Is Breast Really Best? Risk and Total Motherhood in the National Breastfeeding Awareness Campaign

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Abstract From June 2004 to April 2006, cosponsored by the U.S. Department of Health and Human Services and the Ad Council, the National Breastfeeding Awareness Campaign (NBAC) warned women that not breast-feeding put babies at risk for a variety of health problems. "You'd never take risks before your baby is born. Why start after?" asked televised public service announcements over images of pregnant women logrolling and riding a mechanical bull. The NBAC, and particularly its message of fear, neglected fundamental ethical principles regarding evidence quality, message framing, and cultural sensitivity in public health campaigns. The campaign was based on research that is inconsistent, lacks strong associations, and does not account for plausible confounding variables, such as the role of parental behavior, in various health outcomes. It capitalized on public misunderstanding of risk and risk assessment by portraying infant nutrition as a matter of safety versus danger and then creating spurious analogies. It also exploited deep-seated normative assumptions about the responsibility that mothers have to protect babies and children from harm and was insufficiently attentive to the psychological, socioeconomic, and political concerns of its intended audience. Critical analysis of the NBAC suggests that future health campaigns would benefit from more diverse review panels and from a greater focus on providing accurate risk information about probabilities and trade-offs in order to enable informed decision making.

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In Chicago, a counselor at a federal Women, Infants, and Children (WIC) clinic laments the tragedy of teenage mothers choosing to go to school instead of breast-feeding their babies (Law 2000: 407). The director of the neonatal intensive care unit at District of Columbia (DC) General Hospital tells mothers of infants with runny noses that the babies would not be sick if they breast-fed (Hausman 2003: 223). And an anthropology professor argues that formula producers, "just like tobacco companies, produce a product that is harmful to people's short and long-term health" (Dettwyler 2004). Such rhetoric is commonplace in the world of breast-feeding advocacy, and it is staked on an overwhelming consensus that breast-feeding is the optimal form of nutrition for babies.[1] According to the most recent policy statement of the American Academy of Pediatrics (AAP 2005: 496), the "diverse and compelling advantages for infants, mothers, families, and society from breastfeeding and use of human milk for infant feeding . . . include health, nutritional, immunologic, developmental, psychologic, social, economic, and environmental benefits." Infant-feeding studies frequently begin with a reference to breast-feeding's well-known advantages. Even formula companies, which have a vested interest in reducing breast-feeding rates, explicitly state that human milk is the "gold standard" when it comes to feeding babies, and they tout their products as "closest to breast-feeding."

So axiomatic is the superiority of breast-feeding that from June 2004 to April 2006 the Office on Women's Health (OWH), a division of the U.S. Department of Health and Human Services (HHS), in conjunction with the Ad Council, sponsored a public health drive to promote breast-feeding. The National Breastfeeding Awareness Campaign (NBAC) consisted of television, radio, and print advertisements; pamphlets, posters, and billboards; and Web sites maintained by both the Ad Council and the OWH. The campaign advised that breast-feeding reduces babies' risk for ear infections, respiratory illnesses, diarrhea, and obesity; that babies who are exclusively breast-fed for six months "have a better response to immunizations like polio, tetanus, diphtheria, and *Haemophilus influenzae*"; and that "results from some studies show that breast-fed children have greater brain development than non-breast-fed children." On its Web site, the Ad Council stated that "[b]abies who are not exclusively breast-fed for

1. Among the organizations and institutions officially recommending breast-feeding are the American Academy of Family Physicians (2001), the American College of Obstetricians and Gynecologists (2001), the American Dietetic Association (2001), the American Association of Health Plans and Office on Women's Health (2001), the Centers for Disease Control, and the U.S. Department of Health and Human Services (2000).

at least 6 months will be more likely to contract asthma, allergies, diabetes and cancer; suffer more colds, flu and other respiratory illnesses; make more sick visits to the doctor; have inhibited potential IQ due to less infant neural development; [and] be obese adults."[2] Scheduled to be launched in fall 2003, the campaign had been postponed after the AAP leadership and the formula industry objected to proposed public service announcements (PSAs) that had been leaked on the council's Web site. One, according to OWH senior science adviser Suzanne Haynes, depicted a rubber nipple on top of an insulin bottle, suggesting that bottle-feeding causes diabetes (telephone interview, February 2, 2005). Others portrayed pregnant women engaged in strenuous sports, such as Roller Derby and mechanical bull riding. "You'd never take risks while you're pregnant. Why start when the baby's born?" asked the voice-over.

The leaked ads touched off a war of letters to Tommy Thompson, secretary of HHS, in which all of the participants emphasized their support for breast-feeding promotion. The first letter, dated November 6, 2003, came from Carden Johnston, newly elected president of the AAP, who had been approached about the campaign and the controversial PSAs by representatives of the formula industry at the AAP's annual convention earlier that month. While agreeing that breast-feeding was "the optimal source of nutrition for most infants in this country," Johnston expressed concern that the campaign's focus would be on "the risks incurred by not breastfeeding rather than . . . the benefits to be derived from breastfeeding." He counseled against this "negative approach" and stressed that the advertisements "must absolutely avoid making any claims that cannot be scientifically validated and thus undermine the credibility of the campaign." On hearing of Johnston's letter, the AAP's Section on Breastfeeding, which had been consulting with the OWH and Ad Council about the campaign, sent Secretary Thompson a response on November 18, 2003. In it, Lawrence Gartner, the section chair, argued that all claims made in the ads were based on sound medical research and that "for the advertising campaign to be effective, it is essential that the message point out the risks of not breastfeeding." In a separate, undated note to members of the AAP, Gartner complained that the formula companies, some of which counted among the academy's top corporate donors, were exercis-

2. Information about the NBAC was posted on www.adcouncil.org/issues/breastfeeding/, www.adcouncil.org/campaigns/breastfeeding/, www.adcouncil.org/research/wga/breastfeeding_awareness/?issue3Menu, www.4woman.gov/Breastfeeding/bf.cfm?page=Campaign, and www.4woman.gov/Breastfeeding/bf.cfm?page=227 (accessed July 20, 2004; pages now discontinued). Television ads expired at the end of 2005, and radio spots expired in April 2006.

ing undue influence on the organization's leadership (also cited in O'Mara n.d.). Johnston and Joe Sanders, the AAP's executive director, denied that industry contributions had anything to do with their concerns.[3] "Some of the science behind these breastfeeding claims is shaky" (Granju 2003; see also Petersen 2003), argued Johnston, who also worried that mothers who did not breast-feed would feel guilty if their babies got sick.[4]

Meanwhile, the International Formula Council, which represented formula manufacturers, hired Clayton Yeutter, former president George H. W. Bush's agriculture secretary, to lobby on its behalf. In a February 17, 2004, letter to Thompson, Yeutter stressed that the industry supported the idea of a breast-feeding campaign but opposed "scaring mothers into breastfeeding" and the implication of the ads that feeding babies infant formula was dangerous.[5] At the same time, breast-feeding advocates encouraged campaign supporters to write letters to Thompson and elected officials. The United States Breastfeeding Committee (USBC), whose members include the AAP, the American Academy of Family Physicians, and the American College of Obstetricians and Gynecologists, offered fax numbers, addresses, and a sample letter, as did *Mothering* magazine, the International Lactation Consultant Association, and a host of Web sites that promote breast-feeding. According to a USBC press release, HHS received over one thousand communications in support of the NBAC.[6] In light of the controversy, the department met with members of the USBC and the formula industry and reviewed the campaign. Senior scientists determined that the evidence linking not breast-feeding to diabetes and leukemia was insufficient; ultimately, the broadcast and print ads focused

3. Precisely how much money the formula industry donates to the American Academy of Pediatrics (AAP) is unknown to the public. Three companies — Abbott Laboratories, Mead Johnson Nutritionals, and Nestlé USA, Inc. — are contributors to the AAP's Friends of Children Fund (www.aap.org/donate/fcfhonorroll.htm). The Ross Products Unit of Abbott Laboratories, the maker of Similac infant formula, has purchased hundreds of thousands of the academy's breast-feeding guides with the Ross logo printed on them. Ross also donated $500,000 to the academy's operating budget in 2001, although Joe Sanders's staff at the AAP told the *New York Times* that more current information is not available. See Petersen (2002, 2003).

4. Letters by Carden Johnston and Lawrence Gartner were reprinted on various Internet sites, such as www.mothering.com/action-alerts/gartner-letter.shtml and www.promom.org/forum/viewtopic.php?t+2909 (accessed January 12, 2004; pages now discontinued). See also Granju (2003); Petersen (2003); and "Battle Over Breastfeeding Ads," www.cbsnews.com/stories/2003/12/31/earlyshow/health/590864.shtml (accessed January 12, 2004; page now discontinued).

5. Clayton Yeutter's letter was reproduced at www.abcnews.go.com/sections/2020/investigations/2020-breastfeeding-ads-040604.html (accessed June 8, 2004; page now discontinued).

