

4 Breast Pumps

A Feminist Technology, or (yet) “More Work for Mother”?

KATE BOYER AND MAIA BOSWELL-PENC

INTRODUCTION

THIS CHAPTER QUERIES THE extent to which the breast pump can be considered a feminist technology. We approach this question through an analysis of how breast pumps affect women’s mobility after childbirth and experiences of trying to combine milk expression with wage work in the United States. We explore the ways in which this technology can be considered liberatory and/or empowering and, if so, for whom.¹ On the one hand, breast pumps can be seen as one in a long line of technologies designed to mediate and manage women’s bodies—from mammogram machines and IUDs to tampons, home pregnancy tests, menstrual-suppression technologies, and subcutaneous birth control devices, as explored in this volume. On the other hand, this artifact shares characteristics with devices intended to deliver more temporal and spatial freedom to their users, such as cell phones, laptops, and personal data assistants.

On average, women in the United States are allowed less maternity leave than in nearly any country on earth (Seager 1997). In the United States it is estimated that about seven in ten mothers with children under three years old work full time, while between one-third to one-half of working mothers return to work within three months after childbirth² and the remainder return within six months (Boston Women’s Health Book Collective 2008, 273). When viewed in the context of the wage workplace we ask: Does the breast pump provide a means of “pushing back” on the work-life balance—and challenge traditional gendered public/private divides—by bringing to work an activity traditionally associated with the private space of the home? Or, despite its promise, does the breast pump unwittingly create “more work for mother,” as Ruth Schwartz Cowan (1983) argues that so many so-called labor-saving technologies have done? After providing a short background to the cultural context in which the breast pump emerged, we examine the experiences of women who have tried to combine lactation with wage work. We argue that although breast pumps can be considered a liberatory technology in that they expand women’s choice in terms of feeding their

infants, this potential is constrained by attitudes about pumping (and nursing more generally) as well as workplace design. Finally, we suggest a few possible pathways by which the breast pump's liberatory potential could be augmented.

We would like to clarify that we count women's unpaid labor in the space of the home as "work," and we have written elsewhere about the high cost of denying the social importance of care work (Boyer 2003). Yet this research focuses on pumping in workplaces outside the home both because most mothers in the United States return to work before their child is ready to eat solid food, and because pumping at work poses special problems and challenges that pumping at home does not.

Our research is informed by scholarship in feminist science and technology studies on the ways in which technology shapes and is shaped by social relations (Bray 1997; Cockburn and Ormrod 1993; Gorenstein 2000; Mackenzie and Wajcman 1985; Wajcman 1991, 2004; Webster 1996). This work has highlighted the ways gender, ethnicity, class, race, and other factors can be "built-in" to technology at the design phase (Cockburn and Ormrod 1993; Nelson, Tu, and Headlam Hines 2001). This scholarship has also challenged claims advanced by some as to the capacity of artifacts to change structures of power and inequality on their own (Cockburn 2004; Cowan 1983). Our analysis draws on Boswell-Penc's research on breast milk contamination and Boyer's research on gender, technology, and wage work. Boswell-Penc is the mother of two children and while breast-feeding was an avid pump user. Boyer has one child and has also experienced the breast pump as a user. We are both interested in this technology's potential to expand women's mobility, as well as its potential to redefine understandings of "appropriate" behavior and ways of being in the workplace. We base our analysis on twelve one-on-one interviews conducted between the spring and fall of 2005 with friends and acquaintances who had used breast pumps, employing a snowball methodology to constitute our interview pool. We also draw upon primary print and Web material on breast pump manufacturers, breast pump users, and breast pump advertisements, as well as secondary academic literature relating to the broader politics of infant feeding.

BACKGROUND

Breast pumps emerged out of two cultural trends occurring during roughly the same time period. The first of these was the growing recognition of breast milk's nutritional superiority to formula in the 1960s and 1970s, pioneered by lactation advocacy groups such as La Leche League. The second was the rise in the number of U.S. women returning to the wage workplace sooner after childbirth since the

mid-1970s as a result of wage compression, the decline of fordism, and economic restructuring; together with women's advances into better-paying jobs higher up in managerial hierarchies (Hayghe 1986). Although the economic factors requiring greater numbers of women to return to the workplace sooner after childbirth affected women (and men) across race, ethnic, and economic lines, the question of how to proceed with infant nutrition in this context has produced a range of different responses.

