CROSS-CULTURAL CYBORGS: GREEK AND CANADIAN WOMEN’S DISCOURSES ON FETAL ULTRASOUND

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For millions of women in North America, Australia, Europe, and, increasingly, elsewhere as well, at least one or two ultrasounds have become an expected and routine part of pregnancy. For physicians and sonographers, ultrasound represents a necessary, passive, and neutral technology, capable of providing, as one obstetrical text describes it, "a window of unsurpassed clarity into the gravid uterus..."[and] exquisite detail regarding the fetus and the intrauterine environment."2 The possibilities of seeing, we are told, are numerous: the state of fetal anatomy; growth and development; numerous fetal pathologies; the sex of the fetus as early as eleven weeks; and fetal sleep, rest, and activity patterns. There are even claims of witnessing fetal masturbation3 and, as Lisa Cartwright has pointed out, enough fetal behavior for one psychiatrist to begin the practice of fetal psychoanalysis.4

For women, ultrasound has become firmly lodged as a "normal" part of pregnancy, allowing a sneak preview of our baby's sex, age, size, physical normality, and possible personality. So convincing is the cognitive and sensual apprehension of the fetus via the electronic mediation of ultrasound technology that women may routinely experience a "technological quickening" several weeks before they sense fetal movement in their own bodies.5 This article examines what we call the cyborg fetus of ultrasound imaging: the mode of knowing and feeling the fetus through the coupling of human and machine. As Donna Haraway has described it, the cyborg is a "coconstruction" of humans and nonhumans.6 Thus, any exploration of the cyborg fetus must dwell both on the distinctive features of the ultra-
sound technology and of the local cultural understandings and practices in which it is deployed. If, as Haraway has also claimed for the cyborg, "the machine is us, . . . an aspect of our embodiment," it then becomes necessary to inquire into how the cyborg is inflected when "us" is situated in distinctive cultural contexts, with distinctive understandings and practices regarding persons, pregnancy, and technology.

Cyborgs have rarely been explored outside the Euro-American context. In celebrating its utopian potential, the ways in which the cyborg is culturally inflected may be overlooked and, thus, questions about "what is not shared in an emerging global culture of reproduction" obscured.\(^7\) In this article, we draw on our separate studies of routine fetal imaging to explore how the cyborg fetus of ultrasound imaging is culturally configured through practice and discourse. It is based on fieldwork carried out in an ultrasound clinic at a Canadian hospital (by LMM) and a similar study carried out in a public hospital in Greece (by EG). Both studies draw on observations of scans and on interviews with sonographers, pregnant women, and their partners. We look at the cyborg fetus through a cross-cultural lens to highlight that which is culturally and historically specific to North American and Greek understandings of the cyborg fetus. A cross-cultural perspective is also crucial for "getting at the complexities of the way power operates in society."\(^9\) As we will show, the couplings of body and machine, as mediated and translated by experts, are firmly embedded in culturally and historically specific scripts. Yet, even as these couplings are culturally shaped, they in turn shape the embodied experience of pregnancy in novel ways. We begin with an extensive discussion of ultrasound in the North American context, first showing how this coupling simultaneously dissolves women's bodily boundaries, undermines their experiential knowledge, and represents the fetus as an autonomous, conscious agent. We then illuminate how sonographers employ specifically North American cultural scripts about personhood, maternal altruism, and bonding to intervene in the physical and social relationships of pregnancy. Third, we discuss some of the ways in which North American women may use the "transgressed boundaries and potent fusions"\(^10\) of ultrasound's cyborg fetus to reflect on and rework their experiences of pregnancy. We then turn to ultra-
sound practices in Greece to examine the culturally specific production of fetal and pregnant subjects there. In both contexts, the cyborg fetus of ultrasound imaging is often represented alone, as if removing it from the body and life of the woman improved the chances of understanding it. Throughout this article, we try to resist this dis-location, by re-membering the cyborg and critically examining its production in the embodied and social coupling of woman, machine, and sonographer. In the conclusion, we reflect on the implications of our cross-cultural perspective for emerging understandings of cyborgs and the processes of cyborgification.

SONOGRAPHIC PRACTICE:
SEEING THE (NORTH AMERICAN) BABY
Like all cyborgs, the cyborg fetus arises through the coupling of human and machine. As part of the "mechanics" of this coupling, a transducer is pressed on to and rolled over the woman's belly. If the ultrasound is done during the first twelve weeks of pregnancy, the transducer, phallic-shaped and sheathed with a condom, may be inserted into her vagina. Guided by the sonographer's hand, high-energy sound waves are projected from the transducer into her womb and the reflection of these waves produces an image of the uterus, placenta, and moving fetus on a television-like screen.

Ultrasound examinations of pregnant women labeled "high risk" and those with a "suspected anomaly" are generally carried out by a physician, usually an obstetrician, radiologist, or gynecologist. The much larger number of "routine" scans done each year in Canada are more likely to be done by lower paid female ultrasound technicians. During each fifteen-to-twenty minute routine scan, sonographers search for a fetal heartbeat; note the position and number of fetuses; and assess fetal age, size, development, and the expected due date by measuring parts of the fetus. Using ultrasound to discover and know the cyborg fetus is, in Haraway's terms, a problem of translation; sonographers must translate not only the physics of echoes into the landmarks of the fetal and maternal body but also the clinical and social meaning of those landmarks. The repetitive and routinized work of translating ultrasound's echoes into the
The cyborg fetus is, however, often difficult to spot. Sonographers must be trained to see the grayish ultrasound echoes as distinctive uterine and fetal landmarks and structures which convey diagnostic information. Women and their partners, in turn, depend heavily on the sonographers' accounts of the image in order to see their little cyborg baby. As part of their role as gatekeepers, Canadian sonographers silently and quickly search for a fetal heartbeat and major anomalies. Once they believe that the fetus is alive and "normal" at this level, sonographers begin to do what they refer to as "showing her the baby." Describing the image for the woman includes some diagnostic information (usually fetal age, weight, and a statement that "everything looks okay"). As we elaborate below, talk about the cyborg fetus by sonographers to expectant parents also includes statements about its (1) physical body, appearance, and activity; (2) subjectivity; (3) potentiality; and (4) social connections to kin and to sonographers. These statements resonate with sonographers and many pregnant women as signs of both humanness and selfhood and, thus, are integral to how the ultrasound image is made culturally meaningful as a "baby."