6. The U.S. Breastfeeding Committee (USBC) press release, "Babies Were Born to Be Breastfed!" was released to member organizations, including La Leche League, on January 22, 2004. See USBC (2004).

on ear infections, respiratory illness, diarrhea, and obesity, although diabetes and leukemia remained on the Ad Council's campaign Web site at least until July 2004. Specific risk ratios, or the statistical increases in risk associated with not breast-feeding, were omitted for fear that the public would misinterpret them. Because diabetes was withdrawn from the PSAs, the ad with the nipple-topped insulin bottle was also eliminated. The risk message, including the mechanical bull, remained.

At the heart of the controversy over whether to frame the NBAC in terms of benefits or risks are perennial public health dilemmas: What kind of evidence is necessary to justify a public health intervention, a government-funded attempt to alter the way people live? Is it ethical to provoke extreme fear or anxiety in trying to persuade people to change their behavior? If so, how? And under what circumstances? What role should the social context of the target population play in framing the campaign message? Scientists, the American Public Health Association (APHA), and other scholars have engaged in lengthy and ongoing debates about the ethical questions surrounding evidence quality, message design, and cultural sensitivity.[7] These conversations reveal an understanding that "while good science is essential, unassailable science is not possible" (Sandman 1991: 45S). Because it is considered unethical to construct random controlled trials (RCTs) in which babies are assigned to either breast or bottle, infant-feeding research is observational and therefore vulnerable to the charge of having left crucial confounding variables unexamined. Balancing the uncertainty inherent in observational research with the needs and rights of citizens is thus a fundamental responsibility of public health decision makers. On one hand, they are reluctant to recommend lifestyle changes based on imperfectly understood associations; on the other, they do not want to leave uninterpreted findings that could improve health. Ethical dilemmas arise at precisely the moments at which "two valid concerns . . . come in conflict" (Smith 2001: 4).

If consensus is reached that the evidence tips in favor of an intervention, a strategy must be developed that accurately portrays the science, including its ambiguities, and at the same time convinces people to adopt the recommended behavior. This is an especially delicate exercise today, when

7. See, for example, Andreasen (2001); Beauchamp et al. (1991); Editor-in-Chief (2001), Weiss (2001), Greenbaum (2001), and Teret (2001) in *Epidemiology*; Gordis (1991), Sandman (1991), Szklo (1991), and Feinstein (1991) in *Journal of Clinical Epidemiology*; Samet and Lee (2001), Sommer (2001), Rodricks (2001), Szklo (2001), and Matanowski (2001) in *American Journal of Epidemiology*; Smith (2001); Taubes (1995); Rothschild (2001); Victora, Habicht, and Bryce (2004); Witte (1994).

the competition for public attention is fierce and health promoters might be inclined to exaggerate the urgency of a problem in order to "break through the clutter" of competing messages (Saguy and Riley 2005: 874; Smith 2001: 11). Psychoactive ads that cause a targeted group of people to feel intensely anxious or frightened are potentially more persuasive, but their success might rest on misleading or even deceitful portrayals of health risks. Indeed, because the information presented in any health intervention is inherently partial, a distillation of what is likely to be a vast body of research, "*one cannot not manipulate when communicating* about health and disease . . . [and] health communicators have a tremendous ethical responsibility to first determine what appropriate health messages are" and then to "develop strategies for the ethical use of manipulation techniques to promote health and prevent disease" (Witte 1994: 288, 286; emphasis in original). Ethical campaigns, according to various codes, are careful not to dramatize or present evidence in misleading ways. They are also sensitive to cultural differences and the ways in which recommended behaviors might resonate with particular populations.[8]

Ethics in health communication is far from a settled matter. Yet debates among scientists and scholars engaged in public health research provide good reason to question government-sponsored breast-feeding promotion and even stronger grounds to challenge a risk-based campaign. Perhaps the most problematic dimension of the NBAC was the science on which it was based. Medical journals are replete with contradictory conclusions about the impact of breast-feeding: for every study linking it to better health, another finds it to be irrelevant, weakly significant, or inextricably tied to other unmeasured or unmeasurable factors. While many of these investigations describe a correlation between breast-feeding and more desirable outcomes, the notion that breast-feeding itself contributes to better health is far less certain, and this is a crucial distinction that breast-feeding proponents have consistently elided. If current research is a weak justification for public health recommendations, it is all the more so for a risk-based message that generates and then profits from the anxieties of soon-to-be and new mothers. Yet in its emphasis on the dangers of not breast-feeding, the NBAC consciously attempted to manufacture fear in order to increase breast-feeding rates. It did so, moreover, in ways that exploited widespread popular misunderstanding of "risk" and deep-

8. See American College of Epidemiology (2000); Public Health Leadership Society (2002); Council for International Organizations of Medical Sciences (1991); and International Epidemiological Association (1990).

seated normative assumptions about the responsibility that mothers have to protect babies and children from harm. Finally, the campaign employed a crudely instrumental notion of cultural sensitivity and reduced differences to a matter of campaign strategy. From the emphasis on risk to the targeting of African American women, the NBAC demonstrated an awareness of the impediments to breast-feeding — of the obstacles to successful promotion — but not an appreciation of its costs or a sensitivity to the needs and values of different groups of women.

Breast-feeding has many social advantages. It benefits the environment by reducing pollution and waste from the production, packaging, and transportation of infant formula. It also reduces food expenditures for lower-income families. Yet breast-feeding also has costs, such as the labor value of women's nursing and the potentially negative impact of breast-feeding on family dynamics, career trajectories, and women's emotional and physical health. Social advantages, moreover, are "incidental or intermediary outcomes" of an ethical public health program whose "goals generally ought to be expressed in terms of public health improvement, that is, in terms of reduction of morbidity and mortality" (Kass 2001: 1777–1778). In this article, I will investigate the ethical merits of the NBAC as a public health campaign, paying particular attention to the evidence on which it is based, how that research is framed and presented to the public, and the ways in which both the advocated behavior and its representation might affect various segments of the intended audience. In the course of this investigation, I will examine some of the methodological dilemmas in breast-feeding research. I will explore the concept of "risk society" (Beck 1992), particularly as it is informed by an ethic of what I call "total motherhood," and how the NBAC circulates in such an environment. I will also consider how the campaign message — that not breast-feeding is risky — might resonate with different groups of women, including African American and working-class mothers. Finally, I will offer suggestions about how to reduce some of the ethical problems that plague the NBAC and other public health efforts.

Evidence: Confounding Variables and Weak Correlations

Critics of public health contend that "many contemporary practices in the field produce shoddy research, distorted causal evidence, and false alarms that have created needless public fears" (Feinstein 1991: 123S). For various reasons, many significant public health questions cannot be addressed

in RCTs, and thus policy is frequently based on observational research. These studies have produced important results, but they are subject to a greater degree of uncertainty. The most intractable problem is an inability to control for confounders, factors associated with both the variable under examination and the outcome that could create an artificial association. While consideration of confounding is always a challenge in observational research, it is of "paramount importance" when correlations are not strong (Szklo 2001: S13) or when causal pathways "involve not just biological but also behavioral steps that need to be understood and measured to demonstrate a logical sequence between intervention and outcome" (Victora, Habicht, and Bryce 2004: 401).

In breast-feeding studies, potential confounding makes it difficult to isolate the protective powers of breast milk itself or to rule out the possibility that something associated with breast-feeding is responsible for the benefits attributed to breast milk. As the number of years between breast-feeding and the measured health outcome grows, so too does the list of possibly influential factors, which means that the challenge is magnified when trying to evaluate long-term benefits of breast-feeding. Research on siblings who were fed differently is one way to reduce selection bias or the significance of unmeasured environmental variables, and a recent sibling study reported that "nearly all of the correlations found in the between-family model become statistically insignificant in the within-family model" (Evenhouse and Reilly 2005: 1781). The one exception, a positive correlation between breast-feeding and cognitive ability, is itself ambiguous, as the authors acknowledge, "because of unobserved factors that lead a mother to feed two infants differently" (1797). Two additional sibling studies came to contradictory conclusions about breast-feeding's impact on obesity but agreed that even within-family investigations have not controlled for "why a mother chooses to breast-feed one sibling and not another" (Nelson, Gordon-Larsen, and Adair 2005: 252) or why she might breast-feed one child longer than another (Gillman et al. 2006: 114). Breast-feeding, in other words, cannot be distinguished from the decision to breast-feed, which, irrespective of socioeconomic status or education, could represent an orientation toward parenting that is itself likely to have a positive impact on children's health. In instances such as this, in which the exposure (breast-feeding) and confounder (behavior) are likely to be very highly correlated, confounding is especially difficult to detect. When behavior associated with breast-feeding has the potential to explain much of the statistical advantage attributed to breast milk, the scientific claim

that breast-feeding confers health benefits — or, as the NBAC framed it, that not breast-feeding increases risk — needs to be reexamined.

