, and radio; all originating in other locations. In these moments, she says, personal identity snaps back into hyper-sync with the site itself, interacting with the creation of personal memories and narratives that create familiarity in that otherwise unfamiliar place.

A number of technological advances converged to enable these concepts to be realized in locative art-making practices. It is not surprising that so many artists, game designers, and mobile engineers created locative media projects in 2007 and 2008, at around the same time that GPS was becoming standard equipment in mobile phones. These new mobile artworks and games became a force for community building, critique, and change, through the collaborative production of narrative and its integration into public spaces. The desire to use new mobile technologies to imbue public spaces with subjective personal annotation, and to send participants on a quest to find these narratives, inspired many. The simple premise of these projects was to embed an invisible but easily accessible layer of community narrative into public spaces.

Proprioception and narrative in urban environments

Figure 21 Bruce Hinds, Sara Diamond and OCAD University research assistants engaged in fieldwork in Toronto's High Park, *Park Walk*, mobile locative artwork, 2006
Photo: Martha Ladly

The British moral philosopher Alasdair MacIntyre describes the difficulties of *enframing* an adequate *Telos*, or climactic unity, in the narrative of individual lives.[304] He asserts that telling stories and hearing them retold affirms and makes sense of disjointed experience. Narrating life stories *in situ* is revealing because it offers the possibility of a kind of proprioception, or an experiential interaction with the environment, mediated through the various senses. Proprioception refers to sensory perception arising from the

body. It is found in balance and other sensory and muscular interactions that detect the motion or position of the body, in reaction to stimuli from the environment.[305] One's sense of experience as continuous is framed by tensions concerning temporality, people, place, and action. Narrative experience depends on continuity, relation, and interaction. Lives begin to make sense and acquire unity through the framing device of narrative, with the fixed and situated qualities of stories that occur in time and place. MacIntyre describes narrative as a way to enable the narrator and the *existant* (the one to whom the narrative is being related), to enter a quest together. The quest is a shared education in self-knowledge and experience, a revelation of the character of both participants and the events that have shaped their lives. Macintyre's concept of quest connects narration to purposeful movement through an environment and discovering its affordances, often in a quest for self-knowledge.[306]

The idea of the quest informs the Toronto-based mobile locative media project *Park Walk* (2007). This project also responds to the opportunity that mobile media provides of locating the participant directly in the story environment.[307] The *Park Walk* project is a mobile public artwork developed in 2006–2007.[308] At the time, there were no standards for compressing large data such as image streams, audio and video for delivery on different handsets. Our response was to engineer and build a technology called the *Mobile Experience Engine (MEE),* designed by Tom Donaldson and his team of university student hackers.[309] The *MDCN* projects were also created just prior to the standard embedding of GPS technologies in mobile phone devices, so artists and engineers hacked together Bluetooth GPS devices for a variety of mobile handsets. Our

research teams looked quite unusual, carrying GPS devices taped on long poles, holding up our phones so they could "talk" to the GPS. At the time, this was the only way to pick up our GPS-plotted public space co-ordinates, which were then relayed through Bluetooth to the phone handsets.

The first version of *Park Walk* was a social and environmental mapping project originally designed for Toronto's High Park. The environment in the park is rugged, with deep ravines leading down an escarpment towards Grenadier Pond, and Lake Ontario. The site is rich with geophysical, environmental, historical, and cultural interest, but the topography proved to be too challenging for accurate geo-location with early primitive hand-held GPS devices. Grange Park was chosen as the site for the second version of the application for its open spaces and location close to the research lab.

Grange Park is an historic site adjacent to the Art Gallery of Ontario and OCAD University, which contains one of the oldest houses in Toronto. Grange House and the ruins of St. George the Martyr Anglican Church, are both found here. The tower is all that remains of Toronto's largest neo-gothic church, which was destroyed by fire. These architectural treasures are hidden away in relative obscurity in the park, which is bereft of any signage or information about their historical significance. The *Park Walk* project sought to remedy the situation by offering historical and cultural narratives and stories about the park contributed by members of the local community. The project incorporated aspects of urban orientation, flora and fauna identification, local cultural activities, historical insights, and bioregional mapping. Proprioception of place, arising from the encounter with the physical public space and the accumulated stories of the park, brings

memory and physical senses into play. A website was constructed to receive uploads of contributions from community members, and over time, the project built on their engagement with the urban park. In this way, the *Park Walk* project overlaid a gossamer veil of community narratives on Grange Park, creating a shared psycho-geography of an historic public space.[310]

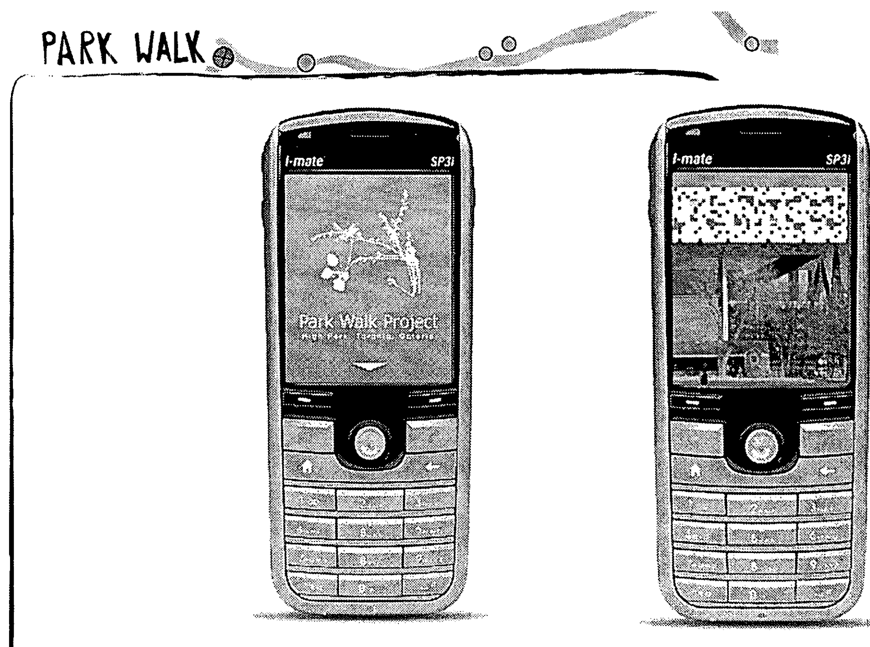


Figure 22 Martha Ladly, Bruce Hinds, *Park Walk*, mobile locative artwork, 2007 – 2011
Photo: Martha Ladly

First- and second-person narratives in mobile art practices

Regarding Cavarero's notions of kinaesthetic embodiment, she states the rather obvious fact that human beings are constitutively exposed to each other through the

bodily senses. But Cavarero claims that it is through the act of narration that a constitutive exhibition occurs, in which one comes to desire her life story as told through the mouth and voice of another.[311] In this way, individuals become selves who are narratable to and by others.[312] The important function of retelling narratives is unique to creative second-person and third-person narratives. Second-person narratives are the most personal, addressed by "I" to "you." Second-person narratives are common when parents, custodians, and family members tell children stories about their childhood, which they could not possibly recall themselves. These second-person narratives bond children to family and community, impulses for creating shared community narratives shared by many of the projects described earlier. Sociologist Mimi Sheller suggests that there are also " . . . instances in which I may inhabit another, and there is a kind of displacement of the subject, or a stereoscopic doubling."[313] She suggests that this phenomena plays into the potential of hybrid mobile environments for self-invention, and participants' ability to play with doubled real and virtual selves.

While participants find themselves in richly complex doubled positions, the contextual environment of the narrative is also doubled. A number of mobile locative art and news projects use the first person narrative address, while setting up a doubling with participants in distant geographical and geopolitical situations. The phenomenon occurs in Alyssa Wright's *Cherry Blossoms* project (2008),[314] and a mobile project with OCAD University colleagues and graduate students, entitled *Re-Tweet Driller* (2011).[315] Both projects were about sharing narratives where the personal had become larger than the individual, and both reached into the political sphere. Both projects used news reports to

show the impacts of geo-political events on real people. Both also employed psycho-geographic mapping with closely bound narrative processes.

Cherry Blossoms is a GPS-activated mobile art project developed by Alyssa Wright at the MIT Media Lab in Boston. It aimed to build a more visceral sense of empathy for the victims of the Iraq war. The project took data from the locations of bombings in Baghdad and, using an overlay of GPS hotspots, mapped them, relative to the city centre, onto the streets of Boston. Participants donned a backpack outfitted with a small microcontroller and a GPS unit attached. Recent news feeds related to bombings in Iraq were downloaded to the unit every night, and the locations were superimposed via GPS coordination onto maps. Walks through Boston were then staged. As the backpack wearer walked through a space in Boston that correlated to a recent bombing in Baghdad, the backpack automatically detonated when the wearer passed through the GPS coordinates. Instead of shrapnel, a compressed-air cloud of paper scraps was released, each scrap inscribed with the names of civilians who died in the attack, along with information about the circumstances of their death. Looking like a mixture of smoke and the white blossoms of a cherry tree, the mini-explosions engulfed participants and onlookers. With a media project about human loss, Wright's Cherry Blossoms resonated in American streets far outside the boundaries of the actual conflict.

The *Re-Tweet Driller* (2011) project was designed collaboratively with my research assistants at the Mobile Experience Lab at OCAD University. The purpose of the project was to build a mobile application that would visualize the impact of mobile journalism on the Arab Spring uprising in Egypt in late 2010 and early 2011. The application analysed

conventional news stories and their relationships to sources, using re-tweeted (forwarded) Twitter posts as a base reference for events unfolding in Cairo's Tahrir Square. The application was deployed on a mobile platform, and allowed readers to create snapshots of news stories disseminated by citizen journalists using mobile devices, presented as short narratives, often accompanied by their writers' Twitter ID images. It then compared them with correlated syndicated news stories. It showed how often stories had been picked up, adapted, or even run in their entirety, based on the posts and re-tweets of people who were present in the thick of current events. The juxtaposition allowed participants outside the conflict to see that Tweets were often the basis of so-called hard news, and that these *tweets* were often coming from locations outside of Egypt.

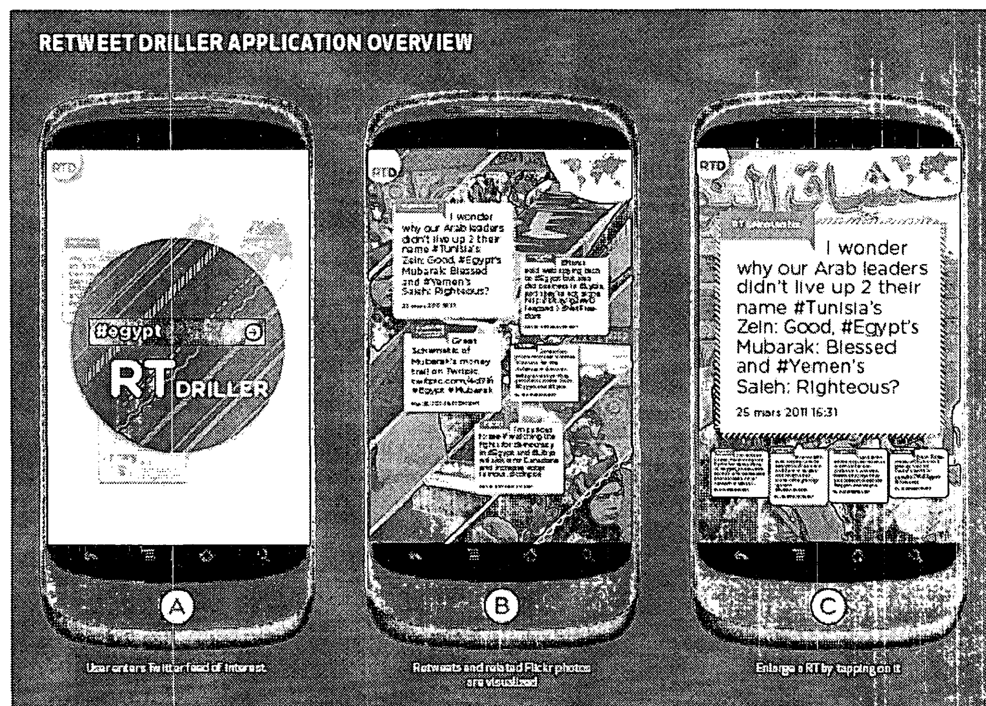


Figure 23 Martha Ladly, Greg Van Alstyne, Geneviève Maltais, Jonathan Resnick, Britt Wray, The *Re-Tweet Driller,* mobile news application, 2011
Martha Ladly, 2011

The circumstances that this social–mobile artwork documented were occurring over the period that the Internet was shut down during the Tahrir Square uprising, forcing individuals to use landlines to call friends outside of Egypt, who would post their messages to social networks and send Tweets on their behalf. The project gave readers a chance to make their own comparative analysis of mobile and conventional news stories. The visualization of the live Twitter feed could be navigated interactively, mapped, or printed out as a digital "news clipping" of the events of a particular day during the uprising.

During the Tahrir Square uprising, politicized uses of social media were re-imagined as social-media revolutions. Many of its participants were women. The presence of revolutionary women in the midst of political turmoil in Tahrir Square, and their employment of social media to distribute news and stories, demonstrates important new uses of mobile technologies and tools. Without the legacy of mobile social media, it is doubtful that stories fuelling the revolution would have been so widely and successfully disseminated or picked up by traditional news channels.

The combination of location, situation, and compelling narrative offered uniquely interdependent catalysts for social and political change. Mobile social media transformed Egyptian women into a vital political force. Events provided compelling reasons for women to present their narratives and reposition themselves within the Egyptian political spectrum. While the rights of women are once again conspicuously absent from the agenda in the post-revolutionary Egypt of the Muslim Brotherhood, Egyptian women are unwilling to give up the progress they have made. With the tools of free speech, open

information, and access to civil society so tantalizingly close, it will be difficult to again submit the women and men of Egypt to repressive laws and outmoded social practices.

Mobile media have opened new channels for personal narratives in public space, creating real-time interaction with people and their personal stories, bringing human interest into focus, with wider implications for emerging hybrid social interactions. Creative practices in mobile media and art have progressed from the personal and serendipitous through to the political and strategic. From the benign layering and annotation of public space in projects like *Trace* and *Park Walk* to projects such as *Cherry Blossoms* and *Re-Tweet Driller* that document and supplement the activation and politicization of public space, mobile media plays a crucial role. It enables direct address to and from narrators and listeners, between and those who occupy and create stories in hybrid locative space, and those who consume the stories.

These first-person narratives engage the audience in experiences that are powerful and personal. They are addressed to *you*—whom *I* most probably do not know—who are reading or listening to my words, beginning to understand and perhaps empathize with my situation. This is a direct form of address, which implicates *you*, the participant, in an active, political encounter. The women who created these mobile media experiences have actively used these channels to strategize, share, and disseminate ideas and views. These women have used technological tools and their own narratives to become skilled public commentators, activists, and actors whose digital identities and stories are managed with equal assiduousness. Mobile frameworks, which encourage the construction of personal

and community narratives through collaborative narrator/participant exchanges, may encourage greater social and political awareness.

Through research-creation practices, mobile artists and designers collaborate with audiences, and participants to develop, share and disseminate their stories. Personal and larger cultural narratives have the potential to foster a profound sense of interconnectedness and the power to affect participation in community building and social change. These adaptations of mobile technologies are positive, powerful, often unanticipated in their outcomes, and unplanned for by commercial developers; they are a form of consumer/artist/community hacking, and therefore subversive. They are easily adopted because they take advantage of the inherent technological and commercial attributes of mobile devices, including their ubiquity. Using the magic of location and the power of story telling, mobile artists turn the mobile phone into a tool for *making*, creating, and participating in art, narrative, games, entertainment, and social welfare, in their own communities.

Chapter Five

Erotic Narratives of the Body, 1998

Every human being, without even wanting to know it, is aware of being a narratable self – immersed in the spontaneous auto-narration of memory. [316]

— *Adriana Cavarero, 2000*

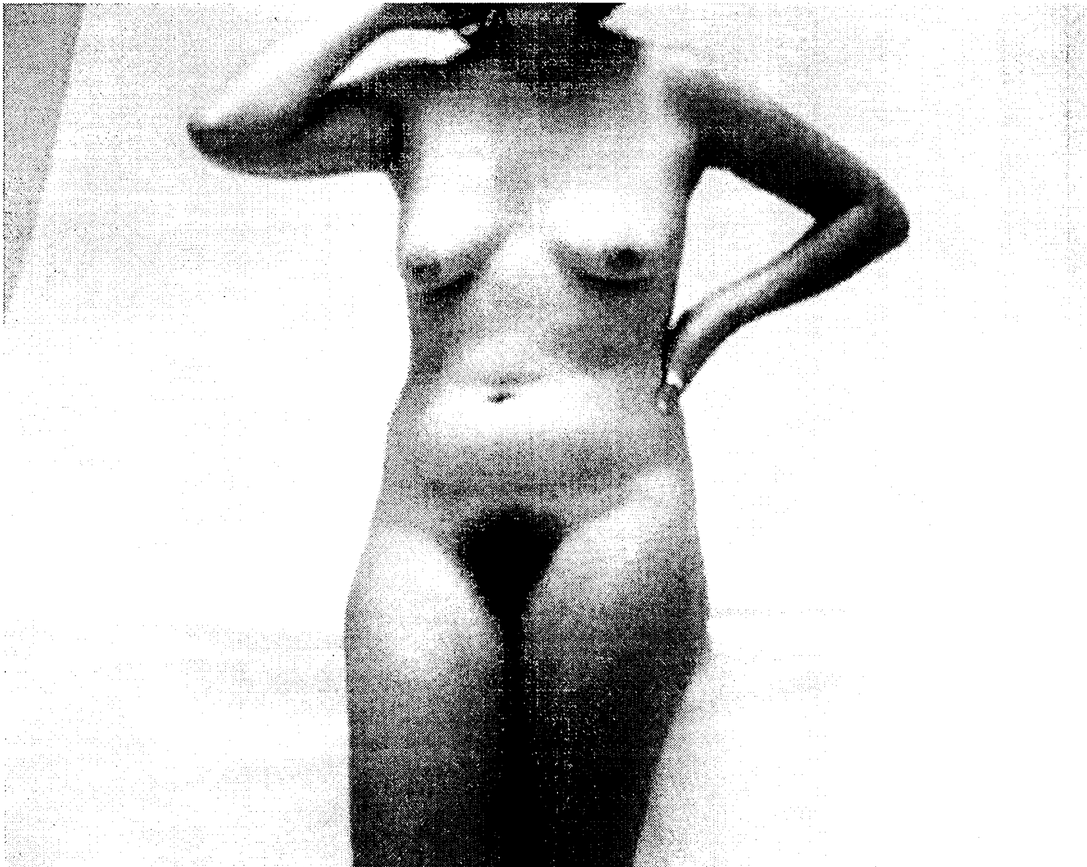


Figure 24 Martha Ladly, *Eros, Women, and Technology*, video interview still, Banff 1998
Martha Ladly, 1998

Narrative as biography and autobiography

Telling and sharing stories often characterizes love, in the way that Adriana Cavarero calls "spontaneous narrative reciprocity" between loved ones.[317] The reciprocal desire to share stories is an autobiographical exercise, which in turn allows each to hear their own stories from the lips of another. To the lover, the loved one appears as unique. The relational character of uniqueness plays itself out most clearly in love, when lovers ask each other "Who am I?" and "Who are you?" In love, the *Who* is an embodied uniqueness, meaning: "You, and I, and not another." Through narrative, they are thrown into the inaugural nudity of appearance.[318] They become narratable entities, trusting their stories to each other, to be narrated in the secret rhythm that alternates between the body and language in storytelling.[319] Lovers therefore come to repeat their fragile beginnings, exposed and naked, reformulated in Eros.

I formulated this study and work of research-creation, to find out more about the erotic experiences of a diverse group of artistic and intellectual women. In so doing, I hoped to learn more about my own erotic experiences and orientations. Although the camera was trained upon my research participants, in many ways it was as much an autobiographical as a biographical narrative exercise. I wanted to discover what I might find in common with the artists and designers who had agreed to participate. I asked each woman to tell me a story about love, and about her erotic bodily experiences. I did not insist that it be taken from their own lives, and I had no way of knowing whether the stories I heard were their own experiences or those of others, but all of the women I interviewed reported that they had chosen to relate a narrative based on personal

experience. I listened closely, and observed how their erotic narratives unfolded. I was reminded of experiences in my own life that had congruency with the stories I heard from my participants; about the wonder of coming to sexual maturity and first sexual experiences, the travails of pregnancy and child birth and caring for children, dramatic changes in the body over time, seismic shifts in relationships, and erotic love.

It is my thesis and experience that telling one's story, and hearing it told back, is of prime importance in building self-image and intimate relationships. As I instantiate my story, and myself, I bring myself into view and into *Being*, through the act of relating my narrative and entrusting it to another. Hearing it told back to me further substantiates the narrative I am creating, with the shared layer of meaning it gains through collaborative telling and retelling. When my story is told back to me, I receive it from another's lips, and I experience it anew. I am given fresh insight into my narrative, and my relationship with the other who tells it back to me. I am embodied, substantiated, and given materiality and relationship, through my narrative's production, reproduction, and reception. In the interview process, I listened, and noted emotions and reactions in my field notes, for clarity. In order to deliver their stories back to the individual narrators, I carefully related back to each participant what I had heard, in my own words.

The place of the Chora in this research-creation

The previous chapter reported on designers and artists working with narrative in new ways, by seeking to substantiate embodied experience and meanings of place with mobile

technologies. The research in this chapter seeks to reveal creative responses to these women's formulations of the place of the Chora, and the female body in their thinking and practices of making. I explored correspondences between the body and the rhythm of narrative, which Kristeva delightfully describes in her work on the Chora, as rhythmic and musical, intimately linked to the pulses and cycles of the body, and in its cadence, reminiscent of the early pre-lingual and pre-semiotic babblings of infants.[320]

The chapter presents the participant's narrative and biographical information and transcriptions of sections of their narratives along with textual and visual analysis of the interviews. Using a radical nude narrative-research methodology, I interviewed fourteen women on aspects of erotic love and their bodies. The following chapter contains documentation of a second set of interviews that was conducted with some of the original participants, thirteen years after the first study. The interviews from 2011 concern changes the original participants have witnessed in their bodies, in their work, and in their interactions with technology, over the intervening years.[321] These second interviews were conducted alongside a set of new interviews with a number of young women who are working in highly technologically mediated spheres. All of the women interviewed in 2011 reflect on their experiences of technological change and its effects. These reflections are poignant observations regarding ways that technology can better serve their needs, in their working and personal lives. They state their own views, as women working in technology. In the concluding chapter, participants present their ideas and make explicit recommendations for possible futures.

The original set of interviews presented here come from a research study I designed and conducted in 1998. It was originally intended as a video documentary project, as part of a self-directed residency at the Banff Centre. My interview participants became involved through our shared experience of working together during an artist's residency. The women artists, scholars, writers, and media-makers I interviewed are all active participants in contemporary art and cultural creation. Their stories have contributed to my work of uncovering the workings of women's creative imaginations, their insights and epistemologies, and their correlations between the erotic body and the playful mind. My questions concerning the importance of the erotic body, and its place in women's knowledge and creative imagination, which originated with the original 1998 interview questions, have been revealed through these artists' erotic narratives and analysed in the process of this research-creation.

The research-creation process

My work of research-creation consists of my reporting, observations, and analysis of the women's stories, organised around certain persistent themes that surfaced during the interviews. Research-creation activities comprised ideation and conceptualisation of the narrative methodology and the interview questions, the interview situations, and the intended outcomes and presentation of the artworks I wished to create. This was followed by a period of searching out the most conducive environment and situation for the interviews, which turned out to be the Banff Centre and the Banff New Media Institute. Funding for travel and equipment costs was found, and assistance with childcare was

arranged so that I could be away from home to work on the project. On arrival in Banff, a social and informational evening was held for potential participants.

There followed an intense two-week period of contacting participants and setting up the interviews, undertaking the informed consents and releases, and organising the studio and equipment. I made the decision to capture the interviews on analogue video; the cost of digital-video recording equipment at that time was prohibitive, as the technology was emerging. This approach presented some difficulties. The analogue video camera was broadcast quality, and enormous. There was an additional microphone set up to record broadcast quality sound. Both would create beautiful, highly resolved images and sound, but the technology was a looming presence in the room. An assistant coordinator was hired to help with consent forms, and to take care of the interview participants, to free me to conduct the interviews and make sure that the aesthetic conditions I had set were satisfied. I also made the decision to take field notes, so that I could capture the context of the interviews and note any important impressions that the camera might not record.

Conducting the video interviews was the most effortless, pleasurable, and sociable stage of the research-creation process. These interviews were an absolute pleasure to conduct and the interview participants were generous beyond measure with their time and their candid responses to my questions. I made new friends, and formed long-lasting bonds with some of my participants.

Following the interviews, I spent a great deal of time copying and digitising and then recopying the videos into a manageable digital format so that I could review and edit them with a new video editing software that had just been launched earlier in 1998, called

Final Cut Pro. I spent weeks reviewing the videos, creating transcripts, visuals, and excerpts from the videos. Some of these excerpts were shown at small group shows at a private gallery, and the work was discussed at a conference at the Banff Centre the following summer.[322] Not long after that, personal and professional events necessitated changes in my circumstances, resulting in a trans-Atlantic move for my family, and a new career. The project languished for some years, but was never far from my mind, as I sought a way to revitalise it in my new practice as an academic researcher.

An opportunity arose to revisit and reanalyse the interviews, as a formal project of research-creation, within the context of my graduate studies. The project was revitalised with a new creative and research-oriented approach. This approach has been the essence of research-creation, an emerging form of intellectual and artistic practice, which comprises an essential part of my research activity. My work of research-creation has fostered the development of an original contribution to knowledge, through a series of methodological, conceptual, intellectual, aesthetic, and technological innovations.

Hermeneutic analysis

My analysis took the form of observations of body language, stress analysis of vocal tracks, and observations and comparisons between the narratives. These observations took into account the content of the narratives, but also vocal inflections, and other information that was being conveyed bodily by the participants. I compared my field notes against the documentary material to see what contextual information from the day

of our interview may be relevant, and to recall any important details that I might have forgotten or overlooked. These field notes were incredibly valuable, as my analysis took place some eleven and twelve years after the original events. They enabled me to create thick descriptions[323] and contextualisation of the situation, details, and contexts of the interviews. I was surprised that I remembered the interviews in vivid detail, and had a clear memory of some of the most compelling interludes and narratives, which I wished to analyse further.

I employed the analysis methodology of the hermeneutic circle[324] (described in Chapter One) to try to understand and draw knowledge out of the rich information in the women's narratives and the interview materials that comprised my primary sources. This involved a great deal of time just sitting through hours of interview materials, viewing, reviewing, referring to my field notes, reviewing again and again, making new notes, sifting, ordering, and abandoning a great deal of material as I winnowed my way through over fourteen hours of video. Gradually, I began to notice affinities, and themes emerged, as I started to draw inferences from my observations. Hermeneutics allowed me the ability to move back and forth between what I knew, or thought I knew, and around what I had recorded and documented, what I was beginning to understand, and eventually, after days and weeks of circling, I felt I could confidently say new knowledge was emerging through the hermeneutic process.

When I felt that I finally had control of the materials, I conducted a thematic affinity mapping exercise, carried out across all of the interviews, looking for topical areas, subjects and positions, repetitions and stresses, which would lend force to my thesis: that

women's distinctive creative knowledge was intimately linked with the erotic body. I grouped these together into six variations on erotic experience, which strongly suggested themselves as themes for analysis. These themes concern erotics of the senses, body image, erotic relationships, the special relationship of mothers and daughters, pregnancy and mothering, and the eroticism of ideas. The work in these chapters constitute a unique body of sustained practice and research creation, which makes an original contribution to the fields of the arts, communication, and philosophy, specifically to philosophies of the body, and the philosophy of technology, relative to erotic experience.

The participants in this research-creation

The participants in my study are of diverse cultural and sexual backgrounds, but all identify as artists, designers, performers, writers, and intellectuals. In my research study, I worked with fourteen women, who agreed to tell their stories and uncover something hidden about themselves related to the body: their motivations, strengths, fears, or triumphs. The women were situated across cultural and sexual boundaries, their ages ranging over four decades, from twenty-three to sixty-three. All of the women I interviewed identified themselves as creative thinkers, and all had a stake in the ways that technology was changing everyday personal and professional life.

I did not know that all of the women had experienced a risky or difficult passage through some sort of life-changing erotic episode. It seems unlikely that any woman would not have experienced a number of such episodes in her life, but the fortunate thing

for me was that these women were interested in talking about their experiences. Erotic events are those that constitute passages through which the subject passes; once the threshold has been crossed, a subject may enter a new stage of life, from which they emerge irrevocably changed.