Sonographers' descriptions of the physical parts of the fetus pass through a cultural sieve, as they select out those parts which they believe are most appealing and reassuring for women—the beating heart, the skull and brain, "baby's bladder," and the hands and feet, especially the fingers and toes. Sonographers consider that the "weird" or "strange-looking" fetal face at sixteen-to-eighteen weeks may be alarming to women. Later in pregnancy, the rounded fetal nose, forehead, and cheeks often receive special comment and sonographers like to include the face in a woman's own copy of the image. During the ultrasound, parts of the fetal body are often not simply named but are described in terms of fetal behavior, their "baby-like" appearance, and their resemblance to the anatomy of other family members. Fetal movement seen dur-
ing ultrasound may be referred to as "the baby moving"; often it is described as a particular kind of movement—an activity. Thus, the fetus is described as "playing," "swimming," "dancing," "partying," and "waving."

Canadian women sometimes refer to the photographic images of the early fetus in their guides to pregnancy as "alien" or "E.T." However, what is called forth even during the earliest routine ultrasounds observed in the Canadian clinic is the image of an idealized infant, rather than that of a fetus or embryo with its distinctive appearance, uncertain subjectivity, and contested personhood. Even the term "fetus" is generally restricted to diagnostic matters and to discussions among sonographers, although there is considerable variation among Canadian hospitals on this point. It is rare to hear expectant parents use the term "fetus," and some sonographers discourage women and men from using it. For example, during a scan one of the authors (LMM) observed, a man looked at the ultrasound photograph handed to him by the technician. "Great!" he said, "Now I can put this on my desk and say, 'This is my fetus.'" The technician replied: "Your fetus? Ugh! Don't say that! It's your baby."

Uncertainty about fetal subjectivity is also erased in the cyborg. Awareness of surroundings and of being distinct from other selves, intention, moods, and emotion on the part of the fetus are included frequently in the explanation of the image for parents. Fetal movement which impedes the process of conducting the examination is described as evidence that the fetus is "shy," "modest," or "doesn't like" something. As sonographers attempt to photograph the image, they may comment: "He moves away when I try to take the picture," or "He's shy. He doesn't want his picture taken." They also refer to fetal shyness and modesty when visualizing the genitalia is difficult. Conversely, a clear, easily attained fetal image may be offered as evidence that the fetus is "being good" or "very cooperative."

The cyborg also demonstrates its potential, its ability to acquire elements of cultural competence such as language, a moral sense, or a role as a "productive" member of society. Just what kind of person the fetus will become (athletic, smart, wakeful, fast-moving, just like Dad) is revealed in the sonographer's explanation. Activity seen during the ultrasound may be
described in terms of future behavior of the baby or young child: "Your baby is moving a lot. You're gonna be busy!" Sometimes these kind of statements are gender specific: "What a big baby. It must be a boy!" "With thighs like that it has to be a girl."

The compelling nature of this cyborg is especially evident when sonographers see an image that they particularly like. Their postures, facial expressions, and voices change as they lean closer to the screen, often tilting their heads, and smiling. Sonographers may even touch, stroke, and "tickle" the on-screen image, particularly the fetal feet, and create a voice so the fetus may "speak" to the expectant couple and communicate its "feelings." Expectant couples watch, delighted, as sonographers may wave to the image, speak to it, giving instructions, words of encouragement or reprimand, as in, "Hold still, baby" and "Smile for the camera." Often these are instructions for the fetus to do something for the parents: "Say hello to Mama" or "Don't move, so Papa can see you." At these moments, sonographers and expectant couples closely resemble people admiring a baby in someone's arms.

Personified in these ways, the cyborg fetus mesmerizes the viewer into forgetting that the embodied, conscious, perceptive actor of ultrasound is the woman. The distinction between the fetus inside the woman and the collection of echoes on screen is blurred, creating what Sarah Franklin has called "bodily permeability," allowing the viewer to move "seamlessly from the outside to the inside of the woman's body." The erasure of their bodily boundaries and bodily knowledge passes unnoticed or without comment by many women, as they are captivated by the fetal image or distracted by the discomfort of the full bladder which some hospitals still insist upon. This bodily permeability may also be desired by many women. Their excitement about the "chance to see," their conviction that "seeing is believing," and their fascination with the printout of the fetal image—the "baby's photo"—that they take home all underscore the cultural valorization of the visual, a point to which we will return in our concluding discussion.

A few women express a sense of sadness that their intimate privileged knowledge of the fetus is lost during ultrasound. Some are startled to see fetal movement on-screen, when they do not yet sense it. Seeing this movement prior to bodily quick-
ening reinforces women's acceptance that ultrasound provides authoritative and distinctive information, but for some women it is unsettling.

It was like it [the fetus] moved for her [the sonographer] but not for me. [Christina, twenty-five, secretary.]

It was neat and all that, you know, to see the baby moving. But, I don't know, I guess I thought the mother was supposed to feel it. Like that's when you know it's there. [Tina, twenty-eight, social services worker.]

We could see it moving and I told her [the sonographer] I had felt it when I was taking the Metro. She said that wasn't it, that I couldn't feel it until a few more weeks. I thought for sure it was the baby moving, but I guess not. [Teresa, twenty-seven, business owner.]

After listening to the sonographer lay claim to the fetus, some women, like Teresa in the previous quote, try to (re)assert the importance of their own bodily awareness in detecting fetal movement and knowing fetal age and gender. But, contests over knowledge about the fetus are usually won by the cyborg, spoken for by the "expert" sonographer. For example, estimates of fetal age based upon ultrasound measurements nearly always take precedence in physicians' reports over the estimates given by women. Sidelined into what some physicians call an "unreliable source" or a "poor substitute" for the ultrasound-generated knowledge, women are left trying to re-locate the fetus in their own bodies, looking back and forth between the image on screen and their own abdomens.