Although research on breast-feeding addresses a range of medical and social issues, the NBAC focused exclusively on its putative benefits to babies, and these studies illustrate well the challenge of separating breast-feeding from its behavioral and environmental surroundings.[9] For example, one of the NBAC's claims was that formula-fed babies could be at higher risk for obesity in later childhood and adolescence. Yet in several studies examining the relationship between breast-feeding and obesity, the results have been variable. In spring 2001, the *Journal of the American Medical Association* (*JAMA*) published two articles, one finding "inconsistent associations among breastfeeding, its duration, and the risk of being overweight in young children" (Hediger et al. 2001: 2453), and the other concluding that "infants who were fed breast milk more than infant formula, or who were breastfed for longer periods, had a lower risk of being overweight during older childhood and adolescence" (Gillman et al. 2001: 2461). The first expressed concern that any association between breast-feeding and risk for obesity "may be confounded by unmeasured sociodemographic or intervening familial factors" (2458). In an effort to control for two such factors, diet and exercise, the second asked its adolescent subjects to complete a mail-in survey that included questions about eating habits, physical activity, and television viewing during the previous year. That the authors attempted to consider the impact of energy consumed and expended on body weight indicates their awareness that these might well obviate any protective effect of breast-feeding, but their data are precarious. Byers et al. (1999: 1365S–1366S) argue that "no single problem has been more formidable to nutritional epidemiology than the measurement of dietary intakes." The difficulties, write Petersen and Lupton (1996: 42), are "notorious" because people are inclined to " 'fudge'

9. PubMed, a database of medical research maintained by the National Library of Medicine, indicates that 4,609 articles with "breastfeeding" or "breast-feeding" in the title were published from January 1990 through December 2006. A full review of research on the topic, therefore, would be impossible. For this article, I examined publications in the journals with the highest impact factor, or rate of citation, in the following fields: general and internal medicine, nutrition, obstetrics, pediatrics, and public health (ISI Journal Citation Reports 2003 can be found at isi9.isiknowledge.com/portal.cgi/jcr). The National Institutes of Health (NIH 2003) suggests that a journal's impact factor indicates its importance compared to others in the same field, and research reveals a strong correlation between a publication's impact-factor rating and how it is evaluated by clinical practitioners and scientists (Saha, Saint, and Christakis 2003). I also examined the journals determined by Birken and Parkin (1999: 941) to contain "the best evidence relating to clinical pediatric practice." I then focused my analysis largely on studies addressing the health outcomes that the NBAC claims are ameliorated by breast-feeding.

their answers" or "lie outright."[10] Diet and exercise are sensitive subjects for most Americans, and the ability of preteens and teenagers wrestling with body image to provide unbiased information is perhaps even more questionable. Given the cultural and generational pressures to be thin, the overweight subjects might have been more likely to overstate exercise and underreport caloric intake, and this would skew the explanation toward some other variable, such as breast-feeding. Conclusions based on these accounts should therefore be drawn cautiously.

In the discussion section of Gillman et al. (2001: 2466), the authors further acknowledge that "residual and unmeasured confounding are always of concern in an observational study where the subjects choose the level of exposure and not all covariates are measured with optimal precision." The data they provide, in fact, support another explanation: that maternal and/or paternal behavior explain the apparent weight differences between breast-fed and bottle-fed children. According to this interpretation, mothers who choose to breast-feed for its purported health advantages might also be more likely to promote a healthy lifestyle, which would include a balanced diet and physical exercise. If heavier adolescents, who in this study were more likely to have been bottle-fed, were not encouraged to eat well and be active, the lower incidence of obesity among breast-fed children would have less to do with breast milk than with mothers and/or fathers who promote healthy living. Because the self-reports are unreliable and because the authors did not eliminate behavioral factors possibly associated with breast-feeding, the lower incidence of obesity among breast-fed children and adolescents cannot be attributed to breast-feeding per se. In the right behavioral context, healthy body weight might well be consistent with bottle-feeding, and other evaluations have suggested that the behavior of women who breast-feed might be responsible for the association between breast-feeding and reduced overweight and obesity (Butte 2001: 196; Gillman 2002: 749–750; Grummer-Strawn and Mei 2004: e85; Strauss 2003: 210; Taveras et al. 2004: 582).

The NBAC also suggested that formula-fed babies could be at risk for slower cognitive development and lower IQ. Yet two separate review articles (Drane and Logemann 2000; Jain, Concato, and Leventhal 2002) argued that few of the existing investigations satisfied basic methodologi-

10. This might explain why von Kries et al. (1999) found that full-fat milk products, sweet desserts, butter, and breakfast cereals were consumed less frequently by overweight children. The authors suggest that this surprising association "reflects avoidance of these products by children who are overweight" (149), although it as at least equally plausible that the questionnaires did not accurately reflect consumption.

cal standards and that the impact of breast-feeding on intelligence had yet to be determined. The latter, published in the AAP's journal *Pediatrics*, concluded that "no convincing evidence exists regarding the comparative effects of breast-feeding and artificial feeding on intelligence" (1052). As critics of one investigation noted, research on breast-feeding and IQ confronts a "lengthy and probably impossible to complete" list of confounding variables, including "the possibility that mothers who breastfeed may also promote academic success in other ways" (Krugman et al. 1999: 193). In a *JAMA* article finding "a significant positive association between duration of breastfeeding and intelligence," the authors state clearly that "behavior predicts behavior, and even within each different social class and educational level, it may be that mothers who spend more time breastfeeding during the first year of life also spend more time later interacting with the child" (Mortensen et al. 2002: 2371). If this were the case, any increase in intelligence among breast-fed babies would be attributable not to breast milk but to behavior linked with breast-feeding, and bottle-fed children with attentive mothers and/or fathers would be equally likely to have higher scores on intelligence tests. A study that controlled for maternal IQ and parenting skills, in fact, concluded that "the observed advantage of breastfeeding on IQ is related to genetic and socioenvironmental factors rather than to the nutritional benefits of breastfeeding on neurodevelopment" (Jacobson, Chiodo, and Jacobson 1999: e71).

The NBAC's claim that breast-feeding reduces ear infections is also weakly supported. Of particular note in this respect is the "Clinical Practice Guideline: Diagnosis and Management of Acute Otitis Media" (AAP and American Academy of Family Physicians [AAFP] 2004: 1459), which mentions breast-feeding only once, saying "the implementation of breastfeeding for at least the first 6 months also seems to be helpful against the development of early episodes" of acute otitis media (AAP and AAFP 2004: 1459). It cites only two studies to support this recommendation: one, which concludes that "the protective effect of breast milk is, at best, limited" (Paradise et al. 1997: 329–330); and another, which states that "if breast-feeding reduces [otitis media] incidence and prevalence, several alternative explanations exist for its benefit" (Daly and Giebink 2000: S33). Supine feeding position, a commonly indicated rival hypothesis, was examined in only one of the investigations cited by the NBAC (Owen et al. 1993), which found that it was associated with fluid in the middle ear, or otitis media with effusion.

The links between breast-feeding and reduced risk for various other illnesses are also problematic. Review articles argue that studies of insulin-

dependent diabetes have neglected confounding factors, produced "little firm evidence of the significance of nutritional factors in the etiology of type 1 diabetes" (Virtanen and Knip 2003: 1053), and appear to be vulnerable to bias (Norris and Scott 1996). One frequently cited investigation that found exclusive breast-feeding for the first two months of life to be linked to a significantly lower rate of type 2 diabetes failed to point out that the decision to bottle-feed was also correlated with less exercise and more central obesity, both independent risk factors for the disease (Pettitt et al. 1997; Simmons 1997). Studies on respiratory infections, including those cited by the NBAC, inconsistently consider the effects of siblings and child care and often contradict each other on the impact (e.g., lower- or upper-respiratory tract infections) and duration of breast-feeding's advantages (Bachrach, Schwarz, and Bachrach 2003; Beaudry, Dufour, and Marcoux 1995; Cushing et al. 1998; Howie et al. 1990; Nafsted et al. 1996; Oddy et al. 2003b; Sinha et al. 2003). A much-discussed and relatively carefully controlled study found no significant reduction in respiratory tract infection among babies likely to have breast-fed longer and more exclusively (Kramer et al. 2001). A review that specifically examined environmental and demographic risk factors for respiratory syncytial virus (RSV), the most common cause of lower-respiratory tract infections in infants and children, found that breast-feeding did not in itself appear to decrease the risk of infection. In fact, the author suggested that if studies linking breast-feeding and lower incidence of respiratory disease applied rigorous methodological standards, including systematic multivariate analyses, breast-feeding itself would likely not be a protective factor (Simoes 2003), a conclusion that echoed earlier research (Holberg et al. 1991).[11]