Listening to these women tell their stories, I found evidence of creativity, courage, deep intelligence, sensuality, originality, wit, and humour. My purpose was to elicit from each of them their story of an incident precipitated by the body, which constituted just such a life-changing event. I sought ways for my participants and I to focus upon the character, texture, and emotional tone of their stories, and the effects that telling them had on their bodies. I sought to identify moments that, although they were unique for each woman, disclosed something about female experience that may be identifiable in others.

A radical erotic narrative methodology

For my fieldwork I adapted qualitative narrative methods, including a *biographical narrative interpretive method*, an interview technique that investigates personal experience and biography, lived situations, and life-stories.[325] I combined this technique with narrative analysis, as I have described. Together these approaches formed the basis of my *narrative inquiry*.[326] I also adopted a radical "full-frontal" interview technique, with participants agreeing to be nude during their interviews. The codicil was that the participant's faces would not be shown, and they would be cropped in shot so that their bodies would be seen only from the neck down. There were a number of reasons that I

requested these conditions for our interviews. Firstly, I hoped to find out more about these women through eliciting narratives that were related directly to their bodies. I hypothesised that relating one's narrative free of the restrictions of clothing would lend itself to a very self-reflexive process, and that these nuances would be more easily revealed to the participant, to me as the interviewer, and to the camera, if unobscured by clothing. Secondly, I was interested aesthetically in the vulnerability of the unclothed body, and hypothesized that unclothed bodies might tell different stories than the participant's words. I hoped that the resulting video, with narratives produced by voices and bodies, absent facial expressions, might lead to a complex and nuanced set of images and stories. Finally, I was interested in creating work that would set up a powerful and provocative aesthetic experience for the viewer.

The interviews were shot with a Sony professional camcorder mounted on a fixed tripod, with the shot framed so that the participant was shown from the neck down so the face would not be visible. Hypothetically, the lack of a talking head would be an advantage, allowing the reviewer to focus on the tone of voice, the words spoken, and the body language. The cropping also afforded a certain amount of confidentiality for the participants, making them more relaxed about telling their stories. The sound and tone of a person's voice is entirely recognizable and identifiable, so participants were warned that anonymity was not promised or possible, and if the resulting videos were shown, they might be identifiable. Consents were gathered accordingly. My methodology was also designed to support the recall of particular events. As the primary topic for the study

was knowledge of erotic love as experienced through the body, nudity should contribute to unusual candour. The premise was borne out during the interviews.

Each participant had responded to an invitation and been given information about the questions and the interview technique in advance. They were invited, individually, to my private studio, by appointment. There is nothing more personal than being unclothed and talking with someone in a quiet, private room. At this point, it is important to note that I, as the interviewer, was fully clothed. My first question before the interviewee disrobed was whether she preferred to be interviewed by me fully clothed or also nude. I remember noting that this was a rather provocative way to start an already sensitive session, but I wanted to ensure that the power balance was not too lopsided between interviewer and participant. Checking my field notes, I do not find evidence of me taking off my clothes, so I presume that the interviewees all politely declined! After that (usually humorous) negotiation, the ice was truly broken, and we were able to proceed.

I began by walking them through the interview technique and the informed consent form, while an assistant gathered up the consent forms, and I set up the camera and sound equipment, checked and logged the tapes. She gave the participant a clean robe and fresh towels, and showed her to a private room where she could change. The assistant then left the room. When the participant returned, I asked her to make herself comfortable on a low trestle table covered with a white sheet and soft cushions, in front of a white curtain. I asked her to remove the robe if, and when, she felt comfortable to do so, and reminded her she could always choose not to disrobe. I also made it clear that she could ask to stop for a break, or request that we discontinue the interview at any time. I also told my

participants about my own self-reflexive concerns within my position as an interviewer, fully clothed, and armed with a battery of sound and video recording equipment, capturing their images and their stories in a situation that was contingent on their level of comfort, and good will. So, I ensured myself that my participants were comfortable with the aesthetic parameters of the interview, and the camera and sound equipment in the room. Sensitive to any discomfort a naked correspondent might feel being interviewed by someone fully clothed, I was quite aware of my own gaze, and the gaze of the camera as we performed these interviews. There was no way to mitigate the intensity of the camera's presence, as it was a large, professional, broadcast-grade camera, and there was a boom microphone set up nearby. The video camera and I were about three meters away from the participant. I was seated on a low chair in front of the participant, outside the camera frame, and the camera was placed some distance behind me and to the left. The participant was talking *to* me rather than talking *at* the camera, but its presence brought to the interviews a form of performativity, which I was interested in and had partially anticipated. There was no disguising the fact that this was a kind of private, unscripted performance, with camera and me as audience.

I was at pains to avoid layering a sensitive situation with overly complex technological arrangements. I relied on natural light from a skylight directly overhead rather than artificial light. Though it was rather large and difficult to ignore, my intention was that the camera would function as a quiet second observer.

Once the participant had settled into a comfortable position, I checked the viewfinder to ensure the image was correctly framed in camera. The framing was adjusted from time

to time as my correspondent changed position. The white background and the framing close into the body gave an aesthetic consistency to the video images, which I hoped would allow a viewer to focus on the expressiveness of the woman's body, without other distractions.

I had requested each woman to bring a favourite personal object that had some erotic or emotional importance. The object was to act as a trigger for memory, and as a self-reflexive representation or reproduction of the erotic sense.[327] I hoped that these familiar objects would also act as comforters and icebreakers, and that they might provide bridges into narrative. Turkle identifies such objects as "relational artifacts;"[328] objects which relate the narrator to familiar occurrences such as dreams, familial arguments, and slips of the tongue.[329] This endows them with natural approachableness. It became clear to me during the interviews that these "objects to think with"[330] were also signifiers for erotic experience.

The interview questions

The interviews began with three open-ended questions:

1. Tell me about the object you brought with you. What does it represent for you? Does it trigger some time or event in your memory?
2. Can you talk to me about a significant erotic experience in your life, one that perhaps instigated or revealed a major change in your life?
3. How has that erotic event or knowledge shaped your experience?

Each of the interviews commenced quite naturally with an explanation of the object and its significance to the participant. The objects functioned as expressive bridges for participants to connect their responses to the other more personal questions. During the interviews, I was mindful to engage in very active listening. I stated my open-ended questions clearly, gave clarifications if asked, and simply listened, taking occasional notes of things that seemed significant. These were narratives rather than conversations. If there were details I was unclear about, I would give a short affirmative *précis* at a natural break in the story, in order to ensure that I had understood. Apart from that, I did not attempt to engage in conversation or commentary. I allowed space and time for thoughts to generate, and responses to slowly emerge. Levels of comfort obviously varied, and participants reported a range of feelings both during and after the interviews: these included nervousness, anticipation, excitement, interest, curiosity, relaxation, ease, release, and catharsis. My interactions were professional but caring and interested. Within the space of an hour with each participant, I was able to elicit an astounding range of responses consisting of personal narratives, opinions, affirmations, and recommendations.

Interview analysis, affinity mapping, and erotic thematics

Shortly after the completion of the interviews, I viewed and transcribed the video. For the post-interview analysis, as I have described, I chose hermeneutics as the organizational and analytic methodology that would enable me to sort through over fourteen hours of interviews to find answers to my research questions, and to discern currents and flows buried in the narratives.

I undertook my work intuitively, with great respect and wonder. This was the honeymoon period, when as a narrative researcher, I fell in love with my interview materials.[331] Aesthetically, the video images were very beautiful, with a simple, clean, consistently formal quality that I had planned for. Lighting conditions and some acoustic qualities differed depending on the time of day the interview took place. I tried to conduct my interviews early in the morning, when the light was diffused, and before other artists were up and rattling around in their adjacent studios. Of course, there was also a wonderful range of different bodies and poses.

I spent a long time studying the video material for non-verbal markers of emotion.[332] I observed each participant's embodied presence, looking for physical qualities such as relaxation or rigidity of the neck, trunk, back and limbs, clutching and guarding movements, protection with the arms, hands and legs of torso and genitals, as well as expressive gestures such as opening the hands and throwing the arms wide. I also closely observed the participant's tone of voice, and any tension, nervousness or emotion that came through in the voice. I also looked for any disjunction between what I heard and what I saw. My premise was that this would signal instances where the body betrayed the intellect. Without facial cues to rely on, I had to develop sensitivity to viewing and reading body language. Through repeated listening and viewing of just part of a small but very detailed episode, I absorbed large amounts of very rich information about the participants and their narratives.[333]

In order to discern and analyse common or recurring themes, tensions, concerns, opinions, reference, and ideas in the interview materials, I created an affinity map, which allowed me to create and cluster themes and populate them with narrative positions and descriptions from each of the participants. There was a remarkable consistency of appearance across all interviews of a small number of themes, with particular variations from each of the participants. I created clusters around these themes and variations, grouping participants' responses in hierarchical order of frequency of occurrence by theme, but I present them in a thematic rationale that corresponds better to narrative flow.

The erotic women of this study

The women of this study represent a variety of sexual orientation, backgrounds, ages, creative practices, and erotic experience. Their interviews elaborate the complex relationship between women's bodies, creative work, and erotic love in their personal and professional lives.

From the fourteen women originally interviewed, I selected ten interviews that were coalescent around seven themes, which seemed particularly pertinent to my topic. To respect my agreement to maintain a consistent level of privacy and confidentiality, all of the participants' identifying information has been removed from the videos and interview data. Each individual has been assigned a pseudonym.[334] According to Josselson, and accepted conventions used in the *narrative inquiry* method[335] employed in my research, all participants were assigned a coded first name. They will be referred to by these names

throughout the remainder of this chapter and the next. I did not ask them to introduce themselves, but I did ask for their biographies, and I construct the brief biographic précis, presented here in alphabetical order, from those segments.

Alejandra is a renowned artist and performer, media theorist, and science-fiction writer. She is a woman of formidable intellect and enthusiasm, which she devotes to technological, computing, and performance projects. As a trans-gendered woman, her feminine perspective is unique.

Beth is an artist and professional gardener. In her spare time, she also enjoys working as an artist's model. She is proud of her strong body, which serves her well. She is the mother of two children.

Candice is a designer, librarian, activist, academic, and technology researcher. She is strong and vivacious, a sexual adventurer who breaks down the barriers of her upbringing in pursuit of new and exciting experiences.

Danielle is a sculptor and an accomplished athlete. She is a mountain biker, runner, rock climber, and soccer player.

Janet is a successful arts administrator and educator. She grew up an as an active and independent young woman, who nevertheless maintains strong family ties. She has confidently pursued professional opportunities that challenge her intellectual and artistic abilities.

Jessica is an artist and a yoga instructor. She is deeply committed to assisting women in learning to know their bodies more intimately, and to helping them to discover the power and strength and energy inherent in the female body.

Lali is a renowned artist, curator, and teacher. She is a Mohawk woman, a mother, and a digital-arts activist. She combines her love of digital technologies with her traditional quilting practice.

Louise is a letter-writer and regular contributor to the Editorial and Op-Ed pages of her local newspaper. She is an origami expert, avid reader, world traveller, and a cook of some distinction. Louise does not call herself an artist, but she is a woman with a finely tuned artistic sensibility.

Marie has been a dancer since childhood, but she gave up her dream of becoming a professional dancer as a teenager. She transformed herself into a performance artist.

Rachel is a renowned university administrator. In a remarkable and prolific career, she has worked as a video artist, a feminist activist, and a computer scientist. She is a respected researcher, an author, and an avid technologist.

These are their stories.

Erotics of the senses

The most prevalent theme in these interviews is sensual eroticism, inspired by the objects participants brought with them to their interviews. Unexpectedly, the majority brought food. The next most common object was something scented.

It is not surprising that the senses of taste and smell should be associated with eroticism. In Freud's work, the oral phase of the libido's organization is centred on food and consumption: what I consume, I incorporate—I am.[336] Such identification relies on

the objective model of projection and assimilation, a form of erotic identification, which enables assimilation of the feelings of others. In kinship, marriage, and child rearing, gratitude for such mutual assimilation is strengthened through the consumption of food together, ritually, and practically, in a common family meal.[337] For the women of this study, taste, and smell were important triggers for recalling the erotic experience.

Alejandra stood for the first part of our interview, which was a performance consisting of her unwrapping, warming with her hands, and then sampling the bar of fine dark chocolate she brought with her. She chose to open our interview with her thoughts on the importance of the senses in opening up her erotic engagement with the world.

> There is a whole list of sensual and arousing things that makes chocolate interesting for me. The first thing you discover when you violate its integument, is the fragrance. Chocolate has a huge heady fragrance that surges out of the package and envelopes you in its essence and its wonder. Then there is the texture. As my touch warms the surface I can begin to smell other fragrances, the odour of the wax begins to be mixed with the pure fragrance of the chocolate. So after having awakened it into life by warming it up and stroking its surface, we can proceed to break off a small part. The way in which it breaks is extremely important, sometimes you get a very crisp break, sometimes it will yield a bit more before it parts. And when you finally taste it, what the nose says is true. Chocolate, being like sex—even when it's bad, it is good!

Rachel brought a smooth, fragrant, soap-like body rub to her interview. Wearing a pair of high-heeled ankle boots, she sat in a three profile quarter pose, one leg bent at the knee and the heel of her boot on the table, and proceeded to apply the unguent to her body, explaining its properties, and rubbing it into her skin, as she spoke. Her pose was remarkable for its openness. She was relaxed and uninhibited, athletic and unashamed to expose any aspect of her body.

I was thinking about the gradations of eroticism. I was thinking about which senses I respond to the most. I realised they are smell, and taste. Eroticism is often fuelled by contradictions as well as likeness. Seville orange, deeply fragrant orange blossom smells, and chocolate. Smells that are very warm, like a summer garden, lush smells. I also like body fluid, organic, stinky smells, cheese-like smells that come from human bodies. I like the way that smell and taste collapse together, that they are similar but not the same. I think that is a big part of my own eroticism.

If someone is my lover and I sleep with them, there is a place at the back of their neck where they really smell like themselves—they smell like a baby, you can smell their hair, you can smell their sweat a little bit, and whatever perfume they are wearing, or whatever—sort of lingered. I love that smell, that smell is so important to me. It is how I identify someone, by holding on to them and sniffing the back of their neck.

In *Civilisation and its Discontents,* Freud said that we have learned how to suppress our senses of smell and taste, because we would be out of control in terms of eroticism and desire, we would completely lose control as a civilization. The sense of smell is very important to me. I love the smells of musk, amber, and patchouli. I think the natural smell of the body is very musky. I love the smell of a guy who has been sweating, a clean sweat. I think that is very arousing. Smell evokes memories; perfume that a friend has worn . . . it is a very powerful sense that a lot of people don't use. I love it when I can identify people by their scent. I love the smell after sex, the way it lingers in the air.

Erotic body image

Candice spoke about her restrictive upbringing and difficulties in her family situation experienced in her teens, which led to a negative sense of self and body image. Like a number of the younger women in my study, she had experienced a period of depression, had struggled with her weight, and had a pronounced, negative body image as a teenager. She sat in a relaxed cross-legged position, and gestured expressively with her hands, and when she was not using her hands for emphasis, she held them together in her lap, covering her genital area.

When I was young it was tough. I lost a lot of weight when I was in high school. It was a time when my self-esteem was low. I was really struggling. I didn't have control over anything at home. I guess I wanted to feel that when people looked at me they would see something that they would approve of. I needed something that I could feel good about, and my good grades weren't enough.

When I lost all of that weight, and people noticed, adults and friends told me how good I looked. I was vulnerable, and that recognition felt good to me. So I kept trying to lose more weight, until finally my physical education teacher took me aside and said to me, "You're not eating enough." I listened to her, and I started eating properly again. I am so grateful I was smart enough not to take it to the extreme, but it could have gone either way.

Janet admitted that she had been insecure about her body image as a girl growing up in a small town. It was when she went to university and travelled that her horizons opened and she grew confident of her body and her intellect.

I have always been confident about my intellect. But I remember being a rather self-obsessed teenager, being conscious of how other people would perceive the way I looked. But as I got older it just became a part of who I was. I come from a rural upbringing, with limited experiences. But as I got older I travelled and went to university, and I am doing a lot more in the world, working, becoming a professional, and I see my body as an integral part of who I am.

Marie reflected on how, upon maturity, the changes in her body became a huge burden for her because she no longer conformed to the image of a dancer that her dance company had in mind.

I had a lot of problems when I was a teenager, because I am a dancer, and weight was a big issue. All of the girls who dance seriously have the bodies of boys, and that is the norm. You are expected to be so thin. I had to work twice as hard at it, because my body wasn't built like that, I had hips; my breasts were developing. I couldn't look like a little boy anymore,

> but the body I was developing just didn't work for dance. I was taking two boxes of Dexedrine a day, and that cannot be good for your physical or mental health. And at the same time I was thinking, "Well does everybody like me now?" And they didn't.

Jessica works with fibre materials and her own body in her art. She brought the materials of her art-making practice with her to the interview: a needle threaded with embroidery floss. She stood throughout, and practiced her breathing exercises and yoga poses as we talked.

> I think the interfaces between the organs, between bones, between the tissues, have to be felt. You have to experience it in a different way than visually. The more you work with the body, get into the internal places of the body, the more you realize how stiff it is, you notice areas that need opening. You become aware of spaces you never really knew existed. You feel your age, because you become so aware of the sensations in your body. Women hold a great deal of emotion and tension in their bodies, in their hips, buttocks, thighs, their breasts, the navel, the sexual areas of the body. This is women's power centre, our energy centre. Western women hold a great deal in there, but it needs to be opened up and expanded and allowed to have a life of its own.

The image of oneself as an Other, different from an accepted gender or biological norm, is doubled in the adolescent years, when a young woman is trying out ways of becoming her gender. As such, it can be a very sensitive time. The feeling of being an outsider is often amplified in artistic individuals, a problematic for young artistic women who may be unsure of their same sex attractions.

Danielle sat in a relaxed position, her legs wide apart and her body slightly tipped back at the hips, her arms loose, her large and beautifully manicured hands spread and

resting on her knees. She altered her position from time to time, like an athlete resting on the bench, stretching between plays.

> I was a weird kid growing up. I never fit in. I gave myself a boy's name when I was four years old; I wanted to be a boy. I never made any connections growing up; I just never fit in, in high school. I always thought there was something different. I assumed it was because I was an artist; that was why I didn't think the same as everyone else. I was sexually dormant, and it wasn't until I came out that I realized that I have a power within myself, in my sex, and I could use it to create pleasure. I didn't know before that this was possible for me. I met a woman who allowed me to do things to her sexually, to touch her, and be with her, without question. It is a gift, to bring someone to the height of pleasure, to orgasm.

On erotic relationships

Rachel talked about love and erotic disillusionment, and their relationship to creativity. She explored both fear and risk and how abundance or depletion of either quality can affect desire and erotic experience. She thought this could be either incredibly destructive or a creative force, if one can channel it into creative practice.

> I was thinking about fear, and I was thinking about different kinds of risk, and what happens when you commit yourself to a really deep relationship with one person, which I have done several times in my life. In a way the exchange, the decision to focus desire and exclude other desires, is also about confronting certain kinds of fears. I think it is really important to do this at least once in one's lifetime.
>
> I am always very curious about the moment with a lover when one becomes disillusioned. Where the idealism falls away and you realize their humanity on some really disappointing level. Then, it is this retreating horizon of desire. What is interesting for me is how I sustain my desire through that process of disillusionment, because it is inevitable. I am very fascinated about that moment before what could become closure, and how it rides panic, anxiety, compulsion, and intense desire.

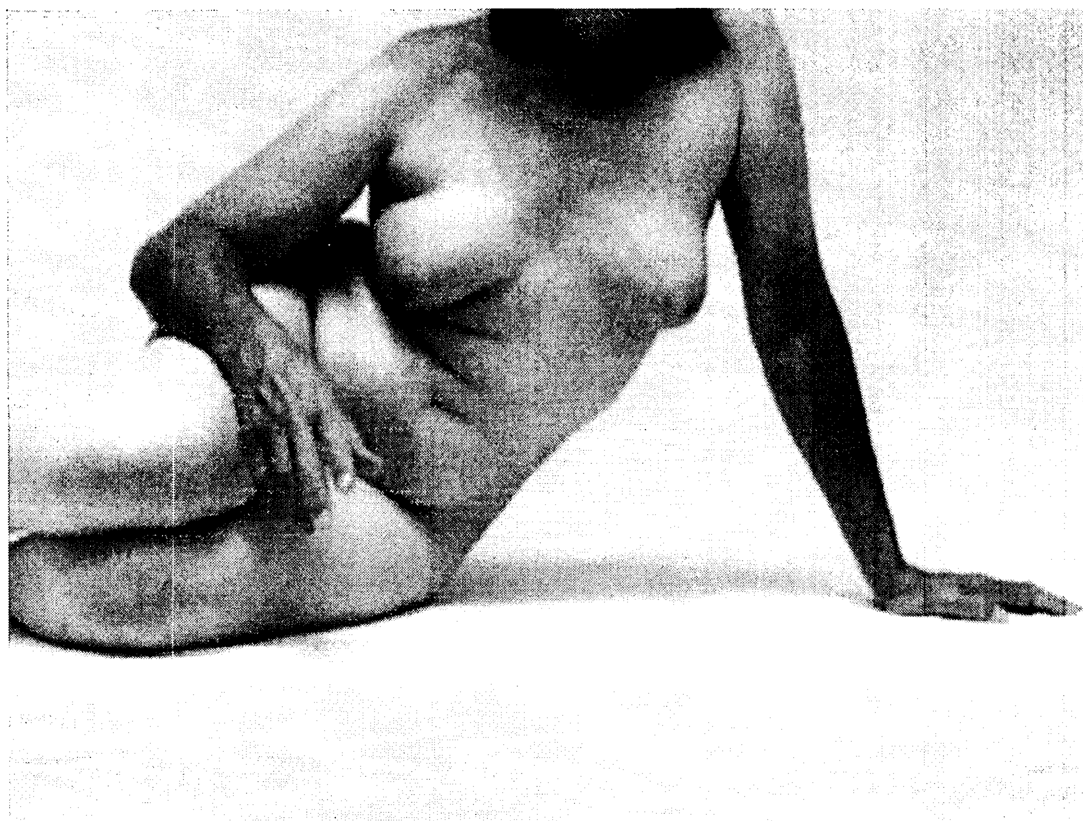


Figure 25 Martha Ladly, *Eros, Women, and Technology*, video interview still, Banff 1998
Martha Ladly, 1998

Alejandra lay relaxed on her side, her top leg crossed over the bottom leg at the knee; torso raised from the hip and supported by an arm bent at the elbow, chin propped in hand, in a classical odalisque pose. She continued to talk openly about her ideas and experiences as an intellectual and a technologist, and her position as a transsexual woman.

> This was simultaneously the moment when I discovered that a heterosexual partnership was possible for me. Because up until then, I had assumed a lot of theoretical things—and it blew my entire theoretical praxis out of the water, not to mention my physical praxis! I had to rethink all of the issues, all about how those things worked. For me it was a very deep scouring, a cleansing examination of everything. You don't have to spend your life questioning, on political grounds, why this is happening.

> You can just say "OK! This is the way my life is working, this is the way I am moving in the world, it feels fantastic!" So my task now, if you will, is simply to say, "All right! I let go into this! I'll enjoy the hell out of it!" I'll laugh and sing and run, and live my life in the knowledge that I have a partner with whom I move, in this wonderful, graceful fashion.
>
> The thing that turns me on about my partner is that I absolutely trust him. He is to me the most honest person I have every met, and part of his honesty is a commitment to never hurting another person, and I am sure that he would amend, consciously. But the idea that there is only one supreme ethic and that is that you may not hurt another person. To me that is something which is so deeply important to the way I want to live my live, the way I would like to live my life, the way I try to live my life, that it goes beyond the bounds of simply acknowledging by rising to his light, the sense that comes out of him, that deep sense of quiet, of calmness, of openness to experience. For me that turns into an erotic response, and it becomes erotic because I feel that I can trust him with it. Erotics, for me, are opening myself to another person, and I opened to him almost unconsciously because I know I can trust him. What I discovered was that in that opening there is a deep erotic sense, and it makes me open more. For me, that discovery that there was another person I could trust that deeply was the most incredible moment of my life.

The erotic relationship of mothers and daughters

> *Women doubtless reproduce among themselves the strange gamut of forgotten body relationships with their mothers. Complicity in the unspoken, connivance of the inexpressible, of a wink, a tone of voice, a gesture, a tinge, a scent . . . the community of women is a community of dolphins.*[338]
>
> *—Julia Kristeva, 1986*

It is not unusual for young women to have a difficult time with their mothers. Irigaray maintains that the mother-daughter relationship is one of the unexplored frontiers of social and psychoanalytical enquiry. She sees the dynamics of the mother-daughter

relation as predicated upon boundary merging and fusion, symbiotic identity, and "specularity."[339]

The boundaries between mothers and daughters are characterized by a mirror-like inter-subjectivity and entanglement. The two share an interconnected bond of particular intensity, and Irigaray herself found it difficult to disentangle her mother from herself and herself from her mother, until she was finally able to accept the inherent interdependency and interpenetration that characterizes such a peculiarly feminine relationship.[340]

Beth wanted to talk about her relationships with her mother and her daughter. She seemed relaxed, fluid and in constant movement during the interview. She used her entire body to gesture and emphasize, and even acted out some of her points. Her manner was playful. Beth compared the intimate close times she and her mother often shared to the ways that she now relates to her daughter, who has grown distant as a teenager.

> I remember my own Mom used to call us into the bathroom for conferences She would be naked, soaking in the tub, and directing things: "Do this, do that, make sure you put the potatoes on!" She had these very beautiful white breasts; it was the only time we got to see our mother's breasts. I don't walk around naked in front of my fourteen-year-old daughter, because she is starting to get a figure. I don't want to horrify her and have her think that this is what all grown women look like; it takes a while before you get this mature! Now, like my mother, I use my bath time to talk to my daughter. I ask her to come and sit on the tub and talk to me, tell me about her day, I want her to tell me everything, well, anything really, but she doesn't want to tell me much anymore. . .

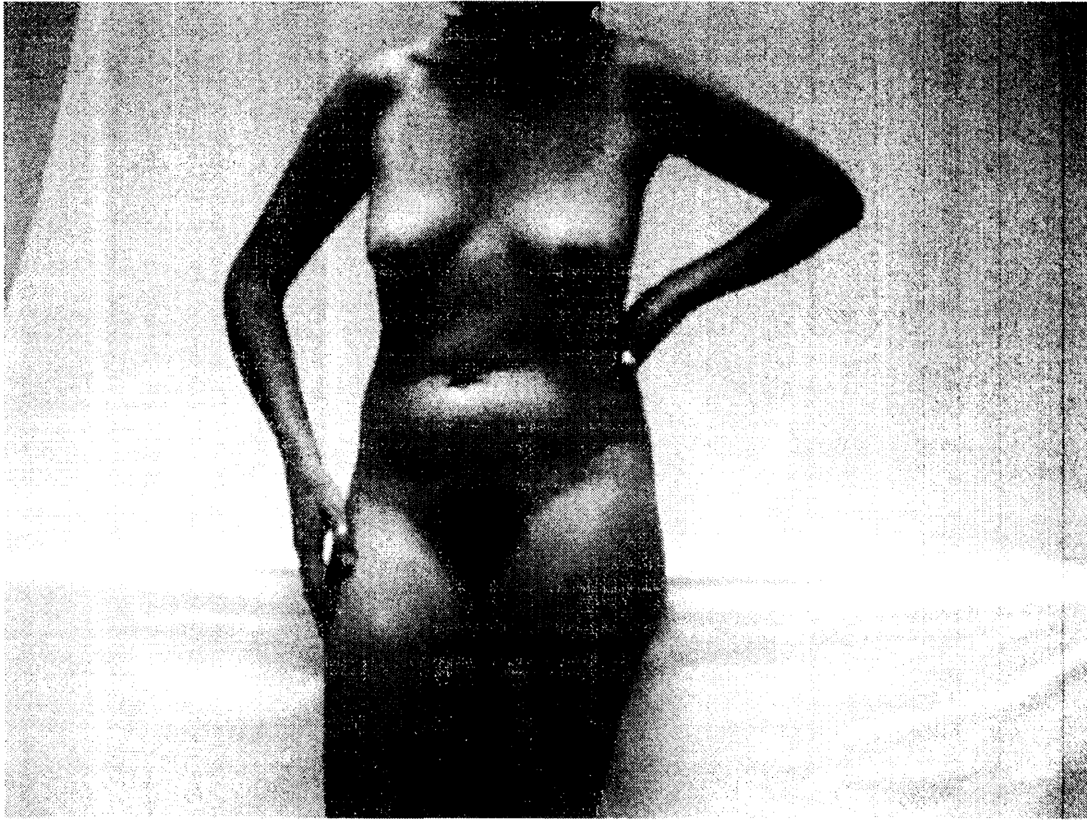


Figure 26 Martha Ladly, *Eros, Women, and Technology*, video interview still, Banff 1998
Martha Ladly, 1998

Janet talked about her relationship with her mother, who lives far away. They don't get to see each other very much any more. Janet jokes about her fear that she is actually beginning to resemble her mother. It is a bittersweet irony that the slightly irritating habits that some mothers indulge in with their daughters are just the ones that probably drove them crazy with their own mothers.