The fact that very few women express negative feelings or are critical of ultrasound while they are pregnant may also be due in part to their feelings of dependence upon the technology. For many of the Canadian women interviewed, the first few months of pregnancy bring about a heightened sense of the possibilities of their own bodies. They talk at length about subtle changes in its shape and appearance and worry openly about its normality and potential for failure. Anxious about miscarriage and fetal abnormalities, many women hesitate to tell friends and extended family about the pregnancy or to signal their changing status by wearing (more comfortable) maternity clothing, effectively putting the pregnancy "on-hold" until after they "pass" the first ultrasound examination. Their dependence on ultrasound diminishes somewhat by the second routine scan during the seventh month of pregnancy. By that time, a wom-
an's own bodily knowledge, based largely on fetal movements, conveyed the message that "everything is okay." By postpartum, however, the appeal and persuasiveness of the cyborg was eroded, when women expressed disappointment and frustration with ultrasound's failure to accurately predict fetal size, long and difficult labors, or cesarean deliveries.

MUM, DAD, AND CY-BABY
Through these conditions of "bodily permeability" and the dislocation of the fetus onto an external monitor, women are simultaneously marginalized and subjected to increased surveillance. As they carry out the scan, sonographers mediate not only the bodily and physical connections between woman and fetus but also their emotional attachment and social relationship. The cyborg fetus, as we discussed, emerges as a social being, a social actor with a distinctive identity—"the baby"—enmeshed in a social network where a pregnant woman and her partner are often referred to as "Mum" and "Dad," and family members who are present are encouraged to look at their "niece" or "grandchild" or "baby brother."

Linked to these identities and included in the sonographers' accounts of the fetal image are normative and culturally specific expectations about parental behavior. Implicit in these accounts is the idea that women who come for ultrasound, who avail themselves of the benefits of this technology, are doing what is best for their babies. The sonographers refer (among themselves) to certain women as "nice patients." These are women who, the sonographers believe, "care" about the fetus; that is, they show interest in the image and concern about fetal health but not too much interest in fetal gender. These women tend to receive detailed and personalized accounts of the cyborg, as described above. In contrast, abbreviated accounts of the image may be given to women believed to be disinterested in the image or more concerned about fetal gender than fetal health.

The sonographers' accounts of the ultrasound image are infused with a powerful cultural script on "natural" behavior for pregnant women and mothers. According to this script, women from certain groups, "different races" to use the sonographers'
term, are assumed to be abnormal or "different" by nature: im-
passive, unemotional, or overly interested in the "wrong thing." Black women and First Nations women are sometimes said to be unexcited or unmoved by the prospect of having a baby and thus may receive relatively brief accounts of the fetal image. In the Canadian clinic, one of the authors (LMM) was told by the sonographers that "some women just want to know the sex." East Asian and South Asian women, in particular, are said to be "overly" interested in knowing the fetal sex and it is assumed that they want only male babies.14 Women who appear to be particularly interested in learning the fetal sex are often told: "Finding out the sex isn't important. The most important thing is that the baby is healthy." If sonographers are concerned that a woman will be disappointed by the sex of the fetus, especially if they think she may seek to terminate the pregnancy, they may simply tell her that they are unable to see whether it is a boy or girl.

This discourse on motherhood is played out not only along lines of cultural or "racial" difference but also in terms of reproductive history, personal habits, and self-discipline. Women having their first child may be dissuaded from knowing the fetal sex with statements such as "This is your first? You don't want to know, do you? You can always try again." Women in their teens, women in their forties, women with more than four or five children may be asked about their decision to have a baby at this point in their lives. Women over thirty-six may be asked to give reasons if they mention refusing amniocentesis. Similarly, if they admit to smoking during pregnancy, women may be shown the image of the placenta and told, incorrectly: "We can see the smoke in it." Obese women, told that "it's hard to see," are thereby reminded that their bodies are an obstacle to prenatal diagnosis. Women are constantly monitored during ultrasound not only for fetal anomalies or physical conditions which may complicate labor and delivery but also for their own shortcomings—failure to monitor their bodies and behavior, failure to be compliant and selfless—in short, for failing to be "good mothers."

Central to this discourse on maternalism is the notion of "bonding" or emotional attachment to the fetus. The idea of using ultrasound to modify women's sentiments and behavior to-
ward fetuses first appeared in clinical journals during the early 1980s. As one physician wrote to the *British Medical Journal*, ultrasound should help women to view the fetus "as a companion aboard rather than a parasite responsible for the symptoms of pregnancy." Once elevated to the status of "psycho-social benefit," bonding with the cyborg fetus during ultrasound quickly became a new area of ultrasound research. Detailed explanations of the fetal image were said to stimulate "positive feelings" toward the fetus, and the reaction of women to the image could then be re-presented as a gauge of their emotional commitment to the fetus. The power of the cyborg fetus to stimulate a woman's "natural" mothering response is now also assumed to reduce her anxiety and improve her compliance with such things as medical advice, regular dental care, and the avoidance of cigarettes and alcohol. As we discussed earlier, the cyborg fetus also serves to identify those women whose "nature" is different. The disciplinary response or corrective action for being different varies from the "silent treatment" observed in the Canadian clinic to the more draconian efforts of some American lawmakers to legislate mandatory viewing of ultrasound fetal images as a way of dissuading pregnant women from having abortions.

The use of ultrasound to promote bonding follows a path similar to the "One-Two Punch of Birth in the Technocracy" as described by Robbie Davis-Floyd. That is, once having mediated and helped effect the conceptual separation of pregnant woman and fetus, ultrasound later comes to be regarded as integral to the process of re-membering the two, that is, technologically "bonding" mother to fetus. Maternal attachment, formerly considered "natural," a ubiquitous "instinct," can no longer be left to nature and to women. In recent years, the sonographer's objective has expanded to encompass fathers as well, as a new clinical niche, "family-centered sonography," has been promoted as a means of enhancing both maternal and paternal attachment to the fetus. In the Canadian clinic, during the routine ultrasounds, male partners are encouraged by sonographers to "move closer" to the screen and to talk about the image; women who come alone to the examination are asked: "Your husband didn't come?"
BOUNDARIES, FUSIONS, POSSIBILITIES
What "dangerous possibilities" do the "transgressed boundaries and potent fusions" of ultrasound hold for women in North America? Universal and comprehensive health insurance throughout Canada includes at least one prenatal scan, and many women now expect this technologically mediated introduction to the fetus. Although the vocabulary, idioms, and metaphors among women's accounts of the cyborg fetus varied, there are few markedly different voices. It is clear that many of these women feel reassured and empowered by the cyborgification of the fetus. Hearing the sonographer say "everything is fine" and seeing the heart beat or fetal movement is eagerly accepted by most women as evidence that they will give birth to "a normal baby" and can publicize the pregnancy. The sonographers' re-description of the fetus in sentimentalized and personalized terms, a particular emphasis at the research hospital, also touches a chord with many women. They use what they saw and heard during ultrasound as both proof of the fetal presence (as opposed to merely "being pregnant") and a means of discovering their baby's gender and clues about its behavior, character, and family resemblance.