Starting in the 1930s, the use of baby formula became widespread both domestically and as an export to the global south by companies such as Nestlé. As Boswell-Penc (2006), Hausman (2003), and others have argued, formula was advertised as being easier and less cumbersome than breast-feeding, and (erroneously) as being nutritionally superior to breast milk. Together with the rise of agrochemistry, bioengineering, and the shift toward more highly processed foods, formula fit within a modernist approach to health and nutrition in which more highly engineered products and practices were viewed as superior to their lower-tech alternatives (Apple 1987; Palmer 1988; Shapiro 2004). Formula remains big business, and the United States has one of the lowest rates of breast-feeding of any country in the developed world. According to a 2009 study by the U.S. Centers for Disease Control, only 35 percent of newborns in the United States are still being breast-fed at six months of age, and by one year only 16 percent receive any breast milk (www.breastfeed.com). Meanwhile, formula is routinely given out to new mothers in the maternity wards of many hospitals. Rates of breast-feeding among women who work outside the home are lower than for those who do not (Blum 1993, 296).

CONSIDERING BREAST PUMPS AS A FEMINIST TECHNOLOGY

Despite formula's dominance, scientific evidence now clearly shows breast milk to be nutritionally superior to formula, even when taking into account environmental toxins breast milk may contain (Boswell-Penc 2006; Hausman 2003). Infants who receive breast milk typically have fewer ear infections and respiratory infections, and fewer problems with diarrhea, among other immunological benefits (www.breastfeed.com). Thus, breast pumps provide a direct benefit for babies in terms of better health, as well as an indirect benefit for their mothers and/or other caregivers because fewer illnesses for the child also means fewer sick days and thus fewer unwanted disruptions to the caregiver's schedule. In addition, breast-feeding—even with a pump—is much less expensive than formula when considered over time. Although one year's worth of baby formula costs more than

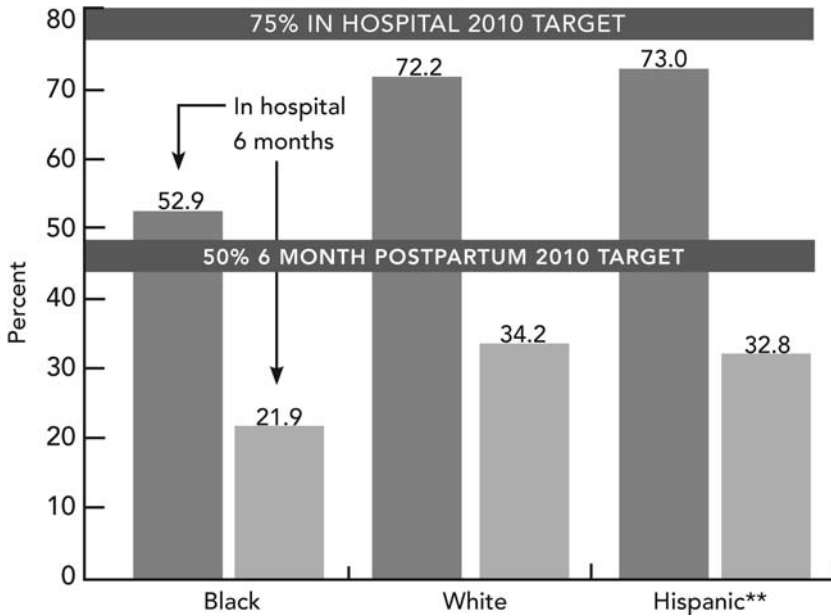
\$2,000, a new pump costs between \$30 and \$300 (www.breastfeedingonline.com). Initiatives such as the Boston-based “Pumps for Peanuts” project has sought to subsidize the cost of breast pumps for low-income groups, and it is also possible to lease pumps, for which prices vary.³