11. Behavior is the most significant confounder for which infant-feeding studies have not accounted. It is difficult to operationalize, especially when the period between exposure and outcome is long, and is often dismissed after being reduced to largely invalid criteria. For example, while multiple studies indicate that women with higher education and income are more likely to breast-feed (e.g., Ahluwalia et al. 2003; Forste, Weiss, and Lippincott 2001; Li et al. 2002; Porter 2003; Ryan, Wenjun, and Acosta 2002), it does not follow that controlling for education and income eliminates behavioral and environmental influences. One study that controlled for maternal education concluded that "in addition to having more illnesses, formula-fed infants cost the health care system money," around $400 per baby (Ball and Wright 1999: 870). A reader would likely associate formula with increased health care costs. Yet in another study, low-income women who chose to breast-feed were more than twice as likely as their formula-feeding counterparts to cite its benefits to babies' physical and psychological development as having contributed to their feeding decision; they were over five times more likely to say it mattered "a lot" (Guttman and Zimmerman 2000: 1462). A reasonable hypothesis is that women who breast-feed because of its ostensible health advantages, regardless of their income or education level, are more likely than women who choose formula to promote healthy living in other ways. The power of breast-feeding, in this case, would rest not in its

Breast-feeding research, in which the results are inconsistent and fail to account for identifiable confounding variables, provided a shaky foundation for the NBAC and reveals the inevitable uncertainty involved in evaluating evidence for public health. As Alfred Sommer (2001: S5), former dean of the Johns Hopkins Bloomberg School of Public Health, lamented, epidemiologists "readily accept the fact that observational studies are inherently less conclusive than randomized trials, but to what degree? All else being equal, do 10 observational studies equal one controlled trial? . . . How many, and of what kind, do we require for conclusive evidence? What are our 'stopping rules'?" Epidemiologists generally concur that compelling policy initiatives must be based on research demonstrating causal links that are strong, consistent, and highly plausible. Opinion varies about what precisely constitutes a "strong" association, but in a much talked-about article in *Science*, several prominent scholars indicated they would be concerned about residual confounding in any study producing a risk ratio under 3 (Taubes 1995: 168). Research finding breast-feeding to be protective, including the studies the OWH lists as NBAC references, almost always calculates relative risks of well under 2.[12] In studies like these, in which the correlations are slight, "positive confounding or bias of a small magnitude may easily result in an observed weak association" that does not reflect the true level of effect (Szklo 2001: S13). The question, then, is at what point "a reported trivial increase in risk ratio, even if statistically significant, becomes a biologically important risk which merits public concern" (Gordis 1991: 10S).

To ascertain the real significance of correlations that are not powerful, epidemiologists employ various strategies. If they can reasonably rule out confounding — and in infant-feeding studies, they have not — they look for consistency, and advocates are able to point to a substantial body of research suggesting advantages to breast-feeding. However, while it may be true that a large number of studies have found a link between breast-feeding and better health, many have not. What is more, epidemiologist David Sackett has argued, "bias times 12 is still bias" (Taubes 1995: 169); confounding itself can be consistent, and if, as is true in breast-feeding research, positive studies have similar design flaws or unexamined confounders, consistency is not a useful measure of reliability.

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intrinsic qualities but in its indication of parental behavior that is itself predictive of healthier outcomes. Costs to the health care system would be alleviated not by increased breast-feeding but by healthier lifestyles.

12. For a list of studies cited as the "Science Behind the Campaign," see www.4women.gov/Breastfeeding/index.cfm?page=ref (accessed February 1, 2007).

A similar problem exists with meta-analysis, a statistical method of aggregating independent studies that is often employed to assess repeated small effects. An assessment of multiple breast-feeding investigations that do not sufficiently consider confounding will not be any more reliable than the original studies themselves, and a meta-analysis that found breast-feeding to be associated with higher cognitive development (Anderson, Johnstone, and Remley 1999) was discounted precisely for relying on methodologically flawed studies (Gordon 2000; Jain, Concato, and Leventhal 2002).

Consistency of result, furthermore, does not take into account prepublication bias. Several studies (Skrabanek 1993; Szklo 1991; Koren et al. 1989) indicate that scientists believe journals, scientific societies, and funding agencies are prejudiced against null hypotheses, especially when an association is taken for granted. They therefore often cling to negligible risks, seize on small positive aspects of studies that are essentially negative, or might not submit negative findings (Taubes 1995: 169). While no analysis has been published regarding null results and the advantages attributed to breast-feeding, belief in its superiority is so widespread that any bias, real or imagined, might result in both the publication of fewer negative studies and an association that appeared to be more consistent than it truly is.

Scientists also look for plausibility that a weak correlation is causal—that is, explanations for how the factor under examination could biologically affect an outcome. In breast-feeding studies, however, plausibility is frequently not discussed (e.g., Bachrach, Schwarz, and Bachrach 2003; Cushing et al. 1998; Scariati, Grummer-Strawn, and Fein 1997), minimally addressed (e.g., Shu et al. 1999: 1770), or followed by the caveat that more research is needed to confirm the absence of confounding (e.g., Chen and Rogan 2004: e438; Duffy et al. 1997: e7; Sinha et al. 2003: e307). Sometimes, in considering plausibility, authors acknowledge that unaccounted for behavioral differences could explain breast-feeding's protective effect (Bergmann et al. 2003: 169–170; Gillman 2002: 749–750; Grummer-Strawn and Mei 2004: e85; Lucas et al. 1992: 264; Mortensen et al. 2002: 2371). In other cases, plausibility is not related to breast-feeding but to behavior—such as offering more frequent small feedings (Singhal et al. 2004) or allowing for babies' self-regulation of intake (Taveras et al. 2004)—that could be adopted by bottle-feeding mothers. Breast-feeding's advantages are most plausible in reducing gastrointestinal infection (Kramer et al. 2001). Research has shown how antimicrobial proteins in mothers' milk, specifically secretory IgA and lactoferrin, act as protective agents in the gut (Wold and Adlerberth 2000; Kelleher and Lon-

nerdal 2001). Yet gastrointestinal illness is a relatively minor problem in the United States and would not in itself serve as the basis for an ethical campaign to promote breast-feeding.

The Department of Health and Human Services did convene a panel of experts to evaluate the medical evidence for the NBAC, but these scientists were constrained by what can be termed the "expert paradox": precisely what qualifies certain individuals to serve as advisers can also prevent them from objectively assessing the literature. According to Suzanne Haynes of the OWH (telephone interview, February 2, 2005), at least four of the six reviewers were either members of or government liaisons to the USBC, whose mission is "to improve the Nation's health by working collaboratively to protect, promote, and support breastfeeding" (USBC n.d.).[13] Their commitment to breast-feeding made them strong choices for the NBAC, but it is also likely to have impaired their ability to assess either the studies' systematic weaknesses or the judiciousness of a public health campaign to promote breast-feeding. When epidemiologists and public health professionals address partiality or conflict of interest, they are largely concerned with researchers' ties to vested-interest groups, such as drug companies or employers, who favor certain results over others. However, they also stress that "all judgments are value driven in the sense that it is necessary to select from a myriad of detail in order to report what is important" (Beauchamp et al. 1991: 165S) and that "partiality can arise through a scientist's own biases and preconceived notions about a problem being investigated" (American College of Epidemiology 2000: 19). For this reason, the HHS's selection of advisers, who shared the same general orientation toward breast-feeding research, was unlikely to yield a critical or balanced interpretation of the literature. Had the panel included experts on obesity, ear infections, or diabetes — scientists invested not in breast-feeding but in the conditions for which breast-feeding is supposed to reduce risk — HHS might have received different recommendations.

13. The names of the first-tier reviewers are confidential, but according to Suzanne Haynes, members included "a top breastfeeding researcher from the CDC (Centers for Disease Control)," "a well-known OB-GYN researcher suggested by ACOG (American College of Obstetricians and Gynecologists)," "a well-known pediatrician researcher active in the AAP," "a well-known pediatric educator," "a respected breastfeeding researcher unrelated to any organization," and "a representative from the OWH." They were selected based on their scientific publications in the area and their membership in the USBC, with "scientific expertise" being the primary criterion. Second-tier reviewers were Duane Alexander, director of the National Institute of Child Health and Human Development; Allen Spiegel, director of the National Institute of Diabetes and Digestive and Kidney Disease; and William Dietz, director of the CDC's Division of Nutrition and Physical Activity. According to Haynes, the second tier served largely as a final check for the first (telephone interview, February 2, 2005).

Finally, the first tenet of the APHA Code of Ethics states that "public health should address principally the fundamental causes of disease and requirements for health" and explains that "this Principle gives priority not only to prevention of disease or promotion of health, but also at the most fundamental levels" (Public Health Leadership Society 2002). Drunk driving and smoking are underlying causes of traffic fatalities and lung cancer, and public health campaigns to reduce them would seem in keeping with the standard set by the APHA. But the evidence for breast-feeding is not nearly as powerful. Even if breast-feeding research were unassailable—if the studies were meticulously designed and carried out, confounding convincingly eliminated, and plausibility established—the associations would still not be strong enough to make the case that not breast-feeding is a *fundamental* cause of the health problems cited by the NBAC. By most measures, in fact, the campaign did not meet the evidentiary standards for ethical public health practice set by multiple institutions.