I know now it's gonna have my attitude. It was calm and slow moving. If it was more like my husband, the baby would move a lot more and pace around. I mean, my husband's a great guy, but I'm glad it's gonna have my personality. [Marie-Claude, twenty-seven, sales clerk.]

The first thing I saw, it's crazy I know, but this kid has my husband's legs. Everything about it was like my husband. Just the way it looked, the build, the bones, the proportions. It was incredible. [Sylvie, twenty-five, florist.]

Notably, for a small group of the interviewed women, recent immigrants to Canada and unfamiliar with both ultrasound and the North American discourse of maternal-fetal bonding, ultrasound is viewed as a diagnostic test rather than as a means of elaborating the social identity of the fetus.

The cyborg created and apprehended in this ritualized, technological, and public quickening appears to transform the social reality of pregnancy for some Canadian women. The dislocation of the fetus from women's bodies and from their experiential knowledge opens up a space with multiple possibilities for monitoring, controlling, and altering women's behavior
during pregnancy. For more than a decade, Ann Oakley and others have argued that ultrasound is one of "a long line of other well-used strategies for educating women to be good mothers." Women, however, are not passive recipients of ultrasound; they are attuned to the possibilities of using the cyborg fetus in the context of their own social relationships.

Ultrasound offers some women a means of re-scripting or validating their position in a network of family and friends. For example, one twenty-four-year-old woman, a business owner, gave an enlarged photocopy of the ultrasound image to her parents and in-laws, hoping to convince them that she and her partner were "really serious about each other." For some women, ultrasound holds the possibility of stimulating or engaging a partner's interest in the baby and testing his commitment to the relationship.

I want him to know that this is a baby. It's not going to go away. He just can't get it yet. I guess it's a physical thing. Men don't have all the changes in their body. . . . The ultrasound changes that. It's like a slap in the face for him! Now he's got to get serious about us and this baby. [Vicky, twenty-five, medical receptionist.]

Among one-quarter of the women, those who had once miscarried or are particularly anxious about miscarriage, ultrasound echoes are especially and poignantly meaningful as reassuring "proof" that they will have a baby. A few are even willing to use the ultrasound as evidence to counter the opinions of their own doctors. Twenty-seven-year-old Marie-Claude, a sales clerk, said: "I was so excited after the ultrasound. I took my picture in to my doctor the next week and said, 'See, see. I told you this time it would be all right.' She's very cautious, always saying, 'Let's take it one step at a time.' But I feel great."

From these interviews, it is clear that some Canadian heterosexual, middle-class women may embrace the cyborg fetus as a means of confirming, strengthening, or testing their relationships with partners, kin, and friends and as a way of asserting the authority of their bodies and voices. The possibilities which the cyborg fetus holds for North American women of different medical traditions and birth philosophies, for women with disabilities, single parents, pregnant teenagers, and lesbians need to be researched.
SONOGRAPHIC PRACTICE:
SEEING THE (GREEK) BABY

In the small city of eastern Greece that is the focus of this section, pregnancy is intensively monitored through monthly prenatal visits with obstetricians, in which fetal ultrasound plays a prominent role. Pregnancy and birth have only recently been redefined as technology-intensive medical events, however. Until a generation ago, home births attended by traditional midwives were still common, and many of the mothers of the young women interviewed had given birth in their homes. The medicalization of pregnancy and birth that has occurred throughout Greece is one manifestation of the widespread modernization that has occurred since World War II. Yet, although proceeding rapidly, the medicalization process remains uneven, and local knowledges of the pregnant body have not been entirely displaced by technological and biomedical discourses.

This prosperous city, a popular destination for tourists from northern Europe on whom its economy heavily depends, serves as the local hub for medical care. The vast majority of the region's births take place in the city's public hospital in which all interviews and observations were conducted. Part of the National Health System established in 1983 by the socialist government that has held power through most of the last fifteen years, the hospital provides low-cost antenatal care to about 900 women a year. In the mid-1980s, the hospital acquired its hand-me-down scanner from Athens, and soon after, fetal imaging became a routine procedure. By the 1990s, not only did no pregnancy go unscanned, but women attending the hospital also typically had several more scans over the course of a normal pregnancy than did Canadian women. Most had four, but a few had up to seven. Normal pregnancies are scanned with ultrasound for a large variety of reasons, including confirming a suspected pregnancy, charting fetal growth, establishing due dates, ascertaining presentation of the fetus, and, surprisingly often, responding to a woman's request to "see the baby."

As many pregnant women and their husbands explained, the public hospital is widely preferred to the city's sole private clinic as much for its stock of "machines" (mihanimata, mihanes), as for the high quality of its physicians (all of whom are male).
As enthusiastic "consumers," women exerted a strong demand for fetal imaging that was, in part, a product of the machine's status as a metonym for the structural and symbolic superiority of modern medical science and technology in general. Additionally, ultrasound, the only "machine" routinely used in pregnancy and birth, deliberately conjoins the technoscientific to the visual—both important signifiers of the modern in Western culture. Physicians, too, particularly those of the under-forty generation, explicitly identified ultrasound as indispensable to the practice of "modern" obstetrics. As one older obstetrician, who was critical of what he considered to be the younger physicians' overuse of the technology, observed:

There are few things my hands can't find that the ultrasound can. My hands are my eyes . . . but patients think it's more modern to use a machine. They themselves wouldn't trust just a manual exam. The doctor needs to show that he's modern too. That is, some will do an exam with a machine just because a woman will trust him more if he does.