We would like to raise three points relating to the economics of pumping. First, in spite of the “value for money” of pumping versus formula when amortized over time, formula is cheaper than a pump (especially a high-quality one) at any single point of purchase. Second, although the U.S. Food and Drug Administration, La Leche League, and certain manufacturers discourage sharing breast pumps, our interviews as well as Web sites such as e-bay and Craigslist speak to the fact that a significant number of breast pumps continue to circulate beyond their first user (for example, a search for “breast pumps” on February 6, 2008, on e-bay produced a list of 889 items). Our third point is that depending on how much milk a woman wants to express, a pump may not be necessary. La Leche League’s landmark book *The Womanly Art of Breastfeeding* (first published in 1963) explains how to express breast milk by hand, as does the *Our Bodies, Ourselves Pregnancy and Birth Book* (Boston Women’s Health Book Collective 2008, 270–71).⁴ That manual milk expression is not more common in the United States may be because of a range of factors, including lack of awareness about this technique, difficulty in successfully executing it, finding this technique too slow and/or laborious (or the perception that it would be), discomfort with the prospect of manually expressing one’s own milk, the perception that a machine “will do it better,” or simply the fact that there isn’t any money to be made in it. Although none of the women in our study was able to express enough milk quickly enough by hand to make this a viable way to combine lactation with full-time wage work, we support hand-expression as an alternative method, and would support initiatives whereby this “no-tech,” “no-purchase-necessary” method might gain wider recognition and acceptance.

Although we were not able to find data on breast-pumping rates in the United States, one study of 346 mothers conducted in early 2000 found that 77 percent of all mothers who breast-fed had used a pump at some point (Geraghty et al. 2005). Despite the health benefits of nursing, the decision to breast-feed, knowledge about the immunological benefits of breast milk, and awareness of breast-pumping alternatives are all structured by cultural background, social networks, and education. As of 2003, rates of breast-feeding in the United States were highest among college-educated white and Latina women over age thirty. Rates were lowest among mothers under age twenty, African American women, women who had not completed high school, and those living in the Southeast (*Child Health USA* 2003) (see page 123 for data on breast-feeding rates in the United States by race).

So to some extent, at present, breast pumps are a classed and racialized technology in that their users are not representative of women with young children as a group, but rather are a whiter and better-educated subset of that group.⁵

It should also be noted that breast-feeding rates and demographics have been changing over time; in particular, between 1990 and 2001, the “race gap” for in-hospital breast-feeding initiation between African American women and other groups has begun to narrow (*Child Health USA*, 2003). These changes are likely a result of some combination of public health campaigns designed to raise awareness about the immunological benefits of breast-feeding combined with changing hospital protocols. However, although most U.S. women now do try breast-feeding in the hospital, rates thereafter (including the period during which women might begin to pump) begin to decline across all racial groups. Moreover, as of 2004 only 12 percent of U.S. women were breast-feeding exclusively for the first six months, as recommended by the World Health Organization.⁶



Breast-feeding rates by race/ethnicity: 2001.* U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau. *Child Health USA* 2003. Available at: <http://mchb.hrsa.gov/chusa03/pages/status.htm#breastfeeding>.

*includes exclusive and supplemented breast-feeding

**may be of any race

Nevertheless, the greater availability of breast pumps since the 1990s has expanded the field of choices in the realm of infant nutrition, and may be working to help raise breast-feeding rates. Choice is important because, as Bronet and Layne note (this volume), women are not a homogeneous group and will have different needs and wishes. While recognizing that the benefits of this technology are not distributed evenly across all segments of society, we nevertheless suggest that this technology can be considered liberatory in that it gives nursing women more spatial freedom and allows more physical separation between mother and child, because even women who are committed to breast-feeding can sometimes feel “engulfed” by their baby. It also allows breast-feeding women to get someone else to take over one or more of the night or early-morning feeds. Breast pumps even provide a benefit for women who choose not to breast-feed as a means of providing relief from breast engorgement after one’s milk comes in. They are also sometimes used by women who want to nurse an adopted infant because pumping (and nursing) can stimulate milk production through nipple stimulation (Boston Women’s Health Book Collective 2005, 482). We suggest that in these respects at least, breast pumps function as a feminist technology.