> I spoke to my mother a month ago. She lives far away. We lost touch for a long time. We haven't spent much time with each other for two or three years now. Because I am not living in that same place we don't see each other, and for a while, we didn't talk so openly. But as we get older, I find now that our conversations are tending to be a little bit more open, we're getting there. Going home recently, my mother commented on my body. We stood next to each other

and she said, "What size are your feet?" and she whipped me around, and checked my backside and she said, "Oh we are the same size, and your butt's getting flat, just like mine did at your age." And I was just, like, "Mom, all right, thanks for that comment." It wasn't flattering of course, but it was kind of humorous to have this moment where we looked at each other and I said to her, "Yeah, I am going to be you in thirty years, aren't I?"

Lali brought a secret story to the interview. It was clear that she was trying to be strong and to contain the emotion in her body. She told a story about mother and daughter relationship, embodied familiarity, and shared love. Her burden was an unintended misunderstanding that led to deception on her part, which became a barrier between them.

> I felt so bad . . . it is just this image I have of her in her bed. We always hang out in her bed in the morning; my father gets up earlier and so I sneak into the bed with her and we talk, and this is a normal thing. And she didn't get up. I started to cry too, so I left, and when I came back in she was just lying there, and we talked. But I kept having to leave the room because I was crying and I didn't feel like I had the right to cry in front of her, because she was the one who had been hurt, not me.
>
> I was able to explain to her why I did it, and that it was partly because of her. I wanted her to be at my wedding. I wanted it to be a real wedding. Anyway, she said, "I will be okay." And she was. I started crying again, in relief. My mom and I have a very open relationship, but we never talked about it again.

The erotics of pregnancy and mothering

> *By giving birth, the woman enters into contact with her mother; she becomes, she is her own mother, they are the same continuity differentiating itself.*[341]
>
> — *Kelly Oliver, 2001*

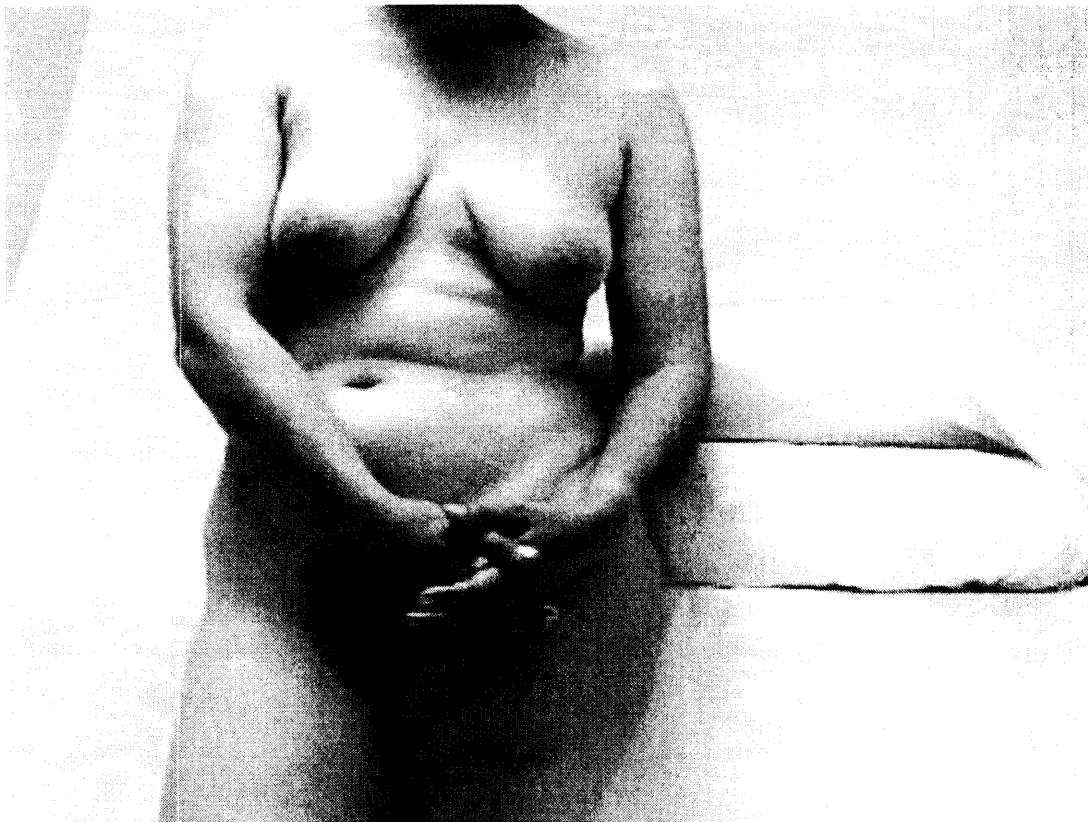


Figure 27 Martha Ladly, *Eros, Women, and Technology*, video interview still, Banff 1998
Martha Ladly, 1998

Women can experience pregnancy and childbirth as a reunion with their own mothers. Pregnancy may identify a woman with her mother; it also requires a new grasp of woman's concept of her own emerging identity, as "mother." According to Julia

Kristeva, who in writing about her own experience of pregnancy describes it as "... a dramatic ordeal: a splitting of the body, the division and co-existence of self and other, of nature and awareness, of physiology and speech ... " the maternal body is a grand subjective project, a subject-in-process.[342]

Beth talked about her joyfully erotic experience of being pregnant, enjoyment of her pregnant body, and allowing herself to revel in her corporeality; the ability to just be in her body, and look forward to giving birth.

> I loved being pregnant. I have two children. That was a very sexy time, because I didn't have to worry about contraception, and that was great. I got to look like something else; I didn't even have to think about whether I conformed to the "right" measurements, or any sort of stereotyped look. I remember with my second child, looking at my body just before I went into labour, I was just wearing a little robe, and I thought, "You look so great!" I had these great big huge tits, they looked terrific, and this enormous wonderful belly, it was marvellous. And my skin was glowing. I am not afraid of labour so I was very interested to participate in that for a second time, and remember what it felt like. It was great. My body has been good to me!

For some women, pregnancy is not a joyful time. Marie's narrative is revealing about the feelings of a young woman who discovers she is pregnant, and how relieved she was when that responsibility was taken out of her hands.

> When I was in university, I accidently got pregnant. I started gaining a lot of weight. I noticed changes; I was moody. I think I have a moody disposition, but I was moodier than ever. I didn't want to smoke, and I smoke, and strange things like that, and I guess it was my body telling me that these things aren't good. But I was getting my period regularly, so I thought it was just the beginning of the school year or something upsetting my body rhythms.

> And then one day I was sitting at the computer and I stood up and blood just gushed out, and I was horrified. But I knew immediately that I was having a miscarriage. It was a weird sensation, and I didn't feel a sense of loss at all, I was just so relieved because I didn't have to go through that decision.

Erotic ideas

Alejandra spoke about her arousing, erotic ideas, and her collaborative relationships, as a transgendered woman working in technology. Her description of the erotic stimuli of ideas and their sensations, and effects on the body, provides a commentary on the powerful connection between eroticism and artistic practices of thinking and making.

> Ideas do turn me on, they turn me on about as hard as anything else, but that was because I discovered ideas before I discovered bodies. Having started off as a young bookish introvert, my ideas came first, but I remember discovering that there was a physicality too, that there were surfaces and interiors—that was an exciting discovery, but it came later. So in some ways, my first experience with erotics was through words, and they weren't erotic words, they were luminous, sensual words and ideas.
>
> For me, it's a turn on just to watch women talk about and practice their work. Particularly in a workshop or a seminar; when people describe what they do; those who have done it for a long time to become quite still within their own practices, you sense a certain kind of energy moving through them, and it appears, when they talk about their practices, not only through their voice, but it suddenly manifests itself all over the surface of their bodies. It's like a light that appears around them, and I find myself lighting up in response, not only outside, but also inside. I get very turned on by that. I feel a warmth. I feel like yielding, a deep yielding, a desire to meet the other person in some interface that includes all of us at once.

Janet brought a book collection of forty vernacular tales written in the sixteenth century by the prolific Suzhou author, Feng Menglong. She stood somewhat formally, leaning slightly back against the table, her weight supported on one leg in a classically *contrapposto*

position, holding the book in her hand. As she spoke, she shifted her weight slowly from leg to leg, and passed the book from hand to hand, in a rhythmic flowing manner. We discussed the importance of integrating the body and the intellect, and the world of erotic ideas.

> I think that ideas and the intellect are what stimulate me the most, what I find sensual about someone else, and also about myself. The thoughts behind or involved with sex can encompass the entire range of emotion. That is what good sex should be about. Sensual feelings can be triggered by everything, from something that one might consider morbid, to something that is innocent, beautiful, naïve. As far as being with someone is concerned, I want someone who is very good at being able to create themselves through words, someone who tells a good story. I find that very sensual.

An erotic affirmation

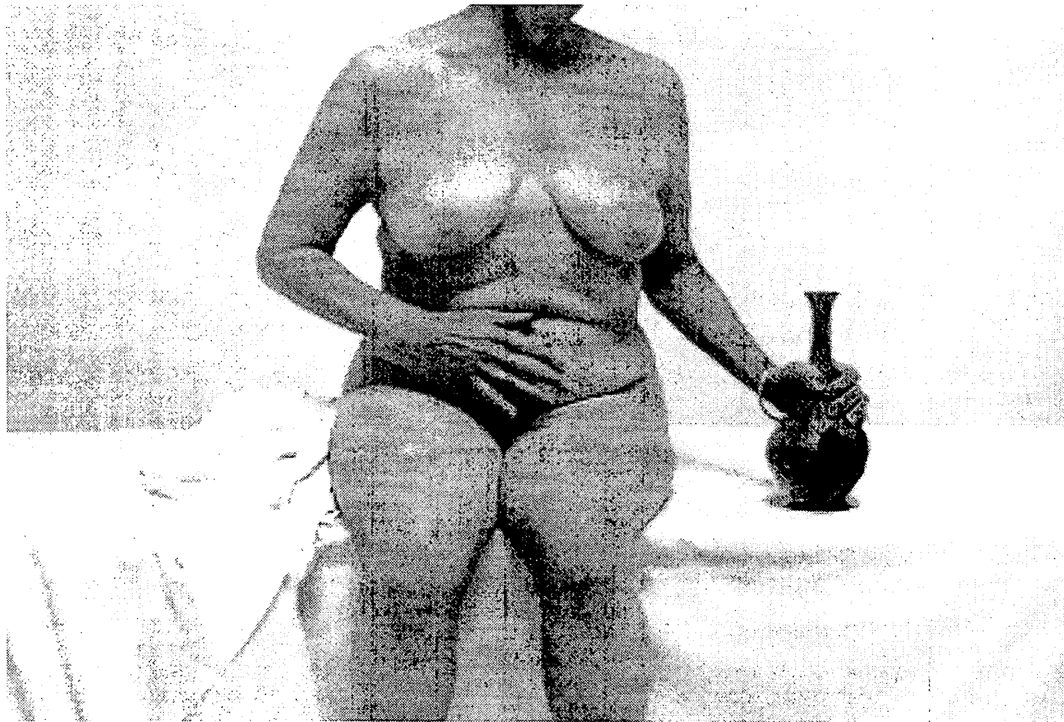


Figure 27 Martha Ladly, *Eros, Women, and Technology*, video interview still, Banff 1998
Martha Ladly, 1998

Louise wanted to train as an artist, but her parents insisted she enter a profession. She shelved her dreams and became a clerk in the sales-analysis department at the head office of a large business where her father worked. Nine months after her marriage to an ambitious young businessman who loved sports and popular music, her first daughter was born; Louise was twenty-one. Within five years, three more baby girls had arrived and her family was complete. It is not surprising that she didn't have the energy to pursue her artistic ambitions. But she found time to learn more about the artists she loved, especially the French Impressionists, and she passed her love of arts and culture on to her daughters, taking the girls on frequent trips to the galleries, museums, the ballet, and the theatre.

Louise talked about the joys of growing older, and of her children growing up. She felt that she was getting her life back. This was reflected in how she viewed her erotic life; her loss of reproductive power—her "disappearance," as she put it, into the invisibility of old lady-hood—and coming to terms with her own mortality.

> Pregnancy was very fulfilling. I have had four daughters, and each one has been a great gift. I can't say how I would feel if I hadn't had any children although I think I would feel rather bereft. My body has served me well; it has given me my children, and it continues to please me. I can't say that I have any disappointments. Actually, I feel better now than I did when I was younger, because when your children are grown, and you get your life back, it is such a great feeling of freedom. Certainly after menopause, you recognize that you are not a young woman any more, so I think that you look at your mortality and become more comfortable with that. And I think you also realize that a certain part of your life is over and you should probably consider that the rest is precious, and try and use it as best you can, for whatever reasons you want.
>
> I am in my seventy-eighth year, and I have joined a different club now, I've joined the old ladies club. It means that you have finally arrived, you've reached the age that you are supposed to be wise, but I am not sure that actually happened. I don't particularly feel like an old lady, but I am

> an old lady, and old ladies are invisible. Now I find that a really freeing experience, because if no one can see what you are doing, then you can just do what you want! I look forward to every morning, whether the sun comes out or not, every day is a gift when you get to be my age . . . I have never felt cheated, or that I wanted any of it back again, I just feel it was a passage. I think that life is a bit like floating downstream, it just goes on, and then it ends at some point, whether you want it to, or not.

Closing thoughts on the analysis of this research-creation

I had intended to test my hypothesis, that interviewing women in the nude would affect the content of their interviews. I tested the notion across the1998 interviews and the interviews conducted in 2011, which were done fully clothed. Nudity was not an independent variable across the interviews, because I also asked different questions in both sets of interviews. I am not claiming this was a scientific study. It was a comparison of different methodologies and outcomes and their suitability for the research I was undertaking, and the participants' erotic and technological knowledge. Although the questions asked in any interview situation will set the tone, and in some ways anticipate the responses and outcomes of the interview, I intentionally set up an element of neutrality and open-endedness in both sets of questions. In the 1998 study, I expected and received highly personal, erotic stories and information about physical events, emotions, and feelings related to bodily changes and sexual interactions. In a second set of interviews conducted in 2011, with participants fully clothed (documented and analysed in Chapter Six), the content of the interviews was much less personal and less about the physical, even when a question was pointedly asked about the effects of technology on the body. Instead, as will become apparent, participants chose to focus on experiences

involving their interactions of technologies with their personal and family lives, and in their work and social life.

I have speculated on some of the other reasons for the marked difference in responses, in some cases with the same participants. My speculation is that technology has become a much more apparent, pervasive, and inescapable feature of personal and professional life for women, with the intervention and the ubiquity of devices, the tasks that are set by technological working practices that demand constant attention to the uninterrupted flow of information, digital communications such as text messages and emails, and the time spent working at computers, all of which have become part of the fabric of every day working and home life. There has been a distinctive change in technological work practices and social practices, over the period of thirteen years that intervened between the first set of interviews in 1998 and those in 2011, which will be discussed and documented in the following chapters.

Research ethics and documentation of this work

The reanalysis of the original 1998 interviews was conducted under the auspices of research ethics approval for my study from York University, which appears in Appendix A. Informed consent was obtained from all participants who appear in the interviews discussed in the thesis. With the permission of a number of the interview participants, documentation of the research-creation has also been included. Video excerpts and images appear on the DVD included in Appendix B.

Chapter Six

Women and Technology: Interviews 2011

Figure 28 Martha Ladly, *Eros, Women, and Technology*, video interview still, London 2011
Martha Ladly, 2011

Setting out to conduct a second study with a small group of artists, designers, and scholars, concerning their practices, and their specific relationships with technology, I brought a number of questions for consideration. All of these questions, regarding creative practice, pedagogy, the body, and the position of women in technoculture, have

arisen in either historical or near contemporary enquiries in earlier chapters. The investigations undertaken in this second study document entirely contemporary concerns, which have arisen from my own observations as an artist, designer, and educator.

The motivation for the questions asked in this second study have accumulated over the last ten years, as I built a career as a pedagogue and scholar in the emerging field of new media. I adapted and learned how to utilise, question, and invent with these new technologies, creating new cultural artefacts and practices of making. I acquired new techniques in my art and design practices, transitioning from an entirely analogue, actual "cut and paste" practice in graphic design, to one that was entirely computer- and software-based, then taking that practice into the realm of new media and entertainment. Over that time, I had the privilege of working on several ground breaking new media art and design projects. These include some of the first art, music, and entertainment CD-ROMs, *Xplora 1*, and *EVE*, and *Ceremony of Innocence*, one of the first multimedia games designed for women, all created with Peter Gabriel's Real World Multimedia company, of which I was a founding member. I worked with Sara Diamond and my colleagues at the Banff New Media Centre to create Canada's first digital arts and culture website, which remains a valuable pedagogical and media resource. I undertook research at the genesis of mobile locative art and design, and anticipated new mobile technologies and practices, as a member of the Mobile Digital Commons Network, and a founder of the Mobile Experience Lab at OCAD University. I led *Mobile Nation*, one of the first conferences on mobile art, design, and communication practices in 2007, and co-edited with my colleague Philip Beesley, the first anthology to be published on the subject.

At the same time, as a working mother, I raised my children, teaching them how to use computers, software, the Internet, mobile technologies, and social networks, long before these skills were taught in schools. I created courses and programs at the college and university undergraduate and graduate levels, to teach others and disseminate what my colleagues and I had learned. I participated in the rapid evolution of design for new entertainment and educational platforms, software interfaces, services for the Internet, and mobile technologies, first hand. All the while, I juggled parenting and professional practice, helping to define an emerging field, and built my career in this exciting new landscape, with a few strong women colleagues and role models. I began to question the status quo regarding women's involvement in the larger technological project, questioning why so few women worked in the field. I have not witnessed the advances that I think my female colleagues and I had expected and hoped for. I formulated some of the questions in this 2011 study, to try to find out more about women's participation in technoculture.

Another driver for my study was an accumulation of observations during my careers in entertainment, technology, and pedagogy over the last twenty-years that have left me with strong attendant concerns, pertinent questions, and critique. I wanted to know more about contemporary women's associations with technologies and the effects they have on women's bodies, practices, ways of communicating, and relationships. I wondered if these effects were different for women than they are for men. Why are there so few women involved in the technological professions? In particular, why are there practically no women leaders in these fields? If there were more women in technology, what would

this look like? What products, services, and ways of *Being* in technology, might women dream up and design? These questions seemed to have no clear or obvious answers.

I framed these questions relative to the effects of technology on bodies; women's relationships to technological artefacts, technology in art, design, and more generally around women's place in technoculture. Questions were reformulated to become the research enquiries for the 2011 field study, presented in this chapter. I decided the best strategy to pursue this knowledge would be to create a new study, and ask some of the smartest women I know for their views. Part of my motivation was to return to some of these women, who I had originally interviewed in 1998, with new questions, and to interview a younger group of women who had grown up with technologies, the first generation to be born digital. Their responses to my investigation form the outcomes of this study.

The methodology of this study

Thirteen years after I conducted my original interviews with women, over the summer and fall of 2011, I attempted to contact all of the original participants from the 1998 interviews. I was still in contact with some; others I was able to track down through the Internet, via their websites and on Facebook and LinkedIn. I was unable to re-establish contact with a few of the women from the original cohort, but all of those I was able to reach were glad to hear from me. Most remembered quite vividly their interview thirteen years before. Some were interested in continuing our conversation, others not,

but I obtained consent from all of them to reanalyse their first interviews as part of this research study.[343] I then set out to re-interview a number of these women. They were as interested as I was to see how their views had evolved over the intervening period of rapid social and technological change.

I then recruited another small, diverse cohort of young creative women, all of whom work with technology in some innovative shape or form. Some of these new participants were children at the time of the original interviews, and I wanted to add to my growing knowledge on this topic the voices of their generation, with its perspective on technology. At the same time, I was interested to reflect on the range of opinions from such a diverse group of women.

For the second set of interviews, I again used a narrative methodology as described in the previous chapter. This time I employed a straightforward, informal, talking head interview style. (Appropriate to the nature of this new study, participants were fully clothed.) The differences between these two sets of interviews are remarkable. The radical nude/narrative approach, and the very authored visual style I had adopted for the first set of interviews were appropriate to the questions about the erotic body I was interested in and the aesthetic I wished to create. As demonstrated in the previous chapter, this radical approach contributed to a very direct and open conversation about intimate stories. I was still interested in their personal observations; stories from their own experience, and opinions on the experiences of others, but I was more interested to see if participants would generalise, deviating from the very particular personal experience to address larger questions relating to technological effects, general trends, new ways of

thinking, and the potential for women to become more involved in designing technologies in the future.

Not surprisingly, technology played a much more important role in the new interview process. I used a small, portable, digital video recording device, very different from the large analogue video camera I had employed in my first set of interviews. Many of the interviews were conducted in participant's workplace or home, or in a neutral meeting place such as a hotel or coffee shop. This gave the interviews a very informal, conversational style. Some of the participants were in other countries, many thousands of miles away, and some were simply too busy to meet in person. In these cases, we conducted our interviews via Skype.[344] I set up a small digital video camera facing the screen, to act as a recording device. For the Skype interviews, participants were virtually inviting me into their homes or offices. So a singular difference in the two sets of interviews was that participants in the earlier study were invited to my studio to participate, whereas the later interviews were conducted on participants' home ground, or at least, in a place of their own choosing. This gave control to the interviewees, and the whole situation took on a more informal, conversational tone. This was a deliberate choice on my part in order to give them the freedom to range over their own choice of topics, make the process easy for them, and allow them to give as much or as little time as they had available to the interview. In some cases, therefore, interviews were short, fitted between meetings or work hours, while others were longer, more sociable, and followed by a cup of tea.

In these interviews, participants were asked to consider the technological artefacts, objects, devices and systems they use every day to work and communicate with, and the impact that these objects, devices, and systems have upon their daily lives. I asked the participants to expand on the following questions:

1. What is your relationship with technologies in your personal and professional life?

2. What effect do you think that technology has on your physical, mental, and emotional wellbeing?

3. If you could change or improve the technologies that you use in any way, how might you change of improve them? What might you design? And how can women contribute to technological change?

To organize the responses, I selected eight interviews that are pertinent to my topic; four are from participants in the original cohort, and four are from the new cohort. I used an affinity mapping process to sort, choose, and analyse the participants' wide-ranging views and answers to my questions. I then grouped participants' responses around the important topics and themes that arose during the interviews. These six overarching themes are:

Technology in practice
Women, Technology, and Education
Eros and Technology
Technology and Others
Women and Technology: contents and discontents
Eros, Women, and Technology: recommendations and possible futures

This thematic grouping gives context to the issues raised by my questions and a means of comparing the participant's responses. In identifying these themes, I paid

particular attention to the topics that seemed most important for each interviewee. I also used quotations from each of their particular responses to introduce relevant topics. The first five of these themes arose in response to the first two interview questions, and are dealt with in this chapter. The final theme arose specifically around the third interview question, and will be dealt with in the concluding chapter of this dissertation.

Participants in the 2011 study

The study participants range in age across six decades. The youngest respondent is in her early twenties, the eldest in her mid-seventies. They are a culturally diverse group. All of the women have professional connections with art, design, and/or communication, and technology. Some chose to reflect on professional matters, others on matters that seemed more personal. I have included a range of information that arose in our discussions that I felt were pertinent to the topic of this dissertation.

All of the women I interviewed in 2011 agreed to be identified. Unlike the 1998 interviews, I asked the participants to introduce themselves in their own words. Their faces and voices are clearly visible on video. Although all participants agreed to be identified by name, those participants who also participated in the 1998 interviews will be identified by their original pseudonyms, to create coherence with the previous chapter. Pseudonyms also allow the reader to reflect more closely on *what* is being said, as opposed to *who* is saying it, especially in the case where participants may be identifiable by some readers. No interview participant saw potential identification as problematic. All

gave their informed consent, either through their interview transcript, their video, or the details of their answers.

In the thematic sections of this chapter, participants will be presented in order of age, from youngest to oldest. I chose this chronology primarily for purposes of ordering of the range of responses. Although this ordering does give an interesting arc to the thematic responses, this was serendipitous. The responses are not ordered in terms of importance I place on them, and no particular conclusions should be drawn from the ordering.

I have lived for many months with the answers to my questions—and the extended interviews—from this group of brilliant women. I have digested their discussions about the impacts of technology on their lives. Their views are personal and particular, and are not set out here for the purpose of gross generalization across the experiences of all women or any particular group of women. Rather, their words are presented as a snapshot of how a group of creative individuals, of diverse ages and backgrounds, are now thinking about education, work, relationships, and how technology touches practically all aspects of their lives.

Participants' thoughtful responses are presented here as a sort of accretion of ideas and observations about individual women's situations: where they find themselves in technoculture, benefits and drawbacks, and things they may wish to change. The analysis lies in what is left out and in the themes used to order their responses. Each theme is also given an introductory overview. Beyond this, I ask the reader to allow participants' observations to sit, to accrete meaning and grow, as they will. As the participants are all

experts in their fields, their knowledge is offered for the reader's deliberation. Further analysis will be undertaken in the concluding chapter.

Participants in this chapter, in rough chronological order by age, are Becca, Alex, Aga, Suz, Lali, Rachel, Alejandra, and Louise. I begin with their introductions.

Becca:

I recently graduated from university, and I am working in online television production and social media. In my professional life, everything I do is completely reliant on technology. I write and do research. I conduct interviews and create programs for Internet TV. I am on my computer every day, working with online tools that we have developed to create and run our website and blogs.

Aga:

I work in technology in the corporate world. I am a developer; I manage our mobile team of developers, designers, interaction designers and testers. We work on projects for the mobile web and mobile applications, mainly for IOS and Android. Technology is a massive part of my work life.

Alex:

I work for a technology company, in on-line luxury fashion, and I design all of their mobile solutions, application design, and mobile website design. Every day I am completely immersed in thinking about how people are interacting with their mobile phones and devices. I love my job. I love design. I am completely immersed in design for mobile. I am constantly researching and discovering things, and enhancing my knowledge.

Suz:

I am a professor at a university of art and design. Understanding practices and approaches towards innovation, and ways of constructing businesses and enlisting creativity, is my domain. My career has been built around the effort to make technologies fit neatly into the lives of everyday users, and also understanding how technologies can be used for the better. That has really been my focus ever since I entered the field in the 1990s.

Lali:

I am an artist, and the co-director of a research network made up of an international cast of artists, technologists, gamers and activists. We are interested in trying to figure out what part aboriginal people are going to play in cyberspace, which we define as websites, chat spaces, virtual environments, and video games, and whatever else is coming.

Rachel:

When I think about my identity in a creative sense, I think of myself now as being primarily a researcher in the fields of computer science, art, and design, with a big focus on data visualization and mobile technology and media. I became a designer through my interest in software as an art form. Before that I was an artist, with a significant career in video art. I do a lot of writing about the history of media, both analogue and now digital media. My research career and my art career are both deeply engaged with technology.

Alejandra:

I'm a researcher and a performer. I teach digital arts and new media production in my lab at an American university, and in the summer I have the privilege of teaching in an experimental interdisciplinary program at a European graduate school. The rest of the time I'm on the road performing, writing, or designing installations, making stuff, living online, reading, and raising hell. I am transgendered and transgender is an important part of my research, theory, and academic praxis.

Louise:

> I'm retired now, but I worked in publishing, and advertising, and in retail, I've had a number of different careers. I had my four daughters when I was very young. I devoted a great deal of time to the children, so I didn't really get the opportunity to pursue the education or the career I would have chosen. But I have no regrets. I love to spend time with my children and grandchildren, and now I have a great-grandson! And I love to travel. Travelling, and meeting new people, and experiencing other cultures has been my education.

Technology in practice

In this section, interview participants addressed themselves generally to an appraisal of the question, "what is your relationship with technologies in your personal and professional life?"

A particularly striking aspect of these responses is the participant's recurring references to the ubiquity of technology, particularly mobile technology, and social networking. Many rely on technology in their every waking hour—for some, throughout sleeping hours as well. The expectation of being "always available" through technology is omnipresent. Their mobile phones are with them always, and always on.