Message Framing: Risk and the Uses of Fear

The controversy surrounding the breast-feeding campaign, however, did not concern weaknesses in the scientific evidence as such.[14] Unlike debates about obesity, in which critics have challenged the claim that being overweight is itself a risk factor for illness and disease (Blair and Lamonte 2006; Campos et al. 2006a, 2006b; Oliver 2006; Saguy and Riley 2005), the NBAC conflict developed largely around the valence, or framing, of what all involved agreed was the worthy goal of increasing breast-feeding rates.[15] In urging a more "positive" campaign, lobbyist Yeutter emphasized to HHS secretary Thompson that the formula industry did not dispute breast-feeding's superiority:

14. This article is part of a larger project on science, risk, and motherhood. One of the many issues I address is the diffusion of knowledge about breast-feeding, or how so many doctors and scientists have come to be persuaded of breast-feeding's superiority despite serious weaknesses in the research.

15. According to the most recent statistics, derived from the 2002 National Immunization Survey, 68 percent of babies are breast-fed to any extent at one week; at three, six, and twelve months, the number drops to 51 percent, 35 percent, and 16 percent, respectively. Sixty-three percent of babies are exclusively breast-fed at one week; at one, three, and six months, the number drops to 57 percent, 42 percent, and 13 percent, respectively. Among African Americans, 49 percent are breast-fed to any extent at one week; at three, six, and twelve months, the number drops to 35 percent, 20 percent, and 8 percent, respectively. Forty-six percent of African American babies are exclusively breast-fed at one week; at one, three, and six months, the number drops to 39 percent, 29 percent, and 5 percent, respectively (Li et al. 2005: e33–e34). Percentages are rounded to closest whole number.

> We all agree that breast feeding has advantages over any of the alternatives, and you'll hear no objections from us if HHS delivers that message regularly and with enthusiasm. Our objection is to the contemplated visuals, featuring pregnant women riding a mechanical bull or engaging in log rolling. Those are catchy images, which obviously is what the advertising experts had in mind. But they are grossly misleading, and no department of our government should purposefully convey misleading information to the American public. (ABC News, *20/20*, 2004)

The "catchy images" resulted from extensive consumer research. After announcing its cosponsorship of the NBAC in summer 2002, the Ad Council contracted with McKinney+Silver, an advertising agency, which then conducted research with thirty-six focus groups and determined that "many think breastfeeding is like supplementing a 'standard diet' with more vitamins. Formula, by default, is credited with the status of being the 'standard.' " Most people, the focus groups indicated, were informed about the putative benefits of breast-feeding but did not perceive any disadvantage to choosing formula. The campaign strategy, therefore, would be one of "conversion," of suggesting not only that breast-fed babies were healthier but also that formula-fed babies were more likely to suffer from a variety of health problems, some of them serious. The idea, in other words, was not to persuade people that breast-feeding was better; most already believed that. The task was to convey that not breast-feeding was risky (McKinney+Silver n.d.).[16]

Architects of the NBAC were not the first to determine that an anxiety-provoking message might persuade an otherwise complacent group of people. Antitobacco messages frequently stress the health risks associated with smoking, and advertisements sponsored by the Partnership for a Drug-Free America — in the most notorious, an egg is cracked into a greasy frying pan while a voice intones, "This is your brain. This is your brain on drugs. Any questions?" — are deliberately designed to provoke discomfort (Buchanan and Wallack 1998). The NBAC's risk-based ads situated the campaign in the broad category of public health communication known as "fear appeals," messages that try to create negative emotion in order to persuade people determined to be "at risk" to adopt a recom-

16. This account is taken from McKinney+Silver's presentation to the Breastfeeding Task Force of Greater Los Angeles, one of eighteen community-based demonstration projects slated to work in coordination with the OWH and the Ad Council to promote breast-feeding at the local level.

mended behavior.[17] These ads, commonly referred to as "loss frames," have always been controversial. While some have suggested that it is unethical to wittingly provoke fear in a targeted population (Guttman and Salmon 2004; Hastings, Stead, and Webb 2004; Hyman and Tansey 1990), others argue that fear can be an appropriate tool as long as the audience is offered viable behaviors by which risks can be reduced (Benet, Pitts, and LaTour 1993; Duke et al. 1993; Maciejewski 2004; Snipes, LaTour, and Bliss 1999; Witte and Allen 2000). What remains largely unexplored are the ideological and cultural roots and consequences of appeals to anxiety, or the mechanisms by which fear operates at the "folk" level. If message frames "enable people to evaluate, convey, and interpret information based on shared conceptual constructs" (Wicks 2005: 339), what were the tropes that shaped the NBAC's fear approach? And why was it likely to resonate?

The message of the breast-feeding campaign—"You'd never take risks before your baby is born. Why start after?"—reflected the *weltanschauung* of risk that has come to animate American society. Myriad scholars have written about a multidimensional "risk society" (e.g., Beck 1992, 1998), a modern culture characterized by pervasive anxiety about and efforts to "colonize" the future (Giddens 1991). Here, events that have not transpired shape how people behave, "so risks are a kind of virtual, yet real, reality" (Beck 1998: 11). Expertise and information are the currency: assessing danger is primarily the task of scientists, and risk society is marked by the pervasiveness of scientific authority and an endless production of data that either support or revise existing risk determinations. Indeed, fixation on an inaccessible future and the ongoing manufacture of information aimed at controlling it create the sense that all risk can be prevented with proper calculation. Secondhand smoke and pesticides, *Escherichia coli* and genetically engineered food, identity theft and abducted children—everyday people are bombarded with advice about how to reduce their risk of everything from cancer to kidnapping. A "culture of fear" (Glassner 1999) develops in which trepidation is the basis for rational action (Ericson and Haggerty 1997: 86), "the unspoken but critical subtext of our social normality" (Maguire 1996: 172).

In a risk society, "the public appetite for health information seems insatiable" (Steinbrook 2000: 1668). The demand for recommendations about

17. Whether and under what circumstances fear appeals actually work remains in dispute. See Becker (1993); Hastings, Stead, and Webb (2004); Hastings and MacFadyen (2002); Keller (1999); Witte and Allen (2000).

diet and lifestyle is especially acute, despite the fact that many, if not most, changes in these areas "will produce only small effects. And the effects might not be consistent" from one person to the next (Angell and Kassirer 1994: 190). Society is also confronted by a "paradox of proportion": now that many major health challenges, such as infectious diseases (AIDS notwithstanding), have been largely controlled, "the bar has been lowered and the elimination of increasingly smaller health risks takes on proportionally larger significance" (Best 2001: 4). Disease and even death seem more avoidable because their causes increasingly can be identified and circumvented. This sense of control means that poor health no longer has to do with luck or chance but is the personal responsibility of each individual to avoid (Beck-Gernsheim 2000; Petersen and Lupton 1996: 49). Fear and risk converge on the body, lifestyle decisions reflect either conscious or unconscious risk calculations, and good health becomes an indicator of discipline, self-control, and wise choices. As Ralph Nader cautioned (in a televised report entitled "Are We Scaring Ourselves to Death?"), "life is preparedness" (Stossel 1996).

Risk, however, is grossly misunderstood. Research suggests that cognitive limitations, skewed media coverage, and misconstrued personal experience distort the process of risk calculation, even among the well informed, and that "people systematically violate the principles of rational decision-making when judging probabilities, making predictions or otherwise attempting to cope with probabilistic tasks" (Slovic 2000: 36, 152–153). Accurate risk assessment is even less likely to occur in situations in which the stakes are high. When strong emotions, such as fear, are involved, "people tend to focus on the adverse outcome, not on its likelihood. They are not closely attuned to the probability that harm will occur. They emphasize worst-case scenarios" (Sunstein 2005: 64–65), as in the common fear that any exposure to a carcinogen is likely to lead to cancer (Kunreuther and Slovic 2001: 338). People also embrace a certain version of the precautionary principle: "Avoid steps that will create a risk of harm. Until safety is established, be cautious; do not require unambiguous evidence. In a catchphrase: Better safe than sorry" (Sunstein 2005: 13). This principle masks the reality that risks are unavoidable, that ostensibly risk-averse behavior creates new risks in other contexts, and that any decision has multiple and lasting effects that determine the range of options in the future. Rather than determining hazard or safety, in other words, risk calculations are evaluations of trade-offs or choices between imperfect options.