BREAST PUMPS, MOBILITY, AND VISIBILITY

The modern breast pump was designed in 1956 by the Swedish/Swiss team of Einar Egnell and Olle Larsson, who went on to found the company Medela, which dominates the pump market globally (Bazelon 2006). Like tampons (Vostral, this volume), breast pumps were first designed for medical use, specifically for use in hospitals in cases where babies were too sick to breast-feed. In 1996, Medela revolutionized the breast pump market by releasing a breast pump designed for portability and personal use. Whereas these early models weighed about sixteen pounds (Bazelon 2006), contemporary portable models are considerably lighter, with common double-electric models (which are the heaviest models) weighing between nine and eleven pounds. Breast pumps now come in a wide range of designs: manual, electric, and battery-powered, as well as versions that are designed to pump either one breast or both at once (see page 125 for an image of a double-electric breast pump). Because breast pumps are competing with formula, their advertisements stress their liberatory potential by emphasizing ease of use and portability (page 125). Pump manufacturers also highlight the unobtrusiveness of their wares, as seen, for example, in Philips Avent’s Isis “back-to-work” model, which is advertised as being especially quiet and discreet.

Starting in 2003, certain manufacturers began to offer “hands-free” models, one of which has been advertised in baby magazines through an image of a woman



Stealth pump: Boyer modeling a “briefcase”-style breast pump. Photo by Maia Boswell-Penc, Albany, New York, 2006.

Double-electric “briefcase”-style breast pump. Photo by Maia Boswell-Penc, Albany, New York, 2006.



supposedly pumping breast milk while pushing a child on a swing. This image could be read as a message that pumping can take place effortlessly amid one's day-to-day activities or, alternatively, as evidence of a culture that values and expects multitasking, in which “just nursing” is not enough.

Advertisements such as these transmit two conflicting messages. On the one hand, they suggest that this artifact will deliver greater autonomy and spatial freedom—desirable qualities. At the same time, these ads also reflect the anxiety that others might find out that one is pumping. Despite the fact that breast-feeding

is starting to be protected by law,⁷ in many places it continues to be perceived as scandalous and/or socially unacceptable. Like other female discharges, breast milk is often viewed in the popular imagination with an admixture of suspicion, fear, and disgust (Douglas 1966). Thus, although nursing may be considered the “natural” choice, the act itself is to be hidden (even if hidden in plain sight, as in the case of the mother pushing her child on a swing in a public playground). This echoes the way in which tampons work to hide the act of menstruation from the human eye (Vostral, this volume).

This raises a broader question about the politics of breast pump design, particularly in terms of who gets to set design objectives, what metrics are used to evaluate what constitutes a successful end-product, and how both of these have changed over time. Originally designed by (male) scientists and engineers, early product evaluations privileged science-based metrics such as prolactin and oxytocin yields over other possible factors (Zinamen et al. 1992). But the breast pump underwent an interesting transformation during the 1990s as it shifted from a primarily hospital-based technology to a product on retail shelves. Whereas there are not clear ways to give feedback on the technologies one encounters as a patient (think, for example, of mammogram machines and speculae), a raft of Web sites now offer customer-generated product reviews of the different varieties of breast pumps on the market. Those in the market for breast pumps are very likely to have Internet access and very likely to already be in the habit of looking to Web sites to get advice, guidance, and support on topics relating to pregnancy and childbirth. Today’s user may factor in considerations not only of efficacy but also comfort, noise level, or product weight (which bears upon portability), and are likely to look to feedback from other users (in both the virtual and nonvirtual world) in deciding which model to buy or lease.