As a result of such associations between technology, medical progress, and modernity, some older hands-on methods still widely used in Canada, such as dating the pregnancy by measuring the height of the uterine fundus, have been completely replaced by ultrasound.

The association between fetal ultrasound imaging and modern visual technologies is explicitly acknowledged in Greek everyday usage. Ultrasound is most commonly referred to as "television" (tileorasi), and doing an ultrasound is referred to as "putting the baby on television" (na valoume to moro stin tileorasi). Television is an apt metaphor for fetal ultrasound imaging in Greece. In its ubiquity, it provides a major vehicle for the dissemination of images of modernity, the West, and "modern" behavior. The women interviewed were nearly all born around the time television was first introduced in Greece (1966), and have thus grown up with its discursive conventions, not least of which is its "ability to carry a socially convincing sense of the real."25

As is the case in Canada, the ultrasound scan as performed in the Greek public hospital is a formulaic procedure that resonates with ritual overtones. The following description is of a typical session, which usually lasts about five minutes. For most women, it is replicated several times over the course of their pregnancies, with little variation and in near silence.
Toward the conclusion of the routine prenatal examination, the physician (or the woman) may suggest "putting the baby on television." The woman then follows the physician down the hospital corridor to a small room, lit dimly only by the shadowy gray light emanating from the ultrasound monitor. No other medical personnel is present during the session, but the woman may be accompanied by family members, usually her husband and possibly a small child. The woman lies on the examining bed next to the apparatus and, generally without being instructed to do so (because she has usually done this before), wordlessly pulls her skirt or slacks and underwear down below her abdomen. The physician squirts her exposed abdomen with a coupling gel and begins to probe its surface with the transducer.

The screen is generally turned toward the physician. The woman can view it by craning her neck, but her eyes are often directed toward the face of the physician, who quickly and silently scans the entire fetal image, then focuses on the genital area for a while. At this point, the physician may break her or his silence to announce "girl" or "boy"—unless the woman has already jumped in to tell him she doesn't want to know the sex. (This rarely happened, however.) Or the physician may tell the woman that the position or age of the fetus doesn't permit her or him to see the sex this time and that she or he will look again next month. Finally, the physician scans to the skull and freezes the image in order to measure the biparietal diameter (skull width). She or he checks a chart over the bed upon which the woman is lying and announces the age of the fetus, in weeks and days. If the physician does not tell the woman at this point that "the baby is all right" (no anomaly was ever detected in the over eighty sessions EG observed), she will ask. Most often, this is the only time she speaks. The physician then wipes the gel from the woman's abdomen with a paper towel and leaves. If her husband is with her, as was the case with about one-third of the women, they may exchange a few quick comments in the corridor, usually about the fetus's announced sex.

Obviously, except for fetal sex, the physician's terse announcements during the ultrasound procedures do not go beyond the most basic diagnostic information. Given the quite dif-
different performances in the two settings, it is striking that the
great majority of the Greek women, like so many of the Canadian women, asserted that fetal imaging had given them a sense,
often their first sense, of the "reality" of their pregnancies. For
instance, Popi, twenty-four, a working-class housewife said:
I didn't believe I had a baby inside me. When you don't feel it or see it, it's had to believe. It's something that you can't imagine—how the baby is, how it's growing, how it's moving. . . . After I saw it on the screen, I did believe it. I felt it was more alive in me. . . . I had also seen it [a fetus] on television, but it's different to see your own.

And Stavroula, twenty-five, a middle-class housewife, said that with ultrasound "you have an idea of what you have inside you. I became conscious that it was a person. I hadn't felt it as much before; I had to see it first." As occurred among the Canadian women, the bodily permeability effected by ultrasound either passes without comment or is eagerly desired, as the Greek women too are captivated by the fetal image. Many also move beyond the limited diagnostic information they receive to appropriate the fetal images for themselves, endowing them with qualities that are meaningful to them alone. ("I became conscious that it was a person"; or, as Stavroula went on to explain, "at that moment, you feel that it's yours, the only thing that's yours.")

Also like the Canadian women, the Greek women depended on the ultrasound technology to assuage feelings of uncertainty associated with the unpredictability of pregnancy. Although awareness of certain kinds of "risks" to fetal health has been expanded and heightened by women's exposure to biomedical discourse, both physical and mental disabilities have historically been stigmatized in Greek culture. Disabilities are dreaded not only for their direct consequences for the affected individual but also for the stigma they may bring to the entire family. Because they are often believed to be hereditary, they may affect the marriage prospects of other family members.

Not surprisingly, then, women commonly described feelings of "anxiety" (anhos), "anguish" (agonia), and "nervousness" (trak) just before the scan, which were put to rest once the physician announced that "the baby is all right." This statement by Maria, a twenty-five-year-old hairdresser, was typical: "I had a lot of anxiety before my first ultrasound, because you
can't know what's inside you. Until then, you only see your stomach. After, I felt more sure. You see that all is well."

All the women interviewed took the physician's assurance that "the baby is all right" to mean that the fetus was physically integral or, to use the women's words, that the "baby had its hands and feet," "all its organs," and was "artimeles" ("entirely limbed"). What it could not reveal, the women agreed, was how these organs, including the brain, functioned. Thus, in both Greece and Canada, evidence of fetal personhood was read through signs of physical normalcy and fetal gender. However, in distinct contrast to the Canadian women, none of the Greek women felt that ultrasound could provide any information on fetal personality or other subjective characteristics (in fact, asking this question usually provoked puzzled looks).

Given its role in assuring women about fetal health and assuaging anxieties (some of which, ironically, are iatrogenic in origin) and in providing the first sensation of the reality of the pregnancy, it is also not surprising that the Greek women most often described strong feelings of pleasure on visualizing the cyborg fetus and that, as in Canada, almost none were critical of the technology. Indeed, the Greek women's descriptions of their experiences with ultrasound were enthusiastic, on occasion even ecstatic. For instance, Katerina, twenty, a middle-class housewife, explained: "The first time I saw the baby, I was crazy with happiness. It was a contact with the child. Every time I went to the doctor, I wanted to see the child again." Litsa, a twenty-eight-year-old shopkeeper, said: "after my first ultrasound I felt like I did when I saw it after giving birth—that much happiness." And Zambeta, eighteen, a clerk in a bakery, exclaimed:

I had four ultrasounds and that wasn't enough! When the doctor first suggested it, I couldn't wait to see it. I was so impatient, the minutes-long wait seemed like eons. . . . I thought it would be like on television, that I would see the little hands, like under a microscope. But I wasn't disappointed: I saw it move, I saw that it was healthy.