Directed at pregnant women, for whom "risk" is weighted with particu-

lar emotional freight, the NBAC capitalized on public misapprehension of risk. Even if infant-feeding studies were more compelling, for example, the campaign drew dubious risk analogies. In the television spots, logrolling or riding a mechanical bull pregnant and not breast-feeding were portrayed as comparably dangerous acts or threats to a baby's safety. Many of the campaign's most outspoken proponents, including USBC chair Amy Spangler, likened bottle-feeding to tobacco use: "[W]e don't hesitate to tell parents what smoking does to themselves and their children," she said. "Why should we not tell people the consequences of not breast-feeding?" (Fisher 2003). Commenting on the NBAC, a pediatrician on ABC's *20/20* also contended that not breast-feeding and smoking carried similar risks (Ross 2004). Yet this kind of reasoning is specious. All risk is not the same, and even if breast-feeding research were methodologically sound, the risks of formula-feeding would be infinitesimal compared to those for smoking. The NBAC, furthermore, neglected to mention that breast-feeding carries its own risks. Numerous studies have revealed the presence and potential negative effects of chemical contaminants in breast milk (Landrigan et al. 2002; Nickerson 2006; Solomon and Weiss 2002). Despite the fact that most lactating mothers have detectable levels of these environmental agents in their milk, current risk assessments do not take them into account (Landrigan et al. 2002: A314). Extensive research, moreover, indicates that babies are at risk for a variety of developmental and health disorders in homes where mothers are psychologically depressed or impoverished.[18] For women who find the demands of breast-feeding overwhelming or who cannot reconcile breast-feeding with employment, bottle-feeding might constitute the less risky option. What the NBAC offered, however, was a Hobson's choice: babies could be either safely breast-fed or riskily formula fed.

Conversations among practitioners and ethical codes established by epidemiologists virtually always stipulate that great care should be taken to present research results honestly and without distortion. This is part of the "implicit contract between epidemiologists and the members of society" (Beauchamp et al. 1991: 163S). According to the Ethics Guidelines of the American College of Epidemiology (ACE), for example, "epidemiologists should strive to ensure that, at a minimum, research findings are interpreted and reported on accurately and appropriately . . . The significance

18. See, for example, Beck (1999); Duncan and Brooks-Gunn (1997); Leschied et al. (2005); Martins and Gaffan (2000); National Institute of Child Health and Human Development (2004, 1999, 1997a, 1997b); Petterson and Albers (2001).

of the findings should neither be understated nor overstated. Epidemiologists should put the strengths and limitations of their research methods into proper perspective" (ACE 2000: 21–22). For researchers, this might mean foregrounding caveats that are normally found in the last paragraphs of published studies. For public health practitioners, it might require that campaign messages be carefully balanced and that those designed to scare people be limited to interventions for which the evidence is strong and the negative outcome serious and likely, conditions that do not obtain in not breast-feeding. Once the NBAC framed infant feeding as a matter of sickness versus health or danger versus safety, it was practically impossible to portray not breast-feeding as risky *and* to present the nuances of research findings. Whereas in ethical public health practice a campaign is designed to represent the research, the message subordinated the science in the NBAC.

Cultural Sensitivity: Total Motherhood, Race, and Class

Risks are always political (Douglas 1992: 44) and "open to infinite social constructions" (Ericson and Haggerty 1997: 101), and which risks are salient at any given moment depends on their resonance in other cultural registers. In the NBAC, the risks attributed to not breast-feeding took on meaning as part of an ethic of total motherhood. Also referred to as "the new momism" (Douglas and Michaels 2004) and "intensive mothering" (Hays 1996), total motherhood obligates mothers to be experts in everything their children might encounter, to become lay pediatricians, psychologists, consumer products–safety inspectors, toxicologists, educators, and more (Douglas and Michaels 2004: 6). Mothers are expected not only to protect their children from immediate threats but also to predict and prevent any circumstance that might interfere with putatively normal development (Jackson and Scott 1999: 89). Total motherhood is a moral code in which mothers are exhorted to optimize every dimension of children's lives, beginning with the womb, and its practice is frequently cast as a trade-off between what mothers might like and what babies and children must have. When mothers have *wants*, such as a sense of bodily, emotional, and psychological autonomy, but children have *needs*, such as an environment in which anything less than optimal is framed as perilous, good mothering is construed as behavior that reduces even minuscule or poorly understood risks to offspring, regardless of potential cost to the mother. Total motherhood manifests what Barbara Rothman (1994: 149)

has called "the commodification of children and the proletarianization of motherhood," in which mothers, "rather like South African diamond miners, are the cheap, expendable, not-too-trustworthy labor necessary to produce the precious products."

Pregnancy literally embodies the essence of total motherhood in a risk society. As Lupton (1999b: 82) writes, "More so than ever in the past pregnancy is portrayed as a series of events that are located within a sphere of rationalist control. Producing a 'perfect' infant is seen to be at least partly a result of the woman's ability to exert control over the body, to seek and subscribe to expert advice and engage in self-sacrifice for the sake of her fetus." Today, in fact, it is the fetus, not the mother, that is at the center of a discourse that pivots on risk control or on regulating maternal behavior to minimize risk. The immensely popular *What to Expect When You're Expecting* (Eisenberg, Murkoff, and Hathaway 1996: 76), which has sold over twelve million copies, situates pregnancy in a risk society: "During pregnancy you will be challenged to make intelligent decisions in dozens of situations, weighing risk against benefit," the authors caution pregnant women in a section entitled "Playing Baby Roulette." Although a few missteps are unlikely to cause serious harm, "almost every decision you make will impact on your chance of having a healthy baby" (79). The book offers general lifestyle advice, including exercise and diet recommendations, designed to assist women from prepregnancy through childbirth. Regarding their "best-odds diet," the authors advise: "Every bite counts. You've got only nine months of meals and snacks with which to give your baby the best possible start in life. Make every one of them count. Before you close your mouth on a forkful of food, consider, 'Is this the best bite I can give my baby?' If it will benefit your baby, chew away. If it'll only benefit your sweet tooth or appease your appetite, put your fork down" (81). Additional recommendations include breathing cleaner air by avoiding waiting in line for gas and adding green plants to homes (71–72), checking microwaves for leaks (65), and eschewing hair dyes and permanents (even though "the risk is only theoretical" [156]).

But it is the rise of a "fetal rights" discourse that perhaps has gone the farthest in embracing total motherhood, suggesting not only that "the womb is the most dangerous place a child will ever inhabit" (Pollitt 1998: 287) but also that fetuses "must be protected from their own mothers" (Tsing 1990: 282). From the prosecution of women for drug use during pregnancy to the highly racialized and much-publicized "crack baby" epidemic — which, researchers now have demonstrated, dramatically exaggerated the number of babies possibly affected and the teratogenicity of cocaine itself

(Daniels 1997; Koren et al. 1989; Roberts 1997: 154–159)—media panics have concretized an image of the fetus as imperiled by its mother. Pregnant women who drink alcohol are held in particular contempt, though only about five percent of women who drink *heavily* give birth to babies affected by fetal alcohol syndrome, and "there is no consistent, reliable evidence . . . to indicate that alcohol categorically affects fetal development regardless of level of exposure or timing of exposure, or absent other factors," including smoking, poverty, and malnutrition (Armstrong 2003: 4, 6). Meanwhile, critical links between fathers and fetuses are either ignored or dismissed (Daniels 1997). It is the pregnant woman who is "positioned in a web of surveillance, monitoring, measurement and expert advice that requires constant work on her part: seeking out knowledge about risks to her fetus, acting according to that knowledge" (Lupton 1999c: 89–90).

Breast-feeding is an integral part of the total motherhood discourse. Dubbed "America's pediatrician" and credited with coining the term "attachment parenting"—which promotes mothers' constant physical and emotional attachment to their babies—Dr. William Sears is perhaps the country's best-known breast-feeding advocate. Virtually all of his advice to women takes as its point of departure babies' needs and the necessity of breast-feeding, and mothers' well-being is addressed largely through these demands. In his discussion of postpartum depression in *The Breastfeeding Book* (Sears and Sears 2000: 224–226), for example, he cautions that independence is not good for mothers: "As you build your relationship with your baby, think of the two of you as *interdependent*. Each needs the other, and each has something to give to the other" (225). "Respect your need to nest and nurse" (224), he tells struggling women. "Do something every day just for yourself," but "choose something that does not require separation from your baby" (225). Self-help measures for maternal depression are best for babies, and they require self-discipline, "but your desire to continue breast-feeding will be a powerful motivation" (226). On his Web site (Sears et al. 2006), depression is addressed only as it affects breast milk, in a discussion of antidepressants under the heading "Taking Medication while Breastfeeding." And, on the site and in the text, women's needs are discussed only as they bolster his case for breast-feeding. "Abrupt weaning can make depression worse," he admonishes. "Women who must wean quickly may feel devastated and may grieve for the end of their breast-feeding relationship with their baby. This feeling is more intense than when weaning was not the mother's choice" (Sears and Sears 2000: 226). Sears contends that breast-feeding is better for a baby's

brain, eyes, ears, mouth, throat, kidneys, appendix, urinary tract, joints and muscles, skin, growth, and bowels as well as its respiratory, heart, circulatory, digestive, immune, and endocrine system. The benefits he attributes to breast-feeding are both more extensive and less scientifically defensible than those of the NBAC. "You are doing the most important job in the world," he tells mothers. "Nothing matters more than this" (224).