The repositioning of users from patients to consumers with high levels of choice and means of communicating with each other raises an interesting potential for users to play an expanded role in product design and evaluation in the future. As Bronet and Layne note in this volume, the design field is still male-dominated in the United States. Although breast pump design and redesign has been led primarily by men with formal expertise in the fields of science and engineering, one now sees the potential for this process to accord more value to different kinds of voices and knowledges; in particular, the lay expertise of users. And indeed, one can find evidence that this is beginning to occur; for example, on the homepage for Philips Avent, a leading breast pump manufacturer based in the United Kingdom, a link invites visitors to “get involved with Philips Avent product development.”⁸ We welcome this shift, and suggest that the inclusion of a range of different kinds of users (and potential users) in the design process

represents a way to deliver even more fully on the breast pump's promise as a feminist technology.

BODIES OUT OF PLACE

We have argued that breast pumps can be considered a feminist technology in that they expand both mobility and choice in the field of infant nutrition. We now turn to what happens when users attempt to deploy this technology in real-world situations, particularly in the wage workplace. Although breast pumps can enable lactating women to return to work, actually pumping at one's place of employment can be difficult. At the most practical level, pumping at work is not a guaranteed right in every state, and women have been fired for it (Blum 1993, 291).⁹ New York Congresswoman Carolyn Maloney noted as a reason for introducing the Pregnancy Discrimination Act Amendments of 2000, designed to protect woman's right to pump at work: "Women who choose to breastfeed have no choice about pumping milk during the day; they simply must express milk regularly." Maloney continued: "When women have stood their ground and told unrelenting bosses that, like it or not, they need [break time] for pumping, these same women have had their pay and benefits docked, and even lost their jobs."¹⁰

Indeed, even the breast-feeding advocacy community has been ambivalent about using breast pumps as a means to return to work. As Hausman has noted, there is a tendency within this community to view the breast pump as a technology that diminishes the emotional and psychological aspects of nursing (Hausman 2003), and historically this community's stance has been that women with young children should stay at home and nurse as long as they can (Bobel 2001). This position might be interpreted as only qualified support for women seeking to combine work and nursing, or possibly an anti-technology, anticonsumerist preference for manual expression, as discussed earlier.¹¹

Even where pumping in the workplace is legal, problems can remain both at the level of built form and cultural practice, in that most workplaces "design out" nearly all activities other than work itself; for example, worksites in which one cannot eat or sit down (such as most stores) and in which bathrooms are too few (such as outside and/or male-dominated worksites) show how workplaces sometimes deny the physical needs of the body for employees of both sexes. Experiences of women seeking to pump and store milk at work, however, offer an illustration of how breast-pumping women—and their bodily products—are constructed as particularly "out of place" at work.

The lactating body in the workplace causes anxiety both because it draws attention to women's biological productivity and because it involves the purposeful

excretion of a bodily fluid. As Boswell-Penc has argued, breast milk is sometimes viewed with suspicion as a potentially contaminated and contaminating substance (Boswell-Penc 2006). This builds on Mary Douglas's argument in *Purity and Danger*, which states that across many cultures, bodily fluids have been understood as dirt or pollution because they traverse what is usually the firm boundary of the body, thereby functioning as a symbol of danger, disorder, and power. Transgressions of the body boundary are fraught with ritual and particular social codes and, in many cultures, the bodily fluids of one sex are thought to pose a particular threat to the other (Douglas 1966, 120–21). Yet along side this disparaging view of breast milk stands an opposite interpretation: that of breast milk as “liquid gold,” thus considered for its unique immunological and hormonal benefits that science has yet to find a way to replicate. In this respect, breast milk perhaps bears something in common with the way Waldby and Mitchell argue other “mobile” bio-objects are now viewed, as alternately precious or threatening depending on the circumstances (Waldby and Mitchell 2006).