Beyond the ability to reassure women, ultrasound images generate visual pleasures that appear to derive their impact and poignancy from the influence of television's realist conventions, as we discuss in greater detail in the following section.
CULTURAL CYBORGs
The cyborg fetus is a cultural rather than a natural entity. The Canadian cyborg fetus may display emotions and consciousness, a distinctive or potentially distinctive self, and be immersed in social relationships; however, in Greece it is clear that other cultural scripts are at work. In this section, we explore more fully the similarities and differences in the production of fetal and pregnant subjects through the couplings of machine and body. Although the sonographers’ descriptions of the ultrasound image are very different in Greece and Canada, women in both countries regard the image as a powerful and objective glimpse of what is "really" happening inside their wombs. Ultrasound's persuasiveness is due in part to the circumstances of its production at the hands of authoritative white-coated medical professionals. The "truthfulness" and authority of the image are further reinforced through the dramatic ability of the cameralike apparatus to compensate for the deficiencies of the human eye—both the physician's and the woman's. In this regard, women's use of metaphors of other visualizing machines (television, camera, microscope) to refer to the ultrasound apparatus is revealing. For both Greek and Canadian women, a common early exposure to television may have socialized them to be "relatively flexible readers of images" and thus prepared them to metaphorize the shadows that appear on the screen into "my baby." The sense that what is seen on the screen is "really real" also derives from the codes and conventions of visual realism that ultrasound shares with other visual technologies. Thus, for instance, ultrasound's ability to reveal fetal movements in "real time," like "live" television, imparts a feeling of "nowness" that promotes a sense of immediate contact with the fetus on the screen. As the impact of the mass media has become increasingly global, so too has the visual realism that is one of its most characteristic genres. In the process, boundaries of cultural difference may become blurred.

Other boundaries remain, however. Although many Canadian and Greek women appear eager and willing to accept the cyborg as an improvement over their own understandings of the fetus, the ways in which they metaphorize the fetal blur indicate culturally specific understandings of ultrasound technology, pregnancy, and fetal personhood. Unlike the Canadian
women, the Greek women never spoke of the fetus as an autonomous in utero subject; and attributions of fetal personality, agency, and potentiality were notable for their absence. According to the tenets of the Greek Orthodox Church, to which nearly all Greeks belong, the soul, and thus, personhood, is acquired at conception. Yet, as translated into everyday cultural understandings, fetal persons, like persons generally, are constituted processionally, across time, and relationally, through their connections with others, most importantly with family members, and not as autonomous and separate units. Here it should be emphasized that cultural categories of personhood should not be taken as monolithic, homogenous, and static representations across time and context. Instead, we suggest, they are best understood as historically and culturally specific folk models, which may, and often do, exist alongside alternative and sometimes contradictory understandings. For both the Greek and the Canadian women, relational and individualistic models coexist, but for each, one model tends to dominate. Thus, for example, although many of the young Greek women considered themselves "incomplete" without motherhood, other valued aspects of their experience, such as consumption, self-care, and waged work, point to the ascent of more individualistic models. Similarly, the Canadian women's talk about the fetus in terms of its relations and resemblance to family suggests that they also value the procedure for the connections it "showed."

Yet, in distinct contrast to the Greek women, many of the Canadian women do think of the fetus as a separate individual. As Barbara Katz Rothman points out, the view of the fetus "not as a part of its mother, but as separate, a little person lying in the womb" has deep historical roots in North American traditions of viewing individuals as "autonomous, atomistic, isolated beings." Moreover, during the last few decades, a significant rupture has occurred in the way the fetus is conceptualized, talked about, and acted upon. The fetus is no longer simply a separate entity, but increasingly, an agent in its own right. Representations in medical discourse (reflected in recent popular culture as well) have shifted from passive and parasitelike to active and independent. Thus, the "feto-placental unit" is said to issue hormonal commands to the mother who, if
she wants to do what's "best for baby" must learn to read her moods and bodily symptoms as evidence of fetal signals for nutritious foods, rest, and regular medical care. This notion of the fetus-as-agent is powerfully naturalized through the discourses of science and maternalism and reinforced in popular culture and anti-abortion rhetoric.

The North American fetus has also become highly visible as a public figure, reflecting once again distinctive constructions of the person, as well as divergent historical and political contexts. Electronic and print media stories about fetal diagnosis and therapy, fetal rights, and the abortion issue appear frequently. Anti-abortion movements are undeniably better organized, more vocal, and more politically powerful in the United States, but Canadian women's understandings of pregnancy are infused with their personal reflections on the legal, ethical, and political controversy over fetal rights and abortion. For example, although only a few of the Canadian women interviewed describe themselves as "anti-abortion" or "pro-life," nearly all women avoided the term "fetus," saying it reminded them of the abortion issue. The North American fetus is also a source of cultural entertainment, appearing in Hollywood films, in advertisements for telephone companies and cars, and in comic strips and novels. Through these diverse representations, North Americans have become accustomed not only to seeing the fetus but also to seeing the fetus as a social actor.

In Greece, in distinct contrast, there is no public fetus. Images of the fetus in the media are not frequent, and only an occasional poster in the public hospital exhorted women not to smoke during pregnancy. Aspects of local knowledge of pregnancy and the fetus which provide alternative interpretive frameworks persist alongside medical and popular-scientific discourses. In everyday contexts, the pregnant woman's body and its contents are less sharply demarcated than they become in the medical setting. Instead, they are embedded in more social understandings in which the well-being of both fetus and woman crucially depend on the intentions and actions of others. Two examples illustrate this more relational perspective. Because children are culturally highly valued (despite, or today, perhaps because of, one of the world's lowest birthrates), pregnancy is thought to incite the envy of others who can unin-
tentionally cause harm. Thus, pregnant women are considered to be especially vulnerable to the effects of the evil eye. In the past, pregnancies were hidden for this reason. Contemporary pregnant women protect against the evil eye by wearing beads and amulets, which they also secure immediately to the pillows of their newborns in the hospital. A second example is the social response to the strong food cravings pregnant women are expected to display. Women are routinely offered morsels of food that they happen to smell, not only by familiars (their husbands should be especially attentive to these cravings), but also by a neighbor or even the occasional street vendor, lest they be responsible for telltale birthmarks in the shape of the food withheld. Both of these practices suggest moral (and thus prescriptive) understandings of person and body that are crucially embedded in interpersonal relations and that stand as alternatives to the firm borders delineated by more individualistic models.