The discursive parameters of the NBAC reflect the role that breast-feeding plays in the ideology of total motherhood. In the Ad Council's news release announcing its partnership in the NBAC, Suzanne Haynes of the OWH is quoted as saying, "I can't think of any campaign that will improve the health of children more than the National Breastfeeding Awareness Campaign" (Ad Council 2002). Given the repeated correlation of poor child health with inadequate prenatal care, poverty, and lack of health insurance,[19] the notion that increasing breast-feeding rates would most improve children's health appears at least slightly overwrought. In addition, the campaign constructed a moral matrix in which mothers who do not breast-feed are positioned as the equivalent of pregnant women who engage in capricious recreation. Only a woman callous enough to compete in a logrolling competition when pregnant would feed formula to her baby, and bottle-feeders are like pregnant women who ride bulls (and presumably drink alcohol) in bars: they knowingly and needlessly put their babies at risk. The incongruity the ads depicted lent them a decidedly comic edge; expectant mothers participating in extreme sports is absurd behavior, and so, by implication, is formula feeding. Although the effects of deploying humor in anxiety frames have not been extensively explored, Hyman and Tansey (1990) have contended that the practice is unethical if it is based on a clever twist likely to trigger fear. Nonetheless, if the risk analogy in the ads seems morally suspect, the ethic of total mothering makes it sensible. While the exaggeration is recognizable, the underlying message—that mothers protect their children from any conceivable risk—is sound. The NBAC fused widespread anxiety about risk and an ethos of total motherhood, with the result that the responsibility to protect babies from the dangers associated with bottle-feeding became something of a moral absolute.

In the campaign, as in total motherhood, women *as individuals* were absent or present only as mothers who serve as vectors of risk for their babies. While the radio ads featured sons waxing sentimental about their

19. See, for example, Herbst et al. (2003); Malat, Oh, and Hamilton (2005); Shi and Stevens (2005); Spencer (2003); Wood (2003).

mothers ("when it comes to disease resistance, that woman could breast-feed like nobody's business") and men educating their partners about the benefits of breast-feeding ("Oooh, hello special lady. It's time for a one-on-one conversation . . . 'bout . . . recent scientific studies on lactation"), women's voices were conspicuously lacking. And while some women have written appreciatively about their breast-feeding experiences (Behrmann 2005; Granju 1999), others describe it as physically and emotionally overwhelming; as difficult to integrate with employment; as "mindblowingly tedious," "a devouring," and "a tactile overload" (Maushart 1999: 150, 161); and as feeling "unnatural" and like a violation of their privacy (Blum 1999; Carter 1995). Yet once breast-feeding became the object of a health campaign, the attention to the "competing needs" (Public Health Leadership Society 2002) of different communities advocated in discussions of public health ethics became secondary to the goal of promotion, and women's needs independent of their responsibilities as mothers receded. Nowhere was this more clear than in the campaign's exclusive emphasis on babies, in its choice *not* to address breast-feeding's putative health advantages for mothers, a discussion that likely would have made its case more persuasive. The NBAC, as Law (2000: 421) writes about breast-feeding promotion in general, was grounded in a notion of women and children as a single biological unit that precludes the possibility of distinguishing mothers' from babies' needs. Whereas some advocates contend that breast-feeding should be regarded as the final stage of reproduction, in which mother and baby are inextricably bound (e.g., Hausman 2003), others suggest that this vision of attachment, which continues metaphorically throughout motherhood, is tantamount to new mothers' "social exile" and is likely to lead to "breakdown pathologies" (Büskens 2001: 84). Law (2000: 423) argues that considering women's needs separately is a precondition for "fully deliberated, ethical, and responsible caregiving," a position more consistent with the principles articulated by public health practitioners.

In the NBAC, however, the reasons why women might choose not to breast-feed were understood as obstacles to be overcome rather than as considerations that might be weighed against the benefits attributed to breast-feeding. According to the Ad Council's "Breastfeeding Awareness" Web page, women "accept that breastfeeding is the 'best' option—and are generally aware of many specific advantages, but their fears and doubts about their ability and perceived inconvenience often outweigh for them what are perceived as the 'added benefits' of breastfeeding" (Ad Council n.d.). While promoting the campaign, Surgeon General Rich-

ard Carmona argued that "very few situations" should "prevent a mom from breastfeeding."[20] In the rhetoric of the NBAC, women's needs—to work, control their bodies, or sustain an identity independent of their children—become "weaknesses in individual maternal character, to be corrected through educational messages" (Kukla 2006: 175). This kind of reasoning, which implies that either ignorance, cowardice, or selfishness is behind a mother's decision not to do what is best for her baby, rests firmly on assumptions about total motherhood in a risk society. Once the focus groups made clear that presenting breast-feeding as advantageous was unlikely to have much of an impact, women themselves became the obstacles to babies' good health. In that sense, the NBAC was not a matter of educating, supporting, or otherwise being sensitive to the concerns of women but rather an attempt to manufacture and exploit fear among pregnant women and new mothers.

When epidemiologists and public health practitioners discuss respecting cultural variations in values, they speak of "difficult choices" and "careful consideration" (International Epidemiological Association 1990: 50) and of the need to appreciate "cultural diversity" (ACE 2000: 10). Yet in specifically targeting African American women, whose breast-feeding rates are well below those of white and Hispanic women, what the campaign demonstrated was less sensitivity than a tactical cultural awareness. Eighteen of McKinney+Silver's thirty-six focus groups were conducted with black women. The NBAC also sent breast-feeding materials with images of African Americans to local WIC offices, which provide low-income women and infants with nutritional counseling and supplementation. These posters and pamphlets included photos of supportive fathers, whom campaign planners considered crucial to increasing breast-feeding among black women. The woman riding the mechanical bull was African American, and a radio spot was set to soul music. The sense, according to Haynes, was that these approaches would "produce responses" (telephone interview, February 2, 2005). But deploying black women and symbols likely to resonate with African Americans represents a use rather than an understanding of cultural particularity. It was the outcome of market research (focus groups) that sought to determine how best to sell a product (breast-feeding) more than an effort to understand the "diverse values,

20. In August 2005, to draw attention to National Breastfeeding Awareness Month, Richard Carmona gave interviews to twelve radio stations around the country. The texts are published at www.4woman.gov/breastfeeding/index.cfm?page=Interviews (accessed May 5, 2006). This quotation comes from the interview with WOR-AM in New York.

beliefs, and cultures in the community" (Public Health Leadership Society 2002).

Others have determined that breast-feeding has particular meaning for many black women. In interviews with black and white working-class mothers, for example, Blum (1999) found many shared attitudes toward breast-feeding and motherhood but also noted that the latter was conceptualized as more of a collective undertaking for African Americans. "Good mothering was not defined by exclusivity, by the mother's singular, irreplaceable presence, as it was for so many of the white mothers" (152), and breast-feeding was at odds with a notion of "kin-work" (Ludington-Hoe, McDonald, and Satyshur 2002: 58). African American women emphasized to Blum that bottle-feeding allowed older children to be involved, which brought the family closer. They stressed that it was more important to work to take care of their children than to be in an unsupportive marriage that might allow for a financial flexibility more conducive to breast-feeding. Their perspectives, moreover, were frequently "refracted through the distinct historical lens of slavery and race hatred, which casts particular meanings on women's bodies" (Blum 1999: 167). This lens reveals a landscape marked by forced wet-nursing of white women's children — often to the detriment of their own children — and charges of hypersexualization, animalism, and primitivism, a cultural legacy that makes the "naturalness" of breast-feeding reverberate in unappealing ways. Soul music and images of black women in campaign materials did not address these issues. As Mary Douglas (1992: 44) argued in her classic study, *Risk and Blame*, "risk analysis that only allows the cautious, risk-averse behavior to be rational is convicted of crippling cultural bias." Even if the risks associated with not breast-feeding were compellingly proved, in other words, it is not clear they would be strong enough to displace centuries of compounded cultural meaning.

Both total motherhood and the NBAC represent what Blum (1999: 63) has otherwise referred to as "a racialized class-enhancing project for white middle-class mothers." Because data consistently show that these women have markedly higher breast-feeding rates than African American and lower-income mothers, the campaign self-consciously targeted the latter. Yet despite the presence of black actors and black and country music in advertisements, as well as community demonstration projects in cities such as Birmingham, San Juan, Baltimore, and Knoxville, the message of the campaign remained decidedly white and middle class. Advice about how to combine breast-feeding with work, for example, consisted largely

of recommendations on how and when to use a breast pump and assumed an idyllic work environment. The OWH (2006) Web page suggests:

> Let your employer know that you are breastfeeding and explain that, when you're away from your baby, you will need to take breaks throughout the day to pump your milk to give to your baby at a later time. Ask where you can pump at work, and make sure it is a private, clean, quiet area. Also make sure you have somewhere to store the milk. Discuss how you plan to fit pumping into your workday. You can offer to work out a different schedule, such as coming in earlier or leaving a little later each day to make up for any lost work time, if this comes up as an issue. . . .
>
> If you are having problems getting your milk to "let-down" at the start of pumping, you may find it helpful to have a picture of your baby close-by . . . Try to clear your head of stressful thoughts. Use a comfortable chair or pillows. Once you begin expressing your milk, think about your baby.