We can find contemporary references to the fear breast milk can illicit in the 2003 case of an Albany, New York, woman who was fired for storing her breast milk in a communal refrigerator at her work.¹² This kind of anxiety also echoes old narratives of fear about women's entrance into the white-collar workplace in the early twentieth century, which produced impressive efforts to physically separate men and women employees and provide for women's “special needs” (a code word for menstruation) such as by providing spacious anterooms to bathrooms complete with sofas that could be used for rests (Boyer 1998). Such efforts can be interpreted variously. In one reading, such interventions reflect an arguably regressive desire to contain or quarantine women's bodies and their effluvia from the rest of the workplace. However, if we instead view these early spatial interventions as being of a piece with the provision of lactation rooms in today's offices, an alternative reading is that such accommodations instead constitute reasonable—indeed progressive—efforts to acknowledge and accommodate women's particular biological realities within the wage workplace.

As opposed to technologies that hide uniquely female bodily functions (such as tampons) that, as Vostral argues, are designed to *unmark* women's bodies (Vostral, this volume), the breast pump calls attention to a uniquely female bodily function, sometimes in a fairly dramatic way. Electric pumps, which were favored by nearly all of our interviewees for their efficiency, are also quite loud, and this was a source of anxiety for lactating women who chose to pump at work. As noted, in both pump advertisements and Web sites devoted to breast pumping, the noise level of breast pump motors is identified as problematic or embarrassing. For example, as Dilys Wynn, one nursing mother interviewed in the article “Express

Yourself: How to Successfully Combine Breastfeeding and Work,” explained her experience: “I didn’t tell my manager or my co-workers that I was expressing milk at work. . . . It was a male-dominated industry and it would have been too embarrassing.” To mitigate her embarrassment, Wynn pumped in her workplace medical office.¹³ One woman in our sample used a manual pump at work as a way to reduce noise, but said that she got tennis elbow as a result.

Pumping requires both time as well as a place that ideally is private, calm, and sanitary. Pumping has to be arranged so as to correspond roughly to the frequency of nursing. Because nursing is a case of supply meeting demand, lactating women need to express regularly by one means or another in order to continue to produce milk. Our research suggests that this amounts to breaks of about fifteen to twenty-five minutes every few hours. In pumping advertisements and in online user groups, the need for privacy is also identified as being essential to the pumping process. Our interviews reveal a variety of strategies to achieve what they viewed as the “appropriate” degree of isolation. None of the women we interviewed had access to dedicated lactation rooms. Some pumped in their cars, some in bathrooms, and some found small unused rooms or closets. One interviewee told of a colleague who worked in state government who wound herself up in a long window curtain. Anxiety about discharging a bodily substance in the workplace or drawing attention to one’s breasts by having them manipulated by a loud machine within earshot of one’s colleagues, together with the desire to avoid adding another layer of spatial and temporal discipline on top of those already required by one’s job, may all serve as disincentives to pumping at work.

We further submit that the emphasis on concealment and banishment described in our interviews suggest that lactating women almost certainly feel more embarrassed to be seen by others engaged in pumping than to be seen nursing. We did not ask about this directly, but it squares with our broader experiences. We have each witnessed colleagues breast-feeding in semipublic spaces of conference rooms, classrooms, faculty meetings, stores, and restaurants. In 2009 in upstate New York, it is very difficult to imagine someone pumping in any of the aforementioned situations or spaces.

TIME, SPACE, AND CLASS

Further, bracketing any inconvenience or embarrassment pumping may produce, being able to engage in this activity in the first place depends on being able to secure the requisite time and space. Here, the onus is on employees (rather than employers) to find a way to make pumping work. As Dilys Wynn put it: “It is up to you to work out where to pump, where to chill and store your milk and how

to schedule work breaks that coincide with let-down times.”¹⁴ Comments such as these suggest that it is up to individual employees to convince one’s employer to allow them to pump at work. Most workplaces do not provide additional breaks to lactating women; thus, as Haidee Allerton points out in her article entitled “Coffee . . . Uh, Milk . . . Break,” many women report having to accomplish their pumping during lunch or coffee breaks, around the edges of their workday (Allerton 1997).