This is particularly taxing for professionals, like the women that I interviewed, who use technology all day long in their work, and then during every other time in their lives for pleasure, entertainment, communication, and connection. Their jobs require this, and by and large they have acquiesced to long working hours. Answering emails and texts at all times of the day and night, and continuing to work at home after the end of the supposed workday are also the norm. This evening and weekend work at home is

necessary to catch up with all of the actual work they were unable to do while attending to the ever increasing and time-consuming demands of email, Twitter, Facebook, and whatever other social networks it is deemed necessary. Add to this the time needed just to stay abreast of the constant churn in technologies, and the whole thing becomes rather exhausting; a zero-sum game, even according to the youngest women I interviewed. The sheer volume of time that is needed to keep up with all of this activity leaves very little time to be away from work, and even less to be away from technology. For some, this is invigorating, and they see themselves very much at the forefront of their professions, ahead of the curve in an exciting race to find or *be* the next technological innovation. They are themselves reflected and even embodied in their close relationships with technology.

Aga:

I think that my life is totally soaked with technology in whatever I do.

I am a technical development manager for mobile, so almost from the second I wake up I have my mobile phone in my hand. On the way to work I read blogs, I check my mail, I see what's going on, I look at apps. When I come to work, we talk about what apps we will build, what mobile sites we will build, how we will support the brand, from marketing perspective but also from a conversion perspective, what problems we are trying to solve. On the way back, I read stuff on my mobile. I check my work email because usually it is too busy to do that in the office.

You go into this because you love it. It is intellectually challenging and very creative. You solve problems every day.

Becca:

Technology plays a massive role in my day-to-day life.

Since getting an iPhone just over a year ago it has transformed how I use technology in my work and personal life. I find myself on my laptop computer a lot less, because I always have my phone with me, so I can work anywhere. I use it for the work I do with social networking, Twitter, updating Facebook. I definitely find myself using my cell phone all the time.

I find myself on Facebook way more than I need to be now that I have my phone. It is cool to keep in touch that way, but there is another side of it, which is too close for comfort. With these new "check-in apps" people can see exactly where you are at any given time, and then post it to Facebook, that has definitely increased how much I use social networking. But it is distracting me from other important things I should be doing. All together I probably use social networks for a couple of hours every day, at work, and when I get home. If I am away for the weekend or out in the evening, I try not to "check-in" at all—I want to check out!

Alex:

I sometimes stop and think about my professional situation and wonder what it would be like if I didn't use technology in my work.

What did people do at design agencies and advertising agencies and before they had computers? Did they just sit and draw things? It seems so extraordinary that we are so completely attached to our computers, and that we sit at them all day every day, and yet, before, things were so different. I can't really imagine it. I asked my mother and some of her friends who are in my industry, what did you do before computers? They drew things, and photographed things, and cut things out, and pasted things, and ordered typography from font houses to use in their layouts. I personally can't imagine that.

Every day I am completely immersed in thinking about how people are interacting with their mobile phones and devices.

That thought process doesn't end when I leave work, I don't just switch off, it is part of my life. It is the way that I think and operate. I am very interested in design for mobile, so it is something I am constantly

researching, trying to discover more and enhance my knowledge. There is a really pioneering feeling about working in new technology. At the moment I'm pitching a prototype we designed for a new mobile experience, an interactive magazine. If it happens, I will feel very excited and eager to be one of the first people to do this in our industry.

Suz:

I use technology primarily for its expressiveness, and the way that it extends us socially.

In my work as an ethnographer, I engage in an exploration of technologies and how they can work better for us, so that we're not fighting them in our everyday lives. That is my emotion-scape, I guess. I think that I am old enough not to take the foibles in technology-land personally. Although I used to be quite personally offended when I would have a crash, or a data loss, for example. It changes our perceptions, and the ways that we engage with the world around us.

Lali:

Professionally, my work relies on new technologies completely at the moment.

I use a computer, and software and peripherals to get my work done, and to actually create my work. I communicate via email and chat every single day. I use social media to promote my work and to find out what my peers are doing. So technology is very important to my professional life.

Women, technology, and education

As discussed in Chapter Two, the technological education of women is important if women are to gain more equitable representation in science and technology fields, especially in the STEM fields. This starts at the earliest possible opportunity and should

continue at all levels in education. Nicholas Negroponte, the founder of the MIT Media Lab and CEO of the *One Laptop Per Child*[345] initiative observed, "In fact, one of the saddest but most common conditions in elementary school computer labs . . . is the children are being trained to use Word, Excel and PowerPoint. I consider that criminal, because children should be making things, communicating, exploring, sharing, not running office automation tools."[346] For many young girls and women, this is the sum total of their training in technology. Some of the participants, including the youngest involved in this study, observe that technology has become steadily more pervasive in schools without necessarily entailing creative or educational benefits.

All of the women interviewed have been involved in one way or another in furthering their own and others' technological education. I am certain they would agree with Negroponte's view that creativity must be at the heart of all education. This extends to creative uses of technology, which is the central preoccupation of a number of the women interviewed here. Many of them have recently finished university studies, and a majority are involved in some way in the technological education of women at the post-secondary level. They are invested in technological education for women, and a number of them are mentors and role models for young women who wish to be educated, trained, and employed in the technological professions. A number of participants identify personal experiences they have had that constituted barriers to their entry into technological professions. Others identified broader cultural problems that inhibit women from entering these fields.

More and better examples and role models for young women working in technology, and greater opportunities for women to receive the best technological education, will assist in the important task of re-imagining technology. The participants in this study have their own observations, and some important general recommendations in this regard.

Becca:

I am in the last generation of people who will remember what it was like before the Internet was widely available.

I can definitely remember the pre-Internet days. We had one computer in our house, and a dial-up connection that we were only allowed to use for ten to fifteen minutes a day. The Internet was a lot more expensive, you paid by the minute to be online, and it was much slower then too. I only got into the Internet when I was fifteen or sixteen, because that was when all the social things started to come along. But before that I was perfectly happy without the Internet. We used books for doing our research! Now, everybody uses the Internet, and increasingly, it's on your phone. By the time I finished university you didn't necessarily have to go to the library, or even be at your computer to do your studying. I don't think that has helped people to do better research, or to think deeply about what they are studying, and why.

Alex:

I cannot remember a time when I didn't use technology.

I remember when we were kids; I probably used my first computer when I was six. My mother is a graphic designer and we always had the latest computer, and my sister and I were always playing on it. I would say that my relationship with technology has developed throughout my life in terms of my education, my work, and in my personal life. Now, it touches everything.

Most of what I know about computers I taught myself, or learned at home.

I went to art school and graduated in design; my specialty was advertising. Of course, we used computers and software all the time in our coursework at university, but more as tools for realizing our concepts. We were taught to draw as well. When I have ideas in initial stages of development I usually sketch them out by hand before I take them to the screen, and I can still draw, just about. I used to draw much more when I was younger. I loved to draw. Using computers now, I draw much less often; I have to work hard to hang on to those skills.

Aga:

I would like to change the perception that working in technology is not for women.

I trained to work in technology, but I never realized I was entering a male world. I was always told, by my mother "you can do this, you can do whatever you want." My mother has a Masters in physics, and she told me, "Well it was hard, but you can learn anything." When I was doing my degree in philosophy, and later, when I was learning computer programming, I sometimes said to her "I can't do this," but she always said to me "you can do this, it might not be easy, but keep at it, it will come to you, it is just a matter of persistence." I did persist. I would like to start changing the perceptions about technology, and telling young women about the ways that they can be feminine, and creative, and how much fun it is to work in this discipline. In education, girls often go into humanistic fields, because the thinking is that if you go to study computer science, it means you are not a proper girl. It is not even that we are not smart enough, there is this perception of this kind of arty or geeky male that goes into computers, and that it is not for women.

We really need more female role models who are working in technology.

On most tech teams, there is one girl, and fifty guys. Imagine you are sitting in a room with guys who have been doing technology since they were six, and they are ten years older then you are, and they think you are talking nonsense. How does that make you feel? It really undermines your confidence. Even now, when I am in a tech meeting, and there is a guy from my team in the meeting, when I say something, the client has to ask the guy "What do you think?" And he has to say, "Yeah, she is right."

Especially if they are guys, they seem to need another guy to approve or sign off. And it is not just men that have this perception of women working in technology. Sometimes other women also need reassurance from a man. They don't have confidence that a woman actually knows what she is talking about in this field. It is almost cultural.

I think we have to make more effort to make technology available to women as an educational and cultural choice.

In the future I would like go and talk to girls in high school and say, "there are lots of jobs for you in tech. Look at what we do! There are so many amazing women who have built this internationally successful online fashion company! They are all smart, they are attractive girls, and look what we do for our living. We have fun, and we solve problems every day. You should consider studying computers and programming, because there is a good future there. You could be doing something like us." I don't agree that women are more talented in humanistic areas. We have just as much potential in the sciences, in computing, and in engineering too.

Suz:

I make an effort in my professional and personal life to try on new technologies and see what happens.

I work with my colleagues at the university on research projects as well as course delivery, and teaching students at the undergraduate and graduate level about how to develop concepts for technology. I like to stay a little bit ahead of the curve. I like to experience technologies as they come out; different platforms, different devices. I listen to my students. I want to hear about what is coming up for them. It keeps me excited about what I do. There is a general feeling around wellness becoming an important aspect of technologies that we design. I think it is important to have an emotional attachment to the technological scape I have around me—that includes old technologies as well. I feel like I have a personal relationship with all of the technologies in my life, which is positive.

Rachel

I think we can agree; artists and designers need to be educated and trained to think as inventors, not just skilled users of technology.

Fundamentally, I see technologies as being products of human enterprise; systems and networks that are beyond one human's control, none the less, they operate in the ways that engineers and designers have designed and created these technologies. Which is to say: "This is an artefact, it is designed, it was made through human effort. Yes, it has a certain autonomy, and when you program something, what people do with it, how people use it or interact with it, is not necessarily what you predict. It has its own dynamics. It has a certain amount of intelligent stupidity built into it.

Alejandra:

My focus is primarily on creativity and secondarily on technology . . .

We use a lot of digital stuff in our lab, but I'm not head-over-heels in love with the word "digital," except in the ways that digital equipment enables new forms of creativity. For me it means doing new things with new and old tools. Digital is lovely and highly seductive, a bit like tulips in the 1600s. Creativity, on the other hand, is unruly by nature and unsettling in progress. My students are ripping up technology, reassembling it in unfamiliar forms, and making it do unexpected things. I've designed a program and a space to do that. That, in a nutshell, is my pedagogy.

Eros and technology

This part of the study focused on a consideration of working motherhood, children's relationships with technologies, and women's work in the technological sphere. Professional women who are also mothers use communication technologies extensively to stay "always connected." In the case of working mothers with young children, expected to be available at all times, in two different modes (as parent and professional),

the situation of operating effectively in both worlds is extremely challenging. As the boundaries between the professional and the personal become increasingly blurred, these women are asking, "where and how am I supposed to find the time to do all of this?" They are constantly "on call" in both of their worlds—to their work and professional obligations, to their children and their children's caregivers and schools, and to all the arrangements for their family's busy extracurricular and social lives. All of this manifests itself in a sense of never really being able to keep on top of things. I sensed a feeling of ennui and exhaustion during my interviews with working mothers.

They are also concerned about the effects of pervasive technologies upon their children. This was balanced by the enthusiasm expressed by all of the women towards the benefits of technology, and in its ability to assist them in communication with their children particularly. There is a general optimism amongst these hard-working women that technology will provide the tools to help them to create better lives for themselves and their children, as well as for society generally.

A number of these women talked about children's intense interactions with technology, and the ways that technology has exerted a highly intrusive influence on family life. Most find technology especially useful for keeping in touch with children when they travel on business. One woman talked about her attempts to use less technology, more often. Her way of coping with the business of raising children and working as a professional artist is to try to avoid multi-tasking, to turn things off and concentrate on the tasks and pleasures in hand, such as preparing and eating a meal with her family. Her advice is to lower the distractions of technology by simply turning them

off more often. Others expressed concern about their children's interactions with technology, their overexposure to screens, and their own radical decision to keep technology out of their children's lives for as long as possible.

Figure 30 Martha Ladly, *Eros, Women, and Technology*, video interview still, Toronto 2011
Martha Ladly, 2011

Suz:

I think that the blurring of life and work, which has been catalysed by many of our technologies, doesn't serve me well, from a parenting perspective. I actually need to bring those boundaries back in.

Having children has provoked quite dramatic changes in my life. Pre-children I worked incessantly, I was quite progressed in my career. That life-work balance thing was never really quite balanced.

I didn't take vacations, unless it was so that I could teach somewhere else or travel for something professionally. I never stopped—and I was pretty successful at it. I was in corporate strategy, and earlier, head of a large European technology department. I managed big groups of well over a hundred employees.

When I had children, I found I just couldn't balance being in corporate life with my family.

I was on a plane twice a week, at least, often commuting through the weekend, or leaving on a Sunday and coming back on a Saturday. The corporate life is such an anathema to motherhood, it really is. Even something very simple like pushing a stroller down the street, and your cell phone goes off. You know, you have to stop everything to answer it, and if it is a business call, you really don't want to take it! And if you are in the midst of childcare, it might be hours before you can really have a focused conversation. Because my life has changed with my children, I really do need to have these quarantine times, where I am not necessarily away from all technologies, but I am away from being accessed, or being asked to be present to someone else. So it is really the technologies of communication that I find difficult, as there is an expectation that I will be constantly present and accessible.

I feed my children quite a lot of technology, probably too much.

My kids are nearly four and five. I used to be very arrogant about the idea that my kids didn't have a lot of screen time, meaning TV. And then I realized that actually, when you calculate, the amount of time that they are on iPads, computers, etcetera, etcetera, it does add up. So I think I need to reconsider that. They don't use screens at school, yet. At home, they probably use screens for two, two and a half hours a day, it is up there, if I am really honest about it.

I am concerned about microwave and radiation levels for my kids, I think about our wireless networks. They have little growing brains, and I am worried about the effects. I am more than a little worried I am going to regret this later.

Lali:

I am starting to think of multi-tasking, especially with work and children, as a bad idea . . .

So now I am actually really trying to do less with technology. I multitask too much. I find it difficult, but I try to devote 15 minutes minimum now to something. I don't want to be flitting through different things. Sometimes it is flitting through email, various programs on my desktop, and other times it is computer/child/dinner. And I don't want to do that. We put an iPad in the kitchen, because I thought, "oh, it would be so great if my recipes were just here," because I store them on the iPad, and I do look at recipes online. So now, there is that temptation to check my email while I am looking at a recipe and waiting for the water to boil. I am trying to resist that, and just be vigilant about it. So instead of looking at Facebook, I think "what is the next thing that I can do that is part of the actual task of the meal? Well, I could just set the table!" And so I turn off the iPad. It is a lovely feeling to just concentrate on one thing at a time: it is freeing.

Alejandra:

We shouldn't put kids online when they are very young.

We should wait until they're a little bit older, so that they can get a grip on the physical world, before we send them off into the virtual world. My daughter has decided she doesn't want the little one to have anything to do with technology until he is older. So she has set up a tech-free house, he is a free-range kid. He plays outside; he plays with blocks and physical toys. He doesn't go online. I see her point and I am inclined to agree with it. So at the moment I am spending a certain amount of time trying to figure out ways to play with my grand kid that don't involve technology, and believe me, it's very hard, because we live our lives immersed in technology.

Technology and others

There is a growing awareness that some of the problems of the digital divide, and attendant barriers to technological inclusion, are not particular to women, and are

replicated in other cultural and sexual demographics such as cultural minorities, and GBLT[347] individuals. Two of the participants in this study come from minority areas and their views have been expressed within all of the themes. The thematic area of "Technology and Others" provides an opportunity for them to express views particular to these communities.

In the case of indigenous communities, new technologies provide unique opportunities for indigenous people to document and preserve languages and cultural practices, and preserve their traditional cultures for the coming generations. Mobile and Internet connectivity can also provide opportunities for people in remote areas to access information and education, as well as to maintain contacts across the great distances that sometimes separate family members and their communities—especially if they are away at school or university, or working. They provide the potential for prosperity and economic renewal. Indigenous people have been particularly affected by the digital divide, because of the costs of technology and problems of access in remote communities. Complex cultural concerns are also in question, such as the management of forms of indigenous knowledge, and the appropriateness of technologies for doing so.[348] One of the participants in this study is an expert technologist working in this area and she presents her views.

Another area of expertise is in the issue of transgender identities. Technologies like the Internet play a significant role in education, awareness and access to health and other information on issues that face transgendered individuals that is not otherwise readily available. Shapiro has documented how "Internet use has helped individuals learn,

practice, and adopt new gender identity scripts, learn about whether and how to shape their body as authentic transgender individuals, and has offered new—and often more accepting—social gender paradigms."[349] Technological mediation has also largely replaced traditional support groups, and plays a significant role in facilitating communication and combating isolation in the transgender community. It is equally important for transgender women to be included in the transfiguration of dominant technological paradigms, and the woman representing them in this study is an eloquent and highly qualified spokesperson.

Lali:

In the past, technology was used to depict and represent aboriginal peoples, and we didn't represent ourselves.

Aboriginal people feel that past practices, like photography and film, have served to our detriment, because we weren't telling our own stories with these technologies. Now we have the opportunity to tell our own stories. We feel that now is a time when aboriginal people are beginning to have a comparable amount of access to the current technologies and new media that are available to the world, like personal computers and the Internet. We want to take that opportunity. We want to find best practices, the best ways we can tell our stories using digital technology, and we want to help other people who want to do that.

What I am doing as an artist, is trying to create and provide positive images of aboriginal people in the future.

What I am trying to do is bring an aboriginal perspective to famous historical events that have usually been told by the mainstream storytellers, be they the media or the history writers. My current project is a "machinima"[350] series, we are telling aboriginal stories, and making movies in virtual environments. I want positive images of us in the future. I want to show us as participants in the future. I want people to have role

models, imaginings of us doing important things in the future, making our contribution to this whole pluralistic society we live in.

Alejandra:

Everybody is trying to work through the new technologies of gender.

Being a "transi"[351] I have been outside the normal medical establishment. Following surgery . . . I didn't do things like have annual check-ups for a while. When I finally got involved in a regular medical regime, my physician said, "Well you'd better have a pelvic." So for the first time in my life, I had the full-on female experience of being manhandled by a doctor. I got the whole technological-allopathic nine yards. I suppose in a way that should be a kind of a self-affirmation of my gender, but at the same time my feelings were definitely mixed.

It is good to find that the mainstream medical establishment has a track for you.

But it is problematic to have the issues, which are part of transgender, being lost perhaps. There are political issues connected with mainstreaming, and the category of transgender. Many of us are very conflicted about how to proceed in that regard. Because if transgender is completely mainstreamed, then people who are pre-operative won't get certain kinds of help that they need. There is a certain amount of argument, that pathologisation is necessary, but pathologisation is exactly that, and if you give it up, and you help others to give it up, then there are people that you hurt. Everybody is trying to work it through.

I absolutely situate myself as a transgender woman in technology.

I see transi women producing technological objects, and I do that too. I think that all "trans" women must identify themselves as such, because we can't lose sight of the fact that in many ways we are similar to genetic women, and in critical ways we are different. If we lose sight of that, then ultimately we have pulled up the ladder. We are not helping other people in similar circumstances. We can't just blend in, that is a kind of betrayal. Until we have a perfect world, we have to maintain difference, as a political statement. In other words, identity politics is not dead! I don't think that genetic women or transgender women can afford to pull up the ladder on this. I don't think that genetic women can do that to other genetic women who are trying to climb various ladders of success, particularly in the realm of technology, because it is a difficult path.

> Women who have had success have to assist other women—to achieve success, this is something that we can do. Women and certainly trans-gendered women cannot afford not to. There is too much history of oppression on all sides to forget this.

Women and technology: Contents and discontents

In this section, the participant's responses to the second question, "what effect do you think that technology has on your physical, mental, and emotional well-being?" are explored. For some women in the cohort, this question was readily answered. There is no lack of clarity about the positive benefits and effects of technology, particularly as it shapes communications, closes distances between people, and helps the body. Some women in the cohort are completely connected, always on, always available, and reaping the benefits of easier and better communication with loved ones. They are less concerned about ill effects than they are with benefits. In the companion theme on technology's discontents, many of these same participants report on an increasing desire to take control of their lives, especially in those areas where technological modes of communications seem to be getting the upper hand.

Some of the responses to the second question—regarding the effects of technology on women's physical, mental, and emotional well-being—took the form of stark realization, and the participants' responses constitute a wake-up call to the deleterious effects of technology. Negative effects are manifested in an erosion of meaningful human communication and interaction. The troubling part is that there do not seem to be many alternatives available. Individuals who prefer not to use mobile technologies and social

networks are seen either as technophobes or hopelessly out of date. This is troubling, and speaks to the larger problem of the difficulty of resisting or refusing to be operationalized by technology.

Weariness arises, across all ages in the cohort, regarding the difficulty of keeping up with the constant churn of technology and the newest versions of hardware, software, and technological trends.

Women in technological workplaces are finding that their working habits have effects on their bodies. Many have been using computers since they were children, and mobile technology since they were in their early teens. This is worrying because young women should have many productive years ahead of them, and they are immersed in technoculture, with effects that are not yet known. They are concerned about the accretion of negative effects on their bodies because of work practices that submit them to constant exposure to screens, microwaves, and long hours of immobility while working on computers.

The problem of presence also raises concerns; young women live their daily lives immersed in technology, but long to be more present in social interactions. They want their presence to count for more than do the interactions of their virtual lives. There is a case to be made for recognition of this as a problem of technology's mode of communication. Issues of the increased demands mobile technology and social networks put on users to be always present, always available (virtually), were also topics of discussion. In this theme, some of the problems arising from technological reification—and the inherent struggles that ensue—are explored. In general, strong concerns about

technology outweigh the praise for benefits here, but they are balanced by the more general benefits that may be seen in the other thematic areas.

Women and technology: Contents

Figure 29 Martha Ladly, *Eros, Women, and Technology*, video interview still, London 2011
Martha Ladly, 2011

Aga:

Emotionally and mentally, technology is helpful to me.

I can call or Skype with my Mum at any time, she lives a long way away, so for her it is super important as well.

It is a special relationship with my mother. We are quite good friends, and we need to stay in touch; she lives by herself. She says, "I don't know what I would do without Skype . . . how did we get along without it before?" So it is almost a relief to me, because I know she can "ping" me if she feels lonely. I know she can get in touch with me at any time, so it is very reassuring, I don't worry about her.

I think technology has changed the way I conduct my friendships.

I have friends all over the world. Before technology was so available you only had friends who were in the same approximate location as you. Now you meet people far away, you meet for a bit, and you get along and then you keep in touch, you talk on Skype, or you send each other "e-links," and keep in touch that way. And we create these modern tribes, modern relationships which were not possible before technological communication.

Alex:

Technology enables me to connect and share things so easily with people I love, who aren't with me.

I absolutely love what I can do with my smart phone. The way I can share images, the fact that I can be somewhere and doing something great and take a picture and send it to someone thousands of miles away, through a free text message, is really great. It helps to keep loved ones close to you, in a sort of casual, normal way. Some of my family members live in another country, so we Skype with each other twice a week, at a minimum, and share text messages and send each other photos we take with our phones every day.

Suz:

When I was away on business, we would just keep a computer open, and if it was night time where I was, we would be Skyping and my children could just watch me sleep.

When I am away from my children I find it strange that I have no way of checking in with them, because I am so used to being able to check in

with just about everybody at all times, and them with me. That felt like a very positive use for technology.

Lali:

In my personal life, I am addicted to my iPhone.

I love it, it doesn't even feel like an addiction, it feels more like a friend, who I take to bed, and play scrabble with, and use to check in with my online friends on Facebook.

The truth is that I love new technologies.

They somehow for me conflate with a utopian idea of the world. I truly believe that the human race is getting better and better. I really think that individuals and all of us are moving towards something better. Every year, people's attitudes become more open, more tolerant, and things get better. And somehow, technology helps me think about that. It is a marker for that.

Rachel:

Technology has essentially made me more productive.

I have always been able to multi-task, and have always liked that way of being. Technology has enhanced my ability to manage multiple projects, multiple strands, be highly productive. There is some critique of that, and I think it can be problematic, particularly around focus, but ultimately, that productivity is pretty exciting in the world that we live in.

Technology has allowed me to be, and stay connected with people all over the world.

This has been fantastic on an emotional level. I have friends and relationships in many places. It has been an amazing force for my own globalization, in a good way. One of my favourite technologies is Skype, the voice-to-voice connection is so important. It is quite a personal

medium. I use technology to re-link to people I have lost contact with, and Skype is a great medium for that.

Maybe in another lifetime?

When Twitter started, I began to use it as a regular commentary or flow, but given how interrupted my life is in any case by email, I found that it would really interrupt moment to moment experience. I was constantly diarizing my experience. I see that Facebook has this great potential for all this social interaction that I don't have time for in my life. I use LinkedIn in a very focused, project-driven way, which is to hire somebody, to search for people, to trace down colleagues I had lost contact with. I found them all online, and that was great. I am now re-connected with them—but I don't have time to be connected with them!

Alejandra:

I almost died a few months ago. I had quite a terrible experience, and in the process, learned a lot in that period about my body's immersion in technology.

It was more or less the usual high-tech critical care for this day and age: a whole bunch of blood tests, very interesting exotic chemicals to correct organ imbalances, microgram doses of various things, exercising in various ways, x-rays, the entire armamentarium of western allopathic medicine. I jumped in. Now I'm fine, but it was a serious lesson in working my body through technology.

Louise:

I think that this Skype business seems like a really good idea.

I am fortunate to have all my daughters around me, but if I had Skype I would certainly be able to converse with my granddaughters and friends that live overseas. That would be an advantage, because phone bills are so expensive, and I don't have the opportunity to converse with them very often, so I would rather like that. The times I have used Skype I thought that it worked well, and it was very pleasant to be able to see my grand

daughters while we talked, to see that they seem to be happy, and doing well.

Women and technology: Discontents

Becca:

Losing my cell phone was like losing a limb. It is your portal, your primary way of being in contact, so it feels very personal, and when you lose it, you feel very cut off.

That feels like way too much dependency on technology. I also really hope that using cell phones hasn't affected my body negatively. I got my first mobile when I was eleven, those were early days for mobile technology, I don't know how well designed phones were then. You read all of these articles about the ways that cell phones are giving off microwaves and whether it is or isn't bad for you. I do try to take my mother's advice, and remember not to sleep with my cell phone on my pillow! But if I get a text at night, I'll hear the notification, and I will wake up and read it. I find it hard not to open a text, even if I get one in the middle of the night. It is hard to switch my phone off.

With social networking, I would like there to be more privacy and more personal control over the things you put online.

Everyone I know worries that their entire life is being saved in some scary database somewhere, never to be released. It is a fear that has been instilled into young people about the negative side of social networking. I think you should have the freedom to be able to erase things when you want to erase them, and that is not made clear. When using social networks like Facebook, there are quite blurry lines as to how much information is yours, how much they keep, what they give to third parties.

When I was younger I was not so aware, but now I am very cautious about what I share online.

I am careful about my security settings, and what is appropriate and what isn't appropriate to put on the Internet. The fact is that you are not best friends with all of your online "friends." I have been using Facebook since I was seventeen and so far, it's all been fine, so I don't think about it all that much really. I have come to terms with the fact that all of my information is public, and thankfully, it so far, it hasn't affected me negatively.

Figure 30 Martha Ladly, *Eros, Women, and Technology*, video interview still, London 2011
Martha Ladly, 2011

Alex:

I hope that the studies that have found no long-term effects of microwaves from mobile phones are correct.

I suppose, unfortunately, my eyesight has suffered from working on a screen every day for the last six years. I have to wear glasses now. Sitting at my computer all day, if I don't sit properly I get backache. I try to get up every hour or so and move around. Having the right sort of padding when you are using your mouse is important. Sitting in the same position all day because you are linked to your computer can definitely have a negative effect on your body.

I want to spend time with people who are present with me, not lost in virtual technology land.

In terms of the effects of technology on my personal life, at one point in a previous relationship, virtual communication was bizarrely beginning to take precedence over our interactions in real life. My ex-boyfriend was incessantly, constantly on his phone, even when we were together, and it started to drive me crazy. His virtual life was more important than our relationship, it was more important than I was, even when we were together and I was sitting right next to him, and this behaviour was really affecting me in a negative way.

Mobile technology has made people less reliable, and more casual with their social and business arrangements.

In the past, when you made a plan with someone before people all had mobile phones, you just had to stick to that plan. Mobile technology has definitely made our lives more flexible, I can't imagine never being able to change a plan. On the other hand, it has raised the level of expectation for staying in touch with people. In the days when people didn't have mobile phones, you wouldn't expect them to call you just to check in, but now we are always checking in with each other. It has put an end to a certain sort of privacy, and added another layer of surveillance onto people's lives.

I am finding social media is becoming more and more intrusive.

If I haven't been on Facebook in a couple of days, maybe three or four days, I get this email from "the Facebook team" saying, "hey, where are you? Did you know you missed this, or that . . . " I think that Facebook are sort of treading a dangerously thin line. I think that they are trying to become too involved in our lives, and I really don't like that. I hate the "friend" culture that social media has created. It is this whole new social etiquette, which I think is frankly quite weird, and not based on real life at all—it is made up life. People have such strange habits on social networks, posting really intimate things about their life, writing things about what they're doing, or uploading pictures to show off to everyone on their list about how great their life is. I frankly don't care, so it is kind of a love-hate relationship that I have with Facebook and social networks.