At the level of Greek public discourse, a particularly telling manifestation of the tendency to emphasize the relational over individualistic premises of fetal personhood can be found in anti-abortion discourse. Abortion is a much more common experience for Greek women than for North American women. Despite the teachings of the Greek Orthodox Church, which equates abortion with the sin of murder, church opposition to abortion remains relatively muted, and anti-abortion discourse in the public sphere is largely limited to the periodic lamentations of the press or of politicians decrying the rapidly falling birthrate. In public discussion, Greece's high abortion and low birthrates are conceptually linked and are represented primarily as threats to Greece's geopolitical security and to the continuity of the Greek nation, the ethnos, or organic national whole, and of the Greek "race" and religion. The Greek context thus differs markedly from North America, where attention has overwhelmingly focused on issues of maternal choice and the fetal individual and its rights.

Not only are fetal subjects culturally constructed in symbiosis with ultrasound technology, so too are pregnant women. For the Greek women, actively consuming ultrasound technology can be read as one way of constituting oneself as a modern pregnant subject. Medical technology (like technology in gen-
eral) can be seen as comprising part of the "standard package" of European consumer goods which are desired (particularly by the newer middle classes of Greeks which flourish in the prosperous city studied by EG) less perhaps for their utility than for their symbolic value. "Europe" and "European" are tropes that carry particular rhetorical force in Greece today. Historically, the idea of "Europe" is closely related to what has been called a "perennial crisis" in Greeks' sense of identity (is Greece part of the East/Orient or of the West/Europe?). This conundrum has deepened in recent years as a result of Greece's "full" membership in the European Union, membership which Greece has actively embraced. In practice, however, Greece is often regarded by the more powerful EU states as a marginal, unruly, and "semi-Oriental," junior partner, whose capability of applying Western values and institutions remains in doubt and whose principal merit, it would seem, is as a quaint and exotized "pleasure periphery" for Northern European tourists.37

In this ambiguous contemporary Greek moment, consumption, perhaps especially consumption of technology and expert knowledges, represents a significant means of identifying oneself as modern and, more to the point, a member of the New Europe. In such a context, the intensive and repetitive use of ultrasound technology can be interpreted as a ritual of consumption that facilitates the representation of oneself as modern and European. Ultrasound is thus both a metonym for modernity and a vehicle for constructing oneself as a modern subject, not only for mothers and fathers, who selected the public hospital largely for its "machines," but for the physicians as well, who regarded the technology as indispensable to the practice of "modern" obstetrics.

In contrast, a few of the Canadian women talked about ultrasound as an example of "medical progress" or "something our mothers didn't have," but most did not. Canadian women seem to regard the ultrasound primarily as a means of "doing what's best for baby" and relieving their own anxieties about anomalies and miscarriage. Rather than a metonymic connection to a modern identity, ultrasound in Canada is firmly embedded in an individualizing ideology of risk and maternal responsibility. Implicit in women's anxieties and actions is the belief that "good" mothers do not take risks and, therefore, avail themselves of ultrasound.38
Differences in Greeks' and North Americans' constructions of the fetal and maternal person are further highlighted when we compare popular cultural translations of expert knowledge about pregnancy. One such important channel for the diffusion of scientific images and knowledge is pregnancy guides. As Barbara Katz Rothman observed, middle-class North American women typically "take pregnancy as a reading assignment." In fact, all the Canadian women had read pregnancy guides, many of which contain Lennart Nilsson's famous photographs of the live fetus in utero. About one-half of the Greek women had used a pregnancy guide, and the majority had consulted the same book, Birth Is Love. The only guide written by a Greek, Birth Is Love, also includes reprints of Nilsson's images—in this case, the earlier (1965) photographs of autopsied fetuses. However, the Nilsson images in the guides read by the Greek and Canadian women are embedded in sharply contrasting rhetorical constructions. Instead of the soft-focus, vulnerable, solitary, pink, thumbsucking North American in utero "baby," the grainy black-and-white photos included in Birth Is Love are far from cuddly. Throughout the Greek text, attention is focused almost exclusively on the physical characteristics and development of the fetus. When fetal personhood is discussed, it is consistently described in processual and relational terms rather than as an either/or state. Thus, the guide's author flatly asserts that in the earliest stages of pregnancy "the embryo doesn't have any human characteristics!" Becoming human is described as a process that unfolds over a considerable period of time. Even at the end of pregnancy the fetus is characterized as "a complete newborn, if not, however, a complete person. Another statement begins . . . only after some years will its development, its flowering, be complete." Eventually, the author asserts, the fetus "will grow into an admirable extension of ourselves."

In direct contrast, the guides read by the Canadian women portray the fetus, even during the early weeks of pregnancy, as a sentient, active, and socialized individual, often engaged in purposeful activities, and emphasize maternal-fetal bonding as a central and essential experience of pregnancy. In the Greek text, this discourse on prenatal bonding is conspicuously absent. Although maternalist assumptions remain strong in both
Canada and Greece, the discourse of fetal individuality and separateness that prevails in North America helps foster the "need" to promote a "bond" between now conceptually divided individuals.