Presumably, savvy employers in highly remunerative sectors of the labor market who value their female employees’ time and want them back at work as quickly as possible after childbirth should provide time and space to allow their employees to blend nursing or pumping with wage work. And indeed, as feminist geographers Mona Domosh and Joni Seager note, one of the leaders in workplace lactation practices has been financial company J. P. Morgan Chase, which provides a lactation room with built-in pumps on their trading floor (Domosh and Seager 2001). Of course, most women do not work at J. P. Morgan Chase. And as a corollary to the gusto with which some high-wage employers have embraced workplace lactation, we suggest that finding time and space to pump is especially difficult in low-wage jobs. Space costs, so women who work in fast-food restaurants, coffee shops, or mall stores are very unlikely to have access to the kind of “extra spaces” such as dedicated lactation rooms, examination rooms, or empty conference rooms that middle-class women might use. Thus, whether one chooses to continue nursing after returning to work is not only a question of cultural preferences or the cost of a breast pump; it is also an issue of workplace design and whether one works for an employer who will make space for this activity.

CONCLUSION

Breast pumps, then, function as part of a broader sociotechnical system that includes workplace design and the social politics of actually pumping. Although we argue that the breast pump is emancipatory in that it expands mobility for some women, we also suggest that current social factors in the United States constrain this technology’s liberatory potential. We are concerned that the “goods” of breast pumping are distributed unevenly to women employed in workplaces that will make room for pumping, and we postulate that one reason low-income women do not continue nursing as long as their middle-class counterparts is because they are less likely to work in such environments. At the same time, we are also concerned that by providing a personalized, technical fix to the question of workplace lactation, breast pumps could inadvertently remove the incentive for employers

to come up with more—and perhaps better—alternatives for women trying to combine work and nursing.

By way of concluding we briefly note an article that appeared in the March 2006 edition of the online magazine *Slate*, written by Emily Bazelon. The article is entitled: “Milk Me: Is the Breast Pump the New BlackBerry?” (Bazelon 2006). By drawing the parallel, Bazelon was getting at the double-edged sword that is the BlackBerry and other such devices that allow us the temporal and spatial freedom to work outside of our allotted workplaces and work times. Although expanding one’s temporal and spatial freedom sounds like a good thing, for many employees these devices have had a way of raising expectations about availability outside of work hours, as well as the amount of time spent on work-related activities outside the workplace (Wheeler, Aoyama, and Warf 2000, 31–41). Bazelon frames the comparison thus: “Like BlackBerrys, pumps give us freedom we otherwise wouldn’t have in exchange for inviting us to go to lengths that we otherwise couldn’t” (Bazelon 2006). Finally, Bazelon’s article pushes us to ask: Despite the mobility-enhancing benefits breast pumps can provide, is there a risk that their existence could inadvertently foreclose other options for combining wage work and care work? Because (some) women now have the capacity to both work outside the home and continue to nurse, will they be pressured to do so? Could the existence of breast pumps be used against efforts to fight for longer maternity leaves (and paternity leaves) or the provision of on-site child care?

Some of these factors can be ameliorated by policy, as through legislation that would force employers to provide the time and space necessary to make pumping and/or nursing possible in *all* workplaces, as other bodily needs are met through the provision of bathrooms and, in some workplaces, first-aid stations.¹⁵ Policy provides an important part of the solution because it has the power to reframe responsibility for a problem from the individual to the collective. Although at present most workplaces in the United States do not provide lactation rooms, incentives to businesses to adopt breast-feeding-friendly policies include savings in health care costs, prescription costs, and lost work hours, as scholars from the Tulane Xavier National Center of Excellence in Women’s Health have observed.¹⁶

Other barriers can be solved through better design, such as through the development of pump models that are lighter and quieter (Perkins 1999), or through other design improvements that are as yet unimaginable. As noted, the shift toward including the perspectives of women in the process to achieve more user-centered designs could serve as an important pathway toward achieving this goal.

In addition to the material and policy changes that are required, we argue that for the breast pump to truly fulfill its potential as a feminist technology, it will require cultural changes as well.¹⁷ We need to change the politics of banishment that accompany breast-feeding, and challenge narratives that encode woman's biological productivity as shameful. We need to expand the limits on what kind of bodies belong at work, and allow a broader range of living to occur there (especially as so much work has followed us home). Finally, rather than focusing single-mindedly on *this* way of blending nursing with other activities, we propose that it is important to remain open to finding *even better* ways, as well as remaining mindful of preserving choice, because this is obviously not a domain in which one solution will fit all. These transformations will require legislative change and changes to the material environment as well as cultural change.