Aga:

I don't build close relationships with people around me: that is a downside of technology.

Technology drives me too much so maybe I don't spend enough time with people. I have friends and I don't see them often, but they know they can just knock on my door, because that is the easiest way of getting me out, to get me away from my computer. I don't do that often enough, that is the problem, and I should work on spending time with people, away from the computer.

It is hard to stop using technology. Too much of a good thing is bad for you!

I am trying to find all of those things I can do without using my phone or my computer. It helps me to get away from my technologies, from time to time. Otherwise, you lose perspective; you loose the freshness, and creativity. It is a struggle for me. I need to actively make a decision that I am going to do something that is not technology-related. The only time I really actively do less with technology is in the summer, and that is lovely, I spend days in the garden and I forget that I have my phone.

Suz:

I find that the expectations that technology brings, of always being in contact, of always having to respond, especially where children are concerned, are difficult to negotiate.

I think that the blurring of life and work, which has been catalysed by many of our technologies, doesn't serve me well from a parenting perspective. I actually need to bring those boundaries back in. But it is a bit of a losing game, I mean, it has its benefits where I can telecommute, but I don't think it really works. I think that increasingly there is an idea of presence, and what it means with technology, as people realize how distracted we are, and how fragmented our attention really is. And I think that being a mom, and a professional, this emerging model is important to reckon with.

The technologies that we use to record and create our data are so fragile.

I have done a lot of recording of my children. A few times I have had enormous data losses and what has gone as well are images of my children, videos of my children which I don't have any more. They are just gone. I regret not having outputted things into physical formats! The amount of data loss that I personally experience is enormous. I also worry about being able to get my images and interactions with my children out of Facebook, or any of the platforms that are collecting our information, and our memories. So I think that on the one hand, the data is very fragile, and on the other, we don't know how to preserve it, and make sure we have access to it.

The issue of silence for women has always been a problem. Technology should assist, not extend this problem.

I reflected on this problem of being asked, or in fact required not to discuss certain issues online, and even though I agreed, I thought, you know, the personal is the political, and this is like another gag order on women who can't speak out against abuse and violence in their lives. So hopefully this is going to become a bigger issue that women will take up, about whether or not we are allowed to talk about abuse in our lives on social media. And I think that people's tolerance for that kind of expression of private issues has definitely gone up, and people are engaging in it more. I think that largely comes from the feminist tradition,

and social media certainly catalysed a broader movement around this. But there are other strong forces at work that are clamping down on freedom of expression.

Lali:

When I talk about aboriginal people having access to technology, I know it is not totally true.

Especially because most remote communities are also aboriginal communities: these communities are so poor, they don't have computers in their houses, maybe there isn't even one in their town. How do they exist, how can they learn, and make a contribution, without this connectivity? This is an enormous problem. Inequality of access to technology and the Internet has to be addressed for our people, to enable the contributions we can make to our communities, and to society more generally.

Rachel:

Technology has stressed my body, definitely disciplined it; reshaped it in certain kinds of ways.

Well, this process started with you and I talking about sexuality quite a while ago, and the body as this sensory apparatus. I do also think about technologies in that way, as being present, and necessary, but also present in this multisensory way. We tend to only think about our shoulders, our necks etc. but there is a holistic way of thinking about both the impacts, but also the potential of having multisensory experiences within the space of a wide range of technologies. In terms of my body, my neck, my shoulders, my back, like so many of us who live on computers, I have definitely reshaped my body in not great ways, through my persistent uses of technology. And now, the thumbs together, head down "prayer" that the Blackberry and other of our mobile devices has engendered, adds yet another level of stress.

Alejandra:

> *At the moment I am caught in a place that I don't think I have ever been before, which is that, I feel that technology is quite far advanced enough for me, thank you very much.*
>
> I would like to get involved in doing more performance. I would like to do more theatre, even though that involves technology. But more importantly, it involves being there, in your body, it involves being with a live audience, it gives me that sense of actually being present with people, and having to respond to them. My body is the tool that I use to communicate within that live circumstance, and I miss that.

Louise generously appeared in both the 1989 and 2011 studies. Although she has aged, her mind is sharp and her wit is even sharper. She has travelled extensively since middle age, and continues to enjoy travel into her elder years. Her family is very important to her, and she has a close relationship with her daughters and their children. She is active and engaged and clear about her choices. It is evident that she feels she has lived a full life and has no regrets. She feels no need to adopt new technologies or give up the media she loves, which have served her well for years: her books, and newspapers, pen and paper.

Louise:

> *If and when newspapers are only available on line, that will be a great loss for me.*
>
> One of my greatest pleasures is to read the newspaper every morning. So I hope that they will continue to print the newspaper, because I have no desire to read it online.

I don't want to write email, it seems like such a shallow form of communication.

I want to write letters, because I am a person who has always written letters, and so few people do now. I think to write a letter, in your own hand, is like giving a gift to someone. It is the gift of your time. And I have beautiful handwriting, so it is good for me to keep it up, to keep practicing. I enjoy writing, so I write letters as often as I can. And I probably always will, as long as I can write.

I don't want to get a computer because I think it might take over my life.

I don't want that to happen. I much prefer reading to looking things up on the computer, or going online, or watching television. I know that I am not going to read all the books that I want to read in my life. I have my list of a thousand books. I have had that list for a long time, I made it years ago, and I am steadily working my way through it. I don't have time to use computers or do email. I think that there are about 500 more books I still have to read!

Questioning technological progress

An analysis of the outcomes of this study has led me to some conclusions, and further questions. In asking about the participant's relationships to their personal computational technologies and mobile devices, I assumed these technologies would not exist, except for individuals' general or specific desires for technological assistance and mediation in working and social life. Although this sounds obvious, it became clear to me through this study that personal technologies are increasingly being perceived as independent things or systems, with the potential of action, influence, and even creative and generative capabilities. In my observations from this study, particularly in the case of the younger women I interviewed, technological artefacts and processes seem to have taken on an uncanny, highly affective, disembodied life of their own.

Anne Balsamo identifies this phenomenon as the double-nature of technology "... as determining and determined, as both autonomous and subservient to human goals."[352] I see this as a form of feedback loop: the desire for personal identification embedded in the design of mobile devices has in turn increased personal identification with these technologies. This deepens both the desire for the technology and its uncanny affective qualities.

The ways we design and integrate designed technological objects into the fabric of social and working life clearly requires further consideration. Feminist philosopher and physicist Karen Barad asserts that our relationships to designed objects are important, and that "matter does matter."[353] Balsamo accurately describes the phenomenon of matter and its relationship to human agency in technological processes: "Matter matters because the world is already a plenitude. For any given technology, agency is manifested unevenly by the people who create the device, program it, engineer it, manufacture it, buy it, use it, abuse it, and eventually dispose of it. But agency—defined pragmatically as the ability to affect the technological outcome—is not an exclusive privilege of human beings. In the process of designing, the matter of the world also manifests agency."[354] This agency is powerful, with both positive and negative effects, such as the ways that technological devices extend capabilities, but also insinuate themselves into everyday life, and take up time and space, where there is little time or space to spare, in contemporary living arrangements. This odd inattentiveness to the ways that matter does actually matter is programmed and built into digital-technological things. It can be combatted with mindful thinking about the ways that technologies are designed, and their interfaces with

human bodies and activities. This includes their design to double certain functions of the brain, such as vision, recall, and memory, while forgetting or negating functions of the body, such as posture, balance, comfort, fatigue, and injury. I am thinking of screen-based computers and mobile devices, designed with or without affordances to fit the body. When technology is designed to imitate life at a personal level and mimic parts of the human body, it is not surprising that they ill fit some individuals, while others develop close, even dependent relationships with their personal technologies and devices.

Figure 31 Martha Ladly, *Eros, Women, and Technology*, video interview still, Toronto 2011
Martha Ladly, 2011

Reconsidering relational-technological artefacts

Building relationships with these artefacts—which Sherry Turkle calls "relational artefacts,"[355]—demands more care and attention. Turkle expands on the notion of the relational object or artefact when she suggests that our immersion in technological/cultural activities is lent to these "objects to think with,"[356] which in turn gives them cultural traction; from there, they are appropriated into culture. I would go further, to argue that all technologically mediated experience holds theoretical relationship to culture, and its tools and artefacts are consistently objectified in a similar way. It is no wonder, nor should it be any surprise, that such objects have become important, valuable, sought after, and influential: they have been catalysed into cultural, creating whole new lexicons, taxonomies of social practices, and new ways of *Being* in technoculture.

I strongly suggest that a disjunction has arisen between disembodied technological interactions and embodied human interactions. In some areas of society, particularly when individuals require care, this has become especially troubling, e.g., in cases where—in the absence of family, friends, and caregivers—vulnerable individuals, such as children, the ill, and the elderly are supplied with technologies to act as helpers, virtual assistants, and even companions. Turkle points out that this is effectively achieved through "relational artifacts, such as robotic pets and digital creatures, [which] are explicitly designed to have emotive, affect-laden connections with people . . . they present themselves as already animated and ready for relationship."[357]

Technological objects and systems have great influence and power over human bodies and interactions. The detachment of technological artefacts and processes from the

best interests and utility of their users has become increasingly troubling. Examples are plentiful: digital screens intrude into nearly every environment the body inhabits, personal and public. They reflect, command, and demand our attention, taking it away from embodied activities such as eating, walking, conversing, and even sleeping. Technological devices which seek to enable better communication, such as mobile phones, actually intrude upon and disable embodied communication with others already co-inhabiting physical space. Communication devices that are "always on" destroy the possibility of attentive self-reflection. The body is given no rest or respite from technological intervention and mediation. This is an insidious proliferation, which is beyond the scope of this dissertation, but which I feel compelled to investigate further in my work.

Attendant deleterious influences of technologies on the body, in all of its diverse ways of being—at work, at play, and even at rest—cannot be underestimated. Working, thinking, *making*, socializing, and social behaviours are now overwhelmingly achieved with the intervention of computers and other technological devices. This has seeped into every crevice, nook, and cranny, and, to paraphrase Raymond Williams, has imprinted itself on what has begun to be understood and accepted as normal everyday life in technoculture. From my research, it is clear that the conflict between the needs and desires of the erotic body and the insistent demands of technologies is a situation of concern for women. It is the primary challenge that creative and pedagogical practices in technology must now address.

Conclusions

Eros, Women, and Technology: Possible Futures

Figure 32 Martha Ladly, *Eros, Women, and Technology*, video interview still, London 2011
Martha Ladly, 2011

This dissertation concludes with participants' responses to interview question three: "If you could change or improve the technologies that you use in any way, how might you change or improve them? What might you design? And how can women contribute to technological change?" I present my research participants' foresight and imaginative

ideas. I then suggest strategies to mobilise these women's creative concepts and recommendations. I draw conclusions, and make recommendations for possible futures.

Finding a useable and useful tradition in which to situate this work of research-creation in technoculture has not been easy. The arts, communication and culture, and the social sciences have all provided traditions to draw on, in formulating my interdisciplinary approach. Frameworks drawn from feminist theories of gender and the construction of self, and theories of the phenomenology of experience, have helped me to situate the lived erotic body in my practice and research. Narrative theory has been instrumentalised in the fieldwork and gathering of primary research materials. Conceptualisation of the *Chora* as the basis and grounding for feminine insight and creativity has provided me with both a theoretical and a practice-based locus for my research.

Research-creation is an emerging methodology, which requires more researchers and practitioners to engage in work that will help to further define it as a legitimate and useful approach. With my research-creation, I have put forward a working practice, and a body of intellectual and creative work, which will help to further define this evolving methodology. Other methodological approaches I have drawn on—narrative enquiry, and hermeneutic analysis—have helped me to describe and illuminate the stories received from my research participants. All of these tactics have assisted me to formulate a mixed methodological approach suitable for a woman engaged in intellectual and creative work.

Throughout the process of research and analysis, it has been helpful to admit that insights drawn are not definitive, and at best contingent. These methods have also been

provisional, improvised, and just good enough for the task in hand. The good enough approach involves doing the best that one can in the situation one encounters. This has been as useful a methodological approach as any to undertake my experimental fieldwork and research, and one that I would recommend to others engaged in this field.

In order to undertake this research, it has been necessary to define the work of women artists and intellectuals through historical exemplars, and then attempt to redefine the roles of women makers in contemporary practice. The goal has been to locate a place for women artists and designers working within technoculture, at a time when culture itself is undergoing massive and transformative technological change. Some of this change has enabled and enhanced women's lives. Simultaneously, technology often ignores, negates, and threatens women.

In constructing possible futures, it is important to acknowledge that some of the systemic and foundational barriers to opportunities for women in technoculture are long-standing wicked problems, which are reified in women's roles in the home, and their work as caregivers. The concluding chapter will identify and highlight some of these concerns. It is outside of the scope of this study to address problems, which are so deeply rooted that they are a part of the construction and framework of culture and everyday life. To make a start on this work of reconsideration, with ideas and strategies for positive change, is the aim of this concluding chapter.

Freeing women for productive working lives

In these conclusions, I will revisit the ways that the gender imbalance in technoculture may be addressed. In almost every part of the world, women's access to technology and technological learning lags behind men's. One reason is that women continue to be primary caregivers in contemporary society, taking on obligations that often prevent them from achieving independence, pursuing education and careers, and taking on public roles. Few industries, professions, or employers can truly accommodate the needs of caregivers, and the structure of the traditional working week does not offer those caring for young children, the ill, and the aged, the flexibility required to fulfil their obligations. Demographic data lead inescapably to the conclusion that more caregivers will be needed as the population ages. Many women face dual roles as caretakers for children and aging parents. The predominance of women in professional caring roles—hospital and institutional care workers and private care workers—is an undiminishing trend.[358] Many of these women are also responsible for caregiving at home.

The time and responsibilities of caregiving effectively take many women out of the running for management, decision-making, and leadership roles. The numbers of women deciding not to have children so they can pursue a career are growing, and negative population growth in many countries, including most countries in Europe, has become a reality.[359] The exodus of highly capable, educated women from the work force is the result of conflicting allegiances between work and family, with the result that many women decide that they cannot manage caregiving with professional responsibilities.[360]

This has cultural ramifications, and can explain lower participation among women in business, industry, and public life.[361]

The under-representation of women in industry and public life, and the attendant repercussions of these phenomena are fundamental, and wide-ranging, affecting women's productivity, wealth, security, health, and life expectations.

Despite many significant steps forward, women remain disadvantaged, especially in matters of the division of labour in families and the home, and their participation in the working world. A 2010 U.N. report on *The World's Women* found that: "[t]he gap between participation rates of women and men [in the labour market] has narrowed slightly in the last 20 years but remains considerable. The smallest gender gaps are in the early adult years and the widest in the prime working ages."[362] This, of course, is because women are busy having and caring for children in the prime years of their work life. In spite of changes in women's participation in the labour market, they continue to bear most of the responsibilities for the home, and for children and other dependents. In all regions, women spend at least twice as much time as men on unpaid domestic work. When unpaid work is taken into account, women's total work hours are longer than men's in all regions.[363]

Without wishing to generalize women's experiences, it is nevertheless cautionary to examine these trends. Positive change will require great insight, renewed recognition of women's equality, and support at all levels for efforts to allow women to share caring responsibilities, so that they can to continue to work.[364] Sustained and determined demands for change, in matters of equity and access to education and technology, will be

a primary contribution women can make, to begin to resolve aspects of this wicked problem.

Creative, resourceful, educated women—just such women as are the participants in this research study—can invent, design, teach, and learn new strategies for reimagining the positive and negative aspects of technology, including its pervasive influences. Women can take a critical stance regarding the ways that technology infringes on the body, and on embodied presence and Being in the world. They can help to check the insidious infiltration of technologies into all realms of private and family relations and home life. Women can seek out and guard against technology's negative impacts on conversation, communication, and daily life. They can agree to stop allowing children to become beta testers for new technologies, and help them see beyond technological ways of thinking, feeling, behaving, and inhabiting the technological world. This may be the most important contribution that women can make to improve the prospects and quality of life for all individuals living in technoculture.

Women's contributions to better technological futures

In these conclusions, I recall my research participants to affirm the ways that women's plural positions can be brought into Being in the world. I synthesise participants' responses to the question: "How can women contribute to technological change?" with some of their most cogent recommendations. I wanted to know what contributions they have made, or would like to make, to technoculture. I asked them what they would design

to improve their lives and the world. Suggestions for improvement to existing technologies and practices, and larger concepts for technological and structural change—blue-sky, utopian, revolutionary ideas—are presented here. These women took up the challenging questions I set, and advocate new ways of imagining their evolving relationships to technology, in communication, culture, and everyday life, as Raymond Williams has described it.[365] They address contributions women have made and can make in an increasingly technological future. The imagination was the limit with these questions, and participants focused on all the disruptions, opportunities, and possible futures they see in the near, medium, and longer term. Their responses begin with concerns, critiques and recommendations, and are followed by suggestions for possible technological futures. Their words are a warning about the seductive benefits and unspoken pitfalls of the technoculture that so saturates their lives. They should be taken as an affirmation of women's participation and inclusion in processes of innovation, and technological and cultural change.

Women have a unique contribution to make in the technological arena. The observations and ideas of the women interviewed for this research are one small, yet strong sample of women's potential. There is valuable information in these responses about the contributions women have made and stand prepared to make, and what they want from technoculture in return. If this small, diverse sample of women can come up with such potent and critical ideas of value, then, take notice: there are vast untapped reservoirs of female talent, imagination and innovation to be put to good, profitable and productive use.

This is also a notice to you, dear reader, to let your imagination soar.

Possible futures: Thirty-three ideas to change technoculture

In the introductory chapter to this work, I quote Anne Balsamo, who noted that gender has not been fully recognized or fully explored as a source of imaginative inspiration.[366] I proposed to explore the feminine imagination in this research, to discover how women's insights, methods, and epistemologies may be uncovered. This has been achieved through their thoughtful and self-reflexive responses to my questions about their practice, and their bodies, which is also reflected in their relationships to others. I take this opportunity to give these imaginative women the opportunity to inspire us with their ideas and conclusions.

Becca: Idea one

We need to put our phones away, and be present when we are with our family and friends.

I will admit that I am guilty of always having my phone with me, and using it even when I am with my friends. Sometimes we will find ourselves sitting together playing, texting, or checking things on our phones. It shows how this technology can disconnect you from real life. I think that sometimes it is just a good idea to switch your phone off, turn the TV off, put your computer away, and focus on what is happening around you, and the people you are actually with.

Becca: Idea two

The thing I want would be technology that is going to enhance our capabilities and make living easier for more people.

Technology is great, if it is put to use for worthwhile things that improve our world. Life is very hard for most people on earth. Healthcare, food, and transportation, and looking after our planet, are all areas we need to improve. I think that our generation has to figure out how to do this better, and how to fix the damage that previous generations have done.

Becca: Idea three

I want the option of being able to climb through the screen. That is what I think we need next, a more tactile form of remote presence when we can't be with our families and friends, the ones we love.

The steps and improvements over the last five years have been monumental, especially with the ways that we are now able to stay in touch with people, but they could be better. Technology that allows me to stay in touch with my family is great, I get to speak with my mum and my friends who are far away every day. When I am tucked up in bed, under the covers, with the lights out, holding my phone in my hand, and I get to see my mum, and my dogs, and my house, thousands of miles away, it is incredible. But I think we can make that connection much more tactile. When I am on Skype, I wish I could just reach into my computer and stroke my dog. I wish I could give my mum a hug. That is what I think we need next: a better form of remote presence, a kind of remote physical touch; a form of teleportation.

Alex: Idea four

Sharing different types of media in social situations is important and we should be able to do it casually and easily.

Improved voice-recognition technology will open up a lot of new potential for mobile interaction. For the sight impaired, hearing impaired and other differently abled people, it will really help them to navigate the world. I think another great idea would be the ability to project images and video from mobile devices. There are so many times when you have

images or ideas that you want to show to a group of people, and it shouldn't be that difficult to do.

Alex: Idea five

We need to rethink the format for digital entertainment, and its place in the home.

I think that television is incredibly behind as a technology; it hasn't really improved or reinvented itself since the mid-nineties with HD. TV is capable of being something quite different from your phone or your iPad or computer, because it exists in your living space. It very much occupies the central social space of the home, and as a technology, it has been overlooked. That potential needs to translate into what ever happens next with "smart homes." I don't see television as channels any more. I see applications or something else that will change the paradigm of watching TV. Digital entertainment in the home is really the next technology that is due for a rethink.

Alex: Idea six

I think that computing needs to become more personal, more responsive and flexible.

I am a bit hesitant to say that I can imagine that everyone is going to want to have thought-control computers, because I think that is a bit scary. Even though I want my computer to know me, I don't want it reading my mind. I am interested in computing devices that are responsive, soft, that you just fold up or stuff away, and then you can re-materialise or reform them when you want to use them.

Alex: Idea seven

I think another thing that will happen quite soon is rewritable digital paper.

I know it does actually already exist, but I am thinking of something more like an actual newspaper that you could carry around and fold up,

but it has moving images and searchable text on it. You just download your news when you want it, so much better than reading on a screen.

Alex: Idea eight

Aggregation of data will reach out to all parts of the world, and hopefully make people better informed, better educated, less biased and prejudiced, and more forward thinking.

All of these technologies make the world a far smaller place. They make distances seem smaller, and where you are is not so important. It is also a case of being able to share this information in lots of different forms, it turns everything into this huge bank of information that anyone can access, really look at—and learn from—which is amazing. So, I think, if anything, this will help people to make better decisions.

Aga: Idea nine

I have an idea for a collaborative technology project that would make the developing world a better place, particularly for women.

In Indonesia, the Internet has helped to raise people from poverty, and the same could be done in Africa, to help people trade and support themselves through these small virtual stores. I was talking with a female colleague about how in Africa mobile transactions and sending money on the phone is so popular. And people make things, they are skilled craftspeople, but they don't have a big enough market available or accessible for their trade. We came up with this idea for a mobile commerce platform, where you can create your little storefront, and sell your baskets, clothing, and fabrics, to broaden your market. It is very simple, nothing new, it is just a new way of thinking about local commerce and using all of the elements that are already set up and available, in a new way.

Suz: Idea ten

I think that the movement of data visualization is really gong to help us see what we are doing, and what we need to do next.

I think that there is a great possibility of connecting with each other and collaborating with each other with new technologies, which is both positive and negative. The possibilities are endless, there is so much that needs addressing. I think we are coming to the table a little late in understanding the effects of our lives on this planet. I think some of the most important work is going to be on big data, and how we visualise and unleash it. And then we will see what kinds of responses we need to create from it.

Suz: Idea eleven

We need a better understanding of the technological legacy we are creating for our children.

We have to think more about the openness of communication using technology, and the vulnerabilities that this openness might set into play. I am cognizant of the fact that my children have a very large presence on the Internet. I have created that for them, and it is not really fair. Because they are their own people, and when they get to a certain age, I would have created something that they didn't have control over. So, I think that is a generational issue that we should be dealing with sooner rather than later.

Suz: Idea twelve

We need to be much more self-reflexive with the way we use technologies in our lives.

I think self-reflexivity is a very pressing issue in most domains, for technology, for business, for parenting. So, you are also seeing schools now where a part of the condition of reflexivity is about kids learning how to turn off the technologies. Maybe kids will have to teach their parents this lesson!

Suz: Idea thirteen

I think that the rate of churn with our technologies has to slow down.

I am quite excited by movements for hacking, and also for repair, and retrieving pieces of technology and refashioning them. And I am quite excited by many of the rapid manufacturing labs, which are helping people to repair, extend lives, and change technologies to suit their needs, and empowering people to do so. I think that those movements will help us all.

Suz: Idea fourteen

The structures of participation and access to knowledge are dependent on information and communication technologies, some of which are prohibitive or inaccessible to many of the most needy individuals.

There are a lot of things that need changing with technology, from the way that they are produced, to the minerals that they use, and the way that we use them, and dispose of them. We have to examine the voracious appetite we have to replace our technologies. I also think that access and the expense of technology is problematic, and the digital divide is growing. So there is a crisis happening, because just to be a participant within every domain of life really requires access to technology.

Suz: Idea fifteen

I would like to bring processes of materialization into the home, as recreational play for children, in a kind of scaled children's laboratory.

I think if I could design a technology for my children, I think that there are many possibilities of adding a constructivist approach to technology. I think that they are ready to start creating technologies themselves. I would love to create an environment where they can create those magical moments, where they can create play through technologies, and explore its possibilities.

Suz: Idea sixteen

There are many pleasures that we can have through technologies, which haven't yet been uncovered.

There are also so many needs that haven't been met, which technology can help us with. They are endless! I am currently working on a project, which is about carbon calculation for products at the point of sale, so that the public can better understand product's carbon footprint. I am also working on a project for interactive furniture, for children with autism. How best can technology help?

Lali: Idea seventeen

I think we are actually going too fast in many ways, with developing new technologies, so that morally and ethically, it is very difficult to keep up with the science.

I do think we have to be more sceptical, and do more questioning with new technologies. We have to learn to adopt and use them with caution. There are a lot of problems we can solve with technology, but I think we have to be very careful about doing things only in the name of a technological progress.

Lali: Idea eighteen

I can imagine that there could be other, and better, more embodied ways of interacting with data.

What would women design? Now, of course women have been in the field of technology and modern design, for hmmm, what, fifty years? O.K. yes, there have been a few incredible pioneers probably earlier than that, and it depends what areas of technology we are talking about, because you could talk about thousands of years ago, when my people were making pottery. The pots, the weaving, they were designed and made by the women. But when you talk about screens and computing, which is such a new thing, what would we design? How about new ways of interacting with information? Why were the screen and the keyboard designed as the primary mode of interaction in the first place?

Lali: Idea nineteen

The most important technological improvement that I want is to just be able to slow down.

I don't want new versions of programs and devices coming out all the time. There is always someone who is trying to introduce new software, a new way of working, trying to sell me a new device, and for me, it is . . . "Well, I just learned how to use the old one!" To employ the quilting metaphor, when I quilt, I feel like a master of the technology. Though, yes, there are new techniques coming out, they don't come at that break neck speed, they are incremental improvements. Basically, I know how to make a quilt, from beginning to end. I know what is going to happen, and I can trust myself and have confidence in myself to do that. And I know that I will do it very well. I wish that digital technology was more like quilting.

Lali: Idea twenty

I would like to think that we could live and make our living in ways that are less dependent on digital technologies.

If I took up quilting as my medium, there would still be email. I would like to think that one day, I might stop using new technologies to make my living and take up quilting as my medium, which I have been seriously considering! I would like to believe that I would still be asked to talk about my work, and be able to make a living. I wouldn't go back to a time without technology unless I had to, unless the Internet was somehow destroyed.

Rachel: Idea twenty-one

We must not lose sight of the body as our primary experiential space.

In terms of sexuality . . . I was thinking, well, in many ways, this is a sort of constructive conversation for me, because it is a lot about the body as a body. You look at your own sexual history and there is certainly all kinds of fun with technology, devices etc. but I think it fundamentally comes back to how we think about the body, and how we use it.

Rachel: Idea twenty-two

I am interested in the relation between emotion, affect, the body, and computation.

That is really where my research is situated. I am very interested in designing tactile and gestural interfaces. I think that body movement is incredibly important; we are trying to design more embodied ways of interacting within computational environments. I am really interested in designing technologies that can suggest experiences that are fun, that are light and mobile. They are less monitoring devices—because I think that we are living in a highly surveillance-driven culture—and are more memory devices, and expressive devices, and maybe pain containing devices as well. A lot of my work is focused on pushing mobile capacity as far as we can in this realm, and making it more inclusive.

Rachel: Idea twenty-three

I think we could invent useful new technologies for "smart" prostheses.

They would use nano-fibres and smart materials, which could help to keep your muscles in good shape. This would help you to exercise, and would also be a sort of prosthetic support, that would also mediate pain. They would not necessarily be invisible—they could be fashionable! I think that too many people live with pain in this world, and we can invent positive ways to alleviate it.

Rachel: Idea twenty-four

I want technologies that support people to be as productive as possible, in an economic sense, and in a personal sense.

I am interested in inventing ways of aggregating email, texts, chat, tweets, etc. so that we are able to prioritize within that constant flow of communication. I have been interested in aggregating chat systems for a long time, and how you can personalize the selection environment, within that space, and that barrage. Anything that we can do to really pull out the important data and make it more viable, useable, and experiential for me is interesting.

Rachel: Idea twenty-five

I am interested in finding ways we can reinvent the dependencies between people and technologies, to make our world more sustainable.

The other piece of technology I am very aware of is the impacts of sustainability, and pollution. I am very aware of the ways that the technologies we rely on also give me a lot of pleasure—travel technologies, the automobile, the design of our homes, the heating of our houses—all have this other impact on the world. These technologies have direct impacts on the body, but they also have direct and secondary impacts on individuals and society.