In *Birth Is Love*, despite its sentimental title, much less of the advice dispensed revolves around the fetus. The guide does devote a considerable amount of attention to advising women about consumption—of medical technologies (including ultrasound), maternity clothes, cosmetics, prenatal care, expert knowledge, and so on. Throughout the text, the specific behaviors and practices being promoted are routinely identified as "European," "American," or even, in one instance, "Canadian." On the one hand, this tagging represents a rhetorical strategy for establishing the authority and credibility of the expert advice being dispensed. On the other, the prescription to follow "European" or "Western" practices can also be interpreted as advice on how to construct one's self as a modern pregnant subject. The guide also contains a lot of advice on how to be a proper patient, urging women to be prompt for appointments and precise and concrete in their reports to the physician, and to recognize that, if they have complaints of their physicians, that they themselves prompt some of the behavior of which they complain. Thus, in addition to encouraging women in their pursuit of a modern pregnant subjectivity, the guide also has a disciplinary program, attempting to instruct women on how to become modern pregnant patients as well. This disciplinary goal is virtually absent in the Canadian guides. Rather, Canadian women, presumably already disciplined and medicalized long before Greek women, can now be "rewarded" with maternal-fetal communication.

CONCLUSION

Conceived and widely regarded as the means to revealing what is natural, true, and common to all fetuses and pregnancies, fetal ultrasound imaging appears to lack culture, to be a universalizing technology. As we attempt to show in this article, rather than the rational unveiling of nature, the cyborg fetus emerging from this technology says as much about the cultural and historical conditions of its production as it does
Specifically, our article illustrates that cyborgification simultaneously reproduces and reconfigures understandings of and relationships with the fetus. In other words, it both shapes and is shaped by local understandings and global discourses. Thus, the ultrasound apparatus may dramatically expand the sensual and cognitive apprehension of the fetus, but it does so within the constraints of dominant discursive formations. One advantage of the cross-cultural perspective we have adopted here is the possibilities it opens up for exploring the complex ways in which these powerful discourses operate in specific societies.

In Canada, ultrasound is about the separation and reconnection of individuals. Pregnant women expect that they will "meet their baby" on the ultrasound screen; and they are encouraged by experts to see in the image digitalized evidence of a gendered, conscious, and sentient fetal actor communicating its demands and needs. Caught in a complex and very public ideology of fetal risk and maternal responsibility, Canadian women embrace ultrasound as a means of demonstrating that they are "good mothers" who are willing to work at forging bonds with their unborn babies.

In Greece, the production of fetal and pregnant subjects is markedly different. Ultrasound's evidence of fetal physical normalcy is read as evidence of fetal personhood. However, fetuses remain relational beings whose personhood is constituted primarily through social networks. As the Greek women eagerly demand and consume ultrasound technology, they actively identify themselves as modern pregnant subjects and, by implication, symbolically affiliate themselves with Europe and the West.

Yet if the cyborg fetus collaborates in the reproduction of dominant discourses about personhood, motherhood, and modernity, it also helps reconfigure women's experiences of pregnancy. For if, as we noted at the beginning of this article, "the machine is us," the cyborgification that results expands and alters the bodily experience of pregnancy in significant ways. Through their intimate interaction with the ultrasound, both Greek and Canadian women have emphatically redefined the experience of quickening as occurring when they first see the fetal image on the screen. "Seeing the baby" and "putting
the baby on television" are now what make the pregnancy feel "real." However, this reconfiguration is not a simple and automatic result of visualizing the sonographic blur. Rather, it is mediated by the codes and conventions of a visual realism embedded in the very design of the technology. Through the ultrasound apparatus, these mass-mediated codes and conventions, now globally familiar, have become part of the commonsense bodily experience of pregnancy for both North American and Greek women. In its reproduction and reconfiguration, the cyborg fetus is constructed of cultural understandings, both local and global.

NOTES

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1. A version of this article appears in "Cyborg Babies: From Techno-Sex to Techno-Tots," ed. Robbie Davis-Floyd and Joseph Dumit (New York: Routledge, forthcoming).
11. Ibid., 164.
12. Although ultrasound images in Canada may show consciousness, emotion, and intention as obvious and "natural" facts of the cyborg fetus, the varieties of ultra-
sound practices among Canadian hospitals point to the continual shaping and filtering of these fetal images by institutional agendas, professional contests, and personal styles. At one Canadian hospital, obstetrician-sonographers compare their ultrasound practices with those of radiologists, claiming that radiologists can obtain technically superior images and more precise measurements but lack certain communicating skills. "Knowing how to talk to patients" during ultrasound, taking the time, that is, to "show women the baby," and personalize the fetal image is believed by the obstetricians to be an essential part of good prenatal care. At a second hospital, one of the sonographers dismissed queries about why her clinic discusses only the diagnostic elements of the ultrasound and does not "show the baby." "We're not in the entertainment or warm fuzzies business," she said bluntly. "All that talk is just stuff to make women feel better. We're using it [ultrasound] to look for problems, make diagnoses, and then we send them home."


21. For more on women's and men's differing responses to fetal ultrasound, see Margaret Sandelowski, "Separate, but Less Unequal: Fetal Ultrasonography and the
22. At the time of the interviews, the forty-nine Canadian women were between the ages of twenty-two and thirty-three and living with a male partner. The women, awaiting the birth of their first child, had been labeled by their obstetricians as "low risk" for fetal anomalies or complications of pregnancy. Most of the women are Canadian-born, but they construct their identities along diverse cultural lines. They include, by their own terms, women who are "Lebanese," "Anglophone," "Italian-Canadian," "Québécoise," "Jewish," "WASP," and "just Canadian," among others. They are also women from different religions, educational backgrounds, and work worlds, but their life-styles, homes, and incomes signal their middle-class status. Despite differences in their cultural and social locations, their narratives on the cyborg fetus are strikingly similar, indicative perhaps of both the pervasiveness of ultrasound in Canada and the particular emphasis the research hospital places on personalizing the image.


24. Such intensive monitoring of pregnancy is not a regional aberration but reflects Greek obstetrical practice generally. Medical students in Athens are taught to do three scans per normal pregnancy, one in each trimester; and a recent survey of more than 500 normal pregnancies in Athens found that, in fact, nearly all women (93 percent) had had at least one fetal ultrasound scan, with about one-quarter experiencing two or more scans in the third trimester alone. See Gérard Breart et al., "Pre-Partum Care in the EC Countries—Preliminary Results of a European Concerted Action," in Care, Concern, and Cure in Perinatal Medicine, ed. J.G. Koppe et al. (Lancaster, England: Parthenon Publishing Group, 1992).


of the Self 'Peculiar' within the Context of World Cultures?" Ethos 21 (June 1993): 107-53.
41. Ibid., 68.
42. Ibid., 60.