NOTES

1. This paper was developed out of our article: "Expressing Anxiety? Breast Pump Usage in American Wage Workplaces," *Gender, Place and Culture* 14, no. 5 (2007): 551–67.
2. http://www.tulane.edu/~tuxcoe/NewWebsite/com_womens_health/pdf/workingmomsbreastfeeding.pdf. (Accessed March 23, 2008.)
3. We were not able to find data on how common breast pump leasing is compared with buying.
4. "Hand Expression," *New Beginnings* 13, no. 2 (1996): 51–52. <http://www.lli.org/NB/NBMarApr96p51.html>. (Accessed February 7, 2007.) *Our Bodies, Ourselves* states that "while you are still in the hospital, a nurse or lactation specialist should coach you on how to express milk by hand" (Boston Women's Health Book Collective 2008, 271).
5. For more on breast-feeding as a luxury, see Blum 1993, 292.
6. Figures are from 2004's "Breastfeeding among U.S. Children Born 1999–2005, CDC National Immunization Survey, Centers for Disease Control, <http://www.cdc.gov/breastfeeding/data/NIS%5Fdata/>. (Accessed May 12, 2009.)
7. "Breastfeeding Legal," *Maclean's* 110, no. 30 (July 28, 1997): 29; "Breast-Feeding: A Civil Right," *New York Times* (May 20, 1994): A14, A26; "Florida Approves Public Breast-Feeding," *New York Times* (March 4, 1993): A8, A18.
8. http://www.avent.philips.com/en_GB/. (Accessed August 8, 2008.) Clicking the link directs visitors to a page where they can fill out contact details so they can become involved in future product development. More research is required to find out exactly how those who express interest in becoming involved are incorporated into the design process.
9. See also "Rep. Maloney Introduces Legislation to Give Women Legal Protection against Termination and Discrimination on the Job for Breastfeeding," http://maloney.house.gov/index.php?option=com_content&task=view&id=831&Itemid=61. (Accessed April 15, 2006.)
10. See also http://maloney.house.gov/index.php?option=com_content&task=view&id=831&Itemid=61. (Accessed April 15, 2006.)

11. Bobel suggests that La Leche League's basic stance is that staying at home to nurse is preferable to returning to work, even with a pump (2001:139).
12. In *Kathleen Landor-St. Gelais v. Albany International Corporation*, July 31, 2003, the plaintiff sought to pump milk at work (in a bathroom stall) and to store it in a communal refrigerator; her suit was dismissed on several grounds (State of New York Supreme Court, Appellate Division, Third Judicial Department).
13. Froud, Helen, "Express Yourself! How to Successfully Combine Breastfeeding and Work" <http://breastfeed.com/resources/articles/bfeedandwork.htm>. (Accessed April 15, 2006.)
14. Froud, Helen "Express Yourself! How to Successfully Combine Breastfeeding and Work" <http://breastfeed.com/resources/articles/bfeedandwork.htm>. (Accessed April 15, 2006.)
15. Some of the most active work in the realm of nursing and breast-pumping legislation has been done by Carolyn B. Maloney from the Eleventh District of New York, Manhattan and Queens. See, for example, the New Mother's Breastfeeding Promotion Act, introduced in 2003, which would protect women from discrimination in the workplace for pumping or breast-feeding. This act would also give tax incentives to employers to set up lactation rooms. "Fighting for New Mothers," http://maloney.house.gov/index.php?option=com_content&task=view&id=419&Itemid=61. (Accessed May 12, 2009.)
16. http://www.tulane.edu/~tuxcoe/NewWebsite/com_womens_health/pdf/workingmomsbreastfeeding.pdf. (Accessed March 23, 2008.)
17. For an analysis of different methods of "fixing" issues in science and technology that challenge the cultural mainstream, see Layne 2000.

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