Rachel: Idea twenty-six

With technology now, there is no reliable reproduction of data. I now believe that data is the oil and water of the twenty-first century.

Managing data, understanding it as this incredibly rich material that needs attention, and shaping, and visualization, and critique, is both a great thing and a negative thing in the era that we live in. The intensification of our lives is the downside of technology. There is this constant interruption—you have to constantly filter the noise. And at the same time, it is hard to carve away a protective space of deep entry that isn't passive. Because I think we end up with this binary of technology either being passive entertainment and spectacle, which can be great of course, or else it is this kind of interactive barrage. Actually creating engagement that is active, and focused, and rich, in the context of a technologically laden society, is a major challenge for those of us working in technology.

Alejandra: Idea twenty-seven

I think women could converge on elegance and simplicity in technological design, which is not a terribly gendered thing.

The view of women-designed technology has to do with an idealized view in which women design technology in a women's environment. That is a wonderful dream, but I don't think it exists. We are women designing

technology in a male environment. If we can do that well, it will make technology different in some interesting ways.

Alejandra: Idea twenty-eight

We need to support the free, open source software movement.

In particular, I like what the Linux[367] people are doing with open source. The work the Debian[368] people are doing with their universal operating system is equally good and equally important. It is not elegant, but what they are trying to do is so complex that I don't think that elegance is even on their horizon yet, but they are moving in that direction as fast as they can and doing some amazing work.

Alejandra: Idea twenty-nine

It is time to rethink the Internet.

I think the recent political uprisings have been a huge wake-up call, that the Internet, which we originally perceived as acephalous, and completely interconnected and non-hierarchical and so forth, had in fact grown up, and was no longer acephalous, and was no longer non-hierarchical, and had become all those things that it was not intended to be. There are backbones, and multinational corporations and governments control all these backbones. So, it is time to rethink communication in general, and find ways to try and re-establish the original liberatory ideas of what the Internet could do, and the way it could be.

Alejandra: Idea thirty

I still think of technology this way: it is a huge force for evil; it is a huge force for good. We have to keep trying to be on the good side.

I am still as active as I can be in trying to find ways to use commercial communication technologies in transformative and liberatory ways. Some of us are working on ways to decentralize cell phones. At the moment cell phones require central towers and a telephone company, but if they operated as mesh networks, you would no longer need a central structure. That would be a big help in situations where somebody pushes

the off button, which has happened several times recently during political uprisings. We are hoping to figure out how to make that work. There is nothing inherently liberatory about technology, but with effort, you can make it liberatory, and that is the guiding force behind everything we do.

Alejandra: Idea thirty-one

I would like to see more advances in health and human longevity.

I have no idea how to achieve that, nor do I see that anyone else, among the various journals that I read, has any breakthrough ideas about how to achieve that, it is just a general goal. I don't see anything coming forward in allopathics either. I think we must all keep going in our own directions, as best we can, and as we see fit, based on our specialties and our own dedication, to make this a general human goal.

Alejandra: Idea thirty-two

You're going to die anyway, so you might as well live every day in the knowledge that you are going to die.

This knowledge really does strip you naked. You make a lot of choices that you wouldn't make otherwise, and you live in ways that you might not have the courage to live otherwise. I try to do that every day, even in silly, unimportant ways. It is something that you learn in many disciplines of meditation, but daily life has ways of making you forget, and it is very good to try to keep that focus.

Louise: Idea thirty-three

Write a letter, in your own handwriting. It is like giving a gift to someone. It is the gift of your time.

I don't write email, it seems like such a shallow form of communication. I write letters, because I am a person who has always written letters, and so few people do now days. I have good handwriting, so I need to keep practicing. There is something joyful about sitting down and taking the time to write a letter. I write letters as often as I can, and I probably always will, as long as I can write.

Eros, Women, and Technology: Concluding strategies

I conclude with four strategies that may help enable some of the thirty-three ideas from the eight women who participated in this research. They did not request assistance, but they were incredibly generous with theirs. I hope that these strategies might help to support and mobilise their ideas, and the ideas of anyone who reads this dissertation. There are women who can *actually* change the world. The following are some examples of important work that will help to build strategies, for more inclusive possible futures.

Collaboration

Multi disciplinary, dialogic, non-hierarchical groups are open to new ways of thinking and produce diverse and surprising results. Collaboration does not always mean consensus. Individuals have to be keenly persuasive to get their ideas across. In fact, collaboration requires that different leaders take the lead in different situations and then allow others to lead in areas where *they* have the greater expertise, or a more dynamic concept or method. Strong decision-making skills, assertiveness, decisiveness, the ability to listen, and openness to the ideas of others, are all key qualities of good collaborators.[369] Collaborative authoring and content sharing was not common with broadcast or narrowcast news ventures. Arianna Huffington, founder of the *Huffington Post*, invited collaborators to cross-post in the new "Politics Aside" section of the *Huffington Post*, because she knew that collaboration would make it a better and more interesting column

for her readers, and everyone (except perhaps the journalists who often work as unpaid contributors to these online publications) would benefit.[370]

Collaboration and co-production taps into an abundance of human resources and encourages people to join forces. There are economic and social benefits for individuals who work together—for themselves or for organisations—towards an ideal of mutual benefit and common good.[371] University of Toronto Rotman School of Management organisational behaviour expert Jennifer Berdahl claims in her study on leadership in organisations that " . . . groups of men are marked by more centralised patterns of interaction, and that groups of women have more egalitarian styles of communicating."[372] Her work shows that women tend to share leadership roles, and are skilful collaborators. Collaboration and co-production are excellent methods for women to work together and create natural models for building mentorship, co-support, and success.[373] I have proven this myself, through collaborative research creation and production, in diverse inter-disciplinary research teams in which women are predominant. The knowledge that we produce, share, and publish, is then disseminated, creating new knowledge and models of collaborative best practice in the arts, social sciences, and humanities.

Many bodies

The "Million Women Study" in the U.K. was conducted between 1996 and 2001with more than a million women volunteers, to compile data on women's health. This is an on-going collaborative study undertaken by the National Health Service and Cancer

Research U.K. to determine factors that affect the health of women over age fifty. With more than one in four women in that age group participating, it is the largest study of its kind ever conducted. The data collected are being used for a long-term study of the effect on women's health of hormonal therapies, such as birth-control pills and hormone replacement. This is an invaluable data set, which will be used for years to come. The latest research papers coming out of this study cross a wide range of women's health issues. They examined the risks of breast cancer and a range of other cancers in relation to hormone-replacement therapy and menopause, body size and reproductive factors, alcohol intake and cancer incidence. In 2012, research was released on the effect of smoking and the benefits of quitting, the effect of body weight and exercise on fractures, and environmental and genetic risks for breast cancer. The range of topics the study will provide data for includes diet, exercise, employment patterns, oral contraceptive use, childbirth, breastfeeding, and family health history.[374] Without the million women who agreed to volunteer as participants, this groundbreaking study—which will improve the lives of so many women for many years to come—would not have been possible. This shows both the power of a great idea, and the support that women will selflessly give to support other women's health and well being, in and beyond their own lifetime. Imagine how this idea could scale across disciplines, providing a model for studying the negative and positive effect of a wide variety of technologies.

Many minds

"All that is needed to make new solutions . . . obvious is that the problem be defined by many minds."[375] Marshall McLuhan was speaking in the context of his work with Idea Consultants, a firm that he set up with his colleagues in Toronto in the 1950s, to tackle intractable problems. McLuhan and his colleagues posited that many minds were needed to look at issues from a multiplicity of angles, and to tease out the complexities of very difficult problems. Indeed, McLuhan claimed that finding new and different angles on a problem would be best achieved by a group of many non-specialists, than through the work of a single highly trained expert. He set out to broadcast his questions to as many people as he could reach, using a television show to solicit responses and ideas from the general public. McLuhan understood that better decisions result when many points of view are considered. Large groups of people are smarter, better at solving problems, fostering innovation, and making wise decisions than a powerful leader or a small élite.[376] This concept is the foundation of democratic institutions and constitutions the world over.

Education

Creating a project that will involve many minds and bodies in collaborative thinking about how to involve more women in technology and the STEM disciplines is, in my opinion, the best way to crack this wicked problem. More women teaching and mentoring other women is a first step. Policies to encourage more women to enter technological fields and STEM areas in education, research, and industry are required. Anonymous

procedures to reduce bias on admissions, funding, and scholarship should be adopted. Work to increase the confidence and reduce the isolation of women studying and working in male-dominated environments—ensuring that these environments are friendly and more appealing to women—is also essential. When women come up against stumbling blocks, it is important to provide acknowledgement and opportunities to discuss and strategize problems and seek support. Encouraging women to stick with their disciplines and take on roles that are more senior will also produce positive benefits for women in the STEM professions. It is crucial to offer better and more informed advice to women working in technology about career paths and career development. Finally, celebrating women's achievements, and giving women more opportunities to present their work at conferences, symposia, professional gatherings, networking events, and exhibitions raises the profiles of women who work in technology. Giving successful women technologists press coverage on their achievements, and making sure that they have places for their work on reading lists and in guest lectures, will encourage more women to go into these disciplines.[377] Creating and strengthening a virtuous circle of women working and collaborating in the technological project will lead to the inclusion of more women, more innovative ideas and better strategies for possible futures.

A concluding synthesis of the research-creation

From a diverse range of responses to my questions in both studies, I learned that the artists I interviewed are all concerned about taking care of themselves and their families, so that they can pursue their work and creative practice, and live full and productive lives.

I have observed how they engage the Chora in self-reflexive expressions of their creative work. In this way, I have reclaimed the Chora for women's practices of thinking and making. I have undertaken a sustained phenomenological engagement with their ideas, their bodies, and their practice, through these interviews.

My own practice has brought me long and fulfilling engagement with a number of the women artists, as well as new relationships with younger artists and designers. I have asked questions of them and myself, and effected a thorough and systematic hermeneutic analysis of their responses, and my own. I have synthesised these ideas and outcomes with themes and topics that arose from the analysis. I sifted and sorted them, and presented them here. I have made connections with these ideas to larger social, political, and cultural issues. And I have attempted to show their relevance to the wider world of women artists, intellectuals, and educators. I edited hours of video and present some very distilled results as part of the research-creation undertaken. Images from the video also accompany this work. Much has been left behind in the visual and intellectual review and write-up of this work. Some of it I have left to fall where it will, and not everything has been subject to analysis.

The artists who have participated in this research regard their bodies as producers of knowledge, and their eroticism, loving relationships, and artistic and intellectual work as an important way to express their knowledge. They expect that erotic fulfilment will be realised through relationships with others, participation in culture, and family life. They express this through making, and see themselves as producers, vitally engaged in technoculture.

The women's responses to the ways that lives are enhanced and affected by technologies are varied and diverse. All see aspects of technology, particularly mobile technologies, phones, and communication devices, as a great enhancement of their ability to stay connected with their children, families, and friends, and to reach out to loved ones around the world. Others see great improvements for their productivity, and their ability to extend themselves into culture, and undertake meaningful work.

All of the women interviewed also expressed some concern about the negative effects of technology. Many expressed concerns about technology's potentially detrimental affects on their bodies and the bodies of their children. All of the participants, across all age groups, expressed concern about the excessive time they spend using and being engaged with technologies. There are concerns about the invasion into all areas of private and public life that occurs with technologies that are always on, and the tolls that their extended use may have on bodies, relationships, and domestic life.

The experienced women in the cohort had a more discerning relationship with the technologies they use, viewing them as tools for extending their range of expressive work, and improving their productivity. Mobile technologies, computing, software, and social networks are viewed as useful, helpful devices and systems that may be picked up and adopted as desired. These women see technology as something outside of themselves, which they can make choices about and have an influence over. They are within their sphere of influence, but outside of themselves. They do not seem to identify these as technologies *of the self*.

The younger women interviewed, on the other hand, so closely identify with the technologies they use—mobile social communications and devices in particular—that they cannot imagine being without them, even while they are sleeping. This poses ethical dilemmas that are beginning to come to light. What happens when young women are so closely identified with their personal technologies, that they view them as *extensions of themselves*? Their virtual presences, mobile devices, social networks, and online identities are becoming so indistinguishably integrated with their actual embodied Being, that boundaries between bodies and devices, and technologies and selves, begin to blur.

A number of younger respondents in my study reported that they are over their infatuation with Facebook. They don't want to be told by a virtual "team" or online "friends" what to think or do, particularly when it comes to their real social lives and networks. They also want to be in control of their data and destinies online. Despite their concerns about social networks exerting too much influence and taking their time away from important daily activities and social pastimes, they seem reluctant to opt out. Their virtual and real social time is too interconnected, and they realise that this just the way that Facebook and Twitter want things to be. These social technologies exert a powerful attraction, but there are real risks involved in putting one's private life online. Many of the young women I interviewed, are just waking up to problems posed by the excessive calls on their time involved with tending to their virtual lives.

Young women are also becoming more cautious online, and wary of the dangers to their privacy and their personal lives that insidious social networks, geo-tracking mobile devices, and "always on" presence in the virtual world brings. So, it comes as a relief to

find that all of the young women I interviewed are becoming wary about handing their digital lives over to gigantic, multi-national, publicly traded corporations. They don't want to "follow" or "be followed" by people they don't know or care about, and they are beginning to tire of technology's intrusive demands on their time.

The romance with social networks may not yet be over, but the honeymoon seems to have ended. Whether social network participants have given up so much control that they may no longer truly opt-out, is the question. The next big technological disruption may be a withdrawal from such all-encompassing technological engagement. It is ironic that technologies created to profit from the longing for human connection, have come to flatten and overrule real human contact, by substituting virtual interaction. Rather than submitting to this as an unintended outcome of technology's influence on contemporary life, why not reject it as false, not helpful, and really, clearly, a bad idea?

Finding ways to minimize, opt out, turn off, and take control of technology may be one of the biggest "wicked problems" yet to solve. Ironically, the solutions to this problem may also be found and achieved with technology. If, through my findings in this research-creation, I could make one prediction about the next important disruption, it would be this: technologies that enable individuals to escape from the overarching effects of technology will become increasingly important. Technologies that transparently assist individuals to create closer, more symbiotic relations to the body, to loved ones, to community, and to every-day culture, are needed. And women will play a major role in imagining and inventing them.

In conclusion, my work claims a reinvigorated role for the erotic body, in technology and culture. Through the process of research-creation, I have undertaken a reconsideration of the place in technoculture of women artists and designers. With the Chora as unifying conceptual and theoretical grounding, I have attempted a re-imagination of the erotic body within creative practice. Within the context of contemporary research-creation, I have explored my own practice, and the work of other women artists and designers, to reveal some of women's creative ways of thinking, knowing, and Being. Women's artistic methods, and epistemologies have been uncovered, in contexts of education, artistic, and technological practice, and everyday life. Through cogent examples of work by historical and contemporary artists, designers, and makers, women's approaches to the challenges of formulating practices which acknowledge the erotic body, embedded in technoculture, have been revealed.

Alongside the women who agreed to participate in this research, I have explored the feminine imagination, created a work of research-creation, and produced new knowledge. Together, we make original, interdisciplinary contributions to the fields of art and design, communication, and the philosophy of technology, and claim our rightful place as thinkers and makers, within technoculture.

Notes

[1] Anne Balsamo, *Designing Culture: The Technological Imagination at Work* (Durham: Duke University Press, 2011), 33.

[2] The Social Sciences and Humanities Research Council defines research-creation as: "A creative process that comprises an essential part of a research activity, and fosters the development and renewal of knowledge through aesthetic, technical, instrumental or other innovations." Social Sciences and Research Council of Canada, "SSHRC, Definition of Terms," Social Sciences and Humanities Research Council, last modified 2004, http://www.sshrc-crsh.gc.ca/funding-financement/programs-programmes/definitions-eng.aspx#a22.

[3] De Beauvoir challenged notions of women's inferiority based on biology, and instead sought to find ways for women to transcend their biology, so that they could claim free, thinking subjectivity on a basis of equality with men. To do so, she emphasised the cultural rather than the biological basis of women's inherent difference. Gill Jagger, *Judith Butler: Sexual Politics, Social Change and the Power of Performance* (New York: Routledge, 2008), 52–53.

[4] Butler rejects the mind-body dualism prevalent in de Beauvoir's account and develops a notion of performativity to attributes of gender identity. Ibid.

[5] Grosz states the fallacy that, "[w]omen are somehow more biological, more corporeal, and more natural than men." Elizabeth Grosz, *Volatile Bodies* (Bloomington: Indiana University Press, 1994), 14.

[6] Irigaray argues that mothers have been associated with nature, the Chora, and therefore have been cast as "unthinking matter" since ancient times. Further, Irigaray holds that "all women have historically been associated with the role of 'mother' such that, whether or not a woman is a mother, her identity is always defined according to that role. This is in contrast to men who are associated with culture and subjectivity." Sarah K. Donovan "Irigaray, Luce (1932–present)," Internet Encyclopedia of Philosophy: A Peer-Reviewed Academic Resource, last modified July 2, 2005, http://www.iep.utm.edu/irigaray/.

[7] According to the binary theory summed up by Elizabeth Grosz: "Conventionally conceived within philosophy as the opposite of mind, corporeality has been associated as the negative within pairs of binary opposites. Where the mind is correlated with reason, subject, consciousness, activity, interiority, and masculinity, the body is implicitly then associated with passion, object, non-consciousness, passivity exteriority, and femininity." Elizabeth Grosz, *Sexual Subversions: Three French Feminists* (St. Leonards: Allen and Unwin, 1989), xiv–xv.

[8] Mol refers to the "body multiple" in her work on the body in medicine. Annemarie Mol, *The Body Multiple: Ontology in Medical Practice* (New York: Oxford University Press, 2002), viii.

[9] Lisa Blackman, *The Body* (Oxford: Berg, 2008), 1.

[10] Simone de Beauvoir, *The Second Sex* (New York: Alfred A. Knopf, 2009), 283.

[11] Julia Kristeva, *Revolution in Poetic Language* (New York: Columbia University Press, 1984), 25–26.

[12] Elizabeth Grosz, "Women, Chora, Dwelling," in *Space, Time and Perversion: Essays on the Politics of Bodies,* by Elizabeth Grosz (New York: Routledge, 1995), 111–24.

[13] Chora was thought to play a primary role in the creation of the universe. For Plato, Chora is "the receptacle, and in a manner the nurse, of all generation." Plato, *The Timaeus,* trans. Benjamin Jowett (Cambridge: Pearson Publishers, 1959), 49.

[14] Raymond Williams, *The Sociology of Culture* (Chicago: Chicago University Press, 1981), 13.

[15] Examples of technological innovations producing attendant socio-cultural changes were observed during the fieldwork and are taken up in the interview analysis in Chapter Six.

[16] Balsamo, *Designing Culture*, 5.

[17] Ibid., 90.

[18] Ibid.

[19] Anne Balsamo, *Technologies of the Gendered Body: Reading Cyborg Women* (Durham: Duke University Press, 1999), 87.

[20] Anne Balsamo, "Notes Toward a Reproductive Theory of Technology," in *Playing Dolly: Technocultural Formations, Fantasies, and Fictions of Assisted Reproduction,* ed. Anne Kaplan and Susan Squier (New Brunswick: Rutgers University Press, 1999), 87.

[21] Heidegger described the phenomenological state of "Becoming" and "Being" as "Da-sein" or "Being in the world." Heidegger reasoned that the natural and inevitable experience of being is not understood by analysis or reduction, but more simply and directly, through experience of Da-sein. Martin Heidegger, *Being and Time: A translation of Sein und Zeit*, trans. Joan Stambaugh (Albany: State University of New York Press, 1996).

[22] Ibid., 89–90.

[23] Ihde relates Heidegger's theory of Technics to technology and art. Don Ihde, *Heidegger's Technologies: Postphenomenological Perspectives* (New York: Fordham University Press, 2010), 115.

[24] Judith Butler, *Bodies That Matter: On the discursive limits of "sex"* (New York: Routledge, 1993), xv–xvi.

[25] Sue Vilhauer Rosser, "Using the Lenses of Feminist Theories to Focus on Women and Technology," in *Women, Gender and Technology*, ed. Mary Frank Fox, Deborah G. Johnson and Sue V. Rosser (Urbana-Champaign: University of Illinois Press, 2006), 23.

[26] Ibid., 32–33.

[27] For an exhaustive list of the historical, social, and cultural reasons that women have been side-lined in the project of technology, see Balsamo, *Designing Culture*, 28.

[28] Anne M. Wagner, *Three Artists (Three Women): Modernism and the Art of Hesse, Krasner and O'Keefe* (Berkeley: University of California Press, 1996), 1–2.

[29] In Kathleen O'Grady, "Nomadic Philsopher: A Conversation with Rosi Braidotti," *Women's Education des femmes* (Canadian Congress for Learning Opportunities for Women) 12, 1 (1996): 35-39.

[30] The design and use of tools may have been the necessary precursor to the evolution of larger brains in humans, which required superior nutrition, stimulating the development of agrarian practices that enabled more secure food sources. It is probable that some of the early designers of tools and technologies during the Neolithic revolution were women, who, anthropologists believe, were especially engaged in the development of agricultural practices, animal husbandry, and in the evolution of crafts, eventually leading to the establishment of early cultures and civilizations. Women's roles as farmers and child bearers gave them status in Neolithic society, as evidenced by the wealth of female representation found in Neolithic fertility votives and statues. Peggy Martin, *5 Steps to a 5 AP World History* (New York: McGraw Hill Professional, 2004), 60.

Women's intimate involvement in early forms of agricultural practices may be inferred from contemporary agrarian societies, where women are responsible for much of the agricultural work. In India, women do the most tedious and backbreaking work in agriculture, animal husbandry, and the home. As women lost their positions as innovators and toolmakers in society during the modern era, they became largely occupied by domestic duties, inhabiting the private sphere of the household. Indian Council of Agricultural Research, *Report on Women in Agriculture* (Delhi: Indian Council of Agricultural Research, 2004), 173.

Work in the home is an independent and often productive activity, and it is largely ignored that homemaking is primarily concerned with the process of *making*. Even with contemporary emancipation and access to the professions and working life, women remain the primary homemakers in both agrarian and westernised societies.

[31] Early tool making dates back more than 2.3 million years, as evidenced by the Oldowan stone tools found in Hadar, Ethiopia. Sharp-edged flakes and hand-held choppers were fashioned to extend human hands and teeth, and used by nomadic hunter-gatherers to cut meat and tubers. W. H. Kimbel, et al. "Late Pliocene Homo and Oldowan Tools from the Hadar Formation (Kada Hadar Member), Ethiopia," *Journal of Human Evolution* 31 (1996): 550.

[32] McLuhan famously observed that "We shape our tools and thereafter our tools shape us." Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: McGraw Hill, 1964), 46.

[33] According to Pew Internet research conducted in December 2010, 82 per cent of North American women owned mobile phones compared to 88 per cent of men; 59 per cent of women owned a desktop computer compared to 60% of men; and 51% of women owned a laptop as compared to 54 per cent of men. In their survey of digital entertainment devices, 46 per cent of women owned an MP3 player compared to 47 per cent of men; 40 per cent of women owned a game console compared to 45 per cent of men; 3 per cent of women owned a computer tablet device compared to 5 per cent of men; and 5 per cent of women surveyed owned an e-book device compared to 4 per cent of men.

Pew also found that 76 per cent of North American women use the Internet at least occasionally, spending about thirty-eight hours online per month, just one hour fewer than men. Ad Age Insights, *Always On Women: A Survey of How Women Are Using Technology Today* (Detroit: Crain Communications, 2011), 4–6.

[34] European Commission on Information Society and Media, *Women in ICT: Status and the way ahead.* (Brussels: European Commission on Information Society and Media, 2008), 15.

[35] So-called "wicked problems" involve complex issues, which defy exact definition. They are unlikely to be addressed with one definitive solution, because any resolution unleashes further insoluble wicked problems. An example of a long-standing wicked problem is child poverty. Wicked problems are not morally wicked; rather they are diabolical, because they resist attempts to solve them. That is why many approaches—interdisciplinary, transdisciplinary, and cross-disciplinary—are recommended for wicked problem solving.

Such an approach is described in Valerie Brown, John A. Harris, and Jacqueline Y. Russell, *Tackling Wicked Problems: Through the Transdisciplinary Imagination* (New York: Earthscan, 2010), 4. The original reference to wicked problems may be found in Horst W. J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," Policy Sciences 4 (1973): 160–61.

[36] In an EU study commissioned in 2006, men outnumbered women by more than 60 per cent in engineering education at the PhD level. Similarly, a significantly larger percentage of men pursued an advanced research degree in computing, with the gap between male and female PhD researchers at 65.08 per cent in engineering, and 62.8 per cent in computing. Women are also significantly under represented in research and development activities in governmental, higher education, and business-enterprise sectors. Across the various sectors, the discrepancy is most significant in engineering and technology research. *Women in ICT*, 11–14.

[37] As summarised by the National Science Foundation (NSF) report of 2002, between 1991 and 2001, more than $84 million was spent on the U.S. Government Program for Gender Equity, with few tangible results. National Science Foundation, *Program for Gender Equity in Science, Technology, Engineering, and Mathematics: A Brief Retrospective 1993–2001* (Arlington, Va.: National Science Foundation, 2008) http://www.nsf.gov/.

[38] Balsamo, *Designing Culture*, 31.

[39] Laura Mulvey introduced the second-wave feminist concept of the "male gaze" (adapted from Lacan), which she conceptualised as a feature of gender and power asymmetry. Laura Mulvey, "Visual Pleasure and Narrative Cinema," *Screen* 16 (1975): 62.

[40] Adriana Cavarero, *Relating Narratives: Storytelling*, trans. Paul Kottman. (New York: Routledge, 2000), 3.

[41] Sherry Turkle, "Wither Psychoanalysis in Computer Culture?" in *Psychoanalytic Psychology: Journal of the Division of Psychoanalysis* (2004): 18-21.

[42] Julia Kristeva, "A New Type of Intellectual: The Dissident," in *The Kristeva Reader*, ed. Toril Moi (Oxford: Basil Blackwell, 1991), 298.

[43] Grosz, *Volatile Bodies,* 14.

[44] Ibid., 6,7.

[45] Ibid., 3, 4.

[46] Grosz, *Sexual Subversions,* xiv-xv.

[47] Grosz, *Volatile Bodies,* 4-5.

[48] Mol, *The Body Multiple,* viii.

[49] A large 2006 VARK (visual, auditory, reading-writing, kinaesthetic) learning questionnaire study with physiology students at Michigan State University showed that the vast majority of women surveyed preferred unimodal kinaesthetic learning—learning from embodiment and the senses—whereas the majority of men preferred multimodal learning evenly distributed across visual, auditory, reading-writing and kinaesthetic learning. Erica A. Wehrwein, Heidi L. Lujan, and Stephen E. DiCarlo, "Gender differences in learning style preferences among undergraduate physiology students," *Advances in Physiology Education,* American Physiological Society (2006), http://advan.physiology.org/content/31/2/153.full.

[50] Peter Costello, *Layers in Husserl's Phenomenology: On Meaning and Intersubjectivity* (Toronto: University of Toronto Press, 2012), 66.

[51] Heidegger, *Being and Time,* 89–90.

[52] After Heideggerian phenomenology, I often call myself a maker as opposed to an artist or designer or technologist, although I employ art, design, and technology practices, in making. This is in alignment with Heidegger, in Martin Heidegger, *The Question Concerning Technology and Other Essays,* trans. William Lovitt (New York: Harper & Row, 1977), 7–8.

[53] Interestingly, the currently rising "maker culture" is an extension of technoculture. Maker culture involves people who make things, and focuses on their ways of making, generally with combinations of hand-made and technological or digital processes.

[54] Heidegger, *The Question,* xxv, 13.

[55] Balsamo, *Technologies of the Gendered,* 89–90.

[56] Balsamo, *Designing Culture*, 5.

[57] Butler, *Bodies That Matter,* xiii.

[58] Judith Butler, *Undoing Gender* (New York: Routledge, 2004), 28.

[59] Judith Butler, "Sex and Gender in Simone de Beauvoir's Second Sex," *Yale French Studies*, 72 (1986): 35, quoting de Beauvoir, *Second Sex,* 301.

[60] Butler, *Undoing Gender,* 217.

[61] Butler, *Bodies That Matter,* xiii.

[62] Ibid., 31.

[63] Commonly held feminine skills might include caring for oneself and the presentation of one's body, caring for others, raising and nurturing children, listening and communicating, and skills as homemakers in the domestic space.

[64] D. A. Louw, *Human Development* (Cape Town: Kagiso Tertiary, 1998), 44; 274.

[65] Ibid., 52b.

[66] Ibid., 50b–c.

[67] Grosz, *Women, Chora,* 116.

[68] Grosz, *Sexual Subversions,* xix.