Working-class mothers and particularly shift workers — waitresses, retail associates, and factory workers — generally do not have enough cultural capital or job security to call attention to special circumstances, such as the need for time, private and relaxing space, and proper storage. Nor do these women, at least some of whom might prefer breast-feeding as a less expensive option, enjoy the flexibility in their schedules for frequent pumping breaks. For many mothers, therefore, the NBAC did not make available a feasible strategy to alleviate the anxiety it deliberately provoked, a requirement for fear appeals to be ethical and effective (Benet, Pitts, and LaTour 1993; Duke et al. 1993; Maciejewski 2004; Snipes, LaTour, and Bliss 1999; Witte and Allen 2000). For working-class women, "who are regularly perceived as harming their children through a host of other 'bad choices,' " including "making their children obese by feeding them cheap food" (Kukla 2006: 173), the NBAC offered yet another opportunity to fail the total motherhood ideal.[21] As Carter (1995: 237) argues, "it is not simply a fact that breastfeeding is better for babies.

21. While middle-class women no doubt choose breast-feeding for many reasons, not the least of which is its ostensible risk-reducing qualities, it is also true that guilt associated with working and spending time away from their babies can be at least partially alleviated by buying a breast pump and sustaining the one practice only they can provide. In this way, breast-feeding makes adherence to the total motherhood ethic more attainable to middle-class working mothers.

Rather, this needs to be explored, evaluated and its meaning deconstructed in relation to particular contexts . . . [and] race, class and ethnicity are highly significant in doing this."

Conclusion

When the science supporting public health campaigns is assumed to be unequivocal, the result can be sensational messages that neglect basic ethical principles concerning evidence quality, message framing, and cultural sensitivity. The NBAC was based on research that is inconsistent, lacks strong associations, and does not account for plausible confounding variables. It capitalized on public misunderstanding of risk and risk assessment by portraying infant nutrition as a matter of danger versus safety and then creating spurious analogies. And it was insufficiently attentive to the psychological, socioeconomic, and political concerns of its intended audience: women whose reasons for choosing not to breast-feed do not appear to have been given real consideration and who were treated essentially as agents of risk for their babies; African American women, whose history and cultural location might offer compelling reasons to bottle-feed; and working-class women of all races, whose structural conditions are not conducive to the demands of breast-feeding. In the campaign, unfounded scientific certainty served as justification for conversion at all costs.

The NBAC is but one instance of how the misrepresentation of medical research can lead to exaggerated and potentially unethical claims in public health education. The ongoing campaign against America's "obesity epidemic," intended to persuade Americans to lose weight, is another. Oliver (2006: 23), for example, argues that "heavier people may have a higher mortality rate but this does not necessarily mean that it is their body fat that is killing them . . . it must be verified that the trait in question is the direct source of the problem and not simply a proxy for other causes." What is unclear in both obesity and infant-feeding research is whether the variable being measured, excess body fat or bottle-feeding, is itself the problem or is a stand-in for some other determinant. Oliver contends that body weight cannot be considered independent of diet, exercise, family history, and genetics; that no convincing theory explains *why* extra fat tissue causes heart disease, cancer, or other ailments; and that altering the metabolic processes behind the various maladies associated with obesity makes more scientific sense than targeting weight per se (8–9, 25–26). "There is little evidence that obesity itself is a primary *cause* of our health woes," and "telling most Americans they need to worry about their weight

is like telling someone dying of pneumonia that they need to worry about how much they are coughing; it conflates the real source of our health problems with a relatively benign symptom"(2). Much the same might be said about breast-feeding. Infant-feeding research often acknowledges but never eliminates the possibility that breast-feeding is an indication of parents' general commitment to well-being that in itself has little impact. No compelling evidence exists to explain *how* breast-feeding reduces risk for diabetes, obesity, or respiratory disease, so warning mothers that not breast-feeding creates health risks for their babies might be like telling them that not having family dinners puts their children's academic success at risk: it conflates a proxy with a cause.[22] Increasing breast-feeding rates, in other words, might have little to do with improving babies' health, and what Oliver argues about weight-loss promotion is true of the NBAC: "Public health officials and doctors need to stop making weight a barometer of health and issuing so many alarmist claims about the obesity epidemic" (12).

Public health campaigns are about advocacy and about changing behavior, and that is why it is crucial for the research on which they are based to be properly evaluated. Otherwise, as the science recedes from view, health officials can become "scientific partisans," often well-meaning advocates who dismiss or ridicule ideas that challenge what they believe to be incontrovertible fact (Ungar and Bray 2005: 8, 9). In matters of scientific partisanship, it is the self-evidence of the science that acts as the most powerful silencer of opposition, and conversation focuses on how, rather than whether, intervention should be carried out. Critics of obesity research and weight-loss advocacy, as well as scientists who question the hazards of secondhand smoke (Ungar and Bray 2005), have confronted this kind of partisanship. It was also prominent in the NBAC, a campaign in which controversy surrounded not whether breast-feeding is medically superior but whether and to what degree not breast-feeding should be portrayed as risky. In a risk society, in which salvation is "dethroned and replaced by

22. In examining existing survey data, Oliver (2006) found that the best predictor of obesity in middle- and high-school students (outside of genetics) was toothbrushing. "Now obviously," he writes, "the act of brushing one's teeth plays little direct role in a child's weight, but it is a good indicator of something else—in what type of household that child lives. Children who brush their teeth more often are more likely to come from homes where health and hygiene are a priority" (165). They are more likely to eat fresh fruits and vegetables, drink more milk instead of soda, and spend less time playing video games or watching television (165). As toothbrushing is to obesity, breast-feeding might well be to the various ailments associated with bottle-feeding: a sign of a much more comprehensive commitment to healthy living that is itself responsible for salutary outcomes. And while toothbrushing has been demonstrated to promote healthy teeth and gums, the independent effects of breast milk are largely unknown.

healing" (Beck-Gernsheim 1996: 141), breast-feeding, secondhand smoke, and obesity are also examples of how scientific partisanship serves not just public health but moral campaigns. Bottle-feeders, smokers, and people who are overweight are maligned for weakness, gluttony, and lack of self-discipline; for ignoring the imperative to take responsibility for their own health; and for preventing others from caring for themselves. Enormous upheaval in untold lives has resulted from science that is not nearly as settled as its champions suggest.

Total objectivity is impossible if only because all people, including scientists, are subject to the limits of human cognition. The same mental processes that enable researchers to see patterns can also prevent them from challenging connections that have come to seem obvious. Steps could be taken, nonetheless, to reduce the impact of this kind of cognitive bias in the evaluation of public health research. Perhaps most important, the constitution of review panels should be reconceptualized. When like-minded individuals deliberate, they usually arrive at a more radical version of their initial views. Through a process of group polarization, people surrounded by others who share their opinions are likely to become even more confident and to adopt more extreme positions (Sunstein 2005: 98–102). For this reason, a review panel entirely comprising advocates of the behavior whose effects are being evaluated, or the independent variable, is unlikely to be able to overcome this dynamic. One way to diminish group polarization would be to add experts who represent the dependent, or outcome, variable fields. A respected scientist in oncology or endocrinology, for example, could comment intelligently on the research concerning infant feeding and cancer or diabetes as well as on the merits of framing breast-feeding as risk-reducing behavior. A medical ethicist, someone who could help make ethical issues explicit and also assist in constructing a campaign message consistent with both the science and the particular concerns of the intended population, would be another potentially fruitful addition. *Ethical* manipulation might be genuinely possible only in such a deliberative context, one consciously designed to maximize diversity, uncertainty, and sensitivity.

Finally, public health must be an educative vocation. Gray and Ropeik (2002: 112) suggest that "most risk communication fails because it tells people only what the communicators want them to know, to get them to behave 'rationally'—that is, the way the communicator wants them to behave." They argue that "risk communication is more likely to succeed if it sets the more realistic goal of helping people understand the facts, in

ways that are relevant to their own lives, feelings, and values, so they are empowered to put the risk in perspective and make more informed choices" (112). Public health, from this perspective, should devote itself to providing accurate risk information about probabilities and trade-offs in order to enable informed decision making. Cole (1995: 81) argues that "nearly all public health issues can be explained satisfactorily to almost every adult," and the focus groups conducted by McKinney+Silver revealed that most women understand why breast-feeding is recommended. If, as Hastings and MacFadyen (2002: 74) have argued, "there is no ultimate deterrent . . . no mother of all health warnings," educating people about how to make informed decisions might be the only ethical mission for public health.

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