[69] The *Chora* is described by Timaeus in Plato's *Dialogue* as a mother or nurse with the creative task of formation. Plato, *Timaeus,* 52d-53a.

[70] Ibid., 44d, 49a.

[71] Ibid., p. 84.

[72] Kristeva, *Revolution,* 29.

[73] Ibid., 161–162.

[74] Adriana Cavarero, *For More than One Voice: Toward a Philosophy of Vocal Expression* (Stanford: Stanford University Press, 2005), 135.

[75] Christine Battersby, *Phenomenal Woman: Feminist Metaphysics and the Patterns of Identity* (New York: Routledge, 1998), 9.

[76] A key finding of the United Nations Department of Social and Economic Affairs study, *The World's Women 2010,* confirms that in family life, women overwhelmingly carry the workload. This inequitable division of labour, until recently predominant in Western industrial societies, sees similar structures in developing countries. As spouses, parents and caregivers, women take on the primary responsibility for ensuring the proper functioning of families and the provision of everyday care and maintenance. Preparing family meals, maintaining hygiene, caring for other family members and a myriad of other chores related to the raising of children consume a good part of the day for women. While men are increasingly becoming involved in the daily functioning of families, it is still primarily women's responsibility. United Nations Department of Social and Economic Affairs, "The World's Women 2010," (New York: United Nations Department of Social and Economic Affairs, 2010).

[77] Elizabeth Grosz, "Bodies and Knowledges: Feminism and the Crisis of Reason," in *Space, Time and Perversion: Essays on the Politics of Bodies* (New York: Routledge, 1995), 31.

[78] Battersby, *Phenomenal Woman,* 12–17. See also Toril Moi, "What is a Woman? Sex, Gender, and the Body in Feminist Theory," in *What is a Woman and Other Essays* (New York: Oxford University Press, 2001), 71.

[79] Maurice Merleau-Ponty, *The Phenomenology of Perception,* trans. Colin Smith (New York: Humanities Press, 1962), 121; 146–47.

[80] Ibid., 147.

[81] Heidegger, *The Question,* 13.

[82] Iris Marion Young *Throwing Like a Girl: And Other Essays in Feminist Philosophy and Social Theory* (Bloomington: Indiana University Press, 1990), 17.

[83] Ibid.

[84] Elizabeth Grosz, "Sexual Signatures: Feminism After the Death of the Author," in *Space, Time and Perversion* (New York: Routledge, 1995), 15.

[85] Grosz is referring here to Irigaray's methods. Grosz, "Bodies and Knowledges," 43.

[86] Paul Kottman "Translator's Introduction," in *For More than One Voice: Toward a Philosophy of Vocal Expression*, by Adriana Cavarero (Stanford: Stanford University Press, 2005), xvi.

[87] Ibid., xxii.

[88] Sylvia Molloy, *At Face Value: Autobiographical Writing in Spanish America* (Cambridge: Cambridge University Press, 1991), 5.

[89] Ibid.

[90] Toril Moi, *Simone de Beauvoir: The Making of an Intellectual Woman* (New York: Oxford University Press, 2009), 7–8.

[91] Ibid.

[92] Ibid.

[93] Mary Catherine Bateson, *Peripheral Visions: Learning Along the Way* (New York: Harper Collins, 1994), 7-10.

[94] Patricia Moran, *Words of Mouth: Body Language in Katherine Mansfield and Virginia Woolf* (Charlottesville: The University of Virgina Press, 1996), 1–3.

[95] D. Jean Clandinin and F. Michael Connelly, *Narrative Inquiry: Experience and Story in Qualitative Research* (San Francisco: Jossey-Bass, 2000), 182.

[96] Shanna R. Daly, *Design Across Disciplines* (PhD diss., Perdue University Graduate School, 2009), 7.

[97] Joseph G. Ponterotto, "Brief Note on the Origins, Evolution and Meaning of the Qualitative Research Concept 'Thick Description,'" *The Qualitative Report* 11, 3 (2006): 538–39.

[98] Clifford Geertz, *The Interpretation of Cultures* (New York: Basic Books), 1973, 6.

[99] Gilbert Ryle *Concept of Mind.* New York: Barnes & Noble, 1949, 305.

[100] Ponterotto, *Brief Note*, 538–39.

[101] David C. Hoy *The Critical Circle: Literature, History, and Philosophical Hermeneutics,* (Berkeley: University of California Press, 1982), 2; 3.

[102] Hans Georg Gadamer, *Truth and Method* (London: Continuum, 1975), 293.

[103] Ibid., 1975, 294.

[104] Balsamo, *Designing Culture*, 208–9. See also: Jürgen Habermas, *The Theory of Communication and Action: Volume One, Reason and the Rationalisation of Society* (Boston: Beacon Press, 1985), 54–55.

[105] Research-creation is "A creative process that comprises an essential part of a research activity, and fosters the development and renewal of knowledge through aesthetic, technical, instrumental or other innovations." SSHRC, *Definition of Terms.*

[106] Patricia M. Spacks, *The Female Imagination* (New York: Knopf, 1975), 35.

[107] Moi, *Simone de Beauvoir,* 3.

[108] Georg W. F. Hegel, *Philosophy of Right,* trans. S.W. Dyde (New York: Cosima Inc., 2008), 174.

[109] Hannah Arendt, *The Human Condition* (Chicago: University of Chicago Press, 1998), 207–208.

[110] Ibid., 35, 55.

[111] Ibid., 186.

[112] STEM fields include Science, Technology, Engineering, and Mathematics.

[113] United Nations Educational, Scientific and Cultural Organization, *Science, Technology and Gender: An International Report* (New York: UNESCO Publishing, 2007), 15-21.

[114] Historical and biographical information concerning Christine de Pizan is taken from Rosalind Brown-Grant, "Introduction," in *The Book of the City of Ladies*, by Christine de Pizan (London: Penguin Books, 1999), iv, xvi–xxxvii, and from Jean Lloyd, "Christine de Pizan," last modified July 7, 2006, http://departments.kings.edu/womens_history/chrisdp.html.

[115] Rosalind Brown-Grant, *Christine de Pizan and the Moral Defence of Women: Reading beyond Gender* (Cambridge: Cambridge University Press, 1999), 3.

[116] Ibid., 215.

[117] This theory led to the definition of hysteria as a woman's illness. The word was derived from the Greek *husterikos*, from the root *hustera* or womb. Natalie Zemon Davis "Women on Top," in *Early Modern Europe: Issues and Interpretations*, ed. James Collins and Karen L. Taylor (Hoboken: Wiley-Blackwell, 2005), 398.

[118] Brown-Grant, *Christine de Pizan,* 5.

[119] de Pizan was probably made aware of Matheolus (Mathieu of Boulogne) and the *Liber lamentationum Matheoluli*, written around 1295, through the writing of her contemporary, theologian and mystic Jean Gerson, in his treatment of Matheolus in *Treatise Against the Romance of the Rose*, about a thirteenth century poem of courtly love composed by Guillaume de Lorris and finished by Jean de Meun. The poem was one of the most widely read in the French language, and de Pizan was familiar with it. She also offered her critique in *The Book of the City of Ladies*. Christine de Pizan, *The Book of the City of Ladies* (London: Penguin, 2000), 200–201.

[120] Brown-Grant, *Christine de Pizan,* 134.

[121] Ibid., 16.

[122] Brown-Grant, *Christine de Pizan,* 6.

[123] Giovanni Boccaccio, *Famous Women,* Translated by Virginia Brown (Cambridge: Harvard University Press, 2001), 52–55.

[124] de Pizan, *City of Ladies*, 18.

[125] Ibid., 21–22.

[126] de Pizan, *City of Ladies,* 14–15.

[127] Ibid., 39–40.

[128] Ibid., 91.

[129] Ibid., 114.

[130] Ibid., 136.

[131] Ibid., 77.

[132] Brown-Grant, *Christine de Pizan,* 6.

[133] Ibid.

[134] Christine de Pizan, Karen Green and Constant J. Mews, *The Book of Peace* (University Park, PA: Penn State Press, 2008), 5.

[135] The fourteenth and fifteenth centuries saw the flowering of the Italian Renaissance and its transformation into the High Renaissance.

[136] See Paleotti's promotion of female education in *Ordine delle Scuole delle Putte che vanno ad imparare la Dottrina Christiana le domeniche e feste nella Citta di Bologna* Paolo Prodi, *Il Cardinale Gabriele Paleotti (1522–1597),* (Rome: Edizioni di storia e letteratura, 1959), 16–18.

[137] Caterina Vigri (1413-1463) was canonized in the early eighteenth century and established as the patron saint of the Bolognese Artist's Academy, making Bologna famous for its association with the female patron saint of artists.

[138] The Poor Ladies, or Sisters of Clare, is a Franciscan order of nuns founded by St. Clare of Assisi, at the Convent of San Damiano, Assisi, in 1212. Kevin Knight, "New Advent Catholic Encyclopedia > P," last modified 2009, http://www.newadvent.org/cathen/12251b.htm.

[139] Babette Bohn, "The Antique Heroines of Elisabetta Sirani," in *Reclaiming Female Agency: Feminist Art History after Postmodernism*, ed. Norma Broude and Mary D. Garrard (Berkeley: University of California Press, 2005), 81.

[140] Lucrezia Marinella, *The Nobility and Excellence of Women and the Defects and Vices of Men,* trans. Anne Dunhill (Chicago: University of Chicago Press, 2000), 1–6.

[141] Ibid., 16.

[142] Ibid., 18.

[143] Diana Robin, Anne R. Larsen, and Carole Levin, *Encyclopedia of Women in the Renaissance: Italy, France, and England* (Santa Barbara: ABC-CLIO, 2007), 236.

[144] Moderata Fonte, *The Worth of Women: Wherein is Clearly Revealed Their Ability and Their Superiority to Men,* trans. Virginia Cox (Chicago: University of Chicago Press, 1997).

[145] Giulio Cesare Croce, *La Gloria della donne* (Bologna: Per Alessandro Benacci, 1590).

[146] Sarah Gwyneth Ross, *The Birth of Feminism: Woman as Intellect in Renaissance Italy and England* (Boston: Harvard University Press, 2009), 106.

[147] "Felsina" refers to the Etruscan name for Bologna, whom Carracci personified as the "Bolognese Paintress." Bohn, *Antique Heroines,* 81–82; Carlo Cesare Malvasia and Anne Summerscale, *Malvasia's Life of the Carracci: Commentary and Translation* (Pennsylvania State University Press, 2000), 2.

[148] The seventeenth century in Italy, the late Renaissance period leading to the counter-Reformation and the Baroque era.

[149] Robin, Larson and Levin, *Encyclopedia,* 31–32; 147–149.

[150] Bohn, *Antique Heroines,* 82–84.

[151] Mary D. Garrard, "Artemisia's Hand," in *Reclaiming Female Agency: Feminist Art History after Postmodernism*, ed. Norma Broude and Mary D. Garrard (Berkeley: University of California, 2005), 71.

[152] Sheila Ffolliott, "Learning To Be Looked At: A Portrait of (the Artist as) a Young Woman in Agnès Merlet's Artemisia," in *Reclaiming Female Agency: Feminist Art History after Postmodernism*, ed. Norma Broude and Mary D. Garrard (Berkeley: University of California Press, 2005), 50–51.

[153] Mary D. Garrard, *Artemisia Gentileschi Around 1622: The Shaping and Reshaping of an Artistic Identity* (Berkeley: University of California Press, 2001), 20–22.

[154] Mineke Van Essen, "Anna Barbara van Meerten-schilperoort (1778–1853): Feminist Pioneer?" *Revue Belge de Philologie et d'Histoire* 77: 2 (1999): 50-51.

[155] Davis, "Women on Top," 399.

[156] Miriam Balmuth, "Female Education in 16th and 17th Century England: Influences, Attitudes, Trends," *Canadian Women's Studies* 9, (1988): 18.

[157] Foster Watson, "Introduction," in *Vives and the Renaissance Education of Women*, by Juan Luis Vives, ed. Foster Watson (Cranbury: Scholar's Bookshelf, 1981), 3.

[158] Ross, *Birth of Feminism,* 174.

[159] Balmuth, "Female Education," 18.

[160] Mary K. Pratt, *Elizabeth I: English Renaissance Queen* (Minneapolis: Abdo Publishing Company, 2011), 90.

[161] Ross, *Birth of Feminism,* 182.

[162] Bathsua Makin, *An Essay To Revive the Antient Education of Gentlewomen in Religion, Manners, Arts & Tongues, With An Answer to the Objections against this Way of Education* (London: Parkhurst, 1673).

[163] Ibid.

[164] Ross, *Birth of Feminism,* 184.

[165] Mary Astell, *A Serious Proposal to the Ladies,* ed. Patricia Springborg (Peterborough: Broadview Press, 2002).

[166] Ibid., 21.

[167] Ibid.

[169] Ibid., 172.

[169] Ibid., 168.

[170] Ibid., 159.

[171] Rebecca Rogers, "Learning to be good girls and women: education, training and schools," in *The Routledge History of Women in Europe since 1700*, ed. Deborah Simonton (New York: Routledge, 2006), 99.

[172] Mary Wollstonecraft, *A Vindication of the Rights of Woman* (London: Pearson Longman, 2007).

[173] Ibid., 181.

[174] Ibid., 182.

[175] Emily Davies, *The Higher Education of Women* (London: Alexander Strahan, 1866).

[176] Not until 1940 was Girton College finally able to confer full degrees from the University of Cambridge upon their women graduates. Marion Royce, "Emily Davies and English Higher Education of Women," *Improving College and University Teaching* 20, (1972): 63.

[177] Olympe de Gouges, *Déclaration des Droits de la Femme et de la Citoyenne* (Paris: Fondation 250ème Anniversaire Olympe de Gouges, 1998).

[178] Carol Strauss Sotiropoulos, *Early Feminists and the Education Debates: England, France, Germany 1760-1810* (Madison, NJ: Fairleigh Dickinson University Press, 2007), 189.

[179] Ibid.

[180] Mineke Van Essen, "Persée: Portail de revues en sciences humaines et sociales," 1999, http://www.persee.fr/web/revues/home/prescript/article/rbph_0035-0818_1999_num_77_2_4364.

[181] Emma Willard, *An Address to the Public, Particularly to the Members of the Legislature of New York, Proposing a Plan for Improving Female Education* (Farmington Hills, MI: Gale Sabin Americana, 2012).

[182] The Troy Female Seminary was renamed the Emma Willard School in 1895, and continues to educate young women today. Emma Willard School, "Emma Hart Willard | Emma Willard School," accessed November 17, 2011, http://www.emmawillard.org/about-emma/emma-hart-willard.

[183] Rudy Willis and John S. Brubacher, *Higher Education in Transition: A History of American Colleges and Universities,* (Piscataway, NY: Transaction Publishers, 1997), 66.

[184] Anna M. Almán and Kristen Renn, *Women in Higher Education* (Santa Barbara: ABC-CLIO Inc., 2002), 8.

[185] Ibid., 65.

[186] Ibid., 66.

[187] Ibid.

[188] Girton College was the first women's college in the United Kingdom, opening on 16th October 1869 at Benslow House, Hitchin, as the College for Women. However, the Regent House at Cambridge University and HM the King in Council did not recognize it for full membership and status as a college until 1948. The college went on to admit men as fellows in 1977, and male undergraduates in 1979. Its balance of men and women in both the fellows and student population is unique to Cambridge University. Girton College, University of Cambridge, "Girton College University of Cambridge," accessed September 20, 2011, http://www.girton.cam.ac.uk/about/college-history/.

[189] University of Oxford, "Women at Oxford - University of Oxford," accessed September 20, 2011, http://www.ox.ac.uk/about_the_university/introducing_oxford/women_at_oxford/index.html.

[190] Moi, *Simone de Beauvoir,* 41–43.

[191] Ibid., 56. In France, graduation from the university *Écoles Normale Supérieur* (ENS) was at the time, and still is considered the epitome of scholarly and intellectual achievement. The position of the ENS is far more dominant than either Oxford University in the United Kingdom or Harvard University in the United States.

[192] Moi, *Simone de Beauvoir,* 45–46.

[193] Ibid., 50.

[194] Ibid., 41–43.

[195] Ibid., 55.

[196] Ibid., 52.

[197] In an apocryphal debate between the young philosophers, on de Beauvoir's contention that the main problem in life was the pursuit of happiness, Weil retorted that it was clear that de Beauvoir had never been hungry. Simone Weil, *Simone Weil: An Anthology,* ed. Siân Miles (London: Weidenfeld and Nicholson, 1986), 7.

[198] Moi, *Simone de Beauvoir,* 49.

[199] Ibid., 49–50.

[200] Weil, *Anthology,* 7.

[201] Moi, *Simone de Beauvoir,* 37.

[202] Institut Français de l'Éducation, Lauréats des concours d'agrégation de 1900 à 1950, accessed June 10, 2011, http://www.inrp.fr/she/chervel_laureats2.htm.

[203] Almán and Renn, *Women in Higher Ed,* 12.

[204] Ibid.

[205] Ibid., 14.

[206] Ibid., 13.

[207] Ibid., 14.

[208] United Nations Educational, Scientific and Cultural Organization "Education Counts: Towards the Millennium Development Goals," last modified 2011, http://unesdoc.unesco.org/images/0019/001902/190214e.pdf.

[209] Lawrence H. Summers, *Educating All the Children,* Policy Research Working Papers Series, World Bank (Washington DC: World Bank, 1992), 12.

[210] Ibid.

[211] UNESCO, "Education Counts," 2011.

[212] UNDSEA, "The World's Women, 2010," viii–ix.

[213] The United Nations Department of Social and Economic Affairs states that: "There is progress —albeit slow and uneven—in the literacy status of adult women and men around the world. However, reflecting the persistent disadvantages they face, women account for two thirds of the world's 774 million adult illiterates—a proportion that is unchanged over the past two decades. Gender disparities in adult literacy rates remain wide in most regions of the world. However, there is a reason to look toward future decades with optimism as improvement in access to education eventually raises literacy levels. In almost all countries, literacy rates for the young are higher than those for adults." Ibid.

[214] United Nations Department of Public Information, "Women at a Glance," last modified May 1997, http://www.un.org/ecosocdev/geninfo/women/women96.htm.

[215] Luce Irigaray, *Key Writings* (London: Continuum, 2004), 93.

[216] Ibid., 39–40.

[217] UNESCO, "Education Counts," 10.

[218] UNDSEA, "The World's Women," viii–ix.

[219] Kevin Pollard, "The Gender Gap in College Enrollment and Graduation," last modified April 2011, http://www.prb.org/Articles/2011/gender-gap-in-education.aspx?p=1 2011.

[220] Ibid.

[221] Terris Ross, et al., *Higher Education: Gaps in Access and Persistence Study: Statistical Analysis Report,* Statistical Analysis, Institute of Education Sciences, National Center for Education Statistics (Washington: US Department of Education, 2012), xii.

[222] Ibid., xv.

[223] Ibid., xi.

[224] Ibid., xii–xiii.

[225] Carolyn Marvin, *When Old Technologies Were New: Thinking About Electric Communication in the Late Nineteenth Century* (New York: Oxford University Press, 1990), 53; 59.

[226] Ibid., 59.

[227] Thomas J. Seifried, "The Chilly Classroom Climate Revisited: What Have We Learned, Are Male Faculty the Culprits?" *PAACE Journal of Lifelong Learning* (Pennsylvania Association for Adult Continuing Education), 9 (2000): 26–28.

[228] Sue Vilhauer Rosser, *Re-Engineering Female Friendly Science: Applying Women's Studies Methods and Theories to Attract Students* (New York: Teachers College Press, 1990), 70.

[229] OECD Horizontal Programme on Sustainable Development, *Gender and Sustainable Development: Maximising the Economic, Social and Environmental Role of Women,* Organisation for Economic Cooperation and Development (OECD), (New York: United Nations, 2008), 23.

[230] Jennifer Saul, "Women in Philosophy," last modified October 16, 2012, http://philosophypress.co.uk/?p=1079.

[231] I have in my own professional career called for affirmative action by creating a joint research group for women at OCAD University, to create opportunities for students working in computer science, design, medical science, and digital technologies, to apprentice with senior colleagues, and work alongside each other as researchers. I also vocally refuse to participate on panels or attend conferences where there is not at least a minority representation of women speakers and experts. I complain to the organisers of such all-male or predominantly male gatherings, and attempt to dissuade my colleagues from attending and supporting organisations that fall victim to such lazy thinking and poor organisation.

[232] Scott Pulizzi and Laurie Rosenblum, *Building a gender friendly school environment: a toolkit for educators and their unions,* Education Development Center (Waltham: Education International, 2007), 21-23.

[233] Anne Balsamo, "Teaching in the Belly of the Beast," in *Wild Science: Reading Feminism, Medicine and the Media*, ed. Janine Marchessault and Kim Sawchuk (New York: Routledge, 2000), 185–214.

[234] Lucy Lippard, "Scattering Selves," in *Inverted Odysseys: Claude Cahun, Maya Deren, Cindy Sherman*, ed. Shelley Rice, (Cambridge: The MIT Press, 1999), 27.

[235] The University of Chicago, "Theories of Media," last modified 2004, http://csmt.uchicago.edu/glossary2004/scopicvocative.htm.2004.

[236] Maria Dibattista, "Responding: Women Artists and the Crisis of Embodiment," in *Women Artists at the Millennium*, eds. Carol Armstrong, M. Catherine de Zegher (Cambridge: October Books, The MIT Press, 2006), 429.

[237] Ibid.

[238] The woman who reveals her body and allows it to be used as material for the gaze of others has been called "scandalous." Her scandal is to show the world what should remain private and hidden from view, to show what is meant for her eyes and the eyes of her lover only. Scandal, from the Latin noun *scandalum*, is sin, the giving in to temptation, the stumble. The woman artist who reveals her body, sins in her revelation. The root of scandal, *scandere*, means to climb, ascend, or mount an obstacle. Against this stumbling ascent, the woman artist attempts to mount, overcome, and materialize the world. She also attempts to imagine what is not yet possible and what is about to be. In this way she is boldly and consciously scandalous, stumbling in her efforts to imagine and materialize the world through means of her creativity, with her own body as both subject matter and base material. Ibid., 431.

[239] There is no supposition of a grand narrative of women's self-portraiture being offered here, rather, some tentative links across the generations, and an investigation of intention, in the work of a group of women who use photographic self-portrait as their main medium. However, the modernist tendency to create a category of master works or artists is not appropriate, and should be avoided in the analysis of women's art. Indeed, Solomon-Godeau argues caution regarding the creation of what she terms "(matri)lineages" which collapse self-representation into a master category of women's art. Abigail Solomon-Godeau, "The Equivocal 'I': Claude Cahun as Lesbian Subject," in *Inverted Odysseys: Claude Cahun, Maya Deren, Cindy Sherman*, ed. Shelley Rice (Cambridge: The MIT Press, 1999), 115.

[240] Ivan Illich, "The Scopic Past and the Ethics of the Gaze: A plea for the historical study of ocular perception," *Ivan Illich,* last modified 1998, http://www.davidtinapple.com/illich/1998_scopic_past.PDF.

[241] Ivan Illich, "Guarding the eye in the age of show," *Science, technology and society working papers, Issue 4,* (University Park: Penn State University Press, 1994), 7; 9.

[242] Ibid., 8; 9.

[243] The American portrait photographer Imogen Cunningham apprenticed as a photographer from 1907–1909 as an assistant to Edward S. Curtis, the Seattle-based photographer who was engaged in a chronicle of indigenous Americans through his portrait work. Cunningham later set up her own studio in Seattle where she specialised in artistic portraiture. She was passionate about opening the profession to women, and wrote and published her book, *Photography as a Profession for Women*, in 1913. Naomi Rosenblum, "Imogen Cunningham," in *Notable American Women: A Biographical Dictionary, Completing the Twentieth Century*, ed. Edward T. James, et al. (Boston: Harvard University Press, 2005), 143-45.

[244] Lippard, "Scattering Selves," 30.

[245] *Changing New York*, published by E.P. Dutton in 1939, was the result of Berenice Abbot's collaboration with art critic and journalist Elizabeth McCausland. With Abbot's photographs and McCausland's text, the book documents subjects such as the city's changing architecture during the skyscraper building boom, new private and public modes of transportation, and new food distribution methods. Beginning in 1939, Abbot spent twenty years inventing new lighting and projection systems to capture scientific concepts, such as magnetism and gravity. Susan Noyes Platt, "Berenice Abbott," In *Notable American Women: A Biographical Dictionary, Completing the Twentieth Century*, ed. Edward T. James, et al. (Boston: Harvard University Press, 2005), 1-2.

[246] Carol Armstrong, "Francesca Woodman: A Ghost in the House of the Woman Artist," in *Women Artists at the Millennium*, eds. Carol Armstrong, M. Catherine de Zegher (Cambridge: October Books, The MIT Press, 2006), 367.

[247] One of Cameron's favourite nieces, Laura Gurney Troubridge, recalled that as children they never knew what their Aunt was going to do next, "Stand there," she shouted . . . and we stood for hours, if necessary." The children who posed as models for Cameron's idealised tableaux often stood still for hours, wearing little or nothing, for the lengthy periods of time that it took for the early photographic plates to expose. Victoria & Albert Museum, "V & A Search the Collections," accessed March 3, 2013, http://www.vam.ac.uk/images/image/4214-popup.html.

[248] Metropolitan Museum of Art, "Search the collections," accessed March 3, 2013, http://www.metmuseum.org/collections/search-the-collections/190036289.

[249] Carol Armstrong, "Cupid's Pencil of Light: Julia Margaret Cameron and the Maternalization of Photography." *October*, 76 (1996): 119.

[250] Lynn Gumper, "Introduction," in *Inverted Odysseys: Claude Cahun, Maya Deren, Cindy Sherman*, (Cambridge: The MIT Press, 1999), x.

[251] Frontispiece of *Part X, Aveux non avenues*, Solomon-Godeau, "Equivocal 'I'," 114.

[252] Whitney Chadwick explores this question in "An Infinite Play of Mirrors," where she proposes that exploration of self-representation and the body was an important theme, inherited from the surrealists, in the work of women artists of the time. "In mobilizing the body as a primary signifier of its cultural politics, surrealism established new parameters within which women artists might begin to explore the complex and ambiguous relationship between the female body and female identity. Women . . . left a collective body of self-portraits and other self-representations that in taking the artist's own body as a starting point and in collapsing interior and exterior projections of the self (regardless of how that word is/was understood) continues to reverberate within contemporary practices by women that articulate how the body is marked by femininity as a lived experience, subjectivity produced through new narratives, and the possibility of a feminine imaginary enacted." This theme continues to have validity. Whitney Chadwick, "An Infinite Play of Empty Mirrors," in *Mirror Images: Women, Surrealism, and Self-Representation*, ed. Whitney Chadwick (Cambridge: The MIT Press, 1998), 4.

[253] From 1925–1927 Cahun was involved in a theatrical collaboration at *Amis des Arts Ésotériques* and then at the *Théâtre Ésotériques* in Paris. From February to May 1929, she was part of the company at the *Théâtre Le Plateau*, directed by Pierre Albert-Birot, together with Roger and Solange Roussot, Helene Duthe and Yasoshi Wuriu. She played Elle in *Barbe bleue*, Monsieur de la première table in *Banlieue* (both by P. Albert-Birot) and Satan in *Le mystère d'Adam*. Claude Cahun, *Ecrits de Cahun,* ed. François Leperlier (Paris: Jean-michel Place, 2002), 13.

[254] Julie Cole, "Claude Cahun, Marcel Moore, and the Collaborative Construction of a Lesbian Subjectivity," in *Reclaiming Female Agency: Feminist Art History After Postmodernism*, ed. Norma Broude and Mary D. Garrard (Berkeley: University of California Press, 2005), 353.

[255] Claude Cahun, *Disavowals, or Cancelled Confessions,* trans. Susan de Muth (Cambridge: Cambridge University Press, 2008), 12.

[256] Illich, *Guarding the eye,* 7; 9.

[257] Ibid., 356.

[258] Margaret Sundell, "Vanishing Points: The Photography of Francesca Woodman," in *Inside the Visible: An Elliptical Traverse of 20th Century Art in, of, and from the Feminine*, ed. Catherine de Zegher (Cambridge: The MIT Press, 1996), 435.

[259] Dibattista, "Responding," 428–29.

[260] Corey Keller, *A Portrait of the Artist as a Young Woman* (San Francisco: San Francisco Museum of Modern Art, c2011), 171.

[261] Ibid., 171–72.

[262] Ibid., 179.

[263] Rhode Island School of Design, "Photography," accessed May 6, 2012, http://photo.risd.edu/content/the-department/history.

[264] Ibid., 173–74.

[265] Rosalind Krauss, "Problem Sets," *Bachelors* (The MIT Press, 2000), 162.

[266] Ibid.

[267] David Levi Strauss, "After You, Dearest Photography: Reflections on theWork of Francesca Woodman," in *Francesca Woodman*, by Francesca Woodman, ed. Corey Keller (Zurich: Scalo Books, 1998), 16.

[268] Keller, *A Portrait,* 59–61.

[269] Oliver Koerner von Gustorf, "DB Artmag - all the news on Deutsche Bank Art," last modified 2008, http://db-artmag.de/archiv/2008/e/4/1/613.html.

[270] Peggy Phelan, *Art and Feminism,* ed. Helena Reckitt. (London: Phaidon Press, 2012), 109.

[271] Jennifer Blessing, "The Geometry of Time: Some Notes on Francesca Woodman's Video," in *Francesca Woodman*, ed. Corey Keller, (New York: D.A.P., 2011), 200.

[272] Chris Townsend, *Francesca Woodman* (London: Phaidon Press, 2006), 244.

[273] Armstrong, "Francesca Woodman," 349–50.

[274] Ibid., 363.

[275] Feminist critic Jui-Ch'i Liu writes that in *House #3*, Woodman articulates a generative maternal space, which " . . . shows an active longing and positive struggle to merge with the wall." Jui-Ch'i Liu, "Francesca Woodman's Self-Images: Transforming Bodies in the Space of Feminity," *Women's Art Journal* 25, 1 (2004): 26.

[276] Francesca Woodman, in undated letter to her mother on verso of print N.383_1/1. Collection of George and Betty Woodman.

[277] Townsend, *Francesca Woodman,* 244.

[278] Francesca Woodman in a letter to Suzanne Santoro, June 18, 1980. Reproduced in *Francesca Woodman: Photographs 1977-1981*, p. 110. Francesca Woodman, *Francesca Woodman: Photographs 1977–1981,* ed. Gieuseppe Casetti (Vienna: AGMA, 2011), 110.

[279] Elizabeth Gumport, "The Long Exposure of Francesca Woodman," *The New York Review of Books*, January 24, 2011.

[280] Ibid.

[281] Lucy Lippard, "The Pains and Pleasures of Rebirth: European and American women's body art," in *The Pink Glass Swan: Selected Essays on Feminist Art*, by Lucy Lippard (New York: The New Press, 1995).

[282] Lippard, "Scattering Selves," 31.

[283] Lynda Nead, *The Female Nude: Art, Obscenity and Sexuality* (London: Routledge, 1992), 67.

[284] Phelan, *Art and Feminism,* 100.

[285] Lippard, "Pains and Pleasures," 95.

[286] Hannah Arendt, *Men in Dark Times* (New York: Penguin Books, 2001), 169.

[287] Ibid.

[288] Cavarero, *Relating Narratives,* 33.

[289] Blixen's quote was one of two mottos for Arendt's fifth chapter, "Action," in *The Human Condition*. Arendt, *Human Condition,* 175. Blixen (writing with her nom de plume Isak Dinesen), wrote the novel *Out of Africa*. Arendt, who greatly admired her work, later wrote a biography of Blixen.

[290] Arendt, *Men in Dark,* 106.

[291] Ibid., viii.

[292] Ibid., xx.

[293] Arendt, *Human Condition,* 184.

[294] Kottman, "Translator's Intro," xxii.

[295] Alasdair MacIntyre, *After Virtue: A Study in Moral Theory* (Notre Dame: University of Notre Dame Press, 2007), 204–219.

[296] Cavarero, *For More,* xxiii.

[297] This idea emanated from a conversation with Mimi Sheller, Director, Center for Mobilities Research and Policy and Professor of Sociology at Drexel University in Philadelphia.

[298] Locative Media Workshop, "Locative Media," last modified July 2003, http://locative.x-i.net/report2.html.

[299] Kunstradio, "Rasa Smite & Raitis Smits," accessed December 2, 2012, http://www.kunstradio.at/BIOS/rasaraitisbio.html.

[300] Janet Cardiff and George Bures Miller, "Walks," accessed December 2, 2012, http://www.cardiffmiller.com/artworks/walks/index.html.

[301] Teri Rueb, "teri rueb," accessed December 2, 2012, http://www.terirueb.net/trace/index.html.

[302] Teri Rueb, "Elsewhere," accessed December 2, 2012, http://www.terirueb.net/elsewhere/.

[303] Ibid.

[304] MacIntyre, *After Virtue,* 219.

[305] Ibid.

[306] Ibid.

[307] This was taken from an idea suggested by Mimi Sheller.

[308] *Park Walk* was developed with my collaborator Bruce Hinds, as part of the *Mobile Digital Commons Network (MDCN),* led by principal investigators and media artists Sara Diamond and Michael Longford. *MDCN* is a consortium of Canadian universities and arts institutions collaborating on the development of new mobile technologies, designs and artistic practices.

[309] Michael Longford and Sara Diamond, "The Mobile Experience Engine," accessed December 2, 2012, http://www.mobilelab.ca/mee.html.

[310] Martha Ladly and Bruce Hinds, "The Park Walk Project Web Site," accessed December 2, 2012, http://mobilelab.ca/parkwalk/.

[311] Paul Kottman, "Translator's Intro," ix.

[312] Ibid., x.

[313] This was taken from a conversation with Mimi Sheller.

[314] Alyssa Wright, "Cherry Blossoms," accessed December 2, 2012, http://alumni.media.mit.edu/~alyssa/.

[315] This research was funded through the Graphics, Animation & New Media National Centre of Excellence (GRAND NCE) Canadian university research network.

[316] Cavarero, *Relating Narratives,* 33.

[317] Cavarero, *For More,* 109.

[318] Cavarero, *Relating Narratives,* 111.

[319] Ibid., 114.

[320] Kristeva, *Revolution,* 29.

[321] See York University Research Ethics approval and the sample informed consent form, in Appendix A.

[322] The field work contained in this dissertation has not been written up, analysed, or shown elsewhere, to date.

[323] Ponterotto, "Brief Note," 538–40.

[324] Gadamer, *Truth and Method,* 294.

[325] Ruthellen Josselson, "Narrative Research and the Challenge of Accumulating Knowledge," *Narrative – State of the Art, Special Issue of Narrative Inquiry,* ed. Michael Bamberg (John Benjamins Publishing Company) 16: 1 (2006): 3–10.

[326] The term is taken from Clandinin and Connelly, *Narrative Inquiry.*

[327] When, in the 1998 research interviews, participants were asked to bring an "object to think with," I also had a notion of how objects act as stand-ins for the maternal body. Psychoanalyst Melanie Klein challenged Freud's account of psychic development with her own theory of object relations. Klein's position was that the capacity for Eros originates with the mother, and the child's experience at the breast. The "good breast" satisfies the child's hunger, giving a feeling of security, comfort, and fulfilment, becoming the foundation for new experiences of happiness. For Klein, feelings of gratitude and an upsurge of joy and plenitude emerge in the child, giving her the strength to confront the forces of loss, loneliness, and deprivation. Rosalind Minsky, *Psychoanalysis and Gender: An Introductory Reader* (New York: Routledge, 1996), 130–31.

British paediatrician Donald Winnicott studied the behaviour of mothers and their babies, and came up with his own Kleinian theory on transitional objects: the "good enough mother." He observed that by moving gradually away, a mother helps develop a healthy sense of independence in her child. Her growing inability to meet her baby's every need helps the child adapt to external realities. "The good-enough mother . . . starts off with an almost complete adaptation to her infant's needs, and as time proceeds she adapts less and less completely, gradually, according to the infant's growing ability to deal with her failure." Donald Winnicott, "Transitional objects and transitional phenomena," *International Journal of Psychoanalysis,* 34 (1953): 89–97.

[328] Turkle, "Wither Psychoanalysis," 19.

[329] Ibid.

[330] Ibid., 23–24.

[331] Described by Clandinin and Connelly as "falling in love." In my case, the respect was generated both by the material and its beauty and by the gift of time the participants had bestowed with their interviews. Clandinin and Connelly, *Narrative Inquiry,* 81.

[332] I did not create full verbatim transcriptions, but rather trusted myself to remember the important stories from each session. Scrubbing the video back and forth to find that section, I would make a swift, rough "top and tail" edit, then transcribe the relevant section. This intuitive method served me quite well. Assisted by my field notes, the sections that seemed important stood out, were easy to locate, and fascinating to transcribe.

[333] Mindful narrative interviewing techniques are described in Clandinin and Connelly, *Narrative Inquiry,* 63–79.

[334] All of the participants agreed to re-analysis of the interview materials for the purposes of this research, though not all are included. Participants agreed to different levels of exposure, disclosure, and confidentiality. Some agreed their interviews could be reanalysed. They allowed me to show edited video narratives and still images from their interviews. Others agreed to reanalysis of the transcripts from their interviews but declined my request to show video excerpts or stills. Still others declined to allow me to reanalyse or show video at all within the context of this thesis. Although all of the participants had originally agreed that I could show the work, I have respected their wish to be withdrawn from this study. Some of the participants who agreed that their videos could be reanalysed and shown publicly have video stills included in this chapter, and short excerpts of their video narratives included in the DVD in Appendix B.

[335] Rosalind Josselson, "On Writing Other People's Lives: Self-Analytic Reflections of a Narrative Researcher," in *Ethics and Process in the Narrative Study of Lives*, ed. Ruthellen Josselson (Thousand Oaks: Sage, 1996), 64.

[336] Sigmund Freud, quoted in Ethel Spector Person, *On Sigmund Freud's "Group Psychology and The Analysis of the Ego"* (Hillsdale: Analytic Press, 2001), 138.

[337] Julia Kristeva, "Freud and Love: Treatment and Its Discontents," in *Tales of Love*, by Julia Kristeva, trans. Leon S. Roudiez (New York: Columbia University Press, 1987), 25.

[338] Ibid., 323.

[339] Luce Irigaray, *Speculum of the Other Woman,* trans. Gillian C. Gill (Ithaca: Cornell, 1985), 122–23.

[340] Luce Irigaray, "When Our Lips Speak Together," trans. Carolyn Burke, *Signs: Journal of Women in Culture and Society* 6, (1980): 69–79.

[341] Julia Kristeva, "Tales of Love: Stabat Mater," in *The Portable Kristeva*, ed. Kelly Oliver (New York: Columbia University Press, 2002), 296.

[342] Ibid., 297.

[343] Please see the "York University Ethics Approval," and the "Participant Information and Informed Consent" documents in Appendix A.

[344] Skype has since introduced a record function for video conversations. Interestingly, Skype was one of the few technological innovations universally referenced by my participants; every one of them was familiar with and comfortable using Skype. As a technology, it was also highly rated across cultural and age ranges of the women I interviewed, and is unanimously characterised as one of the very few helpful, useful, and beautiful, technological innovations they had gladly incorporated into their everyday lives.

[345] One Laptop Per Child, "One Laptop Per Child," accessed January 12, 2013, http://one.laptop.org/.

[346] The Associated Press, "Low-cost laptop could transform learning," NBC News, last modified January 2, 2007, http://www.nbcnews.com/id/16436622/%3E#.USQQakQ66YU.

[347] GBLT is a short-form for "Gay, Bisexual, Lesbian, and Transsexual" persons.

[348] Laurel Evelyn, Max Hendriks, and Stephen Grant, *Information Technology and Indigenous People* (London: Information Science Publishing, 2007), x.

[349] Genny Beemyn and Susan Rankin, *The Lives of Transgender People,* (New York: Columbia University Press, 2011), 58–59.

[350] Machinima is a programming language and a virtual movie-making technology. "The word "machinima"—a loose hybrid of "machine" and "cinema"—refers to the process of creating real-time animation by manipulating a video game's engine and assets." Machinima, Inc. "Machinima," last modified 2012, http://www.machinima.com/.

[351] Alejandra uses the expression "transi" positively and interchangeably with the term "transsexual."

[352] Balsamo, *Designing Culture*, 31.

[353] Karen Barad, "Getting Real: Technoscientific Practices and the Materialisation of Reality," *Differences* 10, no. 2 (1998), quoted in Balsamo, *Designing Culture*, 33.

[354] Ibid., 33.

[355] Turkle, "Wither Psychoanalysis," 23–25.

[356] Ibid.

[357] Ibid., 19.

[358] In both developed and developing countries, women's caregiving provides the backbone of support in homes and institutional settings. In the U.S., it is estimated that the informal care provided by women is valued at up to $188 billion annually. This is based on estimates of women caregivers as a percentage of all caregivers, ranging from 59% to 75 %. Peter S. Arno and Margaret M. Memmott, "The Economic Value of Informal Caregiving," *Health Affairs* 18 (1999).

[359] "Although only a very few countries have declining populations, 61 countries (with about 44% of the world's population) already have below-replacement fertility rates (less than 2.1 births per woman)." United Nations Educational, Scientific and Cultural Organization. Teaching and Learning for a Sustainable Future, "Fertility is Declining," last modified 2010, http://www.unesco.org/education/tlsf/mods/theme_c/popups/mod13t01s003.html.

[360] A U.S. study on women and caregiving highlighted the conflicting demands of work and caregiving, particularly elder care. The study found the majority of women care givers work outside the home, and their careers are negatively affected by caregiving activities:
• 33% of working women decreased work hours
• 29% passed up a job promotion, training or assignment
• 22% took a leave of absence
• 20% switched from full-time to part-time employment
• 16% quit their jobs
• 13% retired early

MetLife Mature Market Institute, Family Caregiver Alliance; The National Center on Women and Aging, "The Metlife juggling act study: Balancing caregiving with work and the costs involved," last modified 1999, http://www.caregiver.org/caregiver/jsp/content_node.jsp?nodeid=892.

[361] In almost every sector, an imbalance persists between women and men in decision-making positions. According to "The World's Women," a United Nations' 2010 report: "In the private sector, women are on most boards of directors of large companies but their number remains low compared to men . . . This is especially notable in the largest corporations, which remain male-dominated.

Women also continue to be underrepresented in national parliaments; where on average only seventeen per cent of seats are occupied by women. The highest positions are even more elusive: only seven of 150 elected heads of state in the world are women, and only eleven of 192 heads of government are women. The situation is similar at the level of local government: female elected councillors are underrepresented in all regions of the world and female mayors even more so." UNDSEA, "The World's Women," x.

[362] Ibid., ix.

[363] Ibid, ix-x.

[364] "A life-cycle approach has to be adopted to overcome the challenges that confront women in gaining access to education and training and in utilizing this training to secure better employment. This includes: improving the access of girls to basic education; overcoming logistical, economic and cultural barriers to apprenticeships and to secondary and vocational training for young women—especially in non-traditional occupations; taking into account women's home and care responsibilities . . . " International Labour Office, *Skills for improved productivity, employment growth and development,* Conference, International Labour Organization, (Geneva: International Labour Office, 2008), ix.

[365] Williams, *Sociology of Change,* 13.

[366] Balsamo, *Designing Culture*, 33.

[367] Linux is a free, open-source operating system in the UNIX family of operating systems for computers. Linux was originally designed by Linus Torvalds, in 1991. It is constantly being added to and updated by programmers all over the world. Linux.org, "Linux.org | Resource for Linux | How to Linux Guide | What is Linux," accessed January 13, 2013, http://www.linux.org/.

[368] Debian makes free, open-source operating systems and software for computers. Debian.org, "Debian – The Universal Operating System," accessed January 13, 2013, http://www.debian.org/.

[369] Jill Flynn, Kathryn Heath, and Mary Davis Holt, "Collaboration's Hidden Tax on Women's Careers," last modified November 11, 2011, http://blogs.hbr.org/cs/2011/11/collaborations_hidden_tax_on_women.html 2011.

[370] Lynne D. Johnson, "Thoughts on Women and Collaboration," last modified August 1, 2006, http://www.fastcompany.com/675943/thoughts-women-and-collaboration.

[371] Anna Coote, "Ten big questions about the Big Society and ten ways to make the best of it," last modified May 21, 2011, http://neweconomics.org/articles/ten-big-questions-about-the-big-society-html.

[372] Jennifer L. Berdahl and Cameron Anderson, "Men, Women, and Leadership Centralization in Groups Over Time," *Group Dynamics: Theory, Research, and Practice* 9, (2005): 46.

[373] Ibid., 45-57.

[374] Million-Women Study Organization, "The Million-Women Study: An Introduction," last modified 2012, http://www.millionwomenstudy.org/introduction/.

[375] This was quoted from Carl Honoré's book, *The Slow Fix,* in Philip Marchand, "Open Book: The Slow Fix, by Carl Honoré," review of *The Slow Fix: Solve Problems, Work Smarter and Live Better in a World Addicted to Speed,* by Carl Honoré, National Post, February 1, 2013, Book Reviews. last modified February 8, 2013, http://arts.nationalpost.com/2013/02/01/open-book-the-slow-fix-by-carl-honore/.

[376] James Surowiecki elaborates this concept in his book *The Wisdom of Crowds*. Last modified 2004, http://www.randomhouse.com/features/wisdomofcrowds/.

[377] Some of these suggestions have been adapted from the strategies proposed by Helen Beebee and Jenny Saul, in Helen Beebee and Jenny Saul, *Women in Philosophy in the UK,* The Society for Women in Philosophy U.K. (London: The British Philosophical Association, 2011). The problems encountered by women who are in the minority in technology and STEM fields, and similar strategies for dealing with them, may be extrapolated from this excellent report.

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Appendix A

Research ethics approval

YORK

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Certificate #:	**STU 2011 - 084**
Approval Period:	**07/14/11-07/14/12**

Memo

To: Martha Ladly, Communication and Culture, marthaladly@gmail.com

From: Alison M. Collins-Mrakas, Sr. Manager and Policy Advisor, Research Ethics
(on behalf of Wade Cook, Chair, Human Participants Review Committee)

Date: **Thursday July 14th, 2011**

Re: **Ethics Approval**

Eros, Women and Technology

I am writing to inform you that the Human Participants Review Sub-Committee has reviewed and approved the above project.

Should you have any questions, please feel free to contact me at: 416-736-5914 or via email at: acollins@yorku.ca.

Yours sincerely,

Alison M. Collins-Mrakas M.Sc., LLM
Sr. Manager and Policy Advisor,
Office of Research Ethics

RESEARCH ETHICS: PROCEDURES to ENSURE ONGOING COMPLIANCE

Upon receipt of an ethics approval certificate, researchers are reminded that they are required to ensure that the following measures are undertaken so as to ensure on-going compliance with Senate and TCPS ethics guidelines:

1. **RENEWALS:** Research Ethics Approval certificates are subject to annual renewal.
    a. Researchers are required to submit a request for renewal to the Office of Research Ethics (ORE) for review and approval.
    b. **Failure to renew an ethics approval certificate or** (to notify ORE that no further research involving human participants will be undertaken) **may result in suspension of research cost fund and access to research funds may be suspended/withheld** ;
2. **AMENDMENTS:** Amendments must be reviewed and approved **PRIOR** to undertaking/making the proposed amendments to an approved ethics protocol;
3. **END OF PROJECT**: ORE must be notified when a project is complete;
4. **ADVERSE EVENTS**: Adverse events must be reported to ORE as soon as possible;
5. **AUDIT:**
    a. More than minimal risk research may be subject to an audit as per TCPS guidelines;
    b. A spot sample of minimal risk research may be subject to an audit as per TCPS guidelines.

FORMS: As per the above, the following forms relating to on-going research ethics compliance are available on the Research website:

a. Renewal
b. Amendment
c. End of Project
d. Adverse Event

Research ethics approval, page 3

Risks and Discomforts:
I do not foresee any risks or discomfort from your participation in this research.

Voluntary Participation:
Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to agree to reanalysis of your previous interview, or to participate in a follow-up interview, will not influence the nature of the ongoing relationship you may have with me, or the nature of your relationship with York University, either now, or in the future.

Withdrawal from the Project:
You can stop participating in the interview process or the project at any time, for any reason. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with me, York University, or any other group associated with this project. In the event you decide to withdraw from the study, your entire associated new interview materials collected will be destroyed, up until the point of data analysis, anticipated in December 2011.

Confidentiality:
Unless you choose otherwise, and with the knowledge that the audio/video/photographic recording of your interview will be associated with identifying information about you, (such as your voice and/or your likeness), all information you supply during the research will be held in confidence. Unless you specifically indicate your consent, your name will not appear in any report or publication of the research. Your data will be safely stored in a locked facility and on a password protected hard drive, and only I will have access to this information. The new data will be stored for a period of three years, and the intention is to maintain it after the study (on the password protected hard drive), as the data may provide part of the materials of an ongoing video documentary / artwork. Confidentiality will be provided to the fullest extent possible by law.

Legal Rights and Signatures:

I ______________________________ consent to participate in the research for *Eros, Women, and Technology*, conducted by Martha Ladly. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature above indicates my consent.

Further, I give my permission for the researcher (please initial as appropriate or indicate N/A)
_____ to reanalyse my previous interview transcript, as part of the dissertation research.
_____ to reanalyse and show excerpts of video & photography from my interview, as part of the dissertation research.
_____ to document my current participation with field notes and/or audio transcripts only, as part of the dissertation research.
_____ to document my current participation with video and/or still photography as part of the dissertation research.
_____ to use the above documents in the dissertation, publications, in public presentations, in art projects, and exhibitions, for the purpose of dissemination of the research.

Participant Signature ______________________________ **Date** ____________________

Email: ______________________________ _____ I wish to receive a copy of the dissertation.

Address/Phone: ______________________________

Signature ______________________________ **Date** 27th September, 2011
Principal Investigator
Please keep one copy for your files.

Do you have questions about this Research?
If you have questions about the research in general or about your role in the study, please feel free to contact me at the address on this form, or you may contact my Graduate Supervisor Professor Bruce Elder: tel. 1 416 977 5000 extension 6859 or by e-mail: belder@ryerson.ca.
You may also contact the *Graduate Program in Communication and Culture*, at 3012 TEL Building, York University, 4700 Keele Street, Toronto ON, Canada, M3J 1P3JOR 729 or Ryerson University, 350 Victoria Street, Toronto ON, Canada, M5B 2K3.

This research has been reviewed and approved by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, York Research Tower, York University (telephone 416-736-5914 or e-mail orc@yorku.ca).

Participant information and informed consent

Informed Consent Form

Study Name: *Eros, Women, and Technology*

Researcher: Martha Ladly
PhD Candidate, Joint Program in Communication and Culture, York University
email: marthaladly@gmail.com

Purpose of the Research:
This dissertation research concerns the question of technology and its transformative affect on the lives of women who identify as artists, designers, technologists, and media-makers. This research concerns feminine identities, bodies, and existence, or ways of being, in society and culture. The position, opinions, and work of contemporary women scholars, media artists and designers who work in the technologically mediated philosophical / cultural space will inform this research. I come from the position that approaches to technology require a pluralism of knowledge, and acknowledgment of the validity of feminine ways of knowing and thinking. Feminine experience may offer a critical perspective on erotic embodiment within technological being in the world.

Through a series of interviews with a diverse group of women artists, makers, designers, scholars, and technologists, I offer video documentation and accompanying stories and analysis concerning these women's relationships with technology. These interviews have been and will be undertaken within the context of artistic, self-reflexive research/creation. I propose that women occupy a unique position and responsibility to voice a critical position on the body in technology. I advocate a critical view of technology, and the potential for technological change, particularly as it impacts women's bodies, sexuality, reproduction, and creativity. Finally, I intend to set out an alternative feminine, embodied, ethical model of living with technology, for women and men alike.

This dissertation has two sources of human participation. The first is a series of video interviews and photographic documentation undertaken at the Banff Centre and in Toronto in 1999-2000 as part of an artistic project, which I intend to re-analyse for my dissertation research. If I have interviewed you in the past for this earlier work, you will be asked to give your permission for me to re-analyse this material for my thesis dissertation. A second set of follow-up interviews will be undertaken with a group of the original participants and others, in order to find out more about a diverse group of women's relationships with technology.

This research will be presented in the format of a written dissertation, in which some of your interview may be transcribed, with attribution to you directly, only if you so choose. This research may also be presented at conferences, and in exhibitions of work.
It is anticipated that with your permission, accompanying photographic and video documentation will also be presented.

If you agree to reanalysis and inclusion of earlier photographic, video/audio documentation of our interview, and/or to participation in the follow up interviews, your participation will not be anonymous due to the nature of the photographic, audio/video documentation. Unless you so choose, your participation and your identity will be kept confidential, and you will not be identified by name, profession, your own body of work, or any other personal means of identification. If you choose not to be identified, no photographic, video and/or audio documentation will not be undertaken, and written notes will be taken instead.

What You Will Be Asked to Do in the Research:

1) If you participated in the earlier interviews, you will be asked to give your permission for reanalysis of the materials for my thesis dissertation.

2) If you agree to participate in the follow-up interview, you will be asked to appear in a head and shoulders (talking head style) video interview, and to be photographed. This should take no more than 1 hour of your time.

The following questions will be asked:

i) What is your relationship with technology in your professional and personal life?
ii) What effect do you think that technology has on your physical, mental and emotional state? Can you give examples of how technology affects your life?
iii) If you could change or improve technologies that you use in any way, what might you change or improve?
iv) What effect do you think that this might have?

Risks and Discomforts:

I do not foresee any risks or discomfort from your participation in this research.

Benefits of the Research and Benefits to You:

If you were one of the original participants you may wish to review your previous interview, and this will be provided if desired. This will potentially be of interest to you as it may give you a view of your attitudes and your physical appearance and your concerns from 10–12 years previously, and may give you an opportunity to reflect upon how your opinions may have proceeded or changed. This could be of benefit to participants in regard to their present and future choices about technology. As a participant you may also see your contribution to knowledge in the fields of research/creation, education, and technology, as a benefit.

Voluntary Participation:

Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to allow reanalysis of your previous interview, or to volunteer for a follow-up interview will not influence the nature of the on-going relationship you may have with me, or the nature of your relationship with York University, either now, or in the future.

Withdrawal from the Project:

You can stop participating in the interview process or the project at any time, for any reason, if you so choose. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with me, York University, or any other group associated with this project. In the event you decide to withdraw from the study, all of your associated new interview materials collected will be immediately destroyed wherever possible.

Confidentiality:

Unless you choose otherwise, and with the knowledge that the audio/video/photographic recording of your interview will be associated with identifying information about you, (such as your voice and/or your likeness), all information you supply during the research will be held in confidence. Unless you specifically indicate your consent, your name will not appear in any report or publication of the research. Your data will be safely stored in a locked facility and on a password protected hard drive, and only I will have access to this information. The new data will be stored for a period of three years, and the intention is to maintain it after the study (on the password protected hard drive), as the data may provide part of the materials of an on-going video documentary/artwork. Confidentiality will be provided to the fullest extent possible by law.

Questions About the Research?

If you have questions about the research in general or about your role in the study, please feel free to contact me or my Graduate Supervisor Professor Bruce Elder, either by telephone at 1 416 977 5000 extension 6859 or by e-mail at belder@ryerson.ca.

You may also contact my Graduate Program in Communication and Culture, at 3012 TEL Building, York University, 4700 Keele Street, Toronto ON, Canada, M3J 1P3JOR 729 or Ryerson University, 350 Victoria Street, Toronto ON, Canada, M5B 2K3.

This research has been reviewed and approved by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, York Research Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures:

I________________________________consent to participate in the research for *Eros, Women, and Technology,* conducted by Martha Ladly. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Further, I give my permission for the researcher

___ to reanalyse my previous interview materials, to be included as part of the dissertation research

___ to document my current participation with video and still photography as part of the dissertation research

___ to document my responses in field notes as part of the dissertation research

___ to use these documents in the dissertation, publications, in public presentations, or in art projects for the purpose of research dissemination.

Signature____________________ **Date**____________________

Participant

Signature____________________ **Date**____________________

Principal Investigator

End-of-project reporting

END of PROJECT REPORTING FORM

Researchers are responsible for reporting the completion of research activities relating to human participants as noted on an approved ethics protocol. Upon receipt of an "End of Project" reporting form, it is expected that all research activities involving human participants as described in the approved ethics protocol, will have ceased. Should further research activities involving human participants be required, **a new protocol must be submitted to the HRPC for review and approval *prior to* the commencement of any research activities.**

PI:	**Martha Ladly**
Contact information:	**322 Reynolds St, Oakville, ON. L6J 3L8**
	Email: marthaladly@gmail.com
	Phone: 416 830 5337
Certificate#:	**STU 2011 - 084**
Project Title:	**Eros, Women and Technology**
Funding Agent:** (**where applicable)	**N/A**

Have all research activities involving human participants been completed?

Yes X No ____

Are any further research activities involving human participants anticipated?

Yes ____ No X

*IF all research activities involving human participants are **not** yet complete, you must renew your current ethics protocol or submit a new protocol to the HPRC for review and approval.

*IF all research activities involving human participants are complete and no further research activities involving human participants are anticipated, then your protocol file will be considered closed and no further research activities involving human participants may be undertaken in relation to the protocol named above.

1 December 2012

P.I. Signature **Date**

Appendix B

Eros, Women, and Technology: video interview excerpts 1998 – 2011 (DVD)

Martha Ladly, QuickTime high definition movie, 2013, 7